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Keywords

Food labels, genetically modified organisms, organic, advertising

Research

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Introduction

Americans spend roughly 15 percent of their household income on food (Crawford, Church, & Rippy, 2012). Studies show consumers are increasingly concerned about food safety, particularly with regard to genetically modified organisms (GMOs), the use of antibiotics and hormones, and the application of pesticides (Brewer & Rojas, 2008). Marketers face a challenge as consumer attitudes toward food safety are ever-changing and food behaviors are not consistent (Brewer & Rojas, 2008).

Despite difficult economic conditions, more families than ever are buying organic products (Greene, 2012). Where organic foods used to be sold in natural food stores, they now occupy prime aisle and shelf space in big-box food retail stores. Organic sales in the U.S. approached $30 billion in 2010, up from approximately $6 billion in 2000. The majority of those sales come from fruits and vegetables (Rossman, 2013). According to the Organic Trade Association (2011), 78 percent of adults buy organic foods at least occasionally. As consumers have purchased more organic food products, retailers have offered more organic options and increased advertising for these new products (Campbell et al., 2013).

The United States Department of Agriculture (USDA) expresses a commitment to the growth

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and success of organic farming on its website, http://usda.gov. The USDA celebrated the tenth anniversary of the USDA Organic Seal in October 2012. The USDA defines organic agriculture as producing "products using methods that preserve the environment and avoid most synthetic materials, such as pesticides and antibiotics" (para. 2). The USDA's organic standards also specify guidelines for how farmers grow crops and raise livestock.

Consumers have an increasingly complex interest in the food they consume. Consumer interest in food goes beyond taste to include social and ethical attributes related to food production (Briggeman & Lusk, 2011; Unnevehr, Eales, Jensen, Lusk, McCluskey & Kinsey, 2010; Zander & Hamm, 2010). While requirements for organic certification vary globally, most organic foods are grown without the use of synthetic pesticides or fertilizers. Most also avoid antibiotics or growth hormones in production. The growing process does not typically involve the use of food additives or genetically modified organisms (International Federation of Organic Agriculture Movements [IFOAM], 2005; National Archives and Records Administration [NARA], 2010). Consumers interpret words like "sustainable agriculture" in different ways and often lack context and information to interpret such terms (Rumble et al., 2014). Researchers have demonstrated a farm-to-table knowledge gap wherein consumers talk about hormones, antibiotics and steroids as important factors in their food decision-making all the while demonstrating a lack of understanding of these terms (Rumble & Buck, 2013). Consumer attitudes and behavior regarding genetically modified foods vary greatly across different cultures (McCluskey & Loureiro, 2003). Consumers often lack awareness about agricultural biotechnology or genetically modified foods (Lundy & Irani, 2004), but research reflects upward trends in adoption of genetically modified crops in the U.S. (Fernandez-Cornejo, 2013).

Food Labels

Regulation and prevalence of food labels varies globally. In the U.S., Congress passed the Nutrition Labeling and Education Act in 1990, providing for regulation of food labels (Hieke & Taylor, 2012). Nearly 25 years later, the effectiveness of food labels on consumer behavior is inconclusive (Hieke & Taylor, 2012). Consumers face labels like "organic," "fair trade," "locally grown," "GMO-free," and "antibiotics free" as they consider food purchases. Labels regarding fair trade and local products usually reflect a valuation of working conditions, labor practices, fair prices for farmers, and supporting family farms. Labels like "organic," "GMO-free," and "antibiotics free" usually reflect concerns related to natural resources or the environment, use of fertilizers, and other production practices (McCluskey & Loureiro, 2003).

Studies have uncovered a number of reasons given by consumers for purchasing organic food products: health (human and animal), taste preference, environmental concerns, and economic concerns (Abrams, Meyers & Irani, 2010; Miles & Frewer, 2001; Smith-Spangler et al., 2012). Hammitt (1990) asked organic-food consumers about risk factors that affected their purchase decisions. Consumers cited concerns about the effects of pesticide residues, growth stimulants, and fertilizers. Depending on circumstances, experience, or personal values, consumers may value any, none, or all of the above.

Most consumers choose (or do not choose) organic foods with little scientific understanding (Abrams, Meyers & Irani, 2010; Campbell, Mhlanga & Lesschaeve, 2013). The increase in organic spending coincides with experts questioning whether organic foods are safer or healthier and, in fact, offering evidence to the contrary (Smith-Spangler et al., 2012). While consumers often are skeptical of labels like "all-natural," they do report selecting products to avoid perceived risks.

Driven by increasing consumer demand for healthier, safer, and more environmentally friendly

food products, the use of food labeling has become increasingly important in recent years. The use of credible labels allows firms to signal quality or the presence of specific desirable attributes and in so doing to create the potential for premiums based on this signal (McCluskey & Loureiro, 2003).

Abrams, Meyers, and Irani (2010) found "Participants also revealed that they do not understand why or how particular additives in meat are bad for them, but when marketing makes claims about not having additives, they are more inclined to buy that product or favor food products with the 'no' labeling theme" (p. 371). The relationship between layman's understanding of risk/health concern and expert information is well-researched in the field of risk analysis (Wynne, 1987).

Although overlap certainly exists in foods that are organic, non-GMO, and antibiotic-free, consumers perceive these labels differently. Anderson, Wachenheim, and Lesch (2006) found consumers in their study perceived organic foods as healthier, safer, and more environmentally sound than traditional food and foods with GMO ingredients. Consumers identified risks to society as a greater threat than personal risks in regards to GMO foods, pointing to unknown aggregate risks they perceived as associated with GMOs (Anderson, Wachenheim, & Lesch, 2006). Consumers also indicated the "use of biotechnology to enhance plants was much more favorable than its use in animals, consistent with existing literature" (Anderson, Wachenheim, & Lesch, 2006, p. 192).

While various researchers have examined consumer attitudes toward organic and environmentally sustainable food production, the only consistent variable associated with purchase of organic food products is the attainment of higher education (Oberholtzer, 2009; Pelletier, Laska, Neumark-Sztainer, & Story, 2013; Zepeda & Li, 2007).

Gain and Loss Message Framing

Framing involves the ways information is packaged and organized (Simon & Xenos, 2000). The way information is framed is often the way people come to understand an issue. Consumers often make up for deficits in scientific understanding by relying on familiar cognitive frames as shortcuts. "Frames are organizing principles that are socially shared and persistent over time, that work symbolically to meaningfully structure the social world" (Resse, Gandy, & Grant, 2001, p. 11).

Gain/loss frames are common in health communication and are rooted in prospect theory. According to prospect theory, people evaluate information regarding uncertain alternatives in relation to either potential gains or potential losses. Prospect theory originated with the study of behavioral economics (Kahneman & Tversky, 1979) but has been widely applied. This theory posits people evaluate decisions based on perceived value of losses and gains responding to message framing. According to Rothman, Bartels, Wlaschin, and Salovey (2006), "People will act to avoid risks when considering the potential gains afforded by a decision (they are risk averse in their preferences) but are willing to take risks when considering the potential losses afforded by their decision (they are risk seeking in their preferences) (p. S203).

According to prospect theory, gain frames usually emphasizes positive outcomes while loss frames usually emphasize negative outcomes, or the avoidance thereof (Dijkstra et al., 2011). In health communication, gain-framed messages emphasize positive outcomes associated with health behaviors while loss-framed messages emphasize negative outcomes or consequences that may be experienced if health behaviors are not adopted (Rothman & Salovey, 1997). The effectiveness of gain vs. loss frames is dependent upon whether the health behavior in question implores a prevention-oriented or a promotion-oriented mindset (Rothman, Bartels, Wlaschin & Salovey, 2006). According to Rothman et al (2006):

> Gain-framed appeals should be more effective when promoting behaviors that elicit a promotion-oriented mindset, and loss-framed appeals should be more effective when promoting behaviors that elicit a prevention-oriented mindset. (p. S213)

In the case of food advertising promoting organic, non-GMO and antibiotic-free foods, it was unclear whether participants would approach the messages they read from a prevention-oriented or promotion-oriented mindset. As such, this study was exploratory in nature and the purpose was to describe the effects of gain- and loss-framed messages in magazine food advertisements. Magazine advertisements offer the space to communicate informative messages to consumers. In the case of unfamiliar products or product attributes (like organic, non-GMO, and antibiotic-free), these messages are especially important. This study asked the following research questions:

RQI: How does message format (gain vs. loss frame) impact participant evaluation of food messages?
RQ2: How does product type (bananas, potato chips, and milk) impact participant evaluation of food messages?
RQ3: What interaction will product type (bananas, potato chips, and milk) have with message format (gain vs. loss) in regards to participant evaluation of food messages?

Methods

Participants

This study included 227 college students enrolled in selective mass communication courses at a southern university. Among the 227, this study eliminated seven data entries containing less than 80 percent of responses for key measures in the screening process. As a result, 220 were included in the data analysis. The participants' average age was 19.94, and 86.8 percent of them were female.

Identifying Organic Products

To select food products pertinent to research participants, this study reviewed relevant literatures and consulted peers and young adults who did not participate in the study. As a result, this study selected bananas, potato chips, and milk, foods generally available in general grocery stores and commonly used by the young adult population. These products represent three of the most popular food-related issues, such as organic, non-GMO, and antibiotics free, respectively. Based on this selection, these food items created the organic, non-GMO, and antibiotic free conditions, respectively.

Independent Variables

This study included two independent variables: message format and product type. First, this study looked at two message frame formats: gain message frame and loss message frame. Based on this classification, 112 research participants were randomly assigned into the gain message format (50.9%), and 108 were assigned to the loss message format (49.1%). Using the induction check scale used by Cho and Sands (2011), this study checked if participants differently perceived two messages formats. Participants' responses were assessed on three seven-point bipolar scales anchored by costs-benefits, losses-gains, and negative outcomes-positive outcomes. Then, index scores were formed by averaging the values of these items (Cronbach's α = .85 for organic condition, α = .88 for GMO condition, and α = .94 for antibiotics condition, respectively). The results showed research participants differently perceived two message frame formats in the three conditions. Second, considering the college popu-

lation and their most common food-related concerns (e.g., organic, GMO, and antibiotics), this study selected bananas, potato chips, and milk for the respective issues.

Dependent Variables

The dependent variable of this study is the effectiveness of food labels used in different food conditions. The dependent variable is measured in seven ways: recall, recognition, attitude, perceived value ($) of organic version, purchase intention, likelihood to pay more, and amount to pay more (%). To measure recall, participants were asked to provide any message context they could recall using open-ended questions. To measure recognition, participants were asked to select using a closed-ended questionnaire that included the food label used in the experiment as well as other types of food labels that were not used in the experiment. Next, attitude toward food labels was measured using the scale developed by Till and Shimp (1998), which uses seven descriptive adjective scales: good, favorable, positive, important, efficient, relevant, and necessary. Each scale ranged from strongly disagree (1) to strongly agree (7). Index scores were formed by averaging the values of these scales. Internal consistency test results showed these measures were reliable (Cronbach's $\alpha = .89$ for the organic condition, $\alpha = .95$ for the non-GMO condition, and $\alpha = .96$ for an antibiotics-free condition).

To determine perceived value of organic products, participants were asked, "If the value of a non-organic product (e.g. regular banana/potato chips/milk) is $10.00, what do you think the value of an organic product will be?" using an open-ended question. For the purchase intention (PI), this study used the scale constructed by Yi (1990; 1993). Index scores were formed averaging the values of these items (Cronbach's $\alpha = .92$ for the organic condition, $\alpha = .95$ for the non-GMO condition, and $\alpha = .94$ for an antibiotics-free condition). Finally, willingness to pay more was assessed in two ways: likelihood to pay more and amount to pay extra (%). Likelihood to pay more was measured by asking participants, "How likely are you to pay more for products with a(n) organic/non-GMO/Antibiotics free label than other products in the same product category?" using a seven-point Likert scale. For the amount to pay more for organic product versions, the following question was asked, "What percentage more would you be willing to pay for products with organic/non-GMO/Antibiotics free labels?"

Experimental Stimuli

This study created six one-page color print ads (two message formats in three food conditions) for experiments (see Figures 1 through 6). In this process, to prevent possible confounding influences from visual differences, all stimuli were created similarly. A single full-page photo was used for all six ads. A head copy and body copy messages appear in a lower center (banana ads), upper center (potato chips ads), and left-center (milk). A brand name was presented in the bottom right-hand corner of each ad. A food label was presented in the bottom left-hand side of each ad ("100% Organic" for banana ads in the organic condition, "Non-GMO Verified" for potato chips ads in the non-GMO condition, and "Free Antibiotics" for milk ads in the antibiotics free condition). In addition, to avoid the possible influence of participants' experience with a certain brand, bogus brands (Gold Acre for bananas, Rockies for potato chips, and Norman Farms for milk) were used.

Experiment Design

Each participant was given a booklet containing five print ads. Participants were asked to view the ads as they normally would any other magazine ad. Using Dahl, Sengupta, and Vohs' approach (2009), participants were strictly limited to 20 seconds of exposure to each ad to guard against the

Figure 1. Gain and loss messages in advertisements.

possibility that different viewing durations would produce reaction differences. In this process, to minimize possible order effects, the experimental stimuli were presented in the middle positions (second, third, and fourth spots), while two additional ads (orange juice and water bottle) that were not included in this study were placed in the bookend sequences. In addition, to further control for possible order effects, this study created three rotations that participants were equally divided among (Rotation 1: bananas, milk, potato chip/Rotation 2: milk, potato chip, bananas/Rotation 3: potato chip, bananas, milk). No statistical difference was found among the three rotations. When completed viewing the booklet, participants were asked to take a computer-based evaluative survey.

Analysis and Findings

In the experiment, the effect of message formats (gain and loss messages) was tested in a between-group comparison design while that of product types (organic, non-GMO, and antibiotics free) was examined in a within-group comparison design.

Impact of brand/organization familiarity and loyalty

Using Simonin and Ruth's (1998) brand familiarity scale, participants' brand familiarity and loyalty were checked. For the brand familiarity scale, this study included three items: brand familiarity,

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brand recognition, and previous exposure to brand. Index scores were formed by averaging the values of these items (Cronbach's $\alpha = .92$ for organic condition, $\alpha = .98$ for GMO condition, and $\alpha = .98$ for antibiotics condition, respectively). The results show the brands used in this study were not familiar to participants at all ($M = 1.35$, $SD = .76$ for the organic condition, $M = 1.28$, $SD = .91$ for GMO, and $M = 1.73$, $SD = 1.40$ for antibiotics free conditions, respectably) and participants are not loyal to the brands: $M = 1.38$ ($SD = .90$) for Gold Acre (bananas), $M = 1.20$ ($SD = .70$) for Rockies (potato chips), and $M = 1.33$ ($SD = .90$) for Norman Farms (milk).

Message Frame Format Effect

This study found a significant difference from recall of the food labels, where participants more recalled labels in the loss message frame format conditions ($M = .24$, $SE = .02$) than those in gain message frame format conditions ($M = .18$, $SE = .02$), $F(1, 218) = 4.19$, $p < .05$, $\eta^2 = .02$. For other measures, however, differences between two message formats were not significant.

Table 1

Between-Group Comparisons of Different Message Frame Formats

Dependent Variables	Gain Frame M (*SE*)	Loss Frame M (*SE*)	M²	*F*-value	Partial η^2
Label Recall*	.18 (.02) $_A$	.24 (.02) $_B$	.21	4.19	.02
Label Recognition	.66 (.03)	.71 (.03)	.12	1.43	.01
Attitude toward warning labels	5.61 (.09)	5.53 (.09)	.32	.40	.00
Perceived value ($)	13.20 (.19)	13.54 (.20)	6.38	1.54	.01
Purchase intention	4.53 (.12)	4.46 (.12)	.24	.15	.00
Willingness to pay more	4.12 (.13)	3.88 (.14)	3.09	1.56	.01
Amount to pay more (%)	19.15 (1.71)	16.91 (1.85)	218.90	.79	.01

Note: A: Subscripts placing next to the mean (standard error) indicate significant difference among breaks in one-way ANOVA at a .05 significance level (i.e., $_A < _B$). B: *** p < .001; ** p < .01; * p < .05

Product Category Effects

The results show the effectiveness of food labels is significantly different among the three product types in all seven measures. First, participants recalled the food labels significantly better in the organic (bananas) condition ($M = .41$, $SE = .03$) than those in the antibiotic free (milk) condition ($M = .16$, $SE = .02$), which also was significantly better recalled than those in the non-GMO (potato chips) condition ($M = .06$, $SE = .02$), $F(2, 217) = 45.23$, $p < .001$, $\eta^2 = .29$. For food label recognition, labels in the organic ($M = .76$, $SE = .03$) and antibiotics free ($M = .73$, $SE = .03$) conditions were better recognized than those in the non-GMO condition ($M = .55$, $SE = .03$), $F(2, 215) = 14.43$, $p < .001$, $\eta^2 = .12$. Similarly, attitude toward food labels showed labels in the antibiotics free ($M = 5.86$, $SE = .08$) and organic ($M = 5.73$, $SE = .07$) conditions were more favorably evaluated than those in the non-GMO condition ($M = 5.12$, $SE = .09$), $F(2, 217) = 37.84$, $p < .001$, $\eta^2 = .26$.

For the perceived value of organic alternatives, participants perceived the monetary value ($) of organic versions of bananas in the organic condition ($M = \$14.14$, $SE = .19$) was significantly higher than those for milk in the antibiotic free condition ($M = \$13.30$, $SE = .18$), which was also significantly higher than those for potato chips in the non-GMO condition ($M = \$12.68$, $SE = .15$), $F(2, 211) = 37.04$, $p < .001$, $\eta^2 = .26$. Similarly, analyses of purchase intention, likelihood to pay more, and

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amount to pay more also show the same pattern. Results indicate purchase intention for bananas (*M* = 4.96, *SE* = .09) was significantly higher than those for milk (*M* = 4.50, *SE* = .12), which was also higher than for potato chips (*M* = 4.03, *SE* = .12), $F(2, 217) = 30.02$, $p < .001$, $\eta^2 = .22$. For the measure of the likelihood to pay more, participants reported higher likelihood to pay for bananas (*M* = 4.74, *SE* = .12) than milk (*M* = 4.11, *SE* = .14), which also was significantly higher than potato chips (*M* = 3.15, *SE* = .12), $F(2, 216) = 70.38$, $p < .001$, $\eta^2 = .40$. Finally, participants indicated they are more willing to pay extra for bananas in the organic condition (*M* = 23.65%, *SE* = 1.69) than milk in the antibiotic free condition (*M* = 18.67%, *SE* = 1.53), which also was significantly higher than potato chips in the non-GMO condition (*M* = 11.77%, *SE* = 1.14), $F(2, 172) = 40.52$, $p < .001$, $\eta^2 = .32$.

Table 2
Within-Group Comparisons of Different Product Categories

Dependent Variables	Organic M (*SE*)	Non-GMO M (*SE*)	Antibiotics Free M (*SE*)	Wilks' λ	*F*-value	Partial η^2
Label Recall***	.41 (.03) $_C$	.06 (.02) $_A$	.16 (.02) $_B$	.71	45.23	.29
Label Recognition***	.76 (.03) $_B$	.55 (.03) $_A$	.73 (.03) $_B$	.88	14.43	.12
Attitude toward Food Labels***	5.73 (.07) $_B$	5.12 (.09) $_A$	5.86 (.08) $_B$	.74	37.84	.26
Perceived Value ($)***	14.14 (.19) $_C$	12.68 (.15) $_A$	13.30 (.18) $_B$	.74	37.04	.26
Purchase Intention***	4.96 (.09) $_C$	4.03 (.12) $_A$	4.50 (.12) $_B$	.78	30.02	.22
Willingness to Pay More***	4.74 (.12) $_C$	3.15 (.12) $_A$	4.11 (.14) $_B$	.61	70.38	.40
Amount to Pay More (%)***	23.65 (1.69) $_C$	11.77 (1.14) $_A$	18.67 (1.53) $_B$	.68	40.52	.32

Note: A: Subscripts placing next to the mean (standard error) indicate significant difference among breaks in one-way ANOVA at a .05 significance level (i.e., $_A < _B$). B: *** p < .001; ** p < .01; * p < .05

Interaction Effects of Message Frame Format in Different Product Category

Interactions between the message formats and product types were determined in two ways: interaction effects of message formats in product categories and those of product category in message formats. Regarding the interaction effects of message formats in product categories, this study found significant interaction effects in food label recall and recognition. Findings of interaction effects of message formats in product categories are displayed in Table 3.

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Table 3

Interaction Effects of Message Frame Formats within Different Product Categories

Dependent Variables	Product Categories	Gain Frame M (*SE*)	Loss Frame M (*SE*)	M^2	*F*-value	Partial η^2
Label Recall	Organic	.38 (.05)	.44 (.05)	.14	.59	.00
	Non-GMO	.07 (.02)	.06 (.02)	.01	.23	.00
	Antibiotics Free**	.08 (.03) $_A$	.23 (.03) $_B$	1.26	9.56	.04
Label Recognition	Organic	.77 (.04)	.79 (.04)	.02	.12	.00
	Non-GMO	.60 (.05)	.51 (.05)	.35	1.43	.01
	Antibiotics Free ***	.63 (.04) $_A$	.83 (.04) $_B$	2.20	11.66	.05
Attitude toward Food Labels	Organic	5.76 (.10)	5.69 (.10)	.25	.22	.00
	Non-GMO	5.20 (.13)	5.05 (.13)	1.22	.68	.00
	Antibiotics Free	5.86 (.11)	5.85 (.11)	.01	.01	.00
Perceived value ($)	Organic	13.88 (.26)	14.39 (.28)	13.62	1.75	.01
	Non-GMO	12.67 (.21)	12.69 (.22)	.02	.004	.00
	Antibiotics Free	13.04 (.24)	13.55 (.26)	14.10	2.13	.01
Purchase intention	Organic	4.94 (.13)	4.98 (.13)	.09	.05	.00
	Non-GMO	4.18 (.17)	3.87 (.17)	5.22	1.66	.01
	Antibiotics Free	4.46 (.17)	4.53 (.18)	.27	.08	.00
Willingness to pay more	Organic	4.88 (.16)	4.21 (.16)	4.61	1.61	.01
	Non-GMO	3.26 (.17)	3.03 (.17)	2.98	.94	.00
	Antibiotics Free	4.21 (.19)	4.02 (.20)	1.95	.47	.00
Amount to pay more (%)	Organic	25.79 (2.30)	21.51 (2.47)	797.40	1.61	.01
	Non-GMO	12.35 (1.55)	11.20 (1.67)	57.89	.26	.00
	Antibiotics Free	19.32 (2.08)	18.03 (2.24)	72.90	.18	.00

Note: A: Subscripts placing next to the mean (standard errors) indicate significant difference among breaks in one-way ANOVA at a .05 significance level (i.e., $_A < _B$). B: *** p < .001; ** p < .01; * p < .05

The results of follow-up tests show in the antibiotics condition participants recalled the food label (antibiotics free) embedded in the loss message frame (M = .23, SE = .03) significantly better than that embedded in the gain message frame (M = .08, SE = .03), F (1, 218) = 9.96, $p < .01$, η^2 = .04. Similarly, in the antibiotics free conditions, participants recognized food label message in the loss message format (M = .83, SE = .04) better than that in the gain message format (M = .63, SE = .04), F (1, 216) = 11.66, $p < .001$, η^2 = .05.

Interaction Effects of Product Category in Different Message Frame Format

Significant interaction effects of product category in two message formats were detected from all seven dependent measures (see Table 4).

Table 4
Interaction Effects of Product Categories within Different Message Frame Formats

Dependent Variables	PSA Mood	Organic M (*SE*)	Non-GMO M (*SE*)	Antibiotics Free M (*SE*)	Wilks' λ	*F*-value	Partial η^2
Label Recall	Gain Frame***	.38 (.05)$_B$	.07 (.02)$_A$	.08 (.03)$_A$	.85	19.75	.15
	Loss Frame***	.44 (.05)$_C$	.06 (.02)$_A$	.23 (.03)$_B$	.79	29.42	.15
Label Recognition	Gain Frame**	.77 (.04)$_B$	.60 (.05)$_A$	.63 (.04)$_A$	.96	5.06	.05
	Loss Frame***	.79 (.04)$_B$	.51 (.05)$_A$	.83 (.04)$_B$	.88	15.31	.13
Attitude toward Food Labels	Gain Frame***	5.76 (.10)$_B$	5.20 (.13)$_A$	5.86 (.11)$_B$	.87	16.08	.13
	Loss Frame***	5.69 (.10)$_B$	5.05 (.13)$_A$	5.85 (.11)$_B$	.83	21.95	.17
Perceived Value ($)	Gain Frame***	13.88 (.26)$_B$	12.67 (.21)$_A$	13.04 (.24)$_A$	.88	13.96	.12
	Loss Frame***	14.39 (.28)$_C$	12.69 (.22)$_A$	13.55 (.26)$_B$	.82	23.93	.19
Purchase Intention	Gain Frame***	4.94 (.13)$_B$	4.18 (.17)$_A$	4.46 (.17)$_A$	.91	10.72	.09
	Loss Frame***	4.98 (.13)$_C$	3.87 (.17)$_A$	4.53 (.18)$_B$	.84	20.41	.16
Willingness to Pay More	Gain Frame***	4.88 (.16)$_C$	3.26 (.17)$_A$	4.21 (.19)$_B$	.75	36.90	.26
	Loss Frame***	4.59 (.16)$_C$	3.03 (.17)$_A$	4.02 (.20)$_B$	.76	35.59	.24
Amount to Pay More (%)	Gain Frame***	25.79 (2.30)$_C$	12.35 (1.55)$_A$	19.32 (2.08)$_B$	.76	27.43	.24
	Loss Frame***	21.51 (2.47)$_B$	11.20 (1.67)$_A$	18.03 (2.24)$_B$	.85	14.85	.15

Note: A: Subscripts placing next to the mean (standard error) indicate significant difference among breaks in one-way ANOVA at a .05 significance level (i.e., A< B < C). B: *** p < .001; ** p < .01; * p < .05

The follow-up tests showed in the gain message format participants recalled labels significantly better in the organic condition (*M* = .38, *SE* = .03) than those in the antibiotics free (*M* = .08, *SE* = .03) and non-GMO (*M* = .07, *SE* = .02) conditions, $F(2, 217) = 19.75$, $p < .001$, $\eta^2 = .15$. In the loss message format, participants recalled food labels better in the organic conditions (*M* = .44, *SE* = .05) than those in the antibiotics free (*M* = .23, *SE* = .03), which is also significantly different from those in the non-GMO condition (*M* = .06, *SE* = .02), $F(2, 217) = 29.42$, $p < .001$, $\eta^2 = .21$.

A similar pattern was observed with food label recognition. In the gain message format condition, food labels in the organic conditions (*M* = .77, *SE* = .04) were better recognized than those in the antibiotics free (*M* = .63, *SE* = .04) and non-GMO (*M* = .60, *SE* = .05) condition, $F(2, 215) = 5.06$, $p < .01$, $\eta^2 = .05$. In the loss message format condition, participants recognized food labels in the antibiotics free (*M* = .83, *SE* = .04) and organic (*M* = .79, *SE* = .04) conditions more than the non-GMO condition (*M* = .51, *SE* = .05), $F(2, 215) = 15.31$, $p < .001$, $\eta^2 = .13$.

In terms of the attitude toward food labels, regardless of message formats, messages in the antibiotics free (gain message format: *M* = 5.86, *SE* = .11; loss message format: *M* = 5.85, *SE* = .11) and organic (gain message format: *M* = 5.76, *SE* = .10; loss message format: *M* = 5.69, *SE* = .10) conditions were more favorably evaluated than those in the non-GMO condition (gain message format: *M* = 5.20, *SE* = .13; loss message format: *M* = *M* = 5.05, *SE* = .13), (gain message format: $F(2, 217) = 16.08$, $p < .001$, $\eta^2 = .13$; loss message format: $F(2, 217) = 21.95$, $p < .001$, $\eta^2 = .17$).

For the perceived value of organic counterparts, participants reported products in the organic condition would be more expensive than those in the other conditions. In the gain message format condition, participants perceived the price of the organic version of bananas (*M* = $13.88, *SE* = .26) would be considerably more than that of milk (*M* = $13.04, *SE* = .24) and potato chips (*M* = $12.67, *SE* = .21), $F(2, 211) = 13.96$, $p < .001$, $\eta^2 = .11$. In the loss message format condition, participants perceived the organic version of bananas (*M* = $14.39, *SE* = .28) would be more expensive than milk

(M = \$13.55, SE = .26), which is also more expensively perceived than potato chips (M = \$12.69, SE = .22), $F(2, 211) = 23.93, p < .001, \eta^2 = .19$.

For the purchase intention of the product from the ads with organic labels, participants showed higher intention for bananas (M = 4.94, SE = .13) than milk (M = 4.46, SE = .17) and potato chips (M = 4.18, SE = .17) in the gain message format condition, $F(2, 217) = 10.72, p < .001, \eta^2 = .09$. In the loss message format, participants also showed higher purchase intention for bananas (M = 4.98, SE = .13) than milk (M = 4.46, SE = .17), which is also different from potato chips in the non-GMO condition (M = 3.87, SE = .17), $F(2, 217) = 20.41, p < .001, \eta^2 = .16$.

For the measure of the likelihood to pay more, regardless of message formats, participants showed higher willingness to pay more for bananas (gain message format: M = 4.88, SE = .16; loss message format: M = 4.59, SE = .16) than milk (gain message format: M = 4.21, SE = .19; loss message format: M = 4.02, SE = .20), which is also subsequently higher than potato chips (gain message format: M = 3.26, SE = .17; loss message format: M = 3.03, SE = .17), (gain message format: $F(2, 216) = 36.90, p < .001, \eta^2 = .26$; loss message format: $F(2, 216) = 33.59, p < .001, \eta^2 = .24$). In terms of amount of pay extra, participants are willing to pay significantly more for bananas (M = 25.79%, SE = 2.30) than milk (M = 19.32%, SE = 2.08), which is also more than potato chips (M = 12.35%, SE = 1.55) in the gain message format condition, $F(2, 172) = 27.43, p < .001, \eta^2 = .24$. In the loss message condition, participants reported they are willing to pay more for bananas (M = 21.51%, SE = 2.47) and milk (M = 18.03%, SE = 2.24) than potato chips (M = 11.20%, SE = 1.67), $F(2, 172) = 14.85, p < .001, \eta^2 = .15$.

Discussion

This study set out to explore the effects of gain- and loss-framed messages in magazine food advertisements. Prior research has demonstrated the effectiveness of gain vs. loss frames depends upon the mindset of consumers and whether they perceive the health behavior presented to be prevention-oriented or promotion-oriented (Rothman, Bartels, Wlaschin, & Salovey, 2006). While this study found a significant difference in recall for the food labels in between the gain and loss conditions, this study did not find a significant difference between the two message formats for other measures. It is unclear whether consumers view the behavior of buying organic, GMO-free and antibiotics free foods as prevention-oriented or promotion-oriented. Indeed, consumers may view each of these types of purchases differently based on their knowledge and experience. Future research should be done to better understand the mindset of consumers toward these purchase behaviors.

This study took a unique look at gain/loss messages in magazine advertisements across three different food products — a fresh, plant-based product (bananas), a processed, plant-based product (potato chips), and a processed, animal-based product (milk). These food products were all unfamiliar brands for the study participants. Overall, the effect of the gain/loss frames was eclipsed by the effect of the product type and food labels. Participants indicated greater recall for the organic (bananas) message than they did for the antibiotic-free (milk) or GMO (potato chips) messages. The recall was also greater for the food labels found in the organic message. The GMO message was received less favorably, in terms of attitude, than the antibiotic or organic messages. These findings are consistent with research showing consumers perceive the use of biotechnology more favorably in plant-based foods (bananas and potato chips) than in animal-based foods (milk) and they perceive organic products differently than GMO products (Anderson, Wachenheim, & Lesch, 2006).

There are other potential reasons for the disparity in participant response to the bananas, potato chips and milk products. Bananas, even organic bananas, are a relatively inexpensive food product.

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For our sample, college students, this may be one of a few organic food products within their economic reach. Familiarity with organic foods is also higher for many consumers than for GMO or non-GMO foods. Studies show that while GMO technology is prevalent in food products, risk perception is still prevalent for some consumers (He & Bernard, 2011; Costa-Font, Gil, & Traill, 2008; Onyango et al., 2003; Burton et al., 2001). Potato chips, while not expensive, are a fried food product and, thus, are not likely perceived as a healthy food option. It may be college students do not see a relative advantage in paying more for non-GMO potato chips because they are not purchasing potato chips with health in mind.

The effectiveness of the gain and loss messages differed depending on product type. It may be participants regarded some of the labels (organic, non-GMO, and antibiotics free) as promotion-oriented and others as prevention-oriented. Further research should be done to evaluate consumer understanding and interpretation of these labels.

Study Limitations

The sample for this study was college students. While these consumers often have limited resources to pay for premium food products, research shows they have positive attitudes toward alternative food production practices like those used in organic food production (Pelletier, Laska, Neumark-Sztainer & Story, 2013). The sample for this study was also predominantly female (86.8%). According to research from Boek, Bianco-Simeral, Chan and Goto (2012), gender significantly affects the way college students approach food choices. Other studies have shown college women place greater value on organic foods than college men (Pelletier, Laska, Neumark-Sztainer & Story, 2013). A sample with more gender diversity may have resulted in different responses to the food messages presented. This is an area for future research.

As food communicators develop messages to help consumers understand the differences between food products, it is important for them to understand how consumers evaluate food production practices and their respective food labels. Gain and loss frames may be effective in persuading consumers to purchase certain food products, but communicators will be most effective in employing these frames if they can discern how consumers view different food production practices.

Suggestions for Future Research

This was the first study to explore the effectiveness of food labels in advertisements considering message frame formats (gain and loss). Future research may take this area of study in several directions. First, a direct extension of this research may examine the factors influencing the effectiveness of food labels, such as demographic determinants (age, gender, and income) as well as personal characteristics (e.g., involvement, perceived threat, and nutrition knowledge) and history with products (degree of product usage, level of satisfaction, and familiarity). Second, other types of food-related issues/labels, such as pesticide-free product, locally-grown products, and the origin of products, could be explored for more comprehensive understanding of food label effectiveness. In addition, subsequent studies may compare the effectiveness of food labels with other types of labels, such as health/safety warning labels (e.g., smoking, drunk driving, and texting while driving) and environmental ecolabels (e.g., energy conservation, pollution, and resource recycling). Further, future research may investigate the role of creativity, viewers' involvement, context-generated mood, physiological status, and brand familiarity as potential moderating variables of the effectiveness of food labels.

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