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Shopper Response to Front-of-Package Nutrition Labeling Programs: Potential Consumer and Retail Store Benefits

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Abstract

A myriad of front-of-package (FOP) nutrition labeling systems have been developed by both food retailers (e.g., Walmart, Safeway, Hannaford) and manufacturers (e.g., Kellogg's, General Mills) to help consumers identify more healthful options at the point-of-purchase. Given the uniqueness of these different approaches, two studies examine the effects of alternative FOP systems on shoppers' product evaluations, choices, and retailer evaluations. When a single food item is evaluated in isolation, both the reductive and evaluative systems had a positive effect on product evaluations. However, when several choice options are presented simultaneously in a realistic retail environment, the evaluative (reductive) system has a stronger (weaker) influence on product evaluation and choice. Results also show that FOP nutrition labeling systems have both direct and moderating effects on attitude toward the retailer and perceived retailer concern for shoppers. These retailer-related outcomes, in turn, mediate the effects of the labeling system on shoppers' intentions to patronize the retailer. Results suggest that FOP nutrition labeling may help retailers build a non-price competitive advantage.

Keywords: Front-of-package nutrition labeling; Consumer health; Obesity; Shopper marketing; Attribution theory; Food disclosures

Introduction

Shopper marketing is a popular and important phenomenon in today's retail environment. Whereas traditional *consumer* marketing focuses primarily on consumers and their consumption patterns, *shopper* marketing refers to those marketing activities that influence a shopper along the shopping cycle (Ailawadi et al. 2009; Shankar et al. 2011). This holistic marketing approach is rooted in the philosophy that opportunities exist in-store to turn shoppers into buyers, especially at the point of purchase, resulting in a "win-win-win" outcome for retailers, manufacturers, and consumers. Current estimates show that retailers and manufacturers spend $50–$60 billion annually on shopper marketing (GMA 2011), and expenditures on in-store advertising, design, and promotions are estimated to continue to grow over 20% annually (Knox 2009).

Shopper marketing is especially prevalent in the food industry. This may be attributable, in part, to the highly competitive nature of the business. Many retailers and manufacturers have long recognized the importance of being involved with health and wellness efforts, and have consequently implemented numerous shopper marketing initiatives that promote the health-related benefits of more nutritious foods at the point-of-purchase (Garry 2012). More specifically, one of the most popular ways to raise consumer awareness of the health benefits associated with the consumption of specific foods is through the use of front-of-package (FOP) nutrition labeling. This simplified in-store nutrition information movement has quickly gained momentum as a wave of unique, retailer-sponsored nutrition labeling systems such as Safeway's SimpleNutrition Benefit Tags, Hannaford's Guiding Stars, and Wegmans' Wellness Keys began to appear in supermarkets across the country. According to the Food Marketing Institute's 2011 "Food Retailing Industry Speaks" survey, nearly half (48.5%) of all surveyed retailers claimed to have some type of nutrition labeling program, twice the number in 2010. Another 15% state that there are in the process of implementing a labeling program (FMI 2011).

This proliferation of nutrition labeling systems has created an unprecedented diversity of health and nutrition icons, all

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competing for a space on packages and a share of shoppers' attention. However, given that FOP nutrition labeling is rarely consistent across retailers or manufacturers, identifying healthier food items at the shelf continues to be somewhat challenging for many consumers (Institute of Medicine (IOM) 2011). In fact, a recent survey reported that many consumers still believe it is harder to identify healthier products while shopping than to do their own taxes (International Food Information Council (IFIC) 2012). Thus, great opportunities exist for retailers to satisfy unmet consumer needs by implementing and refining in-store shopper marketing programs designed to assist consumers make more healthful purchase decisions. The preponderance of existing research on FOP nutrition labeling, though, has only focused on how it may influence consumers' *product* evaluations. To our knowledge, very little research has examined how these different labeling programs affect shoppers' evaluations of the participating *retailer.* As such, whether or not the implementation of a FOP nutrition labeling system can potentially benefit the retailer is uncertain.

Therefore, this research takes an integrated approach to the study of FOP nutrition labeling by considering its potential benefits for both the shopper and the retailer. The primary purpose of this research is to provide insight into how shopper marketing efforts associated with alternative FOP nutrition labeling systems affect consumers' evaluations, purchase intentions, and choices of foods that vary in terms of nutritional value, as well as consumers' evaluations of the retailer using the systems. This latter point is particularly important to retailers for two main reasons: (1) many retailers implement these types of labeling systems in order to differentiate themselves from their competitors on attributes other than price, and (2) such programs are only sustainable in the long term if they offer substantial benefits to *both* consumers and retailers (Shankar et al. 2011).

To explore these issues, two studies were conducted. In the first study, we compare how two commonly used FOP nutrition labeling systems influence evaluations of a single food item and affect shoppers' perceptions of the retailer. Study 2 examines how FOP nutrition labeling systems affect evaluations in a realistic retail setting in which multiple items are offered within a given product category. We draw from both attribution and comparative/non-comparative processing theories for predictions, and extend the findings from Study 1 to a broader domain of specific retailer-related outcomes in Study 2.

Conceptual development and hypotheses

Today, approximately 1 out of every 3 U.S. adults (35.7%) is obese, and more than two-thirds (68.8%) are either overweight or obese (Flegal et al. 2012). One approach used in an attempt to address this national crisis has focused on the provision of front-of package (FOP) nutrition labeling. Two influential trade organizations, the Grocery Manufacturers Association (GMA) and the Food Marketing Institute (FMI), will jointly spend more than $50 million to promote their "Facts Up Front" FOP nutrition labeling system. This system presents, on the front of the package, calories and three nutrients to limit (i.e., saturated fat, sodium, and sugars) drawn from the federally mandated Nutrition Facts Panel typically found on the back of packaged food products (FMI 2012a). We characterize this type of FOP labeling as "reductive" since a reduced amount of information is extracted from the Nutrition Facts panel and placed on the front of the package.

While the Facts Up Front program seems to be positioned to achieve widespread acceptance by the industry, it is not the only type of nutrition labeling system in use. Many other systems do not offer specific, objective nutrient information, but rather provide shoppers with an overall *evaluation* of a product's healthfulness. With most of these programs, a product qualifies for a FOP "evaluative icon" only if it exceeds predetermined nutritional guidelines. This enables shoppers to easily spot more healthful products by quickly looking for the icon. Some examples of these evaluative programs include the American Heart Association's Heart-Check Mark, the IOM's proposed 'Healthy Stars' program, Wal-Mart's 'Great for You' initiative, and Wegmans' Wellness Keys. While prior research has shown that FOP nutrition labeling can influence consumers' product evaluations and purchase intentions (e.g., Andrews, Burton, and Kees 2011; Urala, Arvola, and Lähteenmäki 2003), it is still unclear whether a reductive icon and an evaluative icon have equivalent effects. Furthermore, whether or not these two types of icons interact to influence shoppers' evaluative processes is unknown.

From a shopper's perspective, evaluative and reductive FOP nutrition labeling systems have different strengths and weaknesses. Prior research on consumers' processing modes (e.g., van Horen and Pieters 2012) may provide insight regarding when each type of system may be more or less effective. Consumers engage in non-comparative processing when evaluating a single product in isolation ("How healthful is product X?") and comparative processing when evaluating numerous products simultaneously ("How healthful is product X in the presence of products Y and Z?") (van Horen and Pieters 2012). These two different types of processing modes have been shown to influence intentions, attitudes, and behavior differently (e.g., Hsee and Zhang 2010; Nowlis and Simonson 1997). Although evaluative FOP systems provide more interpretation than reductive FOP systems, they may not always provide a complete and accurate representation of the total nutrient composition of the product (Andrews, Burton, and Kees 2011; Tuttle 2008). Thus, when consumers are in non-comparative processing modes and faced with a simpler evaluation task, a reductive icon that extracts key individual nutrient information from the Nutrition Facts panel and conveys concrete information about a single product should be most beneficial. In this case, there is less need for evaluative information since the interpretation of health information about a single product is not as cognitively challenging as that of numerous competing products. Further, relative comparisons need not be made.

Comparative processing, on the other hand, is often time-consuming and arduous (Kardes et al. 2002); shoppers may only have a limited opportunity to process nutrition information in a supermarket environment (Feunekes et al. 2008). Thus, when shoppers must evaluate many products at once at the retail shelf, we expect an evaluative icon that facilitates simple comparisons

and provides interpretation across the levels of healthfulness for multiple product options to be more beneficial than a quantitative reductive icon. This is consistent with past research that has shown that summary information may be helpful in assessing healthfulness when there are multiple brands to evaluate (Viswanathan and Hastak 2002). For example, shoppers may not know whether 5 g of sugar combined with 420 mg sodium and 5 g of saturated fat per serving is an excessive or acceptable amount when displayed in a reductive icon, especially given varying serving sizes across numerous products.

An evaluative icon, in contrast, can help consumers interpret the meaning of specific nutrient levels, as well as a product's overall healthfulness, thus attenuating their processing load (Scott and Worsley 1994). It provides them with "cognitive shortcuts" by greatly reducing the comparison baselines across products from the much larger scales of individual nutrients found in a reductive icon (e.g., 0 to 1,000+ mg of sodium) to a considerably more simple scale of dichotomous or tiered information that provides interpretation about a product's healthfulness (e.g., a product can receive 0–3 stars; a '3' indicates a high level of healthfulness). Research has shown that the ability of consumers to discriminate between relatively healthier and unhealthier products when in comparative processing modes may be enhanced by the provision of summary information in the form of averages and ranges that provides an evaluative referent at the broader category level (Viswanathan and Hastak 2002). Such referents are in contrast to other referents generally provided at the product level, such as percent daily values. Offering additional support for this proposition, consumers have also been shown to pay less attention to absolute levels of individual nutrients when engaged in comparative, rather than non-comparative, processing modes (Viswanathan and Hastak 2002).

Thus, while conceptually both systems are likely to prove beneficial, compared to instances when no FOP nutrition information is available (e.g., Feunekes et al. 2008; Synovate 2005), we would expect a reductive FOP labeling system to have a greater impact on shoppers' evaluations and purchase intentions at the single product level, whereas an evaluative FOP system should prove more influential at the category level. That is, a reductive icon should have stronger effects when consumers are in non-comparative processing modes (i.e., evaluating a single product in isolation), whereas an evaluative icon should have stronger effects when consumers are in comparative processing modes (i.e., evaluating multiple products at once). While we expect positive effects of both systems, we test these assertions across two studies where the nature of the evaluation task differs. More formally, we predict:

H1. The presence (absence) of a reductive FOP nutrition labeling system will lead to higher (lower) perceptions of (a) product healthfulness, and (b) purchase intentions.

H2. The presence (absence) of an evaluative FOP nutrition labeling system will lead to higher (lower) perceptions of (a) product healthfulness, and (b) purchase intentions.

During a typical food shopping experience, shoppers can choose from a large variety of different items both within and across product categories. Because consumer concern with health and wellness is at an all-time high (IFIC 2012; Trivedi 2011), shoppers are likely to appreciate potentially helpful FOP nutrition information in this complex choice environment. As such, we posit that retailers will benefit from "a halo effect" when either reductive or evaluative FOP nutrition information is offered to consumers at the retail shelf. Attribution theory, which explains how people make causal inferences about the behavior of others and how those inferences then affect subsequent attitudes and behaviors (Jones and Davis 1965; Kelly 1967), provides the theoretical framework to help explain how a retailer's voluntary participation in a FOP nutrition labeling program may positively affect consumers' evaluations of that retailer. We offer an overview of these proposed effects in Fig. 1.[1]

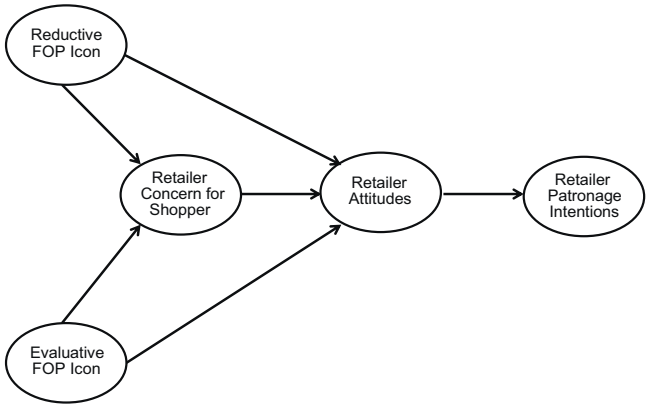

Fig. 1. Conceptual Model: Effects of FOP nutrition labeling systems on retailer-related outcomes.

Prior research on consumers' attribution processes has shown that consumers make inferences about a firm's motives (Friestad and Wright 1994), and in turn, attributions of those motives affect inferences about the firm (Ellen, Mohr, and Webb 2000; Forehand and Grier 2003; Puccinelli et al. 2009). For example, Cheema and Patrick (2008) found that the manner in which a retailer frames its promotions can affect how responsible and professional the retailer is perceived to be by consumers. Thus, attribution theory suggests that when a shopper enters a store and sees voluntary FOP nutrition labeling on foods, he or she may attribute the positive experience to the retailer (e.g., "It's great that this store cares enough to help shoppers find healthier products") rather than to one's self (e.g., "I'm good at finding healthy products"). That is, FOP nutrition labeling may result in positive responses that are attributed to the retailer, and in turn, increase consumers' perceptions of the retailer's concern for the needs and well-being of its shoppers (c.f., Machleit and Mantel 2001). This is consistent with suggestions that firms who are more forthcoming about the specific nutrition levels of their products are likely to be perceived as being more interested in their customers' welfare and more sensitive to their needs (Andrews, Burton, and Kees 2011). Therefore, we predict:

[1] We address these broader effects on retailer outcomes of attitude and patronage intentions in Study 2, where participants are exposed to differing labeling systems in a retail laboratory for a category with multiple brand alternatives.

H3a. The presence (absence) of a reductive FOP nutrition labeling system will lead to higher (lower) perceptions of the retailer's concern for shoppers.

H3b. The presence (absence) of an evaluative FOP nutrition labeling system will lead to higher (lower) perceptions of the retailer's concern for shoppers.

Mediational effects of retailer concern for shoppers

In addition to its influence on perceived retailer concern, the provision of FOP nutrition labeling can be expected to positively influence shoppers' attitudes toward the retailer. Further, we expect that the level of perceived retailer concern for shoppers will (partially) mediate the effect of the nutrition labeling systems on those attitudes (Achabal et al. 1987). Lastly, we anticipate that both perceived retailer concern for shoppers and attitude toward the retailer will mediate the influence of FOP nutrition information provision on consumers' likelihood of repeat retailer patronage. More specifically, as shown in Fig. 1, we propose that perceived retailer concern for shoppers acts as a proximal mediator of the positive effects of FOP nutrition information provision on attitude toward the retailer and the likelihood of repeat store patronage. Also, perceived concern affects the influence of the distal mediator, attitude toward the retailer, on the likelihood of repeat store patronage. These predictions are consistent with Pan and Zinkhan's (2006) conclusion from their meta-analysis that consumers' attitudes toward a store are positively related to their store patronage. More formally, we predict the following main and mediating effects:

H4a. The presence (absence) of a reductive FOP nutrition labeling system will lead to more (less) positive attitude towards the retailer.

H4b. The presence (absence) of an evaluative FOP nutrition labeling system will lead to more (less) positive attitude towards the retailer.

H5. Perceived retailer concern for shoppers mediates the effect of the presence (absence) of the FOP nutrition labeling system on attitude towards the retailer.

H6. Perceived (a) retailer concern for shoppers and (b) attitude towards the retailer mediate the effect of presence (absence) of the FOP nutrition labeling system on repeat store patronage intentions.

In sum, based on prior research that found that the provision of FOP nutrition labeling can have a positive influence on shoppers' evaluations, we expect both reductive and evaluative FOP nutrition information to increase perceived product healthfulness and purchase intentions. Additionally, we posit that the presence of a FOP labeling system will be positively associated with perceived retailer concern for shoppers. These hypotheses are examined in Study 1, an online experiment conducted with adult consumers. Study 2 then provides an extension to Study 1 in a realistic retail shopping laboratory with adult consumers. Unlike Study 1, shoppers are presented an array of choice options within a packaged food product category in Study 2. Thus, this experiment permits a test of the effects of different labeling systems across more and less healthful items within a product category. In addition, the effects of the labeling systems on perceived retailer concern for shoppers and attitudes toward the retailer are also examined, as well as the mediating role of these constructs on shoppers' store patronage intentions.

Study 1

Design, participants, and procedure

The initial study examined effects associated with two types of FOP nutrition labeling, a reductive system (Facts Up Front) and an evaluative system. The participants were randomly assigned to one of four package conditions: (1) a control condition with no FOP labeling system, (2) a reductive (Facts Up Front) system, (3) an evaluative system using a single icon (indicating that the product is healthy), or (4) a package that includes both the reductive and evaluative labeling system. Examples of the stimuli are shown in Appendix A. All package information was invariant other than the FOP labeling manipulation. The 363 participants in this national study completed the experiment online. Approximately 45% of this sample had at least some college education, the median household income was approximately $30,000, and 60% were female. Ages ranged from 18 to 81.

Following prior FOP labeling research, we used a nutritionally mixed (moderate) product (e.g., Andrews, Burton, and Kees 2011). Frozen pizza was chosen for this study because an examination of the category showed a broad range of nutrient levels. Nutrition information from actual products was collected to allow for comparisons among major competing brands offering similar frozen cheese pizzas. This ensured that the nutrient levels of the focal product were moderate, and not especially healthful or unhealthful. Consistent with the retail marketplace, all participants, 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 prior to answering any specific question. Specific nutrient information was taken directly from this panel and presented in the reductive icon when appropriate. After agreeing to participate in the study, participants were informed that their task was to evaluate a food product likely to be found at their local retailer.

Dependent and manipulation check measures

All dependent measures were scaled so that higher values indicate more favorable responses. There were three dependent measures in Study 1, each assessed by three seven-point bipolar adjective scales. All scales show high levels of reliability (all coefficient α's > .90). Drawing from prior research (Alexandrov, Babakus, and Yavas, 2007), we define perceived retailer concern as shoppers' appraisals of a retailer's actions that may affect the well-being of its customers. Concern for shoppers was assessed by the following item: "Based on the information provided, I believe that the retailer providing this product has my best interests at heart" with endpoints of strongly

Table 1
Study 1: Effects of FOP nutrition labeling systems.[a]

MANOVA results			Univariate *F*-values		
Independent variables	Wilks' λ	*F*-Value	Product healthfulness	Purchase intentions	Retailer concern
Reductive icon (RI)	.98	3.20**	5.23**	3.85**	7.64***
Evaluative icon (EI)	.93	9.06***	23.16***	.94	1.36
RI X EI	.99	.22	.21	.37	.49

[a] *Note*: MANOVA = multivariate analysis of variance; nutrition knowledge was included as a covariate in the analyses. The effect of nutrition knowledge on product healthfulness was significant, but it did not reach significance for purchase intentions or retailer concern ($p > .10$).
** $p < .05$
*** $p < .01$

disagree/strongly agree, not at all/very much so, and not probable/very probable." Product purchase intentions (modified from Howlett, Burton, and Kozup 2008) were measured by the following question: "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: very unlikely/very likely, not probable/very probable, and definitely would not/definitely would." Perceived product healthfulness (modified from Kozup, Creyer, and Burton 2003) was assessed by the item: "Please consider the nutrition level of the food product shown. Do you believe that the food product is: not at all nutritious/highly nutritious and very unhealthy/very healthy." Nutrition knowledge (Howlett, Burton, and Kozup, 2008) was measured for use as a possible 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").

After responding to all the dependent measures of interest, items that measured the effectiveness of the experimental manipulations were presented. Participants 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 evaluative icon. Similarly, participants were asked "Did you see a 'Facts up Front Label' on the front of the package of the food item shown?" to assess awareness of the FOP reductive icon.

Results

Manipulation check

Manipulation check results indicated that when the FOP reductive icon was present, 97% of participants reported seeing it; when it was not present, 8% of participants reported seeing it ($z = 16.9$, $p < .001$). Similarly, when the FOP interpretive icon was present, 91% of participants reported seeing it; when it was not present, 9% of participants reported seeing it ($z = 15.6$, $p < .001$). This pattern of findings indicates satisfactorily high levels of awareness of the FOP nutrition disclosure format manipulations.

Tests of predictions

An overview of the effects on consumers' perceptions of product healthfulness, purchase intentions, and perceived retailer concern can be found in Table 1. The analyses indicate that both reductive ($F(1,358) = 5.23$, $p < .05$) and evaluative ($F(1,358) = 23.16$, $p < .001$) icons on the front of a packaged food product increased perceived product healthfulness. Consumers evaluated the product as more nutritious when the reductive icon ($M = 3.82$ vs. $M = 3.54$) or evaluative icon ($M = 3.97$ vs. $M = 3.39$) appeared on the package, thus supporting H1a and H2a. Results further show that a reductive icon had a positive effect on purchase intentions ($F(1,358) = 3.85$, $p = .05$); consumers' purchase intentions were higher ($M = 4.46$ vs. $M = 4.15$) when the reductive icon was present. However, purchase intentions were not influenced by the presence of the evaluative icon ($F < 1$), indicating that while H1b was supported, H2b was not.

Hypothesis 3 focused on how the use of FOP nutrition icons influences perceptions of the retailer's concern for consumers. As shown in Table 1, the provision of the reductive icon affected assessments of the retailer's concern for shoppers ($F(1,358) = 7.64$, $p < .01$). The mean for perceived retailer concern was greater when the reductive icon was present ($M = 4.05$) than when it was absent ($M = 3.64$). However, the results for the evaluative FOP icon were nonsignificant. Thus, there is mixed support for H3; H3a is supported but H3b is not.[2]

Study 1 discussion

The primary purpose of this initial study was to assess consumer reactions to alternative FOP nutrition labeling systems as they relate to two key stakeholders – the retailer and the shopper. The presence of the evaluative icon elicited higher perceptions of product healthfulness compared to when it was absent, confirming previous research on the positive effect of interpretive FOP information on a product's perceived overall healthful-

[2] While no interactions between the two competing labeling systems were predicted, as shown in Table 1, note that all interactions between the two FOP labeling system are nonsignificant (F's < 1). Tests of means against the no FOP control condition showed that the inclusion of both icons on the package had favorable effects ($p < .05$) on perceived healthfulness, purchase intentions, and retailer concern.

ness (e.g., Urala, Arvola, and Lähteenmäki 2003). However, in this context (i.e., when a single product was evaluated non-comparatively by shoppers), the presence of the evaluative icon did not positively affect shoppers' intentions to purchase the product or perceptions of retailer concern. The reductive icon, on the other hand, had consistent effects across the dependent variables; it positively influenced perceived healthfulness, purchase intentions, and perceived retailer concern for shoppers. In this specific context, perhaps the reductive icon had stronger effects on the dependent measures because this quantitative information can be quickly and easily be verified in the Nutrition Facts panel, whereas the simpler, more limited evaluative information cannot (Andrews, Burton, and Kees 2011). Overall, and similar to prior research that has examined summary nutrition information presented in the form of averages and ranges (Viswanathan 1994; Viswanathan and Hastak 2002), these findings show that consumers make inferences about a product's healthfulness based on the presence or absence of nutrition summary information in the form of FOP icons.

Additionally, our results initially suggest that the manner in which retailers choose to present FOP nutrition information about food products may significantly influence customers' retailer-related perceptions. Retailers that voluntarily participate in FOP nutrition labeling systems as a service to their customers may be perceived as more concerned about, and committed to, their shoppers. These perceptions, in turn, may result in more positive attitudes and higher patronage intentions. Thus, one of the main objectives of Study 2 is to further examine this retailer concern construct by assessing the extent to which our initial results extend to other critical retailer-related outcomes.

This initial study, as well as the vast majority of prior research that has examined consumers' perceptions of product healthfulness, has only considered a single product in a relatively artificial environment (see Hieke and Taylor 2012 for a review). However, consumers rarely encounter and evaluate a single product in isolation. Rather, retail shoppers are exposed to, and often consider, many alternative choice options within different product categories during a shopping trip (Roe, Levy, and Derby 1999). Thus, Study 2 extends Study 1 in a novel way by examining effects of FOP nutrition labeling systems on shopper behavior in a realistic retail setting which facilitates the measurement of actual product choice within a category with multiple brand options, rather than only an assessment of shoppers' evaluations and intentions. Additionally, this retail laboratory environment provides a more appropriate context to examine the effects of FOP nutrition labeling on a broader array of retailer-related outcomes.

Study 2

In the retail laboratory setting used, participants were exposed to a number of choices within a product category, providing us with an opportunity to present a variety of more and less healthful options for actual brands on the market. Additionally, a new type of evaluative icon, one that has been recently proposed by the Institute of Medicine (IOM) and provides tiered nutrient information, was introduced and tested. More specifically, Healthy Stars is an interpretive nutrition labeling system that provides an evaluation of a food product's overall healthfulness (IOM 2011). However, unlike the dichotomous icon used in Study 1 (i.e., the product either did or did not qualify for the seal), the Healthy Stars system is tiered and signals multiple levels of product healthfulness. Certain FOP labeling systems such as the one used in Study 1 have been criticized for creating a misleading contrast between healthy and unhealthy foods because they do not allow consumers to distinguish between degrees of relative healthfulness (Butler 2010). Since these FOP icons can only be found on healthier products within a specific category, there is concern that some consumers may be encouraged to think in an oversimplified, dichotomous (i.e., healthy or unhealthy) manner (Van Kleef and Dagevos 2012). In contrast, the Healthy Stars symbol is always present on the front of the package; a product is designated with either zero, one, two, or three stars based on levels of saturated fat, sodium, and sugars, with products qualifying for three (zero) stars being the most (least) healthful.[3] It should be noted that while testing different evaluative icons across studies varying in response contexts and participant tasks may present benefits from a practical standpoint, it may also limit direct comparisons of findings across the two studies.

The presence of this tiered FOP evaluative icon should increase (decrease) the perceived healthfulness of the objectively more (less) nutritious products. Similarly, the reductive icon may provide quantitative nutrition information that accentuates the healthfulness (or unhealthfulness) of competing products. That is, in this context, the provision of FOP nutrition labeling systems should interact with the objective healthfulness of the food items. Thus, Study 2 extends H1 and H2 to a more realistic retail setting and tests whether the FOP systems increase (decrease) perceived product healthfulness, purchase intentions, and choice of the more (less) healthful foods (e.g., Andrews, Burton, and Kees 2011; Kozup, Creyer, and Burton 2003). In addition, since this study was conducted in a realistic retail setting (i.e., the Shopper Experimental Lab Facility (ShELF)), we were able to better assess whether the provision of a FOP nutrition labeling system can potentially have positive implications for the retailer, as predicted in H3 through H6.

Design, participants, and procedure

A sample of 120 adult consumers was recruited 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, and 73% had at least some college education. Additionally, at least 90% of the sample reported having children living at home between the age of 2 and 17, while the number of children (dependents) that participants

[3] The IOM system for the distribution of stars to products is simple: a product must meet certain nutritional standards to initially qualify for any stars (i.e., the product must have less than 4 g of saturated fat and 480 mg of sodium). If these initial standards are met, the product will receive a star for each of the following conditions that are satisfied: saturated fat per serving must be less than 10% of recommended daily value (2 g saturated fat or less), sodium per serving must be less than 20% of the recommended daily value (480 mg of sodium), and sugars per serving must be less than 5 g.

reported ranged from 1 to 4. Each participant was randomly assigned to one of the experimental conditions.

The study utilized a 2 (evaluative FOP icon: Healthy Stars vs. control) × 2 (reductive FOP icon: Facts Up Front vs. control) × 2 (objective product healthfulness: more healthful vs. less healthful) mixed experimental design. Examples of both the evaluative Healthy Stars icon and the reductive Facts-Up-Front icon used are shown in Appendix B. Macaroni and cheese was chosen as the product category for several reasons. First, participants were parents with children living at home, and macaroni cheese has high household penetration rates in this market segment (IRI 2009). Second, nutrient levels of assorted macaroni and cheese products widely vary. This permitted us to create a nutritionally mixed set of products while still adhering to the specific guidelines proposed by the IOM for the Healthy Stars labeling system. In all, seven microwavable macaroni and cheese products were selected from those available on the market. Two were objectively very healthy (qualified for 3 stars), three were moderately healthy (qualified for 1 star), and two were unhealthy products (qualified for 0 stars), based on the specific IOM nutrition criteria. As in Study 1, the nutrient values provided to participants in the reductive icon condition were consistent with values on the Nutrition Facts panel. Thus, each package was carefully modified to include the appropriate labeling system. The between-subject manipulations on the front of the package were consistent for all items (i.e., if a participant was assigned to either the reductive or evaluative FOP conditions, he or she would see that label format on all items within the category).

Each participant met initially with a researcher in a quiet break-out room and read a set of instructions before being directed into the ShELF (which was simply referred to as the "retail store" in the instructions). Participants were informed 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 a newspaper article, the instructions briefed the participants on both the reductive and evaluative systems (i.e., Facts Up Front and Healthy Stars systems and the qualifications for the stars). Participants 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. All participants were given the same set of instructions, regardless of the condition to which they were randomly assigned.

The ShELF was designed to look like an actual small retail store with a wide range of products (food, cleaning supplies, DVD's, etc.) and arrangements (end caps, aisles, and islands, etc.; please refer to Appendix B). The participants were directed to the shelf containing macaroni and cheese brands. The presentation of product options on the shelf was counterbalanced throughout the experiment in order to control for any positioning confounds (i.e., prominence due to eye level or placement). Participants were allowed to examine the products options as long as they desired and were asked to indicate to the researcher when they were ready to begin. Participants were given a shopping basket and were first asked to select the single macaroni and cheese product that they would be most likely to purchase and place it in their shopping basket. Participants were then seated directly in front of the products on the shelf and were asked to fill out a pencil and paper survey. The follow-up questions pertained to evaluations and purchase intentions of one specific "3 star" (more healthy) macaroni and cheese product and one "0 star" (less healthy) product. Stars for the evaluative icon were assigned based on the IOM criteria for the actual objective nutrition profile in the Nutrition Facts panel (NFP), and the FOP reductive nutrient levels reflected the nutrient values shown in the NFP for the product. The lab setting allowed for the physical comparison of products in a realistic retail environment during the product-related questions. After the pencil and paper survey was completed in the lab, participants were individually taken into a separate break-out room to complete a concluding five minute online survey. There they answered some concluding questions, including retailer-related dependent variables, followed by manipulation checks and demographic information.

Dependent and manipulation check measures

All dependent measures were based on measures available in the literature. The product healthfulness and purchase intention items were consistent with Study 1, and reliability levels were again acceptable (coefficient α's > .90). Effects of the independent variables on actual product choice were also considered. Attitude toward the retailer (Kozup, Creyer, and Burton 2003) was assessed through two seven-point bipolar adjective scales (i.e., "Based on my experience in the store, my overall attitude toward the retailer providing the macaroni and cheese products is:" with endpoints of "unfavorable/favorable" and "bad/good.") The Pearson correlation for these items was .90. Perceptions of retailer concern were also assessed through two, seven-point bipolar adjective scales. Endpoints were "strongly disagree/strongly agree" and "not at all/very much so" in response to the following question: "Based on my experience in the store, I believe that the retailer providing the macaroni and cheese products has my best interests at heart." The Pearson correlation for these items was .96. Patronage intentions were assessed through two seven-point bipolar adjective scales (i.e., "Assuming you were interested in purchasing this type of food, how likely are you to shop with this same retailer again based upon your experience in the store?") with endpoints of "very unlikely/very likely" and "not probable/very probable". The Pearson correlation for these items was .97. Similar to Study 1, a manipulation check was conducted to ensure the effectiveness of the exposure to the manipulation of the Healthy Stars (evaluative) and Facts Up Front (reductive) disclosures.

Results

Manipulation checks

Results indicate that the manipulation was successful for both the evaluative icon (100% reported seeing the icon when it was present; 93% reported not seeing it when it was absent; $z = 10.25$;

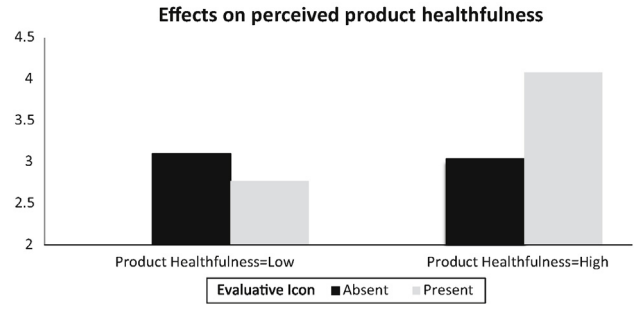

Fig. 2. Study 2: Effects of the FOP evaluative icon and actual product nutrition on perceived product healthfulness. *Note*: Higher values on *Y*-axis indicate higher perceived product healthfulness. The actual (or objective) product healthfulness level shown on the *X*-axis is based on the actual nutrition levels found in the Nutrition Facts panel for the products.

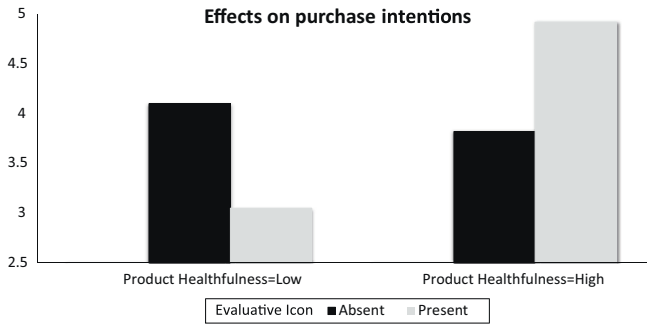

Fig. 3. Study 2: Effects of the FOP evaluative icon and actual product nutrition on purchase intentions. *Note*: Higher values on *Y*-axis indicate higher purchase intentions. The actual (or objective) product healthfulness level shown on the *X*-axis is based on the actual nutrition levels found in the Nutrition Facts panel for the products.

$p < .001$) and the reductive icon (97% reported seeing the icon when it was present; 97% reported *not* seeing it when it was absent; $z = 10.22$; $p < .001$). These results indicate high levels of awareness of the FOP nutrition disclosure manipulations.

Effects on perceived healthfulness and purchase intentions

To examine the effects of the FOP systems on perceived healthfulness and purchase intentions, a mixed design analysis of variance was performed. Unlike Study 1, which utilized a single product with a fixed nutrition profile, this study included multiple choice options with a variety of nutrition profiles. Given this design with repeated measures across different items on the retail shelf, a key interest focuses on whether the FOP labeling systems improved healthfulness perceptions and purchase intentions for items on the shelf that were (objectively) more healthful.

For the perceived healthfulness of the products, the within-subjects results show a significant interaction between objective product nutrition level and the evaluative icon ($F(1,111) = 24.44$, $p < .001$). As shown in Fig. 2, the provision of the evaluative icon seems to accentuate perceived differences between the healthy and unhealthy products. When a FOP evaluative icon is presented on the package, the objectively more nutritious product is perceived to be more healthful ($M = 4.08$ vs. $M = 3.04$) and the unhealthier product is perceived to be less healthful. Both the interaction and main effect of the reductive icon were not significant. Thus, this pattern of results lends support for the evaluative icon (H2a) but not for the reductive icon (H1a).[4]

Similarly, purchase intentions for the more (less) healthful products are positively (negatively) affected by the provision of the FOP evaluative icon ($F(1,115) = 30.55$, $p < .001$). Purchase intentions are higher for the more healthful product ($M = 4.92$ vs. $M = 3.82$) and lower for the less healthful product ($M = 4.10$ vs. $M = 3.05$) when the evaluative icon is present. The plot is shown in Fig. 3. However, the provision of the FOP reductive icon did not interact with objective product healthfulness to influence purchase intentions ($p > .20$). Thus, H2b is supported, but H1b is not.[5]

Additionally, the effects of the experimental manipulations on choice were also tested. The dependent variable was choice of a healthier macaroni and cheese option (coded as a '1' if one of the more healthful options was selected and a '0' otherwise), while the independent variables were the absence/presence of the two icon types. The independent variables were mean centered prior to computing the interaction between the two independent predictors. As expected, results of a logistic regression show that there was a higher likelihood of choosing a healthier product out of a consideration set at the retail shelf when an evaluative icon was present on the packages ($b = 1.10$, SE = .39, $p < .01$). The probability of choosing a more healthful product increased from 37% in the control condition to 64% when the evaluative icon was present. However, neither the reductive icon ($b = .18$, SE = .41, $p > .10$), nor the interaction between the reductive and evaluative icon ($p > .10$), influenced choice.[6]

Effects regarding shoppers' retailer-related perceptions

Hypotheses 3 through 6 focus on how the use of FOP nutrition-related icons influences shoppers' retailer-related perceptions. As shown in Table 2, a series of regression analyses was performed to test these predictions. Models 1 and 2 show effects on the retailer's concern for shoppers and attitude toward the retailer, and provide tests of H3 and H4. Models 3 and 4 hierarchically include the proposed mediators of retailer's concern and attitude toward the retailer, and offer tests of H5 and H6.

[4] The interactions between the two labeling systems for the perceived healthfulness and purchase intentions were nonsignificant, similar to the findings in Study 1.

[5] We also examined effects when individual difference variables (i.e., body mass index, nutrition knowledge, nutrition motivation, and two nutrition behavior measures) were included as covariates. Results of analyses that included these covariates (assessed with reliable multi-item scales) indicated that none were significant. Thus, conclusions from the tests of hypotheses were unchanged.

[6] We also examined these effects for a separate category (soup) for a sample of 100 adults and undergraduate students. The evaluative icon again showed the same pattern of effects for the healthfulness, purchase intentions and choice dependent measures, while inclusion of the reductive icon did not affect these outcome variables. Thus, these findings largely replicate those reported for the macaroni and cheese category previously discussed.

Table 2
Study 2: Tests of the mediating roles of perceived retailer concern and attitude toward the retailer on retailer patronage intentions.[a]

Independent variables	Model 1 Perceived retailer concern		Model 2 Retailer attitude		Model 3 Retailer attitude (with added mediator)		Model 4 Intentions to patronize the retailer (outcome)	
	Coefficient	*T*-values	Coefficient	*T*-values	Coefficient	*T*-values	Coefficient	*T*-values
Reductive icon (RI)	.31	1.06	.69	2.97**	.54	2.91**	−.03	−.17
Evaluative icon (EI)	.72	2.50*	.64	2.75**	.28	1.50	.33	1.72
RI × EI	−2.10	−3.64**	−1.47	−3.15**	−.43	−1.10	−.46	−1.17
Perceived retailer concern	–	–	–	–	.49	8.38**	.23	3.09**
Retailer attitude	–	–	–	–	–	–	.44	4.73**

[a] *Note*: All coefficients are unstandardized. Retailer concern is proposed as a proximal mediator and retailer attitude as a distal mediator for the relationships between the presence/absence of the FOP labeling systems and patronage intentions.
* $p < .05$.
** $p < .01$ (two-tail tests).

As shown in Models 1 and 2, the provision of the evaluative icon increased assessments of both the retailer's concern for shoppers and attitude toward the retailer (H3b and H4b, respectively). While the reductive icon had a positive effect on attitude toward the retailer (H4a), it did not influence participants' perceptions of retailer concern (H3a). Note also in Models 1 and 2 that there is an interaction between the two types of FOP icons, and plots show a generally similar pattern for each. A plot for attitude toward the retailer is shown in Fig. 4. When the reductive icon is present, the evaluative icon has little influence. However, when it is absent, the evaluative icon has a significant influence on the attitude toward the retailer. The pattern of means in the plot suggests that either the evaluative or reductive FOP system has a positive influence on attitude toward the retailer (both *p*'s < .001), but the use of both systems together does not increase the positive effect.

Model 3 provides results relevant to the mediating role of perceived retailer concern. As can be seen, both the effect of the evaluative icon and the interaction are nonsignificant, and the path from the proposed mediator to the attitude toward retailer is significant ($p < .01$). To formally test the indirect effect through retailer concern, we performed analyses using 5000 bootstrap samples and a 95% confidence interval (Preacher and Hayes 2008; see also Zhao, Lynch, and Chen 2010). The lower and upper levels of the confidence interval for the indirect effect for the evaluative icon → concern → attitude path did not contain a value of zero (indirect effect = .36; CI = [.08, .66]), indicating a significant indirect effect through perceived retailer concern. For the mediating role of concern for the interaction of the two FOP systems, the confidence interval for the indirect effect also did not contain a value of zero (indirect effect = −1.04; CI [−1.72, −0.46]). Thus, these results support the indirect effect predicted in H5 for the evaluative icon, and indicate mediation of the moderation for the dependent variable of attitude toward the retailer.

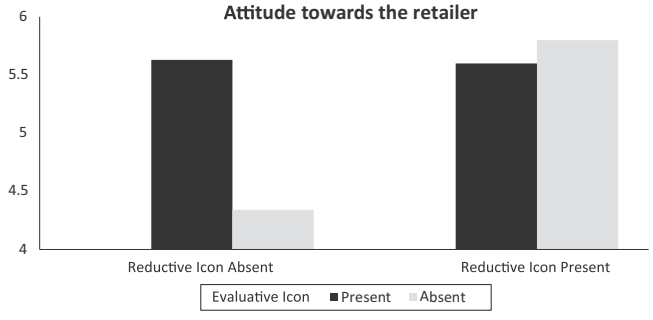

Fig. 4. Study 2: Effects of the FOP evaluative icon and reductive icon on attitude toward the retailer. *Note*: Higher values indicate more positive attitudes.

The last column (Model 4 in Table 2) shows findings pertaining to the mediational effects of both perceived concern and attitude on intentions to patronize the retailer in the future. For this model, the FOP systems have neither a direct nor moderating effect, but both proposed mediators had a significant impact ($p < .01$). The more distal mediator of retailer attitude had a stronger positive impact ($\beta = .44$) on patronage intentions compared to perceived concern ($\beta = .23$; $p < .05$). To formally test the indirect effect associated with each proposed mediator, we again performed analyses using 5000 bootstrap samples and a 95% confidence interval. For the evaluative icon → concern → patronage intentions path, the confidence interval (CI) for the indirect effect did not contain a value of zero (indirect effect = .17; CI = [.002, .42]), indicating a significant indirect effect. For the interaction of the two FOP systems, the confidence interval for the indirect effect also did not contain a value of zero (indirect effect = −.48; CI = [−1.10, −0.02]). Thus, the test for the indirect effect of retailer concern remained significant when both the more proximal and distal mediators were included in the model.

For the more distal mediator of attitude, analyses using 5000 bootstrap samples and a 95% confidence interval indicated significant indirect effects for all of the predictors. The confidence intervals for the indirect effect for the reductive and evaluative icons did not contain a value of zero (CI's = [.07, .57] and [.05, .60], respectively). For the interaction of the two FOP systems, the confidence interval for the indirect effect also did not contain a value of zero (indirect effect = −.64; CI = [−1.23, −0.15]), again suggesting mediation of the moderation. Lastly, the mediation path from the presence of the icons to patronage intentions (through concern and attitude) was significant for both the evaluative (indirect effect = .48; [CI = .15, .88]) and reductive icons (indirect effect = .37; [CI = .03, .72]). In sum, the findings shown in columns 3 and 4 offer support for the mediating roles of perceived retailer concern and attitude toward the retailer proposed in H5 and H6 for the direct effect of the evaluative icon and the interaction of the two systems.

FOP effects compared to store environments with no FOP information

Because retailers and health advocates are both interested in how various FOP systems perform relative to retail store conditions in which no FOP information is available, we conducted additional analyses to tests these differences.[7] Means from this retail lab experiment show that compared to when no FOP nutrition information was available, the more healthful products were evaluated more favorably by consumers in the presence of the evaluative icon, and purchase intentions and choices of these items also increased (all p's < .01). Respondents in the evaluative icon condition also reported lower purchase intentions for unhealthful items compared to respondents in the no FOP information control condition ($p < .02$). The reductive icon, by contrast, increased shoppers' purchase intentions for healthier items ($p = .04$), but did not influence evaluations of healthier items or purchase intentions for unhealthier items, compared to when no FOP information was available. Moreover, the presence of *both* icons on the package positively influenced evaluations, purchase intentions, and choices of healthier products compared to the no icon control condition (all p's < .04). Regarding the retailer-related outcomes however, the results indicate that the provision of *either* evaluative or reductive FOP nutrition information by the retailer, or a combination of *both* types of information, led to more positive perceptions of retailer concern, retailer attitudes, and higher retail patronage intentions compared to when no FOP information was offered (all p's < .01).[8]

Overall, these effects relative to the control condition largely align with the results previously reported. Thus, these findings lend support to our conclusion that shoppers benefit from evaluative FOP nutrition information when comparatively processing multiple products in a category at the retail shelf. They further suggest that shoppers can also benefit when evaluative FOP information is supplemented with reductive FOP information. In addition, these findings strengthen our conclusion that retailers that provide either, or both, types of FOP information will consequently benefit more than retailers who do not participate in labeling programs.

Study 2 discussion

Study 2 examined the effects of competing FOP nutrition labeling systems on shoppers' (a) product evaluations and choices and (b) retailer-related evaluations in a realistic retail setting. In this context, results indicated that the presence of an evaluative FOP nutrition labeling system interacted with the objective healthfulness of the options. As expected, the more healthful products were evaluated more favorably by consumers, and purchase intentions and choices of these items increased. However, the reductive system did not influence shoppers' evaluation or choice outcomes. These results suggest that the summary information presented in the evaluative icon is more beneficial to shoppers than that presented in the reductive icon when they must differentiate between multiple food items of varying healthfulness. However, our findings further suggest that coupling evaluative FOP information with reductive FOP information can also be helpful to consumers. The retailer-related results showed both direct and interactive effects of the FOP systems' effects on perceived retailer concern and attitude toward the retailer, with both systems showing either a positive direct or indirect effect on retailer attitude. Additional tests demonstrated that retailer concern and attitudes were significant mediators of repeat retail patronage intentions, thereby responding to a largely unanswered prior call for additional research on how health-related claims can affect consumer patronage (Grewal and Levy 2007, p. 450).

General discussion

Consumer concern with health and wellness is at an all-time high (IFIC 2012; Trivedi 2011). Many consumers want to buy more healthful products, and many major retail chains such as Walmart, Safeway, and Hannaford have responded with front-of-package nutrition labeling systems designed to help shoppers identify healthier alternatives at the retail shelf. As grocery retailers continue to dedicate increasing amounts of resources to health and wellness point-of-purchase initiatives such as these, it becomes increasingly essential that they understand the implications of such programs. Recent work within the domain of shopper marketing highlights the importance of adopting a more integrated approach to the study of consumer behavior (Shankar et al. 2011), and provides a useful framework from which to assess these implications for multiple constituencies. Our results demonstrate that FOP nutrition labeling represents a change in retail point-of-purchase information environments that influences not only shopper-related outcomes (i.e., food evaluations, intentions, and choices), but also a number of outcomes pertinent to retailers as well (i.e., retailer concern, attitudes, and patronage).

Implications for food retailers and shopper marketing

As FOP nutrition labeling becomes more popular in the marketplace, retailers should carefully consider the impact of different labeling systems on their target customers. Our shopper-related outcomes suggest that retailers can utilize FOP nutrition labeling as a marketing tool to effectively assist consumers with evaluations of product healthfulness. It was also demonstrated that FOP nutrition labeling can further influence shoppers' purchase intentions and product choices. However to be effective, FOP labels must be accessible, comprehensible,

[7] We appreciate the comment of an anonymous reviewer who recommended this supplemental analysis.

[8] We conducted an additional study ($n = 88$) in which adult consumers directly chose to patronize one of two hypothetical retailers. Six scenarios varied such that a retailer could offer: no FOP nutrition information, *either* reductive or evaluative information, or *both* types of information. Results show that patronage was significantly higher for a retailer that provided either type of FOP information, or both types, compared to a retailer that did not offer any FOP information (all p's < .001). Further, patronage was higher for a retailer that offered *both* types of FOP information compared to a retailer that offered *either* type in isolation (both p's < .001). Patronage was not influenced by the type of FOP information offered; that is, both systems were equally attractive ($p > .10$).

and relevant to shoppers' purchasing decisions (Day 1976). Thus, a critical decision for retailers that choose to implement a FOP nutrition labeling system to assist their customers is what *type* of program to utilize (i.e., evaluative, reductive, or both). Our research lends insight into this decision by demonstrating that evaluative systems are generally more beneficial to consumers when they are engaged in a comparative processing mode, whereas reductive systems typically may be more effective when shoppers non-comparatively evaluate a single product for purchase. Additional analyses further suggest that the provision of *both* types of FOP information simultaneously at the retail shelf can also benefit consumers compared to when no FOP information is available. Thus, retailers should consider the benefits of providing both reductive and evaluative FOP icons to shoppers so that they would have the most useful type of information during both comparative and non-comparative processing tasks. Such an approach would likely enable retailers to better assist shoppers in making healthier, more informed food evaluations and choices.

While the specific benefits of FOP labeling systems to shoppers is certainly an important consideration, retailers should also consider which type of system provides benefits to the firm. The results of Study 2 may be especially relevant to these retailer-related outcomes since it was conducted in a more realistic retail environment. These findings suggest that retailers may be able to use FOP nutrition labeling to increase the perceived healthfulness, purchase intentions, and choices of their healthier offerings. Notably, prior research has shown that firms with a higher proportion of their sales in healthy foods also demonstrate superior sales growth, operating profits, returns to shareholders, and company reputations (Hudson Institute 2011). Retailers can also choose to integrate FOP labeling into either their entire product assortment or just exclusively into their own private label assortment. The latter alternative may create more differentiation for retailers' more healthful private label food products and better position them to capitalize on shoppers' increasing interest in, and loyalty to, store brand foods (FMI 2012b).

Our findings also identify FOP nutrition labeling as an important factor likely to influence shoppers' intentions to patronize a retail store. Multi-store shopping trips are becoming increasingly common (Gijsbrechts, Campo, and Nisol 2008), leading some researchers to conclude that retailers should "move beyond competing for customers to competing over shopping trips" (Bell, Corsten, and Knox 2011, p. 42). Patronage is also important to retailers since up to two-thirds of purchasing decisions are made in-store at the point of purchase (Inman, Winer, and Ferraro 2009; Neff 2008). As such, retail patronage is arguably critical to the success of many in-store shopper marketing initiatives such as FOP nutrition labeling. With this in mind, our results demonstrated how FOP nutrition labeling systems can positively influence shoppers' perceptions of retailer concern for their well-being, which in turn can lead to more positive retailer attitudes and higher patronage intentions. Additional analyses indicated that shoppers may purposefully choose to shop with retailers that voluntarily offer FOP nutrition information instead of retailers that do not. This greater understanding of shopper patronage determinants can enable retail managers to better evaluate the extent to which shoppers' perceptions of the store and its offerings are congruent with their own (Pan and Zinkhan 2006).

Taken cumulatively, these shopper and retailer-related outcomes imply that retailers may be able to gain competitive advantages by making healthier products available to shoppers and complementing their offerings with helpful FOP nutrition labels that reduce information asymmetry. Overall from a shopper marketing perspective, this research would suggest that the use of *both* evaluative and reductive FOP nutrition labeling systems simultaneously (or the sole use of an evaluative system to a lesser extent) could offer a "win-win" outcome for both shoppers and retailers. That is, this strategic approach would not only empower a retailer to assist its customers with making healthier decisions, but would also deliver value to the firm (i.e., more positive retailer attitudes, higher perceptions of retailer concern, and increased patronage).

Implications for consumer welfare and public policy

With two-thirds of U.S. adults obese or overweight, obesity is a significant public health issue linked to an increased risk of medical conditions such as type 2 diabetes, hypertension, stroke, and cardiovascular disease (Flegal et al. 2012). Retailers have been referred to as "last line of defense in the obesity war" (Garry 2012, p. 1), and this research suggests that shopper marketing initiatives such as FOP nutrition labeling may ultimately be able to play a key role in promoting public health. Our findings demonstrate that tiered evaluative FOP nutrition labeling can assist shoppers with making healthier, more informed choices by not only identifying more nutritious products, but by also highlighting unhealthier products to avoid as well. Our results further suggest that supplementing evaluative FOP information with reductive information may also lead to similar favorable outcomes for shoppers. Therefore, from a public policy standpoint, these studies answer prior calls for research on comparisons between the presentation of specific nutrient information versus overall healthfulness ratings (Viswanathan, Hastak, and Roland 2009), as well as a greater understanding of FOP nutrition labeling systems, in general (IOM 2011).

Implications for retailing theory

This research also builds upon attribution theory and the emerging literature on consumer packaged good FOP labeling by demonstrating how in-store stimuli, such as nutrition information presented on the front of food packages, can be attributed to the participating retailer and, consequently positively influence shoppers' evaluations and patronage of the retailer. More specifically, the voluntary disclosure of health information was shown to be attributed to the retailer's concern for shoppers' well-being, which led to more positive attitudes toward the retailer and higher patronage intentions. These results were strengthened by a follow-up study which demonstrated that consumers reported preferring to patronize stores that provided FOP information over stores that did not.

Our shopper marketing approach also provides a unique perspective on Inman, Winer, and Ferraro's (2009) model of in-store

decision making. We expanded upon this model by demonstrating how FOP nutrition labeling systems can lead to not only positive product responses (i.e., healthfulness perceptions) and positive affective responses (i.e., retailer concern and attitudes), but also to positive behavioral responses (i.e., choices) that can be beneficial to both shoppers and retailers. We then further demonstrated how the influence of such labeling systems can vary across non-comparative (Study 1) and comparative (Study 2) processing contexts. Thus, this research speaks to the critical need to better understand the in-store factors that influence shoppers' decisions, especially given firms' increased marketing efforts at the point-of-purchase (Inman, Winer, and Ferraro 2009).

These results also have other important theoretical implications for consumer-related research. While Study 1 suggested that a reductive nutrition labeling system has a greater influence on purchase intentions and retailer-related outcomes than an evaluative icon, Study 2 indicated that an evaluative system increases purchase intentions and choice of the more healthful food items. While there are clear differences in the comparative and non-comparative processing modes across the studies, there are also numerous differences between Studies 1 and 2 that may contribute to these findings. Study 1 was an online, between-subjects experiment that presented different FOP nutrition labeling systems on a single, fictitious brand of frozen pizza. Study 2 was conducted in a realistic setting, and thus shoppers were presented with multiple macaroni and cheese options to evaluate. This latter context more closely reflects actual shopping behavior at the retail shelf level.

Further, prior research has suggested that the multifaceted array of nutrient information in the Nutrition Facts panel (NFP) can be difficult for many consumers to comprehend and utilize when evaluating products (Viswanathan and Hastak 2002). The benefit of the reductive FOP system is that it reduces the NFP information and places it in a more accessible location. However, it should be noted that this reductive icon still presents at least four unique pieces of information (with no evaluative summarization) for *each* product. Even in our study that only included seven choice options, the complexity of the comparative choice task is considerably greater than when only a single item is evaluated. While having to consider four nutrient values for seven products in the Study 2 ShELF environment is clearly less daunting than many choices actually faced by shoppers in many product categories, we suspect that the experimental task was sufficiently complex to highlight the greater usefulness of an evaluative system.

This pattern of findings raises serious questions regarding some conclusions from many prior consumer studies conducted in less realistic research conditions. These studies may not have sufficiently taken into account the complexity of the judgment and comparative processing task typically faced by shoppers when evaluating multiple choice options at the point of purchase. Results found when a single product is evaluated in a restricted and controlled context (such as in Study 1) may not replicate those found when consumers evaluate products at the shelf level. In tests of theory that focus primarily on experimental control and maximizing internal validity, this may be not a critical concern to retailing researchers. Yet, potential differences across contexts may provide important boundary conditions that should be of interest in future consumer-based retailing research.

Limitations and future research

While our studies examined effects for adult, nonstudent participants and Study 2 was conducted in a realistic setting, there are several limitations to generalizability that should be acknowledged. First, this research examined only specific types of FOP labeling systems, and as noted previously, there are many different systems currently in the marketplace and analyses of a broader array of systems is desirable. Additionally, in the treatment conditions, our studies presumed that all products in a category would have FOP information available. However, some specific retailers and manufacturers may decide to adopt unique FOP nutrition labeling systems, while others may choose not to adopt any FOP system at all. While Studies 1 and 2 differ in the consumer shopping modes (i.e., comparative and non-comparative modes), there are other differences between the studies (e.g., online versus retail lab product exposure and response environment, fictitious vs. actual brands) that may impact findings and limit strict comparisons between studies. Further research that addresses differences in effects across both shopping modes and consumer decision contexts seems warranted. Also, our studies did not consider the price of the products or include any other types of commonly used shopper marketing promotions. Finally, our research lacks access to secondary data that would serve to complement the existing studies and strengthen their contribution. Quasi-experimental field studies in which different FOP systems have been implemented in different stores and the subsequent retailer-related effects would be of considerable interest.

As FOP nutrition labeling systems continue to increase in both number and variety in the retail environment, so too does the opportunity for future research that would be of considerable interest to numerous constituencies. For example, can inconsistencies across competing labeling systems "backfire" and lead to unintended negative consequences such as consumer confusion, distrust, or misinterpretation? The future examination of different types of labeling systems, both currently in the marketplace and those not yet implemented, will help to further establish the (dis)advantages for both consumers and retailers. As suggested above, the effects of different FOP labeling systems on retailer-related outcomes, such as current and future patronage behavior, might be assessed through the use of secondary data.

Also, from a shopper marketing perspective, a future examination of the effects of FOP nutrition labeling systems on post-purchase consumption behavior and repeat purchase intentions would be appropriate, as it would provide an overall view of the entire shopping cycle. For example, do FOP labels encourage increased (over)consumption of healthier foods at home? If so, do these effects differ according to the type of label or any individual difference variables (e.g., health consciousness)? The answers to such questions and others will likely have important implications for diverse constituencies.

Acknowledgements

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Appendix A.

Example of Study 1 stimuli with both labeling conditions present

Appendix B.

Examples of Study 2 front-of-package manipulations*

*Note: More stars indicate higher product healthfulness.

Example of Study 2 Shopper Experimental Lab Facility (ShELF)

References

Achabal, Dale D., Shelby H. McIntyre, Cherryl H. Bell and Nancy Tucker (1987), "The Effect of Nutrition P-O-P Signs on Consumer Attitudes and Behavior," *Journal of Retailing,* 63 (1), 9–25.

Ailawadi, Kusum L., J.P. Beauchamp, Naveen Donthu, Dinesh Gauri and Venkatesh Shankar (2009), "Communication and Promotion Decisions in Retailing: A Review and Directions for Future Research," *Journal of Retailing,* 85 (1), 42–55.

Alexandrov, Aliosha, Emin Babakus and Ugur Yavas (2007), "The Effects of Perceived Management Concern for Frontline Employees and Customers on Turnover Intentions: The Moderating Role of Employment Status," *Journal of Service Research,* 9 (4), 356–71.

Andrews, J. Craig, Scot Burton and Jeremy Kees (2011), "Is Simpler Always Better? Consumer Evaluations of Front-of-Package Nutrition Symbols," *Journal of Public Policy & Marketing,* 30 (Fall), 175–90.

Bell, David R., Daniel Corsten and George Knox (2011), "From Point of Purchase to Path to Purchase: How Preshopping Factors Drive Unplanned Buying Behavior," *Journal of Marketing,* 75 (January), 31–45.

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/].

Cheema, Amar and Vanessa M. Patrick (2008), "Anytime Versus Only: Mind-Sets Moderate the Effect of Expansive Versus Restrictive Frames on Promotion Evaluation," *Journal of Marketing Research,* 45 (4), 462–72.

Day, George S. (1976), "Assessing the Effects of Information Disclosure Requirements," *Journal of Marketing,* (40), 42–52. April

Ellen, Pam Scholder, Lois A. Mohr and Deborah J. Webb (2000), "Charitable Programs and the Retailer: Do They Mix?," *Journal of Retailing,* 76 (3), 393–406.

Feunekes, Gerda I.J., Ilse A. Gortemaker, Astrid A. Willems, Rene Lion and Marcelle van den Kommer (2008), "Front-of-Pack Nutrition Labeling: Testing Effectiveness of Different Nutrition Labeling Formats Front-of-Pack in Four European Countries," *Appetite,* 50 (1), 57–70.

Flegal, Katherine M., Margaret D. Carroll, Brian K. Kit and Cynthia L. Ogden (2012), "Prevalence of Obesity and Trends in the Distribution of Body Mass Index Among US Adults, 1999–2010," *The Journal of the American Medical Association,* 307 (5), 491–7.

Food Marketing Institute (2011), "The Food Retailing Industry Speaks," (accessed January 22, 2013) [available at http://www.fmi.org/docs/media/the-food-retailing-industry-speaks-2011.pdf?sfvrsn=6].

Food Marketing Institute (2012a), "Facts-Up-Front: GMA-FMI Voluntary Front-of-Pack Nutrition Labeling System," (accessed February 22, 2012) [available at http://fmi.org/docs/health-and wellness/nk_style_guide_for_implementers-2012.pdf?sfvrsn=2].

Food Marketing Institute (2012b), "U.S. Grocery Shopper Trends 2012 Executive Summary," (accessed June 29, 2013) [available at http://www.icn-net.com/docs/12086_FMIN_Trends2012_v5.pdf].

Forehand, Mark R. and Sonya Grier (2003), "When is Honesty the Best Policy? The Effect of State Company Intent on Consumer Skepticism," *Journal of Consumer Psychology,* 13 (3), 349–56.

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

Garry, Michael (2012), "Cutting the Fat: The Fight Against Childhood Obesity," (accessed January 22, 2013) [available at http://www.walmartcommunity.com/wp-content/uploads/2012/07/The-Fight-Against-Childhood-Obesity.pdf].

Gijsbrechts, Els, Katia Campo and Patricia Nisol (2008), "Beyond Promotion-Based Store Switching: Antecedents and Patterns of Systematic Multiple-Store Shopping," *International Journal of Research in Marketing,* 25 (1), 5–21.

Grewal, Dhruv and Michael Levy (2007), "Retailing Research: Past, Present, and Future," *Journal of Retailing,* 83 (4), 447–64.

Grocery Manufacturers Association (2011), "Shopper Marketing 5.0: Creating Value with Shopper Solutions," (accessed January 22, 2013) [available at http://www.gmaonline.org/file manager/Collaborating _with_Retailers/GMA_Shopper_Marketing_5.0.pdf].

Hieke, Sophie and Charles R. Taylor (2012), "A Critical Review of the Literature on Nutrition Labeling," *Journal of Consumer Affairs,* 46 (1), 120–56.

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.

Hsee, Christopher K. and Jiao Zhang (2010), "General Evaluability Theory," *Perspectives on Psychological Science,* 5 (4), 343–55.

Hudson Institute (2011), "Better-For-You Foods: It's Just Good Business," (accessed June 7, 2013) [available at http://www.hudson.org/index.cfm?fuseaction=hudson_upcoming_events&id=889].

Inman, J. Jeffrey, Russell S. Winer and Rosellina Ferraro (2009), "The Interplay Among Category Characteristics, Customer Characteristics, and Customer Activities on In-Store Decision Making," *Journal of Marketing,* 73 (5), 19–29.

Institute of Medicine (2011), "Examination of Front-of-Package Nutrition Rating Systems and Symbols," (accessed October 17, 2012) [available at http://www.iom.edu/Activities/Nutrition/NutritionSymbols.aspx].

International Food Information Council (IFIC) (2012), "2012 Food & Health Survey: Consumer Attitudes Toward Food Safety, Nutrition & Health," (accessed January 22, 2013) [available at http://www.foodinsight.org/Resources/Detail.aspx?topic=2012_Food_ Health_Survey_Consumer_Attitudes_toward_Food_Safety_Nutrition_and_Health].

IRI (2009), "IRI Scanner Data FDMX Latest 52 wks ending 5/17/09".

Jones, Edward E. and Keith E. Davis (1965), "A Theory of Correspondent Inferences: From Acts to Dispositions," in *Advances in Experimental Social Psychology (2)*, Berkowitz L. ed. New York: Academic Press

Kardes, Frank R., David M. Sanbonmatsu, Maria L. Cronley and David C. Houghton (2002), "Consideration Set Overvaluation: When Impossibly Favorable Ratings of a Set of Brands are Observed," *Journal of Consumer Psychology,* 12 (4), 353–61.

Kelly, Harold H. (1967), "Attribution Theory in Social Psychology," in *Nebraska Symposium on Motivation*, Levine David ed. Lincoln, NE: University of Nebraska Press, 192–238.

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.

Knox, Dave (2009), "Brand Managers Need to Practice 'Everywhere Shopper Marketing," (accessed January 22, 2013) [available at http://www.hardknoxlife.com/2009/07/27/brand-managers-need-to-practice-everywhere-shopper-marketing/].

Machleit, Karen A. and Susan Powell Mantel (2001), "Emotional Response and Shopping Satisfaction: Moderating Effects of Shopper Attributions," *Journal of Business Research,* 54 (2), 97–106.

Neff, Jack (2008), "Pick a Product: 40% of Public Decide in Store," *Advertising Age*, (July 28), (accessed January 7, 2013) [available at http://adage.com/article?article_id=129924].

Nowlis, Stephen M. and Itamar Simonson (1997), "Attribute-Task Compatibility as a Determinant of Consumer Preference Reversals," *Journal of Marketing Research,* 34 (2), 205–18.

Pan, Yue and George M. Zinkhan (2006), "Determinants of Retail Patronage: A Meta-Analytical Perspective," *Journal of Retailing,* 82 (3), 229–43.

Preacher, Kristopher J. and Andrew F. Hayes (2008), "Asymptotic and Resampling Strategies for Assessing and Comparing Indirect Effects in Multiple Mediator Models," *Behavior Research Methods,* 40 (3), 879–91.

Puccinelli, Nancy M., Ronald C. Goodstein, Dhruv Grewal, Robert Price, Priya Raghubir and David Stewart (2009), "Customer Experience Management in Retailing: Understanding the Buying Process," *Journal of Retailing,* 85 (1), 15–30.

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.

Scott, Victoria and Anthony F. Worsley (1994), "Tick, Claims, Tables, and Food Groups: A Comparison for Nutrition Labelling," *Health Promotion International,* 9 (1), 27–37.

Shankar, Venkatesh J., Jeffrey Inman, Murali Mantrala, Eileen Kelley and Ross Rizley (2011), "Innovations in Shopper Marketing: Current Insights and Future Research Ideas," *Journal of Retailing,* 87 (Supplement 1), S29–42.

Synovate (2005), "Qualitative Signpost Labelling Refinement Research Report of Findings," (accessed January 22, 2013) [available at http://www.food.gov.uk/multimedia/pdfs/signpostqualresearch.pdf].

Trivedi, Minakshi (2011), "Regional and Categorical Patterns in Consumer Behavior: Revealing Trends," *Journal of Retailing,* 87 (1), 18–30.

Tuttle, M. (2008), "Seeing Spots in the Supermarket? Learn How Nutrition Symbols Influence Which Foods We Buy," *ADA Times,* 5 (4), 12–6.

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 Horen, Femke and Rik Pieters (2012), "When High-Similarity Copycats Lose and Moderate-Similarity Copycats Gain: The Impact of Comparative Evaluation," *Journal of Marketing Research,* 49 (1), 83–91.

Van Kleef, Ellen 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/AD18BC6CED0F4B54 AE6D4 81F16353E3A/155099/[VanKleefandDagevosFrontofPacknutritionlabellingpap.Pdf].

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

Viswanathan, Madhubalan 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.

Viswanathan, Madhubalan, Manoj Hastak and Gau Roland (2009), "Understanding and Facilitating the Usage of Nutritional Labels by Low-Literate Consumers," *Journal of Public Policy and Marketing,* 28 (2), 135–45.

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.