

The effect of ad appeals and message framing on consumer responses to plant-based menu items

Abstract

While the recent surge of meat-like items on restaurant menus has received considerable attention, little is known how to encourage consumers to choose such novel dishes. To address this gap, we investigate the role of various communication strategies in making plant-based menu items more attractive. The results from Study 1 suggest that using a social appeal in the ad increases consumers' preference for plant-based menu items via anticipated pleasure, but a health appeal does not. The results from Study 2 demonstrate that information on social costs induces feelings of ambivalence toward meat eating, thus making plant-based menu items more desirable. However, information on health risks of meat consumption does not have such an effect. Practical implications for promoting plant-based menu items are discussed.

Keywords

Plant-based meat, advertising appeal, anticipated emotion, message framing, ambivalence

1. Introduction

Meat analogue, meat substitute, or plant-based meat is food structurally similar to meat but different in composition (Joshi & Kumar, 2015). Unlike traditional vegetarian food products catering to particular dietary constraints (i.e., vegans and vegetarians), today's meat analogues target a much wider consumer market (i.e., omnivores and flexitarians) by closely mimicking the sensory properties of meat such as appearance, taste and texture (Weinrich, 2019; Ismail, Hwang, & Joo, 2020). Recently, a new wave of meat-mimicking burgers has received considerable attention within academia and the popular press. Major US quick-service and casual restaurant chains have added "meat-like" brands such as Beyond Meat and Impossible Foods (two brands that have successfully achieved taste and texture previously unattainable in meat alternatives) to their menus nationwide. For instance, Burger King launched the Impossible Whopper in all US stores, Subway offers the Beyond Meatball Marinara across the country, Carl's Jr. added new Beyond Meat breakfast items, and more recently, Starbucks started to sell its Impossible Breakfast Sandwich. How do consumers respond to such initiatives? How should restaurants promote their novel menu items?

Environmental sustainability, animal welfare, and health considerations are often discussed as the main drivers of developing meat substitutes (Joshi & Kumar, 2015; Kumar et al., 2017; Ismail et al., 2020). Avoiding animal slaughter is the most commonly perceived benefit among meat-eaters and vegetarians alike (O'Keefe et al., 2016; Tucker, 2014). Moreover, the production of plant-based meats is often regarded as more environmentally friendly than conventional meat due to savings in natural resources such as water and land and reduced greenhouse gas emissions (De Boer & Aiking, 2011; Hoek et al., 2011). In addition to ecological and moral attributes, plant-based meats have potential health benefits such as protection against heart disease,

lower blood cholesterol, reduced risk of cancer and increased bone mass (Joshi & Kumar, 2015; Sadler, 2004). Moreover, plant-based meats help alleviate “modern health worries” - consumers’ concerns about growth-hormone injections for livestock (Devcich, Pedersen, & Petrie, 2007). Although the scientific evidence is ambiguous regarding whether meat analogue products are superior in terms of social impact or nutritional value, it is meaningful to investigate how promoting such benefits might influence consumers’ perceptions and behavioral intentions.

The body of research on consumer attitudes and acceptance of plant-based proteins and meat substitutes is limited albeit growing (Bryant et al., 2019; Hoek et al., 2004; 2011; 2013; Siegrist & Hartmann, 2019; Slade, 2018; Van Loo, Caputo, & Lusk, 2020). Previous studies suggest that the tendency to choose plant-based meat alternatives is much lower than their conventional meat counterparts (Slade, 2018; Van Loo et al., 2020). Food neophobia, meat attachment, unfamiliarity and lower sensory attractiveness are important barriers (Bryant et al., 2019; Hoek et al., 2011; Hwang et al., 2020). However, the new generation of plant-based meats has improved sensory properties (Ismail et al., 2020). Moreover, consumers are more familiar with plant-based alternatives given the heavy advertising by major restaurant chains.

More importantly, there is scant research examining how to increase consumers’ preference for plant-based meat products. Currently, restaurants have predominately used taste appeals in their advertisements and promotions to address the similarity between plant-based burgers and conventional beef burgers (e.g., Burger King’s “100% whopper, 0% beef”). However, does such framing increase consumers’ preference for plant-based burgers? Or, would social appeals and health appeals be more effective? Furthermore, what are the underlying factors that drive consumer choice?

To answer these questions, the present research investigates the effectiveness of various communication strategies from two different perspectives. The first objective is to examine the effectiveness of various ad appeals (social vs. health vs. taste) from the “pull” perspective. In Study 1 we find that a social (vs. taste) appeal increases consumers’ preferences for plant-based menu items via anticipated pleasure, but a health appeal does not. The second objective is to investigate the impact of information regarding negative consequences of meat consumption (social costs vs. health risks vs. control) from the “push” perspective. In Study 2 we show that an exposure to information on social costs of meat consumption (vs. control) enhances consumers’ feelings of ambivalence, thus influencing their choice of plant-based menu items. However, an exposure to information on health risks of meat consumption does not have such an effect.

2. Literature review

While there is a growing number of studies on consumers acceptance of meat substitutes in household and grocery store contexts (Hoek et al., 2004; 2011; 2013; Hwang et al., 2020; Siegrist & Hartmann, 2019; Vanhonacker et al., 2013), research on the new generation of plant-based burgers is scant. Van Loo et al. (2020) is one of the first to investigate U.S. consumers’ preferences for the new beef burger alternatives in grocery stores. Their results show that only 28% participants chose one of the alternatives (16% for plant-based meat with pea protein, 7% for plant-based meat with animal-like heme protein, 5% for lab-grown meat) while 72% chose farm-raised beef. Moreover, providing information about environmental and animal welfare had a small positive effect on consumers’ preference for plant-based meat (Van Loo et al., 2020). However, it is not clear what the underlying mechanism is and if such findings extend

to the restaurant context. Slade (2018) is a rare exception using restaurant as the study context. In a hypothetical choice experiment, consumers were given the option of fast-food burgers made from beef, plant-based protein, or cultured meat. The results showed a marked preference for the beef burger (65%) compared to the plant-based burger (21%) or the cultured meat burger (11%) (Slade, 2018). However, the researcher told participants that all burgers tasted the same, which may not be the case in real life. Moreover, cultured meat was not available in the market and plant-based burgers were not widely offered by restaurants at that time.

Different from previous studies, the present research responds to the recent surge of plant-based menu items and the role of various communication strategies in making them more attractive. Next, we will discuss how health or social appeals used in restaurant ads influence consumer choices via anticipated emotions.

2.1 Advertising appeals

Taste and health claims are the two dominating advertising appeals used in food promotions (Kim, Cheong, & Zheng, 2009). The former focuses on the hedonic value of enjoyment while the latter reflects the utilitarian value of staying healthy (Dhar & Simonson, 1999; Wansink & Chandon, 2006). Previous research suggests that the effectiveness of different types of advertising claims is contingent on food categories (e.g., hedonic vs. utilitarian), consumer segments (e.g., individual difference in health consciousness and dietary concern) and consumption contexts (e.g., luxury dining) (Hwang, Yoon, & Park, 2011; Loebnitz & Grunert, 2018; Yang & Mattila, 2016; Zhang et al., 2014). For example, a taste claim tends to be more appealing when sensory enjoyment is the dominant motive, whereas a health claim is more persuasive when nutritional benefit is the main consideration. Focusing on vegetable consumption,

Turnwald et al. (2017; 2019) show that taste-focused (vs. health-focused) labels and indulgent (vs. healthy) descriptors increases people's vegetable intake in university dining settings. However, Bacon and Krpan (2018) find that whereas vivid descriptions of vegetarian menu items increase the appeal of such dishes among infrequent eaters of vegetarian foods, it leads to a reversed effect for frequent eaters of vegetarian meals. These findings are consistent with the divergent effects of health and taste claims.

In addition to personal values, social and ethical attributes (e.g., environmental friendliness and animal welfare) are increasingly important in food consumption decisions (Hwang et al., 2020; Buttlar & Walther, 2018). As consumers are more and more concerned about the impact of their behaviors and decisions on the environment and the society, the use of social claims has become more prevalent (Bailey, Mishra, & Tihamiyu, 2018; Cho, 2015). Akaichi, Glenk, and Revoredo-Giha (2019) find that consumers' demand for organic animal products can be increased by addressing their superiority in terms of sustainability and animal welfare. Iweala, Spiller, and Meyerding (2019) reveal that feelings of doing something good for the society lead to positive evaluations on food items with prosocial and pro-environmental claims (i.e., fair trade and carbon-neutral). Focusing on vegetarian menu items, Krpan and Houtsma (2020) demonstrate that using a pro-environmental or social (vs. vegetarian) name frame boosts restaurant diners' choice of vegetarian dishes.

Next, we discuss the role anticipated emotions in influencing consumer preferences for plant-based menu alternatives.

2.2 Anticipated emotions

Anticipated emotions refer to “the prospect of feeling positive or negative emotions after performing or not performing a certain behavior” (Rivis, Sheeran, & Armitage,

2009; p. 2987). Different from experienced or current emotions that arise almost instantaneously in decision-making contexts, anticipated emotions are more conscious affective responses regarding future emotional consequences based on whether or not a particular behavior is enacted (Baumeister et al., 2007). Prior to purchasing a product or making a choice, consumers often try to foresee the consequences of their actions and anticipate emotions they might experience as a result of their decisions (Mellers & McGraw, 2001). Previous research suggests that anticipated emotions guide people's decisions and behavioral intentions (Baumeister et al., 2007; Hur & Jang, 2015; Loewenstein & Lerner, 2003; Ravis et al., 2009), even to a stronger extent than felt emotions (Bagozzi et al., 1999; Mellers & McGraw, 2001). In general, consumers strive to experience positive emotions and avoid negative ones. As a result, positive anticipated emotions induce behavioral responses while negative anticipated emotions signal avoidance behaviors.

Anticipated guilt and pleasure influence consumers' decision-making processes involving prosocial behaviors (Olthof, 2012), pro-environmental decisions (Rezvani, Jansson, & Bengtsson, 2017) and healthy food consumption (Hur & Jang, 2015). Specifically, guilt is a negative emotion derived from one's belief of doing something wrong or undesirable (Baumeister, Stillwell, & Heatherton, 1994; Roseman, Wiest, & Swartz, 1994). In contrast, pleasure is a positive emotion reflecting happiness and delight (Hur & Jang, 2015). Previous research demonstrates the positive impact of anticipated pleasure on individuals' pro-environmental behaviors (Verdugo, 2012; Schuitema et al., 2013). Through engaging in sustainable actions such as the adoption of electric vehicles, people experience positive feelings about themselves as they are contributing to the public good (Rezvani et al., 2017; Schuitema et al., 2013). In this paper we argue that when social benefits of plant-based menu items (e.g., good for

environmental sustainability and animal welfare) are highlighted, consumers are more likely to anticipate pleasurable feelings and positive affective experiences when choosing plant-based dishes. In other words, a social appeal will increase consumers' anticipated pleasure by eliciting the feelings of doing good for the society, thus making plant-based menu items more attractive.

We further suggest that focusing on health benefits will be less effective. Menu items based on plant-based meats tend to be indulgent (e.g., burgers, fried chicken, pizza). Health attributes are less important in such consumption contexts because health goals are not salient (Oh, 2020; Ramanathan & Williams, 2007). Moreover, there is an ongoing debate on whether plant-based burgers are healthier than traditional beef burgers (CNET, 2019; NBC News, 2019). Although plant-based meats have certain benefits such as no cholesterol and high in fiber, they are similar with conventional beef burgers in terms of calorie and fat content. Taken together, we put forth the following hypotheses:

H1. A social (vs. taste) appeal increases consumers' preference for plant-based menu alternative, but a health (vs. taste) appeal does not.

H2. Feelings of anticipated pleasure mediate the above effect.

2.3 Message framing

Previous research suggests that to motivate an individual to behave in a certain manner, companies can highlight potential positive benefits (pull) or avoidable negative consequences (push) by message framing (De Boer & Aiking, 2017). In addition to advertising appeals promoting various benefits of plant-based menu items, we also examine whether highlighting negative consequences of meat consumption influences consumer choice. Previous research shows that consumers have a very low awareness

on the environmental impact of meat eating (De Boer, Witt, & Aiking, 2016; Tobler, Visschers, & Siegrist, 2011; Vanhonacker et al., 2013). Therefore, educating consumers on the issue is important. Tukker and Jansen (2006) estimate that 20 to 30 percent of the total environmental impact of Western countries is derived from the food industry, including contributions to waste, energy and water consumption, biodiversity loss, and greenhouse gas emissions. Animal welfare is another unsustainable consequence of the modern meat industry and it has become a major public concern (Grandin, 2010). In addition, excessive red meat intake is associated with increased risk of cardiovascular diseases, type 2 diabetes, and some types of cancer (Barnard, Levin, & Trapp, 2014; Tilman & Clark, 2014). Do messages focusing on social costs and health risks of meat consumption influence people's dining decisions? We propose that feelings of ambivalence towards meat consumption will play an important role in this process.

2.4 Feelings of ambivalence

Attitudinal ambivalence refers to the simultaneous existence of strong positive and negative evaluations towards an object, issue or behavior (De Liver, van der Pligt, & Wigboldus, 2007; Sparks et al., 2001; Thompson, Zanna, & Griffin, 1995). Previous research suggests that meat consumption can elicit ambivalent feelings (Berndsen & Van der Pligt, 2004; Buttlar & Walther, 2018). On one hand, meat consumption is associated with sensory pleasure and tradition; on the one hand, it is linked to moral, ecological, and health-related issues. The existence of both positive and negative evaluations leads to a "meat paradox" that most individuals like to eat meat but they do not want to be connected with the morally troublesome aspects of it (e.g., negative consequences on environment and animal welfare) (Bastian & Loughnan, 2017). Previous studies have demonstrated that meat-related ambivalence leads to less meat consumption (Berndsen & Van der Pligt, 2004) and a higher use of moral

disengagement strategies (Buttlar & Walther, 2018).

We propose that messages on social costs of meat consumption (e.g., climate change and animal slaughtering) will result in more negative evaluations of meat consumption, thus leading to ambivalent feelings. Subsequently, people will be less likely to choose a meat-based menu item and opt for a plant-based alternative. Conversely, we don't expect such effects with health framing. First, the findings from previous studies on the effectiveness of health messages are mixed (Palomo-Vélez, Tybur, & Van Vugt, 2018; Vainio, Irz, & Hartikainen, 2018). While Palomo-Vélez et al. (2018) suggest that framing meat eating as a health issue can reduce future intention to eat meat, Vainio et al. (2018) reveal that reading an essay highlighting health consequence of meat fails to change people's food habits. Since health considerations tend to be less salient in indulgent food consumption contexts (Oh, 2020; Ramanathan & Williams, 2007), health messages may be not very effective in eliciting feelings of ambivalence. Taken together, we put forth the following hypotheses:

H3. Message framing highlighting social costs of meat consumption (vs. control) induces higher feelings of ambivalence, but highlighting health risks of meat consumption (vs. control) does not.

H4. Such ambivalence has a positive impact on consumers' preference for plant-based menu alternatives.

3. Study 1

3.1 Method

This study utilized a single factor (appeal type: social vs. health vs. taste) between-subjects factorial design. Participants were randomly assigned to one of the three

conditions. A completely randomized experiment maximizes the reliability and validity to make statistical inferences of the manipulated factors, and minimizes the influences of nuisance factors such as individual characteristics (Kuehl, 2000). Participants were recruited via Mturk, a widely used online platform that enables researchers to collect data conveniently with sufficient quality (Buhrmester, Talaifar, & Gosling, 2018; Paolacci, Chandler, & Ipeirotis, 2010). Consistent with previous research (Peer, Vosgerau, Acquisti, 2014), participants had to be 18 years or older, reside in the US, and have an approval rate of at least 95%. We also employed attention check questions to ensure valid responses (Luo & Mattila, 2020; Oh, 2020). Forty-one participants were removed due to attention check failures, leaving a sample size of 156. Eighty-one percent of the participants were between the ages of 18 and 49, 61 percent were male, 79 percent had a four-year college degree, and 66 percent earned more than \$40,000 annually.

Participants were asked to imagine that they planned to order a burger online and were browsing a restaurant's website. They were then exposed to two advertisements promoting the restaurant's new burger products. One was a conventional beef burger, promoted with a taste appeal (e.g., "Enjoy the classic taste - savory, juicy, delicious"). The alternative was a plant-based burger promoted with a social appeal (e.g., "Good for the environment and animal welfare"), a health appeal (e.g., "Good for your health – no cholesterol and more fiber") or a taste appeal (e.g., "Tasty and delicious - just like a beef burger"). We used taste appeal as a control condition since it is mostly widely used in restaurants' promoting plant-based burgers and other meat analogue products. To mimic real life (e.g., Burger King, Carl's Jr, Fridays), the two burgers were presented with similar nutrition information.

Participants were asked to indicate their choice preference with a 7-point bipolar scale

(1 = conventional beef burger, 7 = plant-based burger), which has been widely used to capture choice preference in consumer research (Huang & Sengupta, 2020; Yang & Mattila, 2020). Then, they were asked to rate their anticipated emotions and indicate their perceptions for each burger separately. Consistent with previous research (Hur & Jang, 2015), anticipated feelings of pleasure (e.g., “pleasure”, “happiness” and “delight”; 1 = not at all, 7 = very much; $\alpha = 0.96$ for plant-based burger; $\alpha = 0.93$ for conventional beef burger) were measured with three items. Perceptions of each burger were captured on five relevant attributes: health (1 = unhealthy, 7 = healthy), taste (1 = not tasty, 7 = tasty), naturalness (1 = unnatural, 7 = natural), environmentally-friendly (1 = bad for the environment, 7 = good for the environment), and animal-friendly (1 = bad for animals, 7 = good for animals). The order of rating the two burgers was counterbalanced. Finally, participants completed demographic questions and were thanked for their participation.

3.2 Results

A realism check shows that participants perceived the scenario as realistic ($M = 5.73$; $t = 16.67$, $p < 0.001$, as compared to the midpoint). The sample sizes for the three conditions are fairly balanced ($N_{\text{social}} = 50$, $N_{\text{health}} = 56$, $N_{\text{taste}} = 50$). Previous literature on experimental research in hospitality (Fong et al., 2016; Lynn & Lynn, 2003) suggests 30 subjects per experimental condition as the cutoff point. The minimum cell size in the present study was 50 per condition to reflect the need for larger samples in an online context (Mattila, Luo, Xue, & Ye, 2020).

Attribute evaluations

To understand participants’ perceptions on the two burgers, paired sample t-tests were conducted to compare the differences in participants’ evaluations on the five attributes

(see Table 1). The results show that the plant-based burger is consistently perceived as healthier but less tasty across the three ads. Not surprisingly, the plant-based burger is also perceived as better for the environment and better for animals regardless of the appeal. There are no significant differences in naturalness perceptions.

Table 1. Evaluations on health, taste, naturalness and ethical attributes

Attribute	Appeal type	M _{plant-based}	M _{regular}	t-statistic	p-value
Health	Taste	5.12	3.88	-4.72	< 0.01
	Health	5.54	3.95	-4.42	< 0.01
	Social	5.22	4.44	-2.58	0.02
Taste	Taste	4.52	5.70	3.35	< 0.01
	Health	4.88	5.80	2.65	0.01
	Social	4.86	5.56	1.60	0.05
Good for the environment	Taste	5.52	4.42	-3.14	< 0.01
	Health	5.79	4.00	-4.69	< 0.01
	Social	5.82	4.02	-4.92	< 0.01
Good for animals	Taste	5.70	3.60	-5.11	< 0.01
	Health	5.93	3.48	-6.46	< 0.01
	Social	5.70	3.58	-5.48	< 0.01
Naturalness	Taste	4.64	5.20	1.37	0.18
	Health	5.29	5.27	-0.05	0.96
	Social	5.02	5.34	0.92	0.36

To examine whether appeal type influences participants' relative perceptions of plant-based burger (vs. conventional beef burger), a MANOVA was conducted with mean differences in evaluations on the five attributes as dependent variables and appeal type (taste appeal coded as 0, health appeal coded as 1, social appeal coded as 2) as independent variable. The results reveal no significant differences in perceived healthfulness ($F = 1.58$, $p = 0.21$), taste ($F = 0.45$, $p = 0.64$), good for environment ($F = 1.16$, $p = 0.32$) and animals ($F = 0.26$, $p = 0.78$), and naturalness ($F = 0.61$, $p = 0.54$) across conditions. Therefore, we rule out attribute-based evaluations as an alternative account.

Consumer choice

To test the effect of appeal type on consumers' preference for the plant-based burger, An ANOVA was performed with choice preference as dependent variable and appeal type as independent variable. The results show that choice preference varies across the different appeal conditions ($F = 4.08, p = 0.02$). Further simple contrasts reveal that participants exhibited a higher preference for the plant-based burger promoted with a social (vs. taste) appeal ($M_{\text{social}} = 4.64, M_{\text{taste}} = 3.24; t = 2.89, p < 0.01$), whereas there is no difference between health appeal and taste appeal ($M_{\text{health}} = 3.79, M_{\text{taste}} = 3.24; t = 1.21, p = 0.27$). Thus, H1 is supported. Although of less interest in the current study, the difference between social appeal and health appeal is marginally significant ($t = 1.77, p = 0.08$).

Anticipated pleasure

Following Kim (2017), we used the difference of the emotion score between the two burgers (e.g., the score of plant-based burger minus that of conventional beef burger) in the main analysis. To examine whether appeal type influences anticipated pleasure, an ANOVA was conducted with relative pleasure as the dependent variable and appeal type as the independent variable. The results reveal a marginally significant difference in anticipated pleasure ($F = 2.59, p = 0.08$) across the three conditions. Simple contrast analyses further indicate that relative pleasure is significantly higher in the social appeal condition compared to the taste appeal condition (Mean difference = 1.24, $t = 2.39, p = 0.02$), whereas there is no significant difference in relative pleasure between the health appeal condition and the taste appeal condition ($t = 1.50, p = 0.14$).

Mediation analyses

To test the mediating effect of anticipated emotions, we conducted mediation analyses

using the bootstrapping approach (Model 4; Hayes, 2017). The independent variables were dummies for the advertisement appeals, with the taste appeal as the reference category. Relative pleasure was the mediator, and consumer choice preference was the dependent variable. When social and taste appeal served as independent variables, there was a significant mediation via anticipated pleasure (indirect effect = 0.40, 95% CI = 0.081 to 0.707; see Figure 1 for specific results). However, the mediation is not significant when the health and taste appeal were used as independent variables (95% CI = -0.148 to 1.172; see Figure 2 for specific results). Thus, H2 is supported.

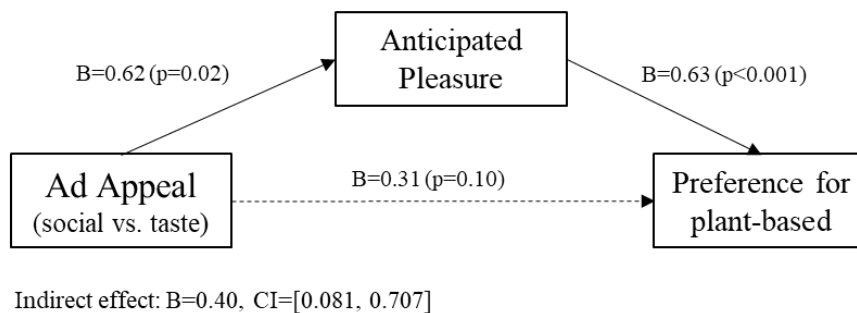


Figure 1. Mediation effect for the social (vs. taste) appeal

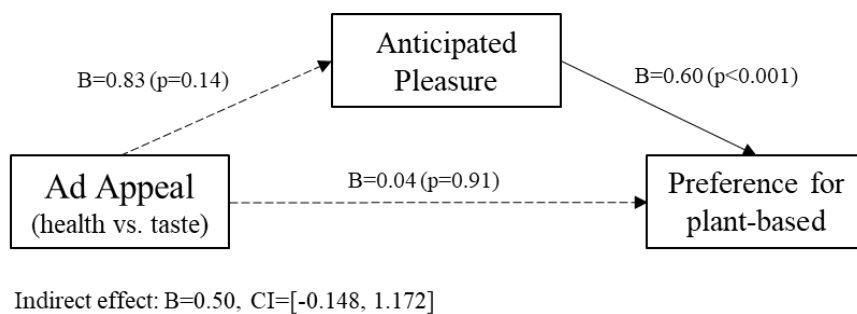


Figure 2. Mediation effect for the health (vs. taste) appeal

3.3 Discussion

Findings from study 1 demonstrate advertising appeal type influences consumers' preference for plant-based burgers. Currently, restaurants use taste appeals to convey the taste similarity between new plant-based menu items and their conventional meat

counterparts. However, our findings suggest that, compared to a taste appeal, promoting social benefits might be more effective in driving demand for plant-based menu items. As social appeals elicit feelings of doing something good for the society, anticipated pleasure was the underlying psychological mechanism explaining the effect. As expected, promoting health benefits was not as effective in influencing consumer choices.

In Study 1, we examined the pull effect of advertising appeals that promote plant-based burgers. Study 2 investigates the push effect of highlighting the negative consequences of meat consumption. To increase the generalizability of our findings, we used a different plant-based menu item.

4. Study 2

4.1 Method

This study adopted a single-factor, between-subjects design (message type: social vs. health vs. control). Participants were randomly assigned to one of the three experimental conditions. The sample contained 160 US adult consumers recruited via Amazon Mturk after deleting 33 participants who failed the attention checks. In terms of demographic background, 83 percent were between the ages of 18 and 49, 58 percent were male, 83 percent had a four-year college degree, and 68 percent earned more than \$40,000 annually.

Participants were instructed to complete two ostensibly unrelated tasks: the first was about message comprehension and the second about restaurant food choices. In the message comprehension task, participants read an article talking about either social cost (in the social condition) or health risks (in the health condition) of meat consumption

(adapted from Vainio et al., 2018). In the control condition, participants read an irrelevant article about the Olympics. Then, participants were asked to recall the main content of the article and to evaluate the information via a four-item, seven-point semantic differential scale (not credible – credible, of no value – of value, not meaningful – meaningful, not convincing – convincing; $\alpha = 0.90$; Graham & Abrahamse, 2017).

Next, participants completed the second ostensibly unrelated study, in which they were asked to image that they planned to order a pasta dish online. While looking at the restaurant menu, “Today’s Pasta Special” caught their attention. They were exposed to two special pasta items: Spaghetti with plant-based meatballs or regular beef meatballs. Afterward, participants were asked to make a choice between the two pasta dishes and to indicate their feelings of ambivalence toward eating meat via three items adapted from Berndsen and Van der (2004) (e.g., “I feel conflicted about eating meat”; 1 = strongly disagree, 7 = strongly agree; $\alpha = 0.92$). Finally, participants completed demographic questions and were thanked for their participation.

4.2 Results

A realism check shows that participants perceived the scenario as realistic ($M = 5.70$; $t = 18.47$, $p < 0.001$, as compared to the midpoint). Moreover, perceived message credibility did not vary across the three conditions ($M_{\text{social}} = 5.77$, $M_{\text{health}} = 5.58$, $M_{\text{control}} = 5.75$; $F = 0.46$, $p = 0.63$). The sample sizes for the three condition are balanced ($N_{\text{social}} = 54$, $N_{\text{health}} = 53$, $N_{\text{control}} = 53$), and exceed the cutoff point of 30 subjects per condition (Fong et al., 2016; Lynn & Lynn, 2003).

Consumer choice

The results reveal a significant difference in participants’ choice between the two pasta

items across the three conditions ($\chi^2 = 6.13$, $p < 0.05$). Specifically, in the control condition 49.1% chose Spaghetti with plant-based meatballs, whereas this number increased to 69.8% and 68.5% in the health condition and social condition respectively. The Chi-square tests further indicate that compared to participants in the control condition, participants exposed to an article about health risks ($\chi^2 = 4.62$, $p = 0.03$) or social costs ($\chi^2 = 4.62$, $p = 0.03$) of meat consumption were more likely to choose Spaghetti with plant-based meatballs.

Feelings of ambivalence

To examine whether message type influences participants' feelings of ambivalence toward meat consumption, an ANOVA was conducted with ambivalence as dependent variable and message type (control condition coded as 0, health condition coded as 1, social condition coded as 2) as independent variable. The results reveal a marginally significant difference across the three conditions ($F = 2.60$, $p = 0.08$). Simple contrast analyses indicate that participants who read the article regarding social costs of meat consumption experienced significantly higher levels of ambivalence than their counterparts in the control condition ($M_{\text{social}} = 4.75$, $M_{\text{control}} = 3.96$; $t = 2.09$, $p = 0.04$), whereas there is no difference between the health condition and the control condition ($M_{\text{health}} = 4.09$, $M_{\text{control}} = 3.96$, $t = 0.33$, $p = 0.74$). Thus, H3 is supported. Although of less importance in the current study, the difference between the social condition and the health condition is marginally significant ($M_{\text{social}} = 4.75$, $M_{\text{health}} = 4.09$, $t = 1.83$, $p = 0.07$).

Mediation analyses

To test the mediating effect of ambivalent feelings, we conducted mediation analyses using the bootstrapping approach (Model 4; Hayes, 2017). The independent variables

were dummies for message types, with the control condition as the reference category. Feelings of ambivalence toward eating meat was the mediator, and consumer choice was the dependent variable (regular choice coded as 0, plant-based choice coded as 1; logistic regression was used as consumer choice is binary). When social cost message and control condition served as independent variables, there was a significant mediation process through ambivalence (indirect effect = 0.13, 95% CI = 0.002 to 0.351; see Figure 3 for specific results). However, when health risk message (vs. control) were inputted as independent variables, there was no mediation through ambivalence (95% CI = -0.265 to 0.330; see Figure 4 for specific results). Thus, H4 is supported.

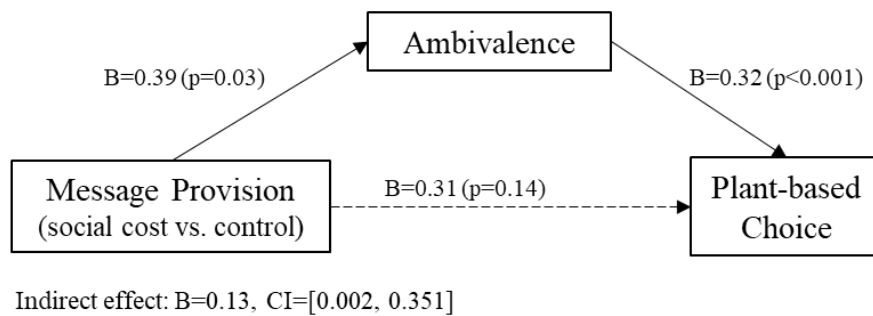


Figure 3. Mediation effect for the social cost message (vs. control)

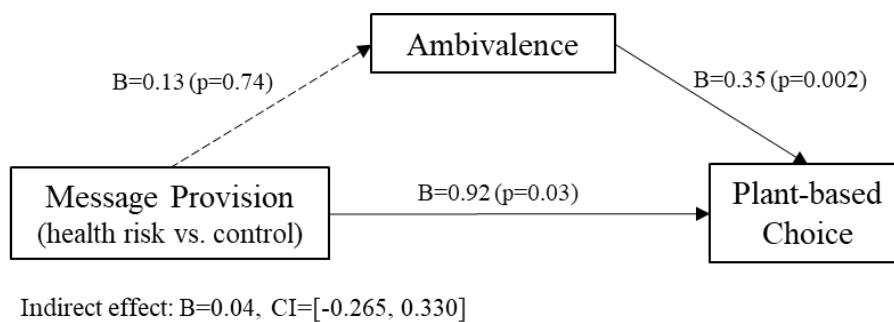


Figure 4. Mediation effect for the health risk message (vs. control)

4.3 Discussion

Findings from Study 2 demonstrate that information on social costs of meat consumption (e.g., negative consequences on environment sustainability and animal

welfare) (vs. control) elicits feelings of ambivalence toward meat eating, thus increasing the likelihood of choosing a plant-based menu item. While information regarding health risks of meat consumption (vs. control) failed to induce feelings of ambivalence, such information had a positive effect on participants' preference for plant-based menu items. Although not the focus of this study, these results indicate that other mechanisms (instead of ambivalence) explain consumer responses to health-related claims of meat consumption.

5. General discussion

Focusing on the recent surge of plant-based (meat-like) menu items, we conducted two studies to explore consumers' responses to such initiatives. In Study 1 we examine the pull effect of advertising appeals promoting social or health benefits. As expected, the social appeal was the most effective way to increase consumers' preference for plant-based menu items. Such an appeal induces anticipated pleasure from positive feelings of doing something good for the society. In Study 2, we examine the push effect of messages providing information on social or health consequences of meat consumption. The results indicate that information regarding social costs of animal meat consumption evokes feelings of ambivalence towards meat eating, which makes plant-based menu items more attractive.

Moreover, the present research demonstrates the importance of affective factors in the choice of plant-based dishes. Specifically, anticipated positive feelings of doing something good for the society act as a "pull" and induce consumers to choose plant-based menu items. Feelings of ambivalence toward meat eating, on the other hand, act as a "push" that reduces the attractiveness of meat-based menu items. We demonstrate that in addition to product attributes and individual level factors

addressed in prior literature (Hoek et al., 2011; Siegrist & Hartmann, 2019), emotions play an important role in influencing consumers' responses to meat substitutes.

Although framing and communicating different benefits does not change people's subjective evaluations of product-related attributes of plant-based menu items, they do influence their affective responses and behavioral intentions.

5.1 Theoretical contributions

This research makes several theoretical contributions. First, we extend prior research on meat substitutes by examining the relative effectiveness of various communication strategies in influencing consumers' menu choices. Prior research on consumers' acceptance of meat substitutes is limited to household and grocery contexts, mainly focusing on individual-level factors (e.g., health awareness, food neophobia and meat attachment) and product-related factors (e.g., availability, price, and brand) (Hoek et al., 2011; Slade, 2018; Siegrist & Hartmann, 2019; Van Loo et al., 2020). Yet, the role of advertising and message framing has been largely ignored. While plant-based menu items are gaining popularity, the psychological mechanisms driving consumer choices are not well understood. Responding to Van Loo et al. (2020)'s call for more research in this area of inquiry, the present study demonstrates the power of social appeals in nudging consumers to choose plant-based menu alternatives.

Second, the study findings add to the existing literature on sustainability and pro-environmental behaviors by examining the role of affective factors in driving sustainable food choices. Consistent with previous studies on pro-environmental behavior and green consumption in non-food domains (Searles, 2010; Tezer & Bodur, 2020), our findings suggest that positive feelings of doing good can increase people's preference for plant-based menu items when promoted as a better choice for the

environment and animal welfare. Moreover, we extend prior research on feelings of ambivalence related to meat consumption (Berndsen & Van der Pligt, 2004) by empirically testing its downstream effect on choosing plant-based dishes. Though consumers are increasingly concerned about the sustainability impact of their purchase decisions (Palomo-Vélez et al., 2018; Chen, Chaudhary, & Mathys, 2019), people's awareness on the environmental impact of meat eating is very low (De Boer et al., 2016; Tobler et al., 2011; Vanhonacker et al., 2013). As a result, providing information about the negative consequences of meat consumption works as an effective way to induce feelings of ambivalence thus making plant-based dishes more attractive. Taken together, the study findings indicate that consumers' decisions and behavioral intentions can be motivated either by retaining and approaching positive emotions or by relieving and avoiding negative emotions (Elgaaied, 2012; Erlandsson, Jungstrand, & Västfjäll, 2016; Hartmann et al., 2017; Iweala et al., 2019).

Finally, we contribute to the hospitality literature by investigating how to promote plant-based menu items. Food decisions are multifaceted, situational, dynamic, and complex (Sobal & Bisogni, 2009). In addition to personal values such as taste, health, cost and convenience, social aspects of food consumption have gained increasing attention (Hwang et al., 2020; Buttlar & Walther, 2018). Prior research has focused on organic and ethical foods (Akaichi et al., 2019; Iweala et al., 2019), whereas this research centers around plant-based menu items. Although health appeals and environment appeals for organic foods are both effective in inducing favorable attitudes and purchase intentions (Kareklas, Carlson, & Muehling, 2014), the findings of this research show that highlighting social benefits is more effective in increasing consumers' preference for plant-based menu items.

5.2 Managerial implications

The study findings provide important practical implications for restaurants interested in developing plant-based menu items. Currently, most US restaurants use taste appeals in advertising plant-based burgers. However, our studies show that highlighting social benefits of plant-based menu items might be more effective. While taste is the ultimate criterion for any food decision, we suggest that restaurants can leverage the socially desirable aspects of plant-based dishes in benefiting environmental sustainability and animal welfare via marketing communications. For example, the two major producers of plant-based meats provide consumers with information about the benefits of their products on the website, including less used water and land, fewer greenhouse gas emissions, and zero animal harm (Impossible Foods, 2020; Beyond Meat, 2020). Likewise, restaurants can incorporate such information into their promotions of plant-based menu items instead of merely using taste appeals.

Previous research demonstrates the positive effect of corporate social responsibility initiatives such as enhanced brand reputation and image, favorable attitudes, and increased loyalty (Bhattacharya & Sen, 2004; He & Lai, 2014; Kim and Ham, 2016). Correspondingly, restaurants have the opportunity to construct a socially responsible image by providing plant-based options on the menu and communicating relevant social benefits of such practices. Since plant-based meats can help minimize the adverse impact of excessive meat consumption on the environment (Ismail et al., 2020; Vainio et al., 2018), restaurants' initiatives of adding plant-based menu items can be framed as a sustainability practice. In addition to promoting such dishes in advertising, restaurants can also share messages that explain the social consequences of animal meat consumption in social media to signal their concern for the society. Kim and Hall (2020) suggest that sustainable restaurant practices and waste reduction

enhance customer loyalty. As a result, promoting social benefits of plant-based menu items may lead to other positive outcomes such as more favorable perceptions of the restaurants.

5.3 Limitations and future research

The present research is an initial step to explore the increasing popularity of meat-like menu items in the restaurant industry. One of the limitations is the scenario-based nature of our studies. Future work can replicate and extend our findings using a field study and measuring consumers' actual food choices. Another limitation is that our investigation was limited to U.S. consumers and therefore, the findings might not be generalizable to consumers in other countries. For example, Impossible Foods is now available in Asian markets, including Singapore, Hong Kong and mainland China. Future research should examine how Asian consumers respond to such meat-like products. Moreover, it would be interesting to conduct comparative studies as Westerners and Asians have different traditions and habits of meat consumption.

Currently plant-based menu items tend to be indulgent, thus reducing the effectiveness of health appeals as health goals are not salient in such consumption contexts (Oh, 2020; Ramanathan & Williams, 2007). Future research should investigate the effectiveness of health and social appeals for different food types (e.g., vice and virtue). Moreover, in our study environmental and animal welfare benefits were combined in the social appeal condition. Future research could isolate these two benefit types and further compare their relative effectiveness.

In addition, previous research on vegetarian menus suggests that labeling and dish descriptions can influence people's choice of vegetarian dishes (Bacon & Krpan, 2018; Krpan & Houtsma, 2020; Turnwald et al., 2017; 2019). Examining such effects

in the context of plant-based meats would be worthwhile. Vegetarianism is often associated with several individual factors such religion belief, ethical consideration, environment concern, and health consciousness (Ruby, 2012), and therefore future research should investigate whether such factors also shape people's preference for plant-based menu items.

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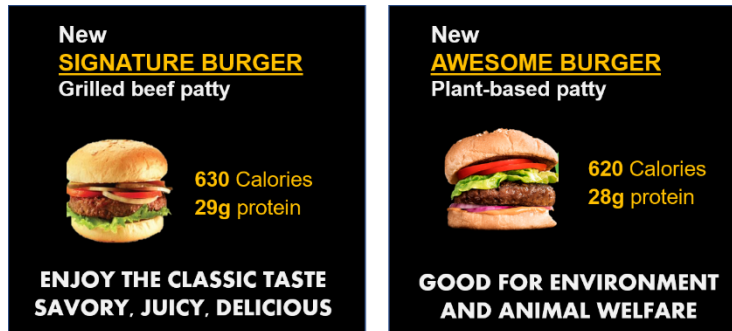
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Appendix

Advertisement sample for Study 1 (social appeal condition)



Message sample for Study 2 (social cost condition)

Some people believe that their food choices have no effect on climate change. However, studies have shown that one third of gases contributing to climate change are derived from the production and consumption of food. Moreover, cattle and sheep produce a lot of methane gas that contributes to climate change.

To satisfy our growing desire for meat, we have resorted to techniques that are, by any standard, cruel to animals. Most of the animals that end up on our plates spend their entire lives locked in cramped quarters without seeing a single beam of sunlight or breathing a single breath of fresh air. Their short, brutal existences are characterized by constant pain and chronic health problems.

Therefore, everyone can effectively mitigate climate change and animal slaughter by limiting the consumption of red meat and replacing it at least partially with plant-based proteins. The Natural Resources Institute recommends that red meat should be consumed less than 1.1 pounds per week, while a minimum of 1.1 pounds of plant-based products should be consumed per day. One cup of plant proteins per meal represents a suitable amount.