Journal of Applied Communications

Volume 110 | Issue 2 Article 6

Tailoring Plant-Based Food Ads: The Role of Variety-Seeking and Message Framing

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Recommended Citation
Kulpavaropas, S., & Rodriguez, L. (2026). Tailoring plant-based food ads: The role of variety-seeking and message framing. *Journal of Applied Communications, 110*(2), 1–25. https://doi.org/10.4148/jac.20846

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Tailoring Plant-Based Food Ads: The Role of Variety-Seeking and Message Framing

Abstract

In this study, we conducted an online experiment (*N* = 171) to explore whether matching message frames to an individual's variety-seeking disposition enhances the persuasiveness of messages promoting plant-based foods. We hypothesized that a loss-framed message highlighting the risks of not consuming plant-based foods would be more persuasive for consumers with a high variety-seeking tendency. In contrast, a gain-framed message emphasizing the benefits of consuming plant-based foods would be more persuasive for those with a low variety-seeking tendency. The results supported this hypothesis for the high variety-seeking tendency group but not for the group with a low variety-seeking tendency. The findings underscore the significance of variety-seeking disposition in promoting positive attitudes toward plant-based foods and enhancing intentions to consume them. The findings point to the benefits of tailoring message frames to consumer traits like variety-seeking as an audience segmentation strategy.

Keywords

Plant-based foods, message framing, variety seeking, attitude, intention

Funding

This research project was fully granted by Mahidol University International College.

Authors

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This research is available in the *Journal of Applied Communications*: https://newprairiepress.org/jac/

Introduction

Plant-based foods have gained significant attention recently for two compelling reasons. First, compared to conventional livestock farming, plant-based food production exerts a significantly lower environmental impact (Poore & Nemecek, 2018). In comparison, livestock farming contributes substantially to greenhouse gas (GHG) and nitrogen emissions. Reducing meat consumption and embracing plant-based alternatives present an opportunity to mitigate these environmental impacts (McMichael et al., 2007). Second, plant-based foods, being rich sources of essential nutrients (Aberoumand, 2009) and dietary fiber (Buttriss & Stokes, 2008), have unassailable health benefits. A substantial body of medical evidence supports the notion that increasing the intake of fruits and vegetables can reduce the risk of various diseases, including obesity (Mytton et al., 2014), oral cancer (Pavia et al., 2006), coronary heart ailments (Dauchet et al., 2006), and stroke (He et al., 2006). Incorporating more plant-based foods into people's diets can thus yield positive outcomes for both human and environmental health.

Communication campaigns can assist public health authorities in driving dietary shifts toward more sustainable and healthier eating habits, specifically by encouraging the public to embrace meat alternatives. One such strategy involves framing messages either positively or negatively (Levin et al., 1998; Tversky & Kahneman, 1981). Some have reported that message framing significantly influenced consumers' attitudes toward and intentions to consume fewer animal products (e.g., Fehrenbach, 2015; Garg et al., 2021; Harguess et al., 2020; Palomo-Vélez et al., 2018). For example, Fehrenbach (2015) found that participants who watched a video about the negative health effects of high meat consumption expressed stronger intentions to eat less meat than those who did not watch the video. Similarly, Garg et al. (2021) showed that consumers demonstrated greater intentions to reduce the amount of unhealthy food products they eat when exposed to negatively framed messages.

Framing literature that offers guidance on designing persuasive messages suggests that gain- or loss-framed content can produce significantly different attitudinal and behavioral effects depending on the individual characteristics of consumers. Studies have documented the greater persuasive power of messages framed to match the target audience's psychographic characteristics (Hawkins et al., 2008). Lee and Aaker (2004), for example, found that when there is a regulatory fit between an individual's goal-pursuit strategy and the message frame, the message "feels right" to the recipient, thus increasing the message's persuasiveness.

Variety-seeking is one of these consumer psychographic traits. In the food domain, the tendency to seek diverse products and experiences over time becomes especially relevant because various factors, including sensory appeal, flavor, and texture , influence food choices (Rodriguez et al., 2017; Rolls et al., 1984). On average, individuals make an estimated 200 or more food decisions daily (Wansink & Sobal, 2007). The extent to which they seek variety in food choices varies from person to person. According to van Trijp et al. (1992), individuals with a high variety-seeking tendency are notably more adventurous in their food selections than those with a low variety-seeking tendency.

Individuals often seek variety in their choices, whether these options are familiar or entirely new to them (McAlister & Pessemier, 1982). They may opt for something different even when they are content with their current product choice (Menon & Kahn, 1995). Variety-seeking tendencies are closely associated with the concept of an optimal level of

stimulation, which postulates that people require a distinct level of stimulation to function effectively (Berlyne, 1960; Steenkamp & Baumgartner, 1992; Richard & Chebat, 2016). When the current stimulation level falls below this individualized optimum threshold, a person seeks diverse experiences and choices to elevate stimulation. Conversely, when stimulation surpasses this optimum level, an individual tends to reduce or altogether avoid stimulating activities and opt for less variety to restore equilibrium. Moreover, some individuals inherently require more stimulation because their ideal stimulation threshold is higher than that of others (Berlyne, 1960; McAlister & Pessemier, 1982). Because individuals with high and low variety-seeking tendencies tend to exhibit differing levels of risk tolerance when making food choices, how a message is framed may influence these two groups differently.

This study aims to enhance our ability to create more persuasive messages by exploring the effects of message framing on consumers with varying levels of variety-seeking tendency. Specifically, it investigates how aligning message framing with an individual's variety-seeking disposition affects persuasion. We focus on the effectiveness of negatively and positively framed messages in promoting the consumption of plant-based foods, where negative frames emphasize the harmful consequences of *not* consuming these foods, while positive frames highlight their benefits.

Despite the growing interest in consuming plant-based foods for health and environmental reasons, marketers and public health advocates continue to encounter consumer resistance and inertia. Traditional one-size-fits-all messaging strategies fail to address individual psychological differences that shape consumer receptivity to persuasive messages. This study addresses that gap by exploring how message framing (gain vs. loss) interacts with an individual's variety-seeking tendency, a key but underexplored psychographic trait, to influence attitudes and behavioral intentions toward plant-based foods and the advertisements.

Consumers frequently seek novelty and stimulation in their food choices, yet few studies have examined how this psychological tendency can be leveraged in message design. Understanding whether high variety-seeking individuals respond differently to gain- or loss-framed messages has the potential to unlock more effective segmentation and persuasion strategies. This study introduces variety-seeking as a novel moderator in the literature on framing effects, exploring how it shapes individual responses to risk-laden (loss-framed) or benefit-driven (gain-framed) appeals. This is especially important in contexts such as sustainable or health-conscious consumption, where behavior change is difficult and entrenched preferences are strong.

Theoretical Framework

Plant-based Foods

The terms "plant-based foods" and "plant-based diet" have varying interpretations (Clark, 2023; Williams & Patel, 2017). For some, the term signifies an entirely animal-free eating pattern—excluding red meat, eggs, and dairy from daily fare (e.g., Freeman et al., 2017; Ostfeld, 2017). Others perceive it as an eating pattern that is primarily made up of plant foods, such as vegetables, fruits, beans, whole grains, legumes, and nuts, with the occasional inclusion of animal products like fish, poultry, milk, and yogurt (e.g., McManus, 2024; Toledano, 2022). The latter interpretation emphasizes increasing the proportion of foods from

plant sources while reducing meat consumption (Lea & Worsley, 2003; Lea et al., 2006; McManus, 2024; Pohjolainen et al., 2015; Tuso et al., 2013).

Research shows several benefits of plant-based diets in relation to the environment and human health (Fehér et al., 2020; Grant, 2017). From an environmental perspective, numerous studies have found that increasing the consumption of plant-based foods while reducing meat intake can help mitigate global climate change and pollution (e.g., Candy et al., 2019; Friel et al., 2009; Quam et al., 2017; Scarborough et al., 2023). Furthermore, several studies have revealed the adverse environmental impact of excessive meat production and consumption, especially through factory farming (e.g., Friel et al., 2009; McMichael et al., 2007; Vanhonacker et al., 2013). Livestock farming generates a substantial proportion of greenhouse gas (GHG) emissions, including methane, nitrous oxide, and carbon dioxide, which contribute to climate change (Steinfeld et al., 2006). In a literature review of dietary health co-benefits, Quam et al. (2017) concluded that transitioning to a diet with a greater proportion of plant-based foods could reduce GHG emissions by up to 36 percent. Similarly, Scarborough et al. (2023) demonstrated that individuals who predominantly consume plant-based foods produce 25 percent fewer GHG emissions than those who consume 100g or more of meat daily.

Plant-based foods are considered a healthy dietary choice because they contain essential nutrients, including vitamins, fiber, protein, minerals, and healthy fats that contribute to overall well-being (Aberoumand, 2009; Buttriss & Stokes, 2008; Fardet, 2017; Toledano, 2022; Tuso et al., 2013). Compelling evidence suggests that eating plant-based foods may play an important role in mitigating risk factors associated with chronic disease development, thus potentially lessening people's reliance on medication (Boeing et al., 2012; Toledano, 2022; Weinrich, 2019). A comprehensive literature analysis by Boeing et al. (2012) underscores that increasing the intake of vegetables and fruit is associated with weight stability and weight reduction. Moreover, a systematic review of eight studies by Mytton et al. (2014) on the effect of increased vegetable and fruit consumption on body weight and energy intake showed that individuals who incorporated more vegetables and fruit into their diet, without necessarily reducing their intake of other foods, tended to experience modest weight loss or slower weight gain compared to those who did not follow such guidelines.

In addition, research has shown that including plant-based foods in one's diet is associated with a reduced risk of cardiovascular diseases, type 2 diabetes, and certain cancer types (Freeman et al., 2017; Oyebode et al., 2014; Richter et al., 2015). For example, Riboli and Norat (2003) found that the intake of more vegetables and fruits can lower the risk of esophageal, lung, stomach, and colorectal cancers. Likewise, a comprehensive meta-analysis of epidemiologic studies done by Pavia et al. (2006) revealed the protective effects of vegetable and fruit consumption against oral cancer development. Their analysis found a substantial 50 percent reduction in oral cancer risk for each daily portion of vegetables consumed, and an equally significant 49 percent reduction for fruit consumption. Therefore, adopting a diet of predominantly plant-based foods offers numerous health benefits that can enhance the overall lifespan of consumers.

Message Framing

Message framing has become a significant focus in the health and environmental communication literature due to its known influence on people's attitudes and behaviors (e.g., Cheng et al., 2011; Corner et al., 2015; Kuo et al., 2019; Latimer et al., 2007). Message

framing refers to the construction of selected perspectives of perceived reality to make them more salient in a communication message. When employing message framing, a communicator can strategically include specific information to highlight certain aspects of a story or issue while omitting others to downplay their significance (Entman, 1993). The communicator can also accentuate either positive or negative views about a person, object, or issue by presenting messages with a corresponding orientation (Quick et al., 2016). Due to time constraints or limited information-processing abilities, people tend to focus on certain aspects of an issue while disregarding others. Consequently, they tend to align their attitudes toward an object, event, or issue with how the message is framed, leading to message-consistent effects (Cacciatore et al., 2015).

However, applying message framing to reduce meat consumption and promote plant-based diets has yielded inconsistent results. Some studies have found that certain frames lead to decreased meat consumption. Wolstenholme et al. (2020), for example, randomly assigned undergraduate students to read information about red meat and its (1) health impacts, (2) environmental effects, (3) both health and environmental impacts, or (4) no information at all (control group). They found that participants who received information highlighting the negative impacts of red meat reported consuming less red and processed meat compared to the control group. In another study, Niemiec et al. (2021) randomly assigned participants to one of five treatments with messages emphasizing (1) the link between animal agriculture and pandemic risks, (2) threats to factory farm workers' safety, (3) animal welfare on factory farms, (4) the environmental impacts of meat consumption, or (5) the personal health impacts of meat consumption. They found no significant differences in participants' intentions to try plant-based diets, reduce meat consumption, or encourage others to explore plant-based alternatives.

A popular way of framing messages is to emphasize what people stand to gain or lose by adhering to or failing to follow a recommended practice (Lee & Aaker, 2004; Rothman & Salovey, 1997; Shao, 2012). Gain-framed messages present the expected benefits of complying with a recommendation, while loss-framed messages highlight the possible negative outcomes of noncompliance (O'Keefe & Jensen, 2007; Tversky & Kahneman, 1985). The differential impacts of these frames can be explained by Kahneman and Tversky's (1979) prospect theory, which posits that risk-seeking tendencies increase in response to loss-framed messages, while gain-framed messages encourage risk aversion. Thus, when people encounter messages reminding them of potential losses, they are more willing to accept risks. Conversely, messages highlighting benefits tend to lead people toward choices with assured gains (McKinley & Limbu, 2020).

The effectiveness of gain and loss frames varies depending on context. For example, in disease prevention, positively framed messages (i.e., emphasizing maintaining or improving health) are more persuasive than negatively framed ones. On the contrary, in disease detection, negative frames (i.e., emphasizing the risk of disease diagnosis) are more persuasive than positive frames (Rothman & Salovey, 1997). Similarly, a gain-framed message (e.g., by practicing climate-friendly behaviors, we can reduce the incidence of winter floods) is more likely to lead to positive attitudes toward climate change mitigation than a loss-framed message (e.g., not practicing climate-friendly behaviors can lead to more winter flood events) (Spence & Pidgeon, 2010). Other studies corroborate that gain frames are more persuasive when audiences perceive themselves as safe from danger or harm, whereas loss frames work better when audiences see themselves as being in a risky situation (Banks et al., 1995).

Recognizing that avoiding negative outcomes is more critical for survival, people tend to respond more strongly to loss-framed messages than to gain-framed messages. This study expects the same psychological effect when individuals encounter messages about plant-based foods presented with a gain or loss frame. Specifically, we expect a message describing the negative consequences of not consuming plant-based foods (loss frame) to generate more positive attitudes toward and stronger intentions to consume plant-based foods compared to a message presenting the benefits of doing so (gain frame).

> Hypothesis 1 (H1): A loss-framed message is more effective than a gain-framed message in generating positive attitudes toward the advertisement, positive attitudes toward plant-based foods, and intentions to consume them.

Existing literature suggests that the effectiveness of message framing varies across individuals and is shaped by personal factors, such as dispositional motivation (Mann et al., 2004), self-regulatory orientation (Shao, 2012), values, beliefs, and attitudes (Shen & Edwards, 2005), and mood (Wegener et al., 1994). One way to enhance message persuasiveness is to align message frames with the traits and dispositions of target consumers (Hawkins et al., 2008). Accordingly, this study examines consumers' variety-seeking tendencies as a variable that may interact with message frames to influence consumers' attitudes and behavioral intentions toward plant-based foods.

Variety-seeking

Variety-seeking is the tendency of individuals to seek diversity in their choice of products, services, or experiences (Kahn, 1995). This behavior can take various forms, such as selecting from multiple options within a single consumption occasion (i.e., diversity in a choice set) or switching choices across different occasions (Kahn, 1995; McAlister & Pessemier, 1982; Ratner et al., 1999). For example, consumers may demonstrate variety-seeking behavior by choosing different foods for a single meal or purchasing a diverse assortment of products rather than multiple units of the same item. Variety-seeking signifies a preference for diversity over consistency in choice (Kahn, 1995) and reflects the uncertainty individuals experience during decision-making (Simonson, 1990; Walsh, 1995).

The motivation to seek variety in the food consumption is often linked to hedonic considerations (i.e., the pursuit of pleasure, sensory enjoyment, and emotional gratification) rather than utilitarian aspects (i.e., functional, instrumental, or nutritional utility; Holbrook & Hirschman, 1982). McAlister & Pessemier (1982) categorized variety-seeking behavior into two forms: derived and direct. Derived variety-seeking stems from external factors and changes in the environment, such as different needs, diverse users, or varying choice situations, rather than a conscious desire for change (McAlister & Pessemier, 1982). Conversely, direct variety-seeking emerges from internal motivations, including a desire for novelty, an intrinsic need for change, or a sense of satiation with the product's current attributes (McAlister & Pessemier, 1982). Individuals may seek variety because they experience satiety or boredom with prior offerings, or simply because they want to explore different alternatives for enjoyment (Inman, 2001; Shen & Wyer Jr., 2010). In purchasing decisions, this attribute satiation often leads consumers to switch away from a previously chosen brand immediately following a purchase (McAlister, 1979, 1982).

People frequently exhibit a tendency to seek variety in the food items they select (Foxall, 1993; Inman, 2001; van Trijp, 1994, 1995; van Trijp & Steenkamp, 1992). This

tendency occurs for two primary reasons. First, switching from one food option to another involves minimal risk (van Trijp et al., 1992). Second, food consumption inherently involves a baseline level of sensory variation and requires a certain degree of involvement (van Trijp et al., 1992). Seeking variety in food choices can also be attributed to a phenomenon that Rolls et al. (1981) termed sensory-specific satiety (SSS). Specifically, as individuals consume a particular food, the hedonic value and the pleasure derived from its flavor decline. This effect makes unselected foods more appealing than the item just consumed, even though the latter's sensory properties remain the same (Brondel et al., 2009; Rolls et al., 1981). The duration of satiation can be delayed by incorporating a broader array of foods during a meal or by adding condiments to subsequent servings of the recently consumed food (Brondel et al., 2009; Rolls et al., 1984). Sequentially offering foods of varying tastes, appearances, and textures during a meal also boosts the rate of consumption relative to providing a single food option, even if that single option happens to be a personal favorite. Greater dietary variety directly heightens the likelihood of this effect manifesting (Rolls et al., 1981).

Individuals exhibit varying degrees of inclination toward seeking variety in their food choices, a trait closely linked to Raju's (1980) concept of optimal stimulation level (OSL). Variety-seeking serves as a means for individuals to regulate their stimulation level, with each person striving to attain their unique optimal state (Menon & Kahn, 1995; Raju, 1980; Steenkamp & Baumgartner, 1992). When an individual's current level of stimulation falls below the optimal threshold, feelings of boredom emerge, driving them to seek greater variety to restore stimulation (Steenkamp & Baumgartner, 1992). Individuals with a higher need for stimulation tend to express a stronger desire for variety (Pessemier & Handelsman, 1984; Steenkamp & Baumgartner, 1992). Those possessing a higher intrinsic preference for variety are also more likely to become quickly bored with their chosen products, prompting them to actively seek more diversity in their selections compared to those with a lower intrinsic preference (van Trijp & Steenkamp, 1992).

Baumgartner and Steenkamp (1996) report that variety-seeking is associated with exploratory buying behavior in which individuals are intrinsically motivated to explore new products to satisfy their need for stimulation. Consequently, individuals with high variety-seeking tendencies are not only more open to trying new products, but also more receptive to unfamiliar and exotic foods in their active search for novelty (Derinalp Çanakçı & Birdir, 2020; McAlister & Pessemier, 1982; van Trijp & Steenkamp, 1992). Because advertisements often extol a fresh and healthier approach to consumption, we hypothesize that such advertisements will resonate more with consumers who have a high tendency to seek variety than with those who have a low tendency to do so.

> Hypothesis 2a (H2a): Individuals with a high variety-seeking tendency (HVS) display a more positive attitude toward an advertisement promoting plant-based foods than those with a low variety-seeking tendency (LVS).
>
> Hypothesis 2b (H2b): Individuals with a high variety-seeking tendency (HVS) exhibit a more positive attitude toward plant-based foods than those with a low variety-seeking tendency (LVS).
>
> Hypothesis 2c (H2c): Individuals with a high variety-seeking tendency (HVS) demonstrate greater intentions to consume plant-based foods than those with a low variety-seeking tendency (LVS).

Given that individuals with a high variety-seeking tendency have a greater propensity than those with a low tendency to explore new and unfamiliar foods to satisfy their need for novelty (Derinalp Çanakçı & Birdir, 2020; McAlister & Pessemier, 1982; van Trijp & Steenkamp, 1992), it can be inferred that HVS individuals are more open to taking risks with their choices, driven by a desire for optimal stimulation and higher risk tolerance. We therefore anticipate that a message emphasizing potential losses of *not* consuming plant-based foods (as opposed to a gain-framed message) will be more persuasive for HVS consumers. Conversely, low variety-seekers, perceiving fewer risks associated with plant-based foods, may respond more favorably to a gain-framed message, following their tendency to adopt a risk-averse stance. Based on these considerations, we propose the following hypothesis concerning the interaction between variety seeking and message framing.

> Hypothesis 3 (H3): The effect of the message frame on persuasion (attitude toward the advertisement, attitude toward plant-based foods, and intention to consume them) is contingent on consumers' variety-seeking tendency, such that a loss-framed message is more persuasive than a gain-framed message for individuals with a high variety-seeking tendency, whereas a gain-framed message is more persuasive for those with a low variety-seeking tendency.

Method

The primary objective of this study was to examine the interaction between message framing and consumers' variety-seeking tendency. This interaction was hypothesized to influence attitudes toward the advertisement as well as intentions to consume plant-based foods.

Participants, Design, and Procedure

This study employed a 2 (message frame: gain vs. loss) × 2 (variety-seeking tendency: high vs. low) between-subjects design to test the impact of framed messages on plant-based food consumption. The online experiment was conducted using the SurveyMonkey. One hundred and seventy-one undergraduate students (62 men, 101 women, 4 nonbinary individuals, and 4 who preferred not to disclose; $M = 20.09$, $SD = 1.26$) participated in this study on a voluntary basis. Participants were indirectly recruited to minimize power-related issues and instructor influence. Instructors who were not involved as researchers in the study passively shared an invitation link and a QR code with students via a digital poster. They explicitly announced that participation was entirely voluntary, anonymous, and completely unrelated to course evaluation. Both the researchers and course instructors were blind to student participation decisions. Upon accessing the link, interested participants were immediately directed to the online experiment, which was hosted within the SurveyMonkey platform. Participants were offered an opportunity to enter a drawing for a gift card as a token of appreciation.

The online questionnaire opened with a recruitment message informing potential participants that the study intended to explore students' opinions about general consumption habits. No explicit reference was made to the study's specific objective to offset potential self-selection bias. Participants were then given a link to access the online experiment, allowing them to complete the study at their own pace. They were instructed to begin the study only when they had an uninterrupted 30-minute time window. Upon accessing the site,

participants were required to read the informed consent form thoroughly and to indicate their voluntary informed consent by clicking the "Accept and Continue" button.

Subsequently, participants were randomly assigned to view either the gain-framed or loss-framed advertising message. At the beginning of the section, they were explicitly instructed to carefully read the message before proceeding. The stimulus was designed to be concise and fully readable within a brief viewing window to encourage reading completion without causing fatigue. After reading the advertisement, participants were asked to report their attitude toward the advertisement, their attitudes toward plant-based foods, and their intention to consume these foods. In the last section of the experiment, participants responded to a series of questions that solicited demographic information and assessed their variety-seeking tendency. Upon completing the questionnaire, participants submitted their responses by clicking the "Submit" button and were presented with a debriefing screen that thanked them for participating in the study.

Stimulus Development

Two advertisements promoting plant-based foods were used as stimuli for this study (Appendix A). These experimental stimuli were custom-created by the researchers using Canva. Design elements were identical across the two experimental conditions to maintain visual consistency. Advertising messages were developed based on MD Anderson Cancer Center's publication, *The Benefits of a Plant-Based Diet* (Van Thomme & Alexander, 2025; originally published as Alexander, 2019). Both advertisements had similar content; they differed only in their message framing. Particularly, the text accentuated either the potential benefits of consuming plant-based foods (gain-framed condition) or the potential consequences of not consuming plant-based foods (loss-framed condition).

To gauge the effectiveness of the experimental manipulation, participants were assessed the extent to which the advertisement they saw highlighted the benefits of consuming plant-based foods (a gain-framed message) or the potential drawbacks of omitting plant-based foods from their diets (a loss-framed message). Responses were recorded on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), adapted from Lee and Aaker (2004). An independent-samples t-test was conducted to check the manipulation of message frames. The results demonstrated distinct perceptions of message framing between participants in the two conditions. Those exposed to the gain-framed message showed a significantly higher level of agreement that the message emphasized the health benefits of consuming plant-based foods ($M_{\text{gain-framed}} = 5.32$, $SD_{\text{gain-framed}} = 1.35$; $M_{\text{loss-framed}} = 4.66$, $SD_{\text{loss-framed}} = 1.50$; $t\ (169) = 3.00$, $p = .003$). In contrast, those exposed to the loss-framed message stressed the potential health risks associated with not consuming plant-based foods ($M_{\text{loss-framed}} = 4.87$, $SD_{\text{loss-framed}} = 1.61$; $M_{\text{gain-framed}} = 3.95$, $SD_{\text{gain-framed}} = 1.70$; $t(169) = -3.64$, $p < .001$). The results suggested the successful manipulation of message frames.

Measures

Attitude toward the advertisement was assessed using four items rated on 7-point semantic differential scales anchored by not persuasive/persuasive, not helpful/helpful, not believable/believable, and not credible/credible. This measure was adapted from the Message Persuasiveness and Believability scales developed by Kim (2006). The items were averaged to create an overall attitude toward the advertisement index ($M = 4.79$, $SD = 1.11$; $\alpha = .72$).

Attitude toward plant-based foods was measured using four items adapted from the Attitude Toward the Brand scale developed by Spears and Singh (2004). Responses were rated on 7-point semantic differential scales anchored by negative/positive, unfavorable/favorable, bad/good, and unattractive/attractive. These four items were averaged to form an attitude toward plant-based foods index ($M = 4.91$, $SD = 1.17$; $\alpha = .70$).

Intention to consume plant-based foods was measured using three items rated on 7-point scales ranging from 1 (*definitely no*) to 7 (*definitely yes*). These items were adapted from the Behavioral Intention scale developed by Mullan et al. (2015). Participants evaluated the following statements: (1) "I would consider ordering plant-based foods when I go to a restaurant." (2) "I intend to consume plant-based foods in the future," and (3) "I intend to try plant-based foods next time." The responses were then averaged to construct an index of intention to consume plant-based foods ($M = 4.29$, $SD = 1.52$; $\alpha = .72$).

Variety-seeking tendency with respect to food choices was captured using the VARSEEK scale developed by van Trijp and Steenkamp (1992). It was composed of eight items scored on 7-point Likert scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*): (1) "When I eat out, I like to try the most unusual items even if I am not sure I would like them," (2) "While preparing foods or snacks, I like to try out new recipes," (3) "I think it is fun to try out food items one is not familiar with," (4) "I am eager to know what kind of foods people from other countries eat," (5) "I like to eat exotic foods; (6) Items on the menu that I am unfamiliar with make me curious," (7) "I prefer to eat food products I am used to,"; (8) "I am curious about food products I am not familiar with." The mean score of these eight items was computed to form a variety-seeking tendency index ($M = 4.24$, $SD = 1.11$; $\alpha = 0.80$). This variety-seeking tendency index was then dichotomized using a median split.

Results

Effects of Message Frame on Attitudes and Behavioral Intention

Hypothesis 1 (H1) posited that a loss-framed message would generate more favorable attitude toward both the advertisement and plant-based, as well as a greater intention to consume plant-based foods, compared to a gain-framed message. To examine the main effects of message framing, independent-samples t-tests were conducted. The results revealed no statistically significant differences between the two framing conditions across any of the dependent variables. Consequently, H1 was not supported. Table 1 presents an overview of the means and standard deviations across the experimental conditions and the outcomes of hypothesis testing.

Table 1

Effects of Message Frame on Attitudes and Behavioral Intention

Dependent variables	Gain frame (n = 85)	Loss frame (n = 86)	t(169)	p
	M (SD)	*M (SD)*		
Attitude toward the advertisement	4.88 (1.03)	4.69 (1.18)	1.14	.25
Attitude toward plant-based foods	4.81 (1.17)	5.00 (1.18)	-1.07	.29
Intention to consume plant-based foods	4.18 (1.50)	4.40 (1.54)	-.96	.34

Note. M and *SD* stand for mean and standard deviation, respectively.

Effects of Variety-Seeking Tendency on Attitudes and Behavioral Intention

Hypothesis 2 (H2) proposed that individuals with a high variety-seeking tendency (HVS) would exhibit more favorable attitudes toward both the advertisement (H2a) and plant-based foods (H2b), as well as a higher intention to consume these foods (H2c), compared to those with a low variety-seeking tendency (LVS). Independent-samples t-tests revealed that participants with a high variety-seeking tendency showed a significantly more favorable attitude toward plant-based foods (M_{HVS}= 5.12, SD_{HVS} =1.16; M_{LVS}= 4.63, SD_{LVS}=1.14; t(169) = 2.74, p=.007) and a greater intention to consume them (M_{HVS}= 4.69, SD_{HVS}=1.44; M_{LVS}= 3.79, SD_{LVS}=1.48; t(169) = 4.04, p<.001) than those with a low variety-seeking tendency. However, variety-seeking tendency had no significant effect on attitude toward the advertisement (M_{HVS}= 4.85, SD_{HVS}=1.11; M_{LVS}= 4.70, SD_{LVS}=1.10; t(169) = 0.86, p=.39). Consequently, H2b and H2c were supported, while H2a was not. Table 2 summarizes the means and standard deviations across the experimental conditions, and the results of the hypothesis test. See also Figure 1.

Table 2

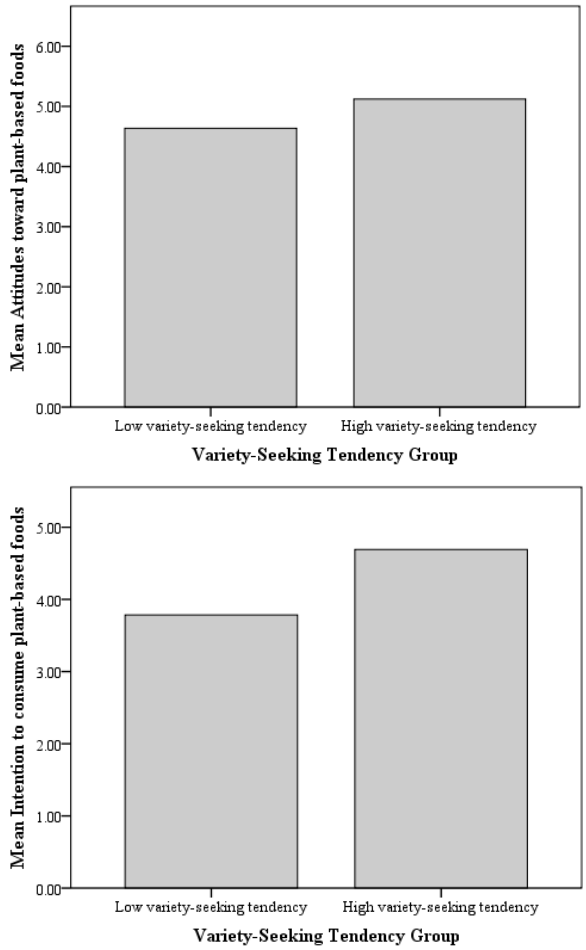
Effects of Variety-Seeking Tendency on Attitudes and Behavioral Intention

Dependent variables	HVS (n = 95)	LVS (n = 76)	t(169)	p
	M (SD)	*M (SD)*		
Attitude toward the advertisement	4.85 (1.11)	4.70 (1.10)	.86	.39
Attitude toward plant-based foods	5.12 (1.16)	4.63 (1.14)	2.74	.007
Intention to consume plant-based foods	4.69 (1.44)	3.79 (1.48)	4.04	< .001

Note. HVS = High variety-seeking tendency; LVS = Low variety-seeking tendency. *M* and *SD* stand for mean and standard deviation, respectively.

Figure 1

Effects of Variety-Seeking Tendency on (a) Attitude Toward and (b) Intention to Consume Plant-Based Foods

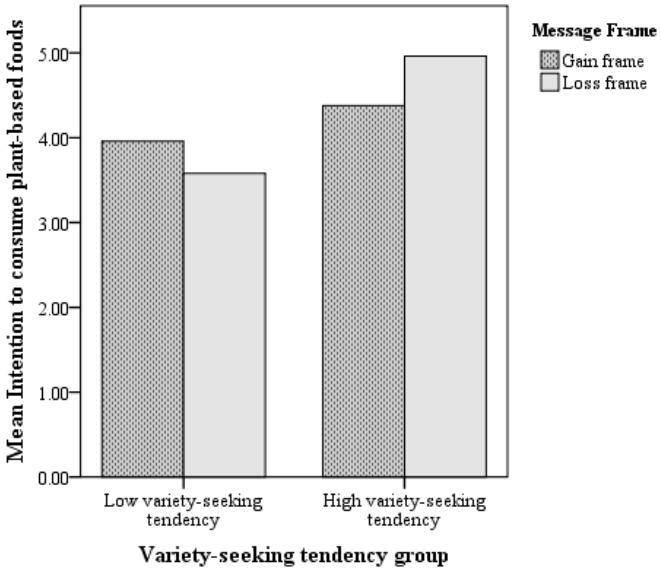


Interaction Effects between Message Frame and Variety-Seeking Tendency on Attitudes and Behavioral Intention

Hypothesis 3 (H3) proposed an interaction effect between message framing and variety-seeking tendency, specifically suggesting that a loss-framed message would be more persuasive than a gain-framed message for individuals with a high variety-seeking tendency, whereas a gain-framed message would be more persuasive for those with a low variety-seeking tendency. Two-way analyses of variance (ANOVAs) were conducted to examine the influence of message frame and variety-seeking tendency on attitudes and intentions. The results showed no significant interaction effects on attitude toward the advertisement, F (1, 167) = .39, p = .53, or for attitude toward plant-based foods, F (1, 167) = 1.09, p = .30. However, a statistically significant interaction effect between message frame and variety-seeking tendency was observed for intention to consume plant-based foods, F (1, 167) = 4.63, p = .03 as shown in Figure 2.

Figure 2

Interaction Effects of Message Frame and Variety-Seeking Tendency on Intention to Consume Plant-Based Foods



Subsequently, simple effects analyses were conducted for each variety-seeking tendency group to assess the impact of message framing on attitudes and consumption intentions (see Table 3). For participants with a high variety-seeking tendency, message framing did not significantly affect attitude toward the advertisement (M_{Gain} = 5.01, SD_{Gain} = 0.93; M_{Loss} = 4.71, SD_{Loss} = 1.25; $t(93) = 1.32$, $p = .19$) or attitude toward plant-based foods (M_{Gain} = 4.95, SD_{Gain} = 1.18; M_{Loss} = 5.27, SD_{Loss} = 1.13; $t(93) = 1.36$, $p = .18$). However, high-variety-seeking participants reported a significantly stronger intention to consume plant-based foods after exposure to the loss-framed message (M_{Loss} = 4.96, SD_{Loss} = 1.40) compared to the gain-framed message (M_{Gain} = 4.38, SD_{Gain} = 1.45, $t(93) = -1.99$, $p = .05$). For participants with a low variety-seeking tendency, message framing had no significant effects on attitudes and behavioral intentions. Thus, H3 received partial support.

Table 3

Simple Effects of Message Frame on Attitudes and Behavioral Intention

Dependent variables and moderator group	Gain frame *M (SD)*	Loss frame *M (SD)*	*t*	*p*
High variety-seeking tendency (*n*=95)				
Attitude toward the advertisement	5.01 (.93)	4.71 (1.25)	1.32 (93)	.19
Attitude toward plant-based foods	4.95 (1.18)	5.27 (1.13)	-1.36 (93)	.18
Intention to consume plant-based foods	4.38 (1.45)	4.96 (1.40)	-1.99 (93)	.05
Low variety-seeking tendency (*n*=76)				

Dependent variables and moderator group	Gain frame *M (SD)*	Loss frame *M (SD)*	*t*	*p*
Attitude toward the advertisement	4.74 (1.13)	4.66 (1.08)	.34 (74)	.73
Attitude toward plant-based foods	4.66 (1.16)	4.61 (1.14)	.19 (74)	.85
Intention to consume plant-based foods	3.96 (1.55)	3.58 (1.38)	1.12 (74)	.27

Note. Total degrees of freedom are shown in parentheses next to the *t* statistics. *M* and *SD* stand for mean and standard deviation, respectively.

Discussion and Conclusions

Understanding how individual differences and message framing affect consumer attitudes and behaviors is crucial in the design of persuasive messages, especially those that encourage consumers to adopt a healthy diet. One such trait that deserves more scholarly attention is an individual's variety-seeking tendency. This study investigated how message framing and variety-seeking tendency interact to influence attitudes toward plant-based food advertisements, attitudes toward plant-based foods, and behavioral intentions to consume them. Hypotheses derived from the literature on message framing and variety seeking were formulated empirically and tested.

The first hypothesis was based on the message framing framework of Levin et al. (1998), which showed that negative (loss) frames can exert a stronger persuasive impact than positive (gain) frames in promoting behavioral adoption. Therefore, we expected that participants exposed to the loss-framed message would demonstrate more favorable attitudes toward the advertisement and plant-based foods, as well as a stronger intention to consume them. However, our findings did not support this hypothesis. No significant main effects of message framing were observed.

The second hypothesis was grounded in Optimum Stimulation Level (OSL) theory, which posits that individuals with a high variety-seeking tendency (characterized by elevated OSL) tend to be less constrained by their prior experiences and are thus more willing to try something new (in this case, a plant-based diet). In contrast, those with a low variety-seeking tendency (associated with lower OSL) are more inclined to stick to familiar routines (Raju, 1980). Given that plant-based food advertisements offer a fresh approach to dietary choices, we hypothesized that high- variety-seeking individuals would evaluate the advertisement more favorably and exhibit more positive attitudes toward plant-based foods and greater intentions to consume them than their low-variety-seeking counterparts. The results partially supported this hypothesis, highlighting the prominent role of variety-seeking tendency in shaping food-related evaluations. Participants with a high variety-seeking tendency exhibited more favorable attitudes and stronger intentions to consume plant-based foods. However, there was no significant difference in attitudes toward the advertisement between individuals with high and low variety-seeking tendencies. This finding provides empirical support for the notion that variety-seeking tendency is a crucial personality trait to consider when introducing new ideas, concepts, and behavioral recommendations.

The third hypothesis stemmed from evidence that message effectiveness increases when the message framing aligns with the recipients' personal traits (Hawkins et al., 2008). Specifically, it was hypothesized that a negatively framed message would be more effective

than a positively framed one for individuals with a high variety-seeking tendency. This hypothesis was grounded in the premise that high variety seekers are more inclined to seek and adopt novel alternatives (Pessemier & Handelsman, 1984; Steenkamp & Baumgartner, 1992). Thus, we postulated that a positive (gain) message frame might not evoke as much concern among high variety seekers compared to a negative (loss) frame. Conversely, individuals with a low variety-seeking tendency tend to be more selective and cautious in their choices. For them, a negative frame might not be as compelling as a positive frame. The study results partially supported the hypothesis, as the interaction between message framing and variety-seeking tendency significantly enhanced persuasion with respect to behavioral intentions to consume plant-based food.

These results suggest that under certain conditions, the influence of message framing on intentions to consume plant-based foods depends on consumers' variety-seeking tendency. High-variety-seeking individuals were more persuaded by the loss-framed message, whereas low variety-seeking individuals responded similarly to both framing conditions.

The absence of a significant effect on attitude toward the advertisement may be due to the fact that the stimulus lacked message sensation value (MSV), defined as "the degree to which a message's format and content features elicit sensory, affective, and arousal responses" (Palmgreen et al., 1991, p. 219). In addition, Lang (2006) suggests that messages targeting consumers with a high need for stimulation should incorporate novel, intense, complex, or surprising elements. We surmise that the stimuli might not have generated sufficient stimulation to shift evaluations of the advertisement. This suggests that future research could examine how message sensation features interact with message framing and variety-seeking tendency. Such investigations could provide stronger guidelines for creating compelling advertising materials.

Implications for Theory

This study contributes to the message framing literature by shedding light on the power of aligning an individual's disposition with message framing to increase message persuasiveness. According to the conceptual fluency framework—messages that are congruent with a recipient's disposition are easier to process, yielding a more favorable subjective experience and ultimately leading to a stronger persuasive impact (Lee & Aaker, 2004). While prior framing research has examined various dispositional traits, such as regulatory focus (e.g., Lee & Aaker, 2004) and sensation-seeking tendencies (e.g., Hull & Hong, 2016), the role of variety seeking in this context remains largely underexplored. This study addresses this gap, offering fresh insights into how variety-seeking tendencies interact with message framing to shape consumer attitudes and behavioral intentions.

Moreover, this study also enriches Prospect Theory and Regulatory Fit Theory by demonstrating that perceived congruence between message frames and consumer predisposition enhances message persuasiveness—not universally, but selectively. Although variety seeking has been extensively studied in the contexts of product choice and brand switching, its influence on message processing and persuasion has been largely overlooked. By connecting variety-seeking tendencies to processing fluency and "feeling-right" effects, our findings suggest that messages matching a consumer's intrinsic behavioral orientation (e.g., variety-seeking) are processed more fluently and are thus more persuasive. This deepens our understanding of how dispositional traits affect not only product selections, but also message elaboration and cognitive receptivity.

Implications for Advertising Practice

The results buttress the speculation that campaign strategists and food marketers should deliberately consider variety seeking as a robust variable in efforts to enhance the adoption of practices that harkens to individuals' hedonic inclinations and penchant for experimentation (Inman, 2001; van Trijp et al., 1996), especially when switching costs are relatively low (Kahn et al., 1986; van Trijp et al., 1996). Using variety-seeking tendency as a basis for message tailoring holds considerable promise as a strategic segmentation approach, particularly when promoting plant-based foods. Additionally, understanding how differences in variety-seeking tendencies influence responses to gain- and loss-framed messages offers actionable guidance for crafting persuasive advertising campaigns.

Our study thus offers actionable insights for advertisers by showing that audience segmentation based on variety-seeking tendencies can inform message framing strategies. For example, the results suggest that consumers who enjoy new experiences may respond more favorably to loss-framed messages that highlight the risks of *not* trying plant-based foods, while less-variety-seeking consumers may respond better to benefit-oriented (gain-framed) messaging. Advertisers and campaign designers can leverage these insights to match message frames with motivational traits, thereby increasing the relevance and impact of their campaigns. In the context of sustainability, nutrition, or public health, this tailoring can foster greater engagement and behavioral change.

The study's insights can also help guide creative concept development and media placement (e.g., placing high-sensation loss-framed ads on digital platforms popular among novelty seekers or customizing ad copy for food delivery apps based on user behavioral data).

In addition, the findings show how framing strategies can be refined to promote behaviors characterized by psychological or habitual resistance, such as reducing meat consumption or adopting more sustainable diets—key challenges in consumer and public interest advertising.

Limitations and Suggestions for Future Work

This study explored the interaction effect between variety-seeking tendencies and message framing in influencing intentions to consume plant-based foods. However, it is worth noting that perceived risk associated with food choices was not measured in this study. Speculating on the potential interplay between perceived risk related to novel choices and variety-seeking tendencies, in conjunction with message frames, constitutes an important area for future inquiry. Exploring these dynamics could provide valuable insights for persuasive messaging strategies.

Another limitation involves the study's reliance on a single set of framed messages targeting young adults. While the underlying psychological mechanisms may operate similarly across populations, testing these effects with more diverse demographic groups would enhance the study's generalizability. Additionally, the use of static, text-based, non-professionally created advertisements might not have considerably coaxed responses from generally young study participants. Future research could explore different advertising formats, including professionally crafted videos or visually engaging materials to boost external validity and overall impact.

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Appendix A: Stimuli Used in the Study

- Gain-framed Message



- Loss-framed Message

