Framing Strategies and Consumer Willingness to Adopt Plant-Based Diets

Exploring the Impact of Combined Framing Strategies

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ABSTRACT

The current food system places unsustainable pressure on environmental resources. As livestock farming contributes significantly to greenhouse gas emissions, land degradation, biodiversity loss, and deforestation, shifting toward plant-based diets is widely recognized as a critical strategy for mitigating the environmental impact of current dietary patterns. Despite increasing awareness, public support for and behavioural adoption of plant-based diets remain limited. This study investigates how framing strategies influence consumers' willingness to adopt a fully plant-based diet. Specifically, it examines the interaction between gain vs. loss framing *and* individual vs. societal value-based arguments, addressing the research question: *How do framing strategies and types of arguments affect consumers' willingness to adopt a fully plant-based diet?* To explore this question, an experimental survey design was employed. Respondents (N = 169) were randomly assigned to one of four message conditions that varied by framing type and argument focus. The primary dependent variable was self-reported willingness to adopt a plant-based diet; two validated psychological scales, namely meat attachment and food choice motives, were included as covariates to control for individual differences. Data were analysed using ANCOVA to assess main and interaction effects of the experimental condition on willingness, while adjusting for covariates. The overall model was significant. However, argument type and framing did not have a statistically significant effect once covariates were controlled for. In contrast, both meat attachment and food choice motives were strong predictors (p < .001), underscoring the importance of pre-existing attitudes in shaping openness to dietary change. These findings suggest that while framing strategies alone may not directly influence willingness, individual-level psychological factors play a more decisive role. Future research should further investigate the conditions under which framing may be effective, perhaps by tailoring messages to audience profiles or combining them with behavioural nudges. This study highlights the relevance of psychological dispositions in communication design and reinforces the need to consider deeper motivational barriers when promoting sustainable food transitions.

KEYWORDS: *Framing effects, plant-based diets, consumer behaviour, dietary shifts, meat attachment*

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Chapter 1. Introduction

In 2022, approximately 361 million tonnes of meat were produced globally, marking a 48% increase compared to a decade earlier (Federal Statistical Office, 2024). Over this ten year period, the surge in per capita meat consumption has even outpaced population growth (Ritchie et al., 2023). This trend reflects a disproportionately sharp increase in global demand for meat.

Although the increase is worldwide, meat consumption remains heavily concentrated in high-income countries. These nations account for roughly 30% of global meat consumption while comprising less than 16% of the global population (Ritchie et al., 2023). For instance, Portugal reports an average annual per capita meat consumption of 151 kg. Similarly high levels are observed in the United States, Argentina, China, and the United Kingdom, where average annual consumption exceeds 100 kg per person. Conversely, lower-income countries such as India or Ethiopia typically report an average yearly consumption below 20 kg per capita (Ritchie et al., 2023).

This level of meat consumption places considerable pressure on environmental systems. The global food production system is currently responsible for about 26% of global greenhouse gas emissions, with animal agriculture accounting for over half of the share (Ritchie, 2019). Specifically, the production of meat, dairy, eggs, and aquaculture farming occupies approximately 83% of global farmland and accounts for 56–58% of food-related GHG emissions. Yet, animal-based foods provide only 37% of the world's protein and 18% of its caloric intake (Poore & Nemecek, 2018, p. 990). Furthermore, livestock farming is the leading driver of deforestation, primarily due to pasture expansion and the cultivation of feed crops like soy (Poore & Nemecek, 2018, p. 991). Were the entire global population to consume animal products at the current rate of high-income countries, sustaining this demand would require the resources of two to three Earths (Global Footprint Network, 2025)!

Rethinking global dietary patterns—particularly in wealthier countries—is therefore crucial. The urgency is amplified by current and projected demographic trends as well. As of 2024, the global population has reached nearly 8.2 billion and is expected to peak at around 10.3 billion over the next 60 years (United Nations, 2024, p. 1). At the same time, the FAO estimates that global food demand will rise by over 50% by 2050, with meat production

projected to increase by up to 88% compared to 2010 levels (Ranganathan et al., 2018).

In this context, plant-based diets have emerged as a pivotal strategy for reducing the environmental footprint of food systems. These diets center on foods derived primarily from plants, including vegetables, fruits, legumes, whole grains, nuts, and seeds, and minimize or exclude animal-based products (World Health Organization, 2021, p. 1). Research consistently shows that plant-based foods have substantially lower environmental impacts than even the most sustainable animal products (Poore & Nemecek, 2018, p. 990).

Transitioning to a fully plant-based diet could significantly reduce environmental pressures: greenhouse gas emissions could fall by up to 49%**,** and global land use for food could decline by 76% (Poore & Nemecek, 2018, p. 991; Carey et al., 2023, pp. 861-864). It could also lead to a 19% reduction in freshwater withdrawals and significantly mitigate biodiversity loss (Poore & Nemecek, 2018, p. 991). Moreover, restoring ecosystems on land currently used for animal agriculture could sequester approximately 8.1 billion metric tons of CO_2 annually for the next century (Poore & Nemecek, 2018, p. 991). Even partial shifts in diet could yield considerable benefits: replacing half of animal product consumption with plant-based alternatives could deliver over 70% of the emission reductions achieved by a fully plant-based diet (Poore & Nemecek, 2018, p. 990).

Beyond environmental benefits, research indicates that plant-based diets are associated with significant health improvements. When compared to an omnivorous diet, a fully plant-based diet has been linked to a risk reduction of 11-19% in all types of cancer (Segovia-Siapco & Sabaté, 2018, p. 67). Greater commitment to plant-based eating habits has also been repeatedly linked to reduced risks of type 2 diabetes, heart disease and circulatory conditions, obesity, and overall mortality (Wang et al., 2023, pp. 5-8).

In addition to improving individual health, a shift toward plant-based diets could lead to substantial reductions in healthcare spending as well. The excessive intake of red and processed meats, for instance, contributed to 2.4 million deaths globally in 2020 and generated around €240 million in related healthcare costs (World Health Organization, 2021, p. 5).

From a social justice perspective, shifting towards plant-based diets also intersects with the issue of global hunger. In 2021, around 828 million people worldwide faced chronic undernourishment (World Health Organization, 2022). A large share of agricultural resources,

particularly land and feed crops, are allocated to livestock production rather than direct human consumption (Poore & Nemecek, 2018, p. 991). Reducing animal agriculture could free up resources to help alleviate food insecurity and distribute food more equitably.

To summarize, current patterns of animal agriculture are placing unsustainable pressure on environmental systems, exacerbating public health risks, and contributing to global food inequity. In contrast, plant-based diets offer a compelling solution: they can dramatically reduce greenhouse gas emissions, land and water use, and biodiversity loss, while also improving health outcomes and freeing up resources to combat hunger.

Due to their clear benefits, plant-based diets are attracting growing interest. Nowadays, approximately 75 million people identify as vegetarian, constituting about 22% of the global population (Leahy et al., 2010, pp. 2, 4). Vegetarians typically exclude meat and fish but may still consume dairy and eggs. Pescatarians, who exclude all meat except fish, also comprise another significant portion, while flexitarians, who mostly follow a plant-based diet but occasionally consume animal products, represent the fastest-growing dietary group worldwide (Grimmelt et al., 2022).

Vegans currently make up the smallest group. In 2023, approximately 88 million people identified as vegan, equating to only 1.1% of the global population (Osborn, 2024). However, in January 2025 alone, 25.8 million people tried veganism and 28% of them decided to stick with it (Chelsea, 2025). A vegan diet (also defined as a fully plant-based diet) consists of grains, legumes, vegetables, fruits, and nuts, and excludes all animal-derived foods, such as meat, fish, eggs, milk, dairy products, and honey (World Health Organization, 2021, p. 1).

This growing interest in plant-based diets is also reflected in market trends. The global market for plant-based alternatives to meat and dairy products, in fact, reached 10.15 billion US dollars in 2023 and it is expected to reach approximately 16.78 billion US dollars by 2028 (Statista, 2024).

While it is true that more and more people are gradually embracing this change, most of the global population remains omnivorous. Consumers' concerns over taste, cost, and convenience continue to challenge widespread adoption (Bryant, 2019, p. 12). Moreover, there is a general lack of knowledge over plant-based diets benefits (Leiserowitz et al., 2020, p. 18). For instance, public support for plant-based diets as a climate solution remains limited.

A 2021 survey across 50 countries found that while 64% of respondents recognized climate change as an emergency and 59% supported tackling it by all available means, only 30% endorsed promoting plant-based diets as a policy measure (UNDP, 2021, pp. 16–17, 46).

Overcoming all these barriers through effective messaging is essential, particularly because dietary shifts have the potential to offer environmental benefits that far exceed those achievable through production efficiency improvements alone (Poore & Nemecek, 2018, p. 991).

The growing importance of the topic and the urgency to act have led research to focus on which communication strategies can play a key role in shaping perceptions of plant-based diets and willingness to try such diets (Bryant, 2019; Pink et al., 2022; Dobson, 2023). Researchers have sought answers to questions such as: Which type of arguments is the most effective? Is it better to focus on the environmental benefits of a plant-based diet or on its positive health outcomes? And is it more impactful to highlight the benefits of plant-based diets or the risks associated with continuing to consume animal-based products?

Existing work has yielded valuable insights but also leaves three important gaps. Firstly, the effects of combining multiple arguments types remain unexplored. Most studies investigate the effect of persuasive communication by comparing three distinct social arguments, namely health, environment and animal welfare (Bryant, 2019; Pink et al., 2022). While health benefits are often prioritized over environmental ones (Pink et al., 2022, pp. 1, 11), messages combining health, environmental, and animal welfare arguments may have different effects, since framing interactions can shape outcomes in different ways (Chong & Druckman, 2007, p. 111).

Secondly, no study has quantitatively investigated the relationship between willingness to try a plant-based diet and individual arguments, such as taste, cost, or convenience. These factors are typically identified as perceived limitations of the diet by consumers (Bryant, 2019, p. 12) but have never been treated by research as argument types to examine as variables in quantitative studies.

Thirdly, previous research has mainly focused on how either framing (gain vs. loss) or the type of argument used influences willingness to try a plant-based diet. No study has yet examined how gain vs. loss framing interacts with different argument types in influencing willingness to adopt a fully plant-based diet.

By addressing these gaps, this study holds both academic and societal relevance. The academic relevance lies in the opportunity to refine framing theory within the complex domain of dietary choices, both by testing the combined effects of multiple argument types and by analysing frame-by-argument interactions. Moreover, this study introduces individual arguments as variables that can influence willingness in a quantitative research setting, rather than treating them merely as perceived limitations listed outside experimental conditions.

The societal relevance of this study stems from its potential to contribute to global efforts aimed at tackling pressing challenges such as climate change and world hunger. Understanding how to effectively communicate this dietary shift to consumers is essential to enable the behavioural changes needed for a more sustainable and just food future. Clearer guidance on effective messaging can support multiple stakeholders in accelerating a transition that is critical for climate mitigation and global food security.

For example, NGOs and advocacy groups often emphasize animal welfare arguments, resonating with people's moral values; yet, they frequently limit their communications due to fears of triggering defensive reactions and cognitive dissonance (Laestadius et al., 2014, p. 88). Evidence on which combinations of values and framing resonate with their target audience would enable NGOs to design more effective messages. These messages could better overcome defensive responses and advocate for a switch to plant-based diets.

Public agencies and policymakers could also benefit from this research, as promoting dietary change is vital for meeting climate goals, reducing healthcare costs, and enhancing food security. Evidence-based framing could improve the cost-effectiveness of national dietary guidelines, public information campaigns, and procurement policies.

Finally, the commercial success of plant-based products depends on overcoming entrenched beliefs about taste, price, and convenience (Leiserowitz et al., 2020, p. 3). Marketers and food brands could use findings from this research to identify the most effective strategies for different consumer segments, shortening the intention–action gap and boosting trial rates.

To address these academic and societal needs, this study asks the following research question:

RQ: *How do framing strategies and types of arguments affect consumers' willingness to adopt a fully plant-based diet?*

Chapter 2. Theoretical Framework

This chapter introduces the theoretical framework guiding the study. It outlines key psychological constructs used to understand attitudes and how these can be shaped through strategic message framing. It continues applying such concepts to the specific realm of plant-based diets adoption. Drawing on theories of attitude formation, framing, and value activation, the chapter provides the conceptual basis for the experimental design and the development of testable hypotheses.

2.1. Framing theory

An attitude is the general evaluation an individual has regarding a given object, person, or concept (Ajzen, 2001, p. 28). An individual's attitude toward a behaviour, for instance, is defined as the overall evaluation of such behaviour as favorable or unfavorable; this evaluation depends on the outcomes they associate with the behaviour (e.g. benefits, costs, or risks) (Ajzen, 1991, p. 188). A central question scholars have explored over time is: How are attitudes formed?

As previously mentioned, attitudes are formed through evaluative processes. This is clearly explained by the expectancy-value model, which suggests that attitudes develop based on the beliefs people hold about the attitude object. Each belief connects the object to a specific attribute (e.g., healthy or unhealthy, convenient or inconvenient) (Chong & Druckman, 2007, p. 105).

Let's consider a person's attitude toward a plant-based meat substitute. According to the expectancy-value model, this attitude is shaped by various beliefs, each linked to a specific attribute of the product. For example, this person may believe that the meat substitute is better for the environment (positive evaluation) but also think that it is more expensive than traditional meat (negative evaluation). Whether the overall attitude toward the product is positive or negative depends on how important each attribute is to the individual. If price is the most salient attribute for them, then the negative belief about cost will weigh heavily, likely resulting in an overall negative attitude. Indeed, an attitude can also be defined as the combination of beliefs and the importance assigned to each belief (Chong & Druckman, 2007, p. 105). However, is this attitude stable, or can it change depending on situational factors?

Suppose this individual watches a television advertisement that emphasizes how switching to plant-based meat can significantly reduce one's carbon footprint and help combat climate change. The advertisement features striking visuals of environmental degradation and frames the behaviour as a meaningful and responsible personal choice. This type of framing can shift the individual's focus away from cost and toward environmental impact, a value they also hold but had not previously considered salient. As a result, the positive belief about sustainability gains weight, potentially modifying the overall attitude toward the product.

In this sense, framing does not create new beliefs, but influences which pre-existing beliefs become accessible and applicable at a given moment, thereby shaping the attitude accordingly. The frame selectively activates certain beliefs and values over others and such activation alteres which attributes are most accessible.

This idea, that any given issue can be interpreted from multiple perspectives and linked to several different values, is foundational to framing theory. Framing is the process through which individuals form a specific understanding of an issue or shift the way they think about it (Chong & Druckman, 2007, p. 104).

The psychological mechanisms underlying framing involve three main stages: availability, accessibility, and applicability; these stages determine how a particular frame influences an individual's attitude and, potentially, behaviours (Chong & Druckman, 2007, pp. 110-111).

The first stage is availability. For a framing effect to occur, the presented belief must be stored in the individual's memory (Chong & Druckman, 2007, pp. 110-111). For instance, if an individual does not comprehend the concept of animal welfare, they will not be influenced by an animal welfare frame. Repetition and frequent exposure may enhance the storage of information (Higgins, 1996, p. 139). Likewise, significant personal experiences enable the creation of memories and associations, which affect how readily information is available in memory (Higgins, 1996, p. 141). Let's consider the example of a consumer who has never heard of farm animal welfare and whose food choices are primarily driven by price and taste. Over time, however, they begin to see advertisements, documentaries, and social media posts about this topic and the conditions of animals in intensive farming systems. This repeated and frequent exposure helps make the concept of farm animal welfare more available in their memory.

The second stage is accessibility, which refers to how easily a belief can be retrieved from long-term memory. In 1996, Higgins defined availability as the "activation potential of available knowledge" (p. 141). Accessible knowledge typically remains in a latent rather than an active state and its activation can be triggered by a stimulus (Higgins, 1996, p. 134). Recent or repeated exposure to a particular frame increases the accessibility of that belief (Chong & Druckman, 2007, p. 110). Increased accessibility increases the chances of knowledge being activated (Higgins, 1996, p. 134). Returning to our example, suppose this consumer is now grocery shopping. An "animal welfare certified" label triggers memories of images they saw in a documentary. Although they were not consciously thinking about animal welfare, this relevant stimulus activates the latent knowledge they have stored.

The third stage is applicability, which concerns the match between the characteristics of the stored knowledge and those of the stimulus being processed. The more similar the features are, the more relevant the knowledge becomes, and the more likely it is to be activated when encountering the stimulus. In the example we are painting, the consumer now decides to buy one product over another, based on the animal welfare label they just saw. In this case, the farm animal welfare frame has influenced their attitude *and* their actual behaviour. Although it's possible that in the applicability stage, individuals tend to unconsciously base their opinions on easily available and accessible beliefs (Higgins, 1996, p. 135), it is also possible that this process of evaluation of applicability occurs in the realm of consciousness (Chong & Druckman, 2007, p. 110). Individual may consciously decide what is relevant and appropriate to the situation at hand when sufficiently motivated by personal interests or beliefs (Stapel et al., 1998, p. 892). Conscious judgement of applicability can also take place when individuals are prompted to deliberate over alternatives as the competitive context will push them to considered alternatives to reconcile conflicting beliefs (Druckman, 2004; Kuklisnski et al., 2001, as cited in Chong & Druckman, 2007, p. 110).

2.2. Value based arguments

Values can be defined as deeply held moral principles or core beliefs of an individual or a society; these values guide reasoning and decision-making **(**Sniderman & Theriault, 2004, p. 142). A value-based argument is a type of persuasive argumentation that connects a specific issue or position to these values (Sniderman & Theriault, 2004, p. 132; Sinclair et al., 2025, p. 10).

In their 2004 study, Sniderman and Theriault designed what became known as the "Government Spending Experiment"(Sniderman & Theriault, 2004, pp. 142–145). Participants were presented with two alternative arguments for the same policy issue regarding the possibility of an increased government spending to expand opportunities for the poor. The substance of the policy remained constant across both conditions; only the symbolic emphasis used to frame the question varied. One group received what was termed the "getting ahead" argument:

"Are you in favor of or opposed to a big increase in government spending to increase opportunities for poor people *so they can have a better chance of getting ahead in life*?" (p. 143)

The other group was exposed to the "higher taxes" argument:

"Are you in favor of or opposed to a big increase in government spending to increase opportunities for poor people, *even if it means higher taxes*?" (p. 143)

In addition to assessing opinions on the policy proposal, the researchers also measured participants' attachment to relevant values that could influence their stance. To do this, they posed a forced-choice question requiring respondents to indicate which of two competing values, such as narrowing the gap between rich and poor versus increasing economic growth, they considered more important. This approach reflects the authors' belief that values are most meaningfully assessed when respondents are compelled to prioritize one over another, rather than evaluating each in isolation (Sniderman & Theriault, 2004, p. 143).

The results clearly demonstrated a framing effect: among those who prioritized equality over economic growth, 87 percent supported increased government spending when the issue was framed as promoting opportunity, consistently with their core values. However, support dropped sharply when the same policy was framed in terms of raising taxes, with 52 percent opposing the proposal. A similar reversal occurred among those who prioritized economic growth: 58 percent opposed the policy when it was framed as resulting in higher taxes, aligning with their preference, but this opposition declined when the policy was presented in terms of expanding opportunity, with 64 percent then expressing support (pp. 144-145). These findings suggest that the argument used has a greater effect on people who already hold the relevant underlying value.

In order to further test the results of the first experiment, Sniderman and Theriault conducted a parallel replication: the "Rally" experiment (Sniderman and Theriault, 2004, pp. 151- 155). Again, a randomly selected subset of participants was presented with the "free speech" condition and "violence risk" condition:

"This question is about a group that has very extreme political views. Suppose they wanted to hold a public rally to express their ideas. *Given the importance of free speech,* would you be in favor of or opposed to allowing this group to hold the rally?" (p. 151)

"This question concerns a group that holds highly extreme political views. Suppose they intended to organize a public rally to express their ideas. *Given the risk of violence,* would you be in favor of or opposed to allowing this group to hold the rally?" (p. 151)

Once again, participants were asked to indicate their general value orientation by choosing between a primary emphasis on ensuring law and order in society or individual freedom.

In the "free speech" condition, four out of five participants expressed support for allowing the rally. This majority held across both value orientations, although support was slightly higher among those prioritizing individual freedom compared to those emphasizing law and order. Conversely, in the "violence risk" condition, the pattern of responses shifted markedly: 63 percent of those prioritizing law and order opposed permitting the rally, and support among those who prioritize individual freedom dropped to approximately 50 percent (pp. 152-153). Coherently with the previous one, this study confirmed that arguments types have a greater effect on people when coherent with their underlying values.

On this note, one final clarification is necessary. It is widely acknowledged that ambivalence plays a crucial role in framing effects (Sniderman & Theriault, 2004, p. 137). Ambivalence means people have valid reasons both to support and to oppose a given action (Sniderman & Theriault, 2004, p. 137). In the "Rally experiment", for instance, participants had both reasons to support the rally, such as safeguarding free speech, and reasons to oppose it, such as concerns about security. Another example would be a consumer who cares about animal welfare, but also enjoys eating meat and is concerned about the higher price of ethically sourced products. This individual is ambivalent: they value the ethical treatment of animals, but also face practical constraints such as taste preferences and budget. Because they hold both positive and negative beliefs about buying high-welfare meat, they are more

vulnerable to the influence of framing. A message that highlights the cruelty of intensive farming may push them toward ethical purchasing, while a frame that emphasizes the economic aspect may reinforce their decision to stick with cheaper, conventional products.

2.2.1. Value based arguments for plant-based diets adoption

In the diets domain, this study identifies two possible sets of values on which persuasive messages can be anchored.

The first set consists of *social arguments*, which address collective concerns and emphasize that the primary beneficiary of an action is someone other than the self (White & Peloza, 2009, p. 110). These arguments highlight how engaging in—or refraining from—a particular behaviour impacts society as a whole (Nan, 2007, pp. 493-494).

The second set consists of *individual arguments*, which address personal concerns and emphasize the self as the main beneficiary of an action (White & Peloza, 2009, p. 110). These arguments focus on how a behaviour directly affects the individual (Nan, 2007, pp. 493–494).

In the realm of plant-based diets, the social arguments are health, environment and animal welfare. The *health argument* highlights that people choose foods based on their perceived health benefits, such as better nutrition, disease prevention, and overall well-being. Importantly for this classification, these benefits apply not only to individuals but also to public health systems, helping to reduce the strain on collective healthcare resources.

On the other hand, the *environmental argument* highlights concerns about the environmental impact of food production, including resource usage (e.g., water, land), carbon emissions, and the effects on ecosystems. Finally, the *animal welfare argument* focuses on ethical concerns regarding the treatment of animals, particularly in terms of humane conditions and cruelty prevention.

When it comes to the willingness to try a plant-based diet, studies consistently show that omnivores who are not already reducing their meat consumption tend to prioritize health benefits over environmental or animal welfare concerns (Mullee et al., 2017, p. 301; Pink et al., 2022, pp. 1, 11). Interestingly, this prioritization appears to reverse among vegetarians. While health and nutrition are the most frequently cited reasons for reducing animal product consumption among omnivores, vegetarians most commonly cite animal welfare as their primary motivation. Vegans, who already follow a plant-based diet, report a coherent pattern (Humane League Las, 2014, p. 16). According to Bryant (2019, p. 3) this shift depends on the

fact that health improvements and environmental benefits can be also achieved by gradually reducing rather than eliminating animal products; however, viewing animal products as the result of animal suffering or exploitation is more likely to lead to a complete rejection of them.

Individual arguments make up for the second group identified in the study; they include cost, taste, and convenience. The *cost argument* refers specifically to the price of plant-based food, particularly meat and dairy alternatives, compared to animal-based products. The *taste argument* concerns the flavor and sensory appeal of plant-based ingredients, as well as the new culinary possibilities they offer. The *convenience argument* relates to the effort required to access vegan products, especially meat and dairy substitutes, whether in restaurant chains, grocery stores, or through food delivery services.

Empirical studies have identified taste, cost, and convenience as crucial factors influencing individuals' willingness to try a plant-based diet. Although many consumers recognize the ethical and environmental motivations behind plant-based eating, individual arguments often play a decisive role and can become significant barriers to adoption when such diets are perceived as more expensive, less tasty, or less convenient (Bryant, 2019, p. 12; Niemiec et al., 2021, p. 1). Consistently, consumers tend to affirm that they would be more willing to transition to a more plant-based diet if the prices of plant-based products were lower (Leiserowitz et al., 2020, p. 3; Lehmann et al., 2025, p. 1).

As previously discussed, the receptiveness to certain types of arguments depends on individual's pre-existing values (Sniderman & Theriault, 2004, p. 143). However, there are psychological mechanisms that can make individual arguments more persuasive than social ones in contexts such as food choices.

In a study by Nan (2007), participants evaluated persuasive messages (framed either around societal or individual arguments) in promoting public transport instead of driving. Social arguments emphasised the benefits of taking public transportation for the entire community ("Chances are *people in your community* will have healthier lungs if you take a public transportation instead of keeping driving your own car", p. 496). Individual arguments emphasised the benefits of such action for the individual ("Chances *you* will have healthier lungs if you take a public transportation instead of keeping driving your own car", p. 496). Findings revealed that social arguments were more persuasive when participants considered decisions for socially distant others (e.g., an average college student) rather than for

themselves (Nan, 2007, p. 502). Nan concluded that greater social distance prompts abstract, high-level thinking that aligns with collective-benefit rhetoric, thereby enhancing the impact of social arguments in that context (Nan, 2007, p. 508).

Similarly, in a study by White and Peloza (2009), participants were tested across multiple experiments to evaluate the effectiveness of different types of marketing appeals in influencing donation intentions and behaviours. The appeals were framed either around benefits to others or benefits to the self. Social arguments were defined as *other-benefit appeals*, highlighting that the primary beneficiary of the action is another individual or organization. It is the case in Goodwill Industries, that uses a message emphasizing other-benefits: "Your donations help fund job training and other career services that help people achieve success in the workforce" (pp. 109-110). Individual arguments were defined as *self-benefit appeals*, focusing on the donor as the main beneficiary. This is the case of Big Brothers Big Sisters of America, that uses a self-benefit message such as: "Being a Big Brother or Big Sister is one of the most enjoyable and rewarding things you'll ever do" (pp. 109-110). The results showed that social arguments (other-benefit appeals) were more effective when consumer responses were public and when concerns about social image were high. Conversely, in situations where public image concerns were low and responses were private, individual arguments (self-benefit appeals) proved to be more persuasive (White and Peloza, 2009, p. 116).

Finally, in the context of green advertising, Ekebas-Turedi et al. (2017, pp. 392-396) examined the effectiveness of different arguments for eco-friendly products. Advertisements were presented with either an other-benefit tagline (social arguments) or a self-benefit tagline (individual arguments). Messages framed with social arguments proved more effective when consumers believed that their individual actions could positively impact environmental issues. In other words, when people felt that their personal choices made a difference, they were more persuaded by messages highlighting collective or environmental benefits. Conversely, messages framed with individual arguments were more persuasive when consumers perceived their individual impact as low. In such cases, when people doubted that their actions alone could help the environment, they responded more positively to ads that emphasized personal advantages, such as saving money.

Together, these three experiments suggest that messages stressing individual arguments often outperform social arguments whenever (a) the decision is made in private,

(b) personal impact feels low, or (c) immediate action is required. These conditions closely reflect how most dietary choices are made: privately, routinely, and often with uncertainty about the broader impact on issues like climate change or animal welfare. In such decisions, immediate and personally relevant factors tend to carry more weight. In fact, research shows that people typically base food choices on short-term, tangible benefits such as taste, price, and convenience (Aggarwal et al., 2016, p. 2; Bryant, 2019, p. 12; Lehmann et al., 2025, p. 10). It is therefore reasonable to expect that, when message framing is held constant, appeals that highlight individual arguments will be more persuasive in promoting the adoption of a plant-based diet than those that emphasize social arguments.

H1: A message with *individual arguments* will lead to higher willingness to adopt a plant-based diet than a message with *social arguments*.

2.3. Gain and loss framing

Drawing on Prospect Theory (Tversky & Kahneman, 1979), studies on gain–loss framing have primarily focused on comparing the persuasive impact of messages framed in terms of gains versus losses. In such messages, a gain frame underscores the positive consequences of taking action, while a loss frame emphasizes the negative consequences of failing to act (Nan, 2007, p. 492).

A classic example would be "The Asian Disease" problem, designed by Tversky & Kahneman in 1981. During the experiment, 307 participants were asked to imagine a scenario in which an Asian disease threatens to kill 600 individuals and to choose between two public health programs (Tversky & Kahneman, 1981, pp. 453-454).

In the first version of the experiment (Problem 1, $N = 152$), the two public health programs presented to participants were:

1. Program A: If adopted, program A will save 200 lives;
2. Program B: If program B is adopted, instead, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no one will be saved.

A significant majority (72%) opted for Program A, revealing a preference for the certainty of a positive outcome—a phenomenon known as *risk aversion* in the domain of gains.

In contrast, a second group of participants (*Problem 2, N* = 155) was presented with the same statistical outcomes, but the scenario was reframed in terms of losses. In this version:

1. Program C: If adopted, 400 people will certainly die;
2. Program D: If adopted, there is a 1/3 chance that no one would die and a 2/3 chance that all 600 would perish.

Here, a majority (78%) chose Program D, the riskier option, demonstrating a *risk-seeking tendency* when outcomes are described as losses (Tversky & Kahneman, 1981, pp. 453-454).

Although the statistical outcomes of Problems 1 and 2 are equivalent, the stark difference in preferences underscores the framing effect: once again, it is noticeable how individuals evaluate options not solely on their expected utility but also on how the outcomes are linguistically or conceptually presented. This inconsistency in choice behaviour violates the core assumption in rational choice theory, which is that individuals evaluate alternative options by assessing their respective advantages and disadvantages, ultimately opting for the course of action that yields the highest perceived utility or overall satisfaction (Tversky & Kahneman, 1981, pp. 453-454).

2.3.1. Gain and loss framing for plant-based diets adoption

The effectiveness of gain- versus loss-framed messages has been widely studied as a way to persuade consumers to adopt a plant-based diet. A gain frame emphasizes the rewards and advantages of adopting a plant-based diet, while the loss frame stresses the risks or costs of not adopting it. Importantly, both societal and individual arguments can be expressed in terms of gains or losses.

Health related arguments, for instance, may be framed both as a gain (e.g., by adopting a plant-based diet you are actively reducing your risk of cancer) or a loss (e.g., by not adopting a plant-based diet, you're missing out on the opportunity of reducing your risk of cancer).

Similarly, cost related arguments may be framed as a gain (e.g., by adopting a plant-based diet you'll be saving on your grocery bills) or a loss (e.g., by not adopting a plant-based diet, you'll be paying more on your grocery bills).

According to Prospect Theory, people tend to react more strongly to potential losses than to equivalent gains. In other words, the discomfort of losing something usually outweighs the satisfaction of gaining the same amount (Tversky & Kahneman, 1979, p. 456). For example, in a debate about how to handle the cost of credit card transactions, industry representatives preferred to describe the pricing difference as a discount for paying with cash rather than a fee for using a credit card. Although the actual price difference remained the same, calling it a fee made people feel like they were losing money. It felt like they were being penalized, which triggered a stronger negative reaction. In contrast, framing it as a discount made people feel like they were receiving a benefit, even though the outcome was financially identical (Thaler, 1980, p. 45).

However, when gain and loss frames are applied to plant-based messaging, findings are mixed. Loss-framed messages that emphasize the negative environmental impact of meat consumption have been found to be more persuasive in encouraging individuals to consider plant-based alternatives compared to gain-framed messages (Chang & Wu, 2015, as cited in Dobson, 2023, p. 3). In contrast, for health-focused messages gain framing has been found to be more persuasive than loss framing; consumers are generally inclined to make choices that benefit their own health and the well-being of others, but they are unlikely to be motivated by fear or guilt (Dobson, 2023, p. 5).

Other studies have examined how gain and loss frames affect the promotion of plant-based meat alternatives, focusing on general motivational messages such as “cut back on animal products” or “increase plant-based intake”. Although these messages do not focus on a specific argument (such as health or environmental benefits), the findings remain relevant. They suggest that when the emphasis is on loss-framed messages, such as calls to reduce or eliminate animal product consumption, consumers are often driven away from adopting a plant-based diet (Hwang et al., 2020, p. 11; Carvalho et al., 2022, p. 3).

These negative reactions to loss-framed messages—particularly in health and food-behaviour contexts—suggest that gain framing may offer a more constructive, motivating approach for encouraging behavioural change. Therefore, it is reasonable to formulate the second hypothesis as:

H2: A *gain*-framed message will lead to higher willingness to adopt a plant-based diet than a *loss*-framed message.

2.4. Combining argument types with gain and loss framing for plant-based diets

Individual arguments tend to be more effective in private and concrete decision-making contexts, such as everyday food choices. In these situations, considerations like taste, price, and convenience play a major role and they can either encourage or discourage people from adopting a plant-based diet (Bryant, 2019, p. 12; Niemiec et al., 2021, p. 1). Similarly, gain-framed messages are less likely to trigger defensive reactions or rejection, thereby fostering a more open attitude toward change (Dobson, 2023, p. 5).

In contrast, social arguments may appear distant or abstract in relation to an individual's immediate concerns, thus reducing the persuasiveness of the message in contexts like dietary choices. Especially when formulated using loss framing, such messages can elicit defensive reactions, guilt, or skepticism, ultimately decreasing individuals' willingness to engage in sustainable behaviours (Carvalho et al., 2022, p. 3; Hwang et al., 2020, p. 11).

Combining these effects, it is reasonable to hypothesize that gain-framed messages with individual arguments will be more persuasive than loss-framed messages with social arguments.

H3: A *gain*-framed message with *individual arguments* will lead to higher willingness to adopt a plant-based diet than a *loss*-framed message with *social arguments.*

2.5. Meat attachment

While different frames and argument types may influence consumers' willingness to adopt a plant-based diet, dispositional factors may hinder this transition. Among these, meat attachment stands out. This construct is defined as "a positive bond toward meat consumption" (Graça et al., 2015, p. 114). It encompasses beliefs, emotions, and habits that make meat more than just a food; meat consumption becomes a source of pleasure, a deeply ingrained habit, and a crucial factor in identity formation, especially in Western countries (Holm & Møhl, 2000, p. 277).

Graça et al. (2015, p. 116) identified four key dimensions of meat attachment:

1. Hedonism: the sensory pleasure derived from eating meat;

2. Affinity: the affective attraction toward meat consumption;

3. Entitlement: the perceived right to consume meat;

4. Dependence: the feeling of relying on meat.

These dimensions emerged from three sequential studies (total N = 1751), which led to the development of the Meat Attachment Questionnaire (Graça et al., 2015, pp. 115-121). The MAQ has proven to be a strong predictor of consumers' intentions and openness toward meat reduction. Higher MAQ scores are associated with lower willingness to reduce meat intake or try plant-based alternatives**,** and a greater likelihood of rejecting persuasive appeals, reacting with defensive resistance or lack of interest (Graça et al., 2015, p. 122).

2.6. Food choice motives

Previous work shows that food choices are guided by personal, distinct, and significant motives (Steptoe et al., 1995, p. 267). To systematically investigate these motives, Steptoe and colleagues created the Food Choice Questionnaire (FCQ). They began with 68 items drawn from the literature and expert interviews, gave them to a sample of 358 adults, and used exploratory factor analysis to extract nine factors (Steptoe et al., 1995, pp. 267, 270-271). The health and ethical concern factors are particularly relevant for the present study.

The health factor includes elements related to both chronic disease prevention and general nutrition and well-being. Individuals who score high on this factor in the Food Choice Questionnaire (FCQ) tend to prefer foods they perceive as beneficial for their overall health and disease prevention (Steptoe et al., 1995, p. 280). Moreover, the more individuals believe their actions can impact their health, the more importance they place on health-related criteria in their food choices (Steptoe et al., 1995, p. 279).

Although not directly linked to the willingness to adopt a plant-based diet, the health factor may hold indirect predictive value. In their study, Steptoe and colleagues (1995, p. 269) compared the Food Choice Questionnaire's health factor to a health consciousness factor identified in the Nutrition Attitudes Survey (Hollis et al., 1986). This latter construct was associated with lower meat consumption and a greater willingness to change behaviours, particularly to avoid illness (Hollis et al., 1986, p. 365).

The second factor, ethical concern, encompasses elements related to environmental and political issues (Steptoe et al., 1995, p. 282). Within this dimension, environmental concern is particularly relevant to the present study; this is due to the substantial ecological impact of food production and the increasing public awareness of the environmental consequences of animal agriculture. Individuals who exhibit a high level of environmental awareness are generally more inclined to adopt and maintain sustainable eating practices, including plant-based diets (Krizanova et al., 2021, pp. 4–6).

Chapter 3. Methodology

This chapter outlines the research design, methodological approach, and procedural steps adopted in the study. It explains the processes through which data were gathered, measured, and analysed in order to effectively address the research question. Serving as a link between the theoretical foundation and the empirical outcomes, the methodology section clarifies how key concepts were translated into measurable variables and how rigor was maintained in terms of reliability and validity throughout the research process.

3.1. Research design

To examine consumers' willingness to adopt a plant-based diet, this study employs a between-subjects experimental design. Firstly, a quantitative approach was adopted as it allows for the empirical examination of proposed relationships between variables, providing a statistically rigorous means of evaluating potential causal links (Lim, 2024, pp. 2-3). Furthermore, an experimental design was chosen as the methodological framework because it allows for the deliberate manipulation of one or more independent variables to assess their impact on a dependent variable, typically within controlled environments. Although such designs may have limited applicability to real-world contexts, especially when experiments are hypothetical or conducted in artificial laboratory settings, they remain highly effective for identifying causal relationships (Lim, 2024, p. 5).

The selection of an experimental design should align closely with the research question and the practicalities of implementation; presenting decision-making contexts either sequentially (within-subjects) or in isolation (between-subjects) can yield markedly different outcomes (Charness et al., 2011, p. 1). When participants directly observe the shift in a key parameter across otherwise identical scenarios, they may feel prompted to update their judgments in ways they might not in more naturalistic settings. Moreover, sequential exposure to different conditions can introduce cognitive carry-over that would be absent under independent evaluation (Charness et al., 2011, p. 4). Social desirability biases and cognitive carry-over effects are the reasons why this study employed a between-subjects experimental design, which allowed the effects of four different framing strategies to be measured independently (Sniderman & Theriault, 2004, p. 143; Charness et al., 2011, p. 4).

Participants were randomly assigned to one of four groups. This study did not employ a traditional control group; still, it allowed for meaningful comparisons between the four experimental conditions to assess the effects of different framing strategies on consumer behaviour. The focus was on measuring the 'change' in participants' willingness to adopt a plant-based diet after exposure to the various framing conditions. In this design, no neutral or frame-free condition was required; instead, each frame served as a benchmark against the others (Sniderman & Theriault, 2004, p. 109). Because participants were randomly assigned and the sample size was large enough, it was possible to assume that any differences in outcomes were attributable to the framing itself. Moreover, prior literature had already established that such frames could influence consumer behaviour, so the study aimed not to test whether framing worked, but which framing format was more effective.

3.2. Sampling strategy and sample

Participants were recruited through non-probability sampling methods, including convenience sampling, snowball sampling, paid online panel sampling and street-intercept sampling. The combination of these non-probability methods facilitated the recruitment of 200 participants in line with the study's logistical constraints.

The majority of the sample was recruited through convenience and snowballing sampling. Convenience sampling is a non-random sampling method in which individuals from the target population are selected based on practical considerations such as ease of access, geographic proximity, availability at the time of the study, or their willingness to participate (Etikan et al., 2016, p. 2). Focusing on engaging those participants who are most readily accessible to the researcher , this approach was chosen due to its cost-effectiveness and feasibility within the time and resource constraints of the project. In this study, the method was employed by disseminating the questionnaire through the researcher's personal network and on social media platforms, such as Instagram, Facebook, LinkedIn and WhatsApp. To reduce self-selection biases, the study advertisement did not disclose its specific purpose (Graça et al., 2015, p. 115). Snowball sampling was also utilized, as participants were encouraged to share the questionnaire with other potentially interested individuals in their networks (Noy, 2008, p. 330).

Another portion of the sample was recruited using intercept sampling, a data collection technique that falls under the broader category of personal or face-to-face interviews. This method involves positioning researchers in public locations—typically busy or central areas—

to stop individuals and invite them to participate in a study (Bush & Hair, 1985, p. 158). The choice of this approach was consistent with the resource constraints of the current research. However, the limit is that the likelihood of selecting any given individual depends on how frequently they are present in the location where the recruitment occurs (Bush & Hair, 1985, p. 161). Since intercept sampling for this study took place exclusively within the university setting, it is important to acknowledge the sampling bias (Bush & Hair, 1985, p. 161) associated with this method.

A final portion of the sample (N = 40) was obtained via Prolific, an online platform for paid participant recruitment. Similar to the previous sampling techniques, online platforms for participants recruitment also carry the risk of producing a sample that may not be representative of the general population (Peer et al., 2017, p. 159). Still, this method is increasingly common and generally considered acceptable in academic research, as it allows for quick and cost-effective recruitment of targeted samples (Bryant, 2019, p. 4). In order to ensure as much demographic diversity as possible, the filters used in the platform did not exclude any nationality or gender.

Eligibility criteria included only being 18 years or older and possessing a sufficient level of English to comprehend the questionnaire. The broad inclusion criteria were intended to enhance the generalizability of the findings to a wider population. However, it is recognized that all the sampling techniques used may entail a risk of selection bias, as the sample may over represent individuals who are more accessible, available, or willing to participate, while underrepresenting others (Bush & Hair, 1985, p. 161).

Two hundred responses were collected; thirty-one subjects were excluded due to missing information or because they reported already following a vegan diet. The final sample of the study consisted of 169 participants (71 men; 97 women; 1 prefer not to say) with an age range between 18 and 76 years (M = 31.13, SD = 11.41). Participants were asked to share their highest level of education, with the most common response being Bachelor's degree (43.8%), followed by Master's degree (30.8%) and high school diploma (20.1%). The three most prominent diets of the sample were the omnivore diet (76.9%), the flexitarian diet (10.7%) and the vegetarian diet (4.7%).

3.3. Procedure

Firstly participants were given a cover story designed to mask the true purpose of the study and reduce potential social desirability bias. Participants were then clearly informed that their participation was entirely voluntary and that they could withdraw at any time without penalty or consequence.

Upon providing informed consent, participants were randomly assigned to one of four experimental conditions. Each participant was asked to read a short text (stimulus) corresponding to their assigned condition. Following this, participants answered a series of scale items presented on a Likert scale, including the selected subscales from the Meat Attachment Questionnaire and the Food Choice Motives Questionnaire and 2 items to asses *Willingness to Try a Plant-Based Diet*. No question randomization was implemented. To encourage honest responses and reduce social desirability bias—particularly the tendency to over report behavioural intentions—each set of questions was preceded by the message: *"Thank you for being honest!"*, a technique adopted by Bryant (2019).

Following these items, participants were asked two manipulation check questions to assess whether they correctly understood the type of argument (social vs. individual) and the framing (gain vs. loss) of the message.

Finally, participants were asked to provide basic demographics information, including gender, age, highest level of education and current dietary habits. At the end of the survey, all individuals were debriefed and informed about the real purpose of the study.

3.3.1. Research ethics

Participation in this study was entirely voluntary, and participants were informed that they could withdraw at any time without any penalty. To ensure confidentiality, all responses were anonymized. Although general demographic information (such as age and gender) was collected to support data analysis, no personally identifiable information (e.g., names or email addresses) was gathered. While IP addresses were recorded for technical purposes, they were stored separately and not used to identify or match survey responses. Participants were fully debriefed at the end of the study and were invited to contact the researcher for any questions or concerns. The study posed no foreseeable risks to participants, and ethical standards were maintained throughout the research process.

3.4. Measurements

The primary construct under investigation in this study was *Willingness to Adopt a Plant-Based Diet*. In order to control for individual differences in attitudes and motivations toward meat consumption, two validated psychological scales were included as covariates.

3.4.1. Willingness to adopt a plant-based diet

The choice to measure willingness, rather than actual change in dietary behaviour, was due to two main reasons. First, assessing actual behaviour would have required a longitudinal observational design, meaning following the same sample over the years with repeated data collection (Farrington, 1991, p. 369); this was not feasible given the time and resource limitations. Still, willingness may reflect participants' openness to change and may be considered a proximal antecedent of behaviour according to models such as the Theory of Planned Behavior (Ajzen, 1991, pp. 181-185).

The construct *Willingness to Adopt a Plant-Based Diet* was assessed using two items adapted from prior research on consumers' willingness to reduce meat consumption (Graça et al., 2015, p. 116; Wang and Scrimgeour, 2021, p. 4). The two items were: "I am willing to reduce my daily meat consumption" and "I am willing to try a vegan diet"; they were assessed on a seven-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

The item "I am willing to try a vegan diet" was a slight rewording of the original item of the scale "I am willing to try a more plant-based diet". This decision was taken to maintain consistency with the stimulus text, where the term vegan was used to describe a fully plant-based diet. This change was made to ensure clarity and help respondents focus on the content of the diet under investigation, rather than be distracted by two alternative, but more nuanced, definitions. Still, the reliability of the scale was confirmed ($\alpha = .85$). An overall *Willingness to Adopt a Plant-Based Diet* score was computed by averaging the item scores.

3.4.2. Meat attachment factors

In Wang and Scrimgeour (2021, p. 4), the Meat Attachment Scale (Graça et al., 2015) included four factors - Hedonism**,** Affinity**,** Entitlement**,** and Dependence - each measured with two items. Responses were recorded on a seven-point Likert scale. Item three and four

were reverse scored (see Table 3.1). After recording, higher scores indicate stronger emotional and cognitive attachment to meat, which is expected to negatively correlate with openness to dietary change (Graça et al., 2015, p. 122). An overall meat attachment score was computed by averaging the item scores.

Expecting the psychological constructs to be interrelated (Fabrigar et al., 1999, pp. 281-282), a Confirmatory Factor Analysis with direct oblimin rotation (Oblimin with Kaiser Normalization) was conducted. The analysis revealed that the four factors were identical to the original scale. The KMO value of .86 verified the sampling adequacy for the analysis (Kaiser, 1970, pp. 404-406); Bartlett's Test of Sphericity was significant, $X^2(28) = 843.36$, $p < .001$. The resultant model explained 87% of the variance in meat attachment. Factor loadings, R^2 and Cronbach's alphas are shown in Table 3.1.

Table 3.1. Factor loadings, explained variances and reliability of the four factors found for the scale "Meat Attachment Factors" ($N = 169$)

Item	Hedonism	Affinity	Entitlement	Dependence
I love meals with meat	.91			
I'm a big fan of meat	.76			
By eating meat I'm reminded of death and suffering of animals (R)		.97		
I feel bad when I think of eating meat (R)		.81		
According to our position in the food chain, we have the right to eat meat			.98	
Eating meat is a natural and undisputable practice			.91	
I don't picture myself without eating meat regularly.				.93
Meat is irreplaceable in my daily diet.				.81
R^2	.60	.12	.09	.07
Cronbach's α				

	.92	.82	.78	.85

3.4.3. Food choice motives

In line with Wang and Scrimgeour's (2021, pp. 4–5) methodology, two subscales were used from the original scale (Steptoe et al., 1995). The subscales were Health Concern and Environmental Concern, each measured with two items on a seven-point Likert scale. An overall food choice motives score was computed by averaging the item scores. Factorial validity was supported by a Confirmatory Factor Analysis with direct oblimin rotation (Oblimin with Kaiser Normalization). The KMO value of .64 verified the sampling adequacy for the analysis (Kaiser, 1970, pp. 404-406); Bartlett's Test of Sphericity was significant $X^2(6) = 245.35$, $p < .001$. The resultant model explained 84% of the variance in food choice motives. Table 3.2 reports factor loadings, R^2 and Cronbach's alphas.

Table 3.2. Factor loadings, explained variances and reliability of the two factors found for the scale "Food Choice Motives" (N = 169)

Item	Health Concern	Environmental Concern
It's important to me that the food I eat on a typical day…		
Keeps me healthy	.93	
Contains a lot of vitamins and minerals	.93	
Has been prepared in an environmentally friendly way		.93
Has been produced in a way which has NOT disrupted the balance of nature		.86
R^2	.60	.24
Cronbach's α	.77	.84

3.4.4. Manipulation-check items

To verify whether participants correctly perceived the experimental manipulation, two forced-choice questions were administered after the scale items.

The first item assessed participants' recognition of the argument type (social vs. individual). Participants were asked to indicate which statement best described the content of the message they had read. The response options were:

- *The text describes the health, environmental, and animal welfare implications of a vegan diet* (social arguments);
- *The text describes the cost, convenience, and taste implications of a vegan diet* (individual arguments);
- *I don't remember*.

The second item assessed recognition of the message framing (gain vs. loss). Again, participants were asked to indicate which statement best described the content of the message they had read. The response options were:

- *The text highlights how adopting a vegan diet can be beneficial* (gain frame);
- *The text highlights how NOT adopting a vegan diet can be a loss in benefits* (loss frame);
- *I don't remember*.

All 139 participants responded to both attention check questions; there were no missing data. The "I don't remember" option was included to reduce the likelihood of random guessing. In both questions, a small number of participants per condition (between two and six) selected this option.

3.5. Stimuli

The materials used as stimuli (IV) were designed exclusively for this research and include four informative texts about a plant-based diet. Participants were all presented with the same standardized introduction about statistics and definition of the omnivorous and vegan diet.

Following the standardized introduction, participants were randomly assigned to one of four experimental conditions based on a 2 (Framing: Gain vs. Loss) × 2 (Argument Type: Social vs. Individual) between-subjects design.

- In the Social-Gain (SG) condition (N = 44), participants read about the *positive social outcomes* of adopting a vegan diet, highlighting benefits for health, the environment, and animal welfare.
- In the Social-Loss (SL) condition (N = 42), the same three social domains were emphasized, but framed in terms of *negative consequences* of maintaining an omnivorous diet.
- In the Individual-Gain (IG) condition (N = 44), the message focused on *personal benefits* of veganism, such as better taste, convenience, and lower costs.
- Conversely, in the Individual-Loss (IL) condition (N = 39), the same individual-level themes were framed as *missed opportunities* of not adopting a vegan diet.

Despite variation in tone and focus, all messages were matched for structure and length to ensure consistency across conditions. This design allowed for the assessment of both main and interaction effects of framing and argument type on participants' attitudes and intentions toward a plant-based diet.

Chapter 4. Results

This chapter presents the findings derived from the statistical analyses conducted to test the study's hypotheses. It begins with a manipulation check to verify whether participants accurately recognized the experimental conditions to which they were assigned. Subsequently, the results of the analysis of covariance (ANCOVA) are reported, examining the main and interaction effects of *message framing* and *argument type* on participants' *Willingness to Adopt a Plant-Based Diet*. Each hypothesis is examined individually, with detailed reporting of descriptive and inferential statistics.

4.1. Manipulation check

To verify the effectiveness of the experimental manipulation, two crosstabulation analyses were conducted to check whether participants correctly identified the argument type and framing of the message they were exposed to.

4.1.1. Recognition of the argument type

A Chi-Square Test of Independence compared participants' identification of the argument type with the four experimental conditions (Gain-Individual, Gain-Social, Loss-Individual, Loss-Social). The association was statistically significant, $\chi^2(6) = 42.32$, $p < .001$ (see Table 4.1).

Table 4.1.Chi-Square Test of Independence between experimental condition and argument type identification (N = 169)

Test Statistic	Value	df	*p*
Pearson Chi-Square	42.319[a]	6	<.001
Likelihood Ratio	45.897	6	<.001

Note. [a] 33.3% of cells had expected count less than 5. The minimum expected count was 3.00.

Overall, two-thirds of all participants (67.5 %) correctly identified the argument type of their condition. However, accuracy was higher in the social-argument conditions (≈ 76–85 %) than in the individual-argument conditions (≈ 55–57 %) (see Table 4.2). The manipulation succeeded in differentiating social from individual arguments; however, it was more salient for social arguments than for individual ones, suggesting room for improvement

in conveying the individual argument messages.

Table 4.2. Accuracy of argument type identification across conditions

Condition	N	N Correct identification	% correct identification
Social arguments – Gain Frame	42	32	76.2%
Social arguments– Loss Frame	39	33	84.6%
Social arguments	81	65	80.2%
Individual arguments – Gain Frame	44	24	54.5%
Individual arguments – Loss Frame	44	25	56.8%
Individual arguments	88	49	55.7%
Overall	169	114	67.5%

Note. Correct = choosing "The text describes the health, environmental and animal-welfare implications of a vegan diet" in the social-argument conditions or "The text describes the cost, convenience and taste implications of a vegan diet" in the individual-argument conditions.

4.1.2. Recognition of the message framing

A Chi-Square Test of Independence compared participants' identification of the framing with the four experimental conditions (Gain-Individual, Gain-Social, Loss-Individual, Loss-Social). The association was statistically significant, $\chi^2(6) = 15.60$, $p = .016$ (see Table 4.3).

Table 4.3. Chi-Square Test of Independence between experimental condition and framing identification ($N = 169$)

Test Statistic	Value	df	*p*
Pearson Chi-Square	15.595 [a]	6	.016
Likelihood Ratio	15.907	6	.014

Note. [a] 33.3% of cells had expected count less than 5. The minimum expected count was 3.00.

Overall, slightly more than half of all participants (56.8%) correctly identified the framing of their condition. However, accuracy was higher in the gain framed conditions (≈73-79 %) than in the loss framed conditions (≈ 32-39 %) (see Table 4.4). In conclusion, the manipulation successfully differentiated the gain from loss frames; however, the gain frame was recognized significantly more often than the loss frame, suggesting that it may have been more salient or easier to interpret.

Table 4.4. Accuracy of frame identification across conditions

Condition	N	N Correct identification	% correct identification
Social arguments – Gain Frame	42	33	78.6%
Individual arguments– Gain Frame	44	34	73.3%
Gain Frame	86	67	77.9%
Social arguments – Loss Frame	39	15	38.5%
Individual arguments – Loss Frame	44	14	31.8%
Loss Frame	83	29	34.9%
Overall	169	96	56.8%

Note. Correct = choosing "The text describes how adopting a vegan diet can be beneficial" in the Gain Frame conditions or "The text describes how NOT adopting a vegan diet can be a loss in benefits" in the Loss Frame conditions.

4.2. ANCOVA analysis

To test the main and interaction effects of message framing and argument types on participants' willingness to adopt a plant-based diet, an analysis of covariance (ANCOVA) was conducted. The dependent variable was participants' *Willingness to Adopt a Plant-Based Diet*. The independent variables were *message framing* and *arguments type*. Two covariates were included in the model to account for individual differences known to affect openness to plant-based diets: *Meat Attachment* and *Food Choice Motives*.

The ANCOVA revealed that the overall model was significant, $F(5, 163) = 20.25$, $p < .001$,

with a partial η2 = .383, indicating that the model explained approximately 38.3% of the variance in Willingness to Adopt a Plant-Based Diet. However, as detailed below, only the covariates were statistically significant predictors in the model ($p < .001$); the independent variables *message framing* and *arguments types* did not reach statistical significance after adjusting for covariates (see Table 4.5).

Table 4.5. Results of ANCOVA for Willingness to Try a Plant-Based Diet with arguments types, message framing, and covariates

Dependent Variable: Willingness to Try a Plant-Based Diet						
Source	Sum of Squares	df	Mean square	F value	Sig.	Partial Eta Square
Corrected Model	166.656	5	33.331	20.246	<.001	.383
Intercept	176.828	1	176.828	107.411	<.001	.397
Meat Attachment	104.629	1	104.629	63.555	<.001	.281
Food Choice Motives	27.732	1	27.732	16.845	<.001	.094
Argument Types	2.019	1	2.019	1.227	.270	.007
Framing	2.106	1	2.106	1.279	.260	.008
Argument Types * Framing	4.053	1	4.053	2.426	.119	.015
Error	268.344	163	1.646			
Total	16947.250	169				
Corrected Total	435.000	168				

4.2.1. H1: Main effect of argument type

Hypothesis 1 posited that messages framed with individual arguments would produce greater Willingness to Adopt a Plant-Based Diet than those employing social arguments. Descriptive statistics are presented in Table 4.6; groups exposed to individual arguments showed a slightly lower mean persuasiveness score (M = 9.73, SD = 1.70) compared to those exposed to social arguments (M = 10.05, SD = 1.50). The ANCOVA revealed no significant main effect of argument type, $F(1, 163) = 1.23$, $p = .201$, partial $\eta^2 = .007$ (see Table 4.5). Therefore, H1 was not supported by the data.

Table 4.6. Means and standard deviations of argument type on Willingness to Try a Plant-Based Diet score

Argument Type	N	*M*	*SD*
Individual Arguments	88	9.7330	1.69846
Social Arguments	81	10.0494	1.49918

4.2.2. H2: Main effect of framing

Hypothesis 2 proposed that a gain-framed message (emphasizing the benefits of adopting a plant-based diet) would result in higher Willingness to Adopt a Plant-Based Diet than a loss-framed message (emphasizing the negative consequences of not adopting such a diet). Descriptive statistics are presented in Table 4.7. Participants in the gain-framed message groups reported a mean score of $M = 9.75$ ($SD = 1.62$), whereas those in the loss-framed message groups reported a slightly higher mean score of $M = 10.02$ ($SD = 1.59$). The ANCOVA did not reveal a significant main effect of message framing, $F(1, 163) = 1.28$, $p = .260$, partial $\eta^2 = .008$ (see Table 4.5). Thus, H2 was not supported by the data.

Table 4.7. Means and standard deviations of framing on Willingness to Try a Plant-Based Diet score

Framing	N	*M*	*SD*
Gain Frame	86	9.7500	1.62291
Loss Frame	83	10.0241	1.59248

4.2.3. H3: Interaction effect of argument type and frame

Hypothesis 3 predicted an interaction effect whereby the gain frame combined with individual arguments (expected to be the most persuasive) would result in significantly higher willingness than the loss frame combined with social arguments (expected to be the least persuasive). Descriptive statistics are presented in Table 4.8. Participants in the loss frame with social arguments condition yielded the highest mean willingness score (M = 10.41, SD =

1.25), while the gain frame with individual arguments condition showed a slightly lower mean (M = 9.78, SD = 1.62) (see Table 4.8 and Figure 4.1). Once again, the ANCOVA did not reveal a statistically significant overall effect of the experimental condition, $F(1, 163) = 2.46$, $p = .119$, partial $\eta^2 = .015$ (see Table 4.5). Since no significant interaction effect was detected, H3 was not supported by the data.

Table 4.8. Means and standard deviations of framing*argument type on Willingness to Try a Plant-Based Diet score

Framing	Argument Type	N	*M*	*SD*
Gain Frame	Individual Arguments	44	9.7841	1.62251
	Social Arguments	42	9.7143	1.64221
Loss Frame	Individual Arguments	44	9.6818	1.78850
	Social Arguments	39	10.4103	1.250

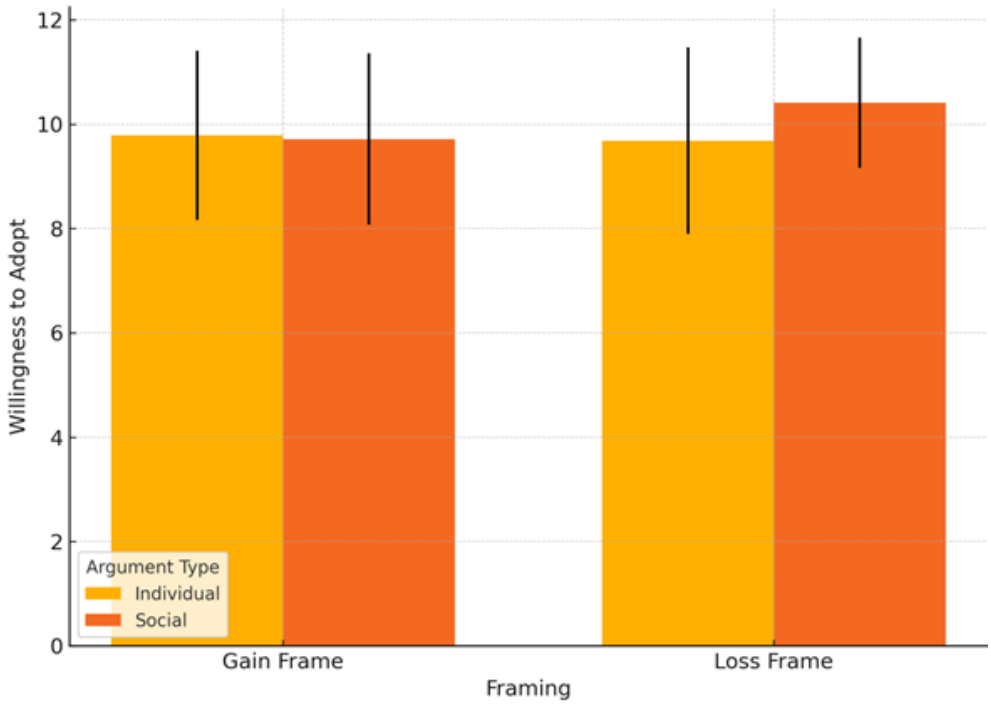

Fig. 4.1. Mean Willingness to Adopt a Plant-Based Diet by framing and argument type

4.2.4. Effects of covariates

The inclusion of covariates significantly improved the model. Specifically, meat attachment was a strong and significant predictor of Willingness to Try a Plant-Based Diet, $F(1, 163) = 63.56$, $p < .001$, partial $\eta^2 = .281$, with a negative coefficient ($\beta = –0.556$), indicating that higher attachment to meat was associated with lower willingness (see Table 4.5 and 4.9).

Food choice motives also had a significant effect, $F(1, 163) = 16.85$, $p < .001$, partial $\eta^2 = .094$, with a positive coefficient ($\beta = 0.432$), suggesting that these motives are meaningfully related to willingness as well, though to a lesser extent than meat attachment (see Table 4.5 and 4.9). These results highlight the important role of individual differences in meat attachment and food choice motives in predicting Willingness to Adopt a Plant-Based Diet.

Table 4.9. Summary of ANCOVA results predicting Willingness to Try a Plant-Based Diet from Meat Attachment and Food Choice Motives

Predictor	(Beta)	F value	p-value	Partial η^2
Meat Attachment	-0.556	63.555	<.001	.281
Food Choice Motives	0.432	16.845	<.001	.094

4.3. Summary of findings

This study aimed to investigate the effects of message framing (gain vs. loss) and argument types (individual vs. social) on individuals' willingness to adopt a plant-based diet. Contrary to the initial hypotheses, the analysis of covariance (ANCOVA) revealed no significant main or interaction effects of message framing and argument type on participants' willingness to change their dietary habits; all three hypotheses were rejected (see Table 4.10). The covariates—meat attachment and food choice motives—emerged as significant predictors, indicating that pre-existent individual differences play a more substantial role in dietary intentions than the specific framing or content of persuasive messages.

Table 4.10. Summary of accepted and rejected hypothesis

Hypothesis	Accepted	Rejected
H1: A message with *individual arguments* will lead to higher willingness to adopt a plant-based diet than a message with *social arguments*.		X
H2: A *gain*-framed message will lead to higher willingness to adopt a plant-based diet than a *loss*-framed message.		X
H3: A *gain*-framed message with *individual arguments* will lead to higher willingness to adopt a plant-based diet than a *loss*-framed message with *social arguments.*		X

Chapter 5. Discussion

This section firstly discusses the findings of the study, comparing them with previous research. Through this comparison, it reflects on the reasons behind the non-significant effects and examines the role of covariates in shaping the observed patterns. It then addresses the research question. The discussion proceeds to outline the study's key limitations and proposes directions for future research. While the study was designed with attention to theoretical grounding and methodological rigor, several constraints may have influenced the findings. Acknowledging these limitations is essential to accurately contextualize the results and guide more nuanced future investigations.

5.1. Interpretation of non-significant effects

While the descriptive trends offered some variation between conditions, these differences did not reach statistical significance. The lack of statistically significant effects across all three hypotheses suggests that the experimental manipulations - argument type (social vs. individual), message framing (gain vs. loss), and their interaction - did not meaningfully influence participants' Willingness to Adopt a Plant-Based Diet within this sample. This appears to contrast with previous research that indicate that message framing can affect dietary intentions.

However, the discrepancy in findings may be attributed to methodological differences between this study and previous ones. Most of the prior research investigates the framing effect in experimental setting using a survey method (Dobson and Poels, 2020, as cited in Dobson, 2023, p. 5); however, they do not investigate the combined effect of gain- loss-frames and argument types, nor do they include covariates. The findings of this study differ, for instance, from those of Conor et al. (2018), who reported a marginally significant main effect of message framing on willingness to adopt a plant-based diet [$F(2) = 2.550$, $p = .081$] (p. 4). Three differences may help explain why the present study did not replicate these findings.

First, the two studies employed distinct framing manipulations. Conor et al. (2018) operationalized gain and loss frames in terms of inclusion vs. exclusion: the gain frame described what a plant-based diet includes, whereas the loss frame focused on what it excludes. In contrast, the present study emphasized either the benefits of adopting the diet

(gain) or loss in benefits of not adopting the diet (loss), within either individual or social argument categories. A standardized definition of a plant-based diet was provided across all conditions, to control for potential confusion or variation in interpretation. These differences in framing content and clarity may have influenced how participants processed the messages.

Second, Conor et al. (2018) did not include any covariate in their ANOVA model. In contrast, the current study incorporated relevant covariates (meat attachment factors and food choice motives) that proved to be significant. Not accounting for moderating factors, such as personal involvement, the type of behaviour being promoted, individual differences, and situational context, fails to acknowledge that the effectiveness of message framing is not universal but rather depends on these very factors. The effectiveness of gain- and loss-framed health messages in changing behaviour depends, for instance, both on the content of the message itself and on recipient-specific characteristics (Updegraff & Rothman, 2013, p. 699). Similarly, gain-framed messages can be effective in promoting the Mediterranean diet, but their impact is moderated by the impact of eating self-efficacy (Carfora et al., 2021, p. 10), namely people's judgments of their capabilities to effectively manage their eating habits (Carfora et al., 2021, p. 2).

Finally, after the framing manipulation, all participants in Conor et al (2018) received the same definition of a plant-based diet before continuing with questions on barriers and perception, thereby removing them from their original condition. While the authors explored the barriers (eg. willpower, price, routine) that may form the previous attitude toward a plant-based diet, these were only analysed outside of the original condition and in correlation with each other, and not with willingness to adopt the diet (Conor et al., 2018**,** pp. 5, 13).

These methodological differences suggest that the absence of a significant framing effect in the present study may not reflect a contradiction of previous findings, but rather a refinement of our understanding of when and how framing works. By incorporating relevant covariates such as meat attachment and food choice motives, this study confirms once again that framing effects do not operate in a vacuum, but are shaped by individual predispositions and motivations. In this sense, the findings do not oppose previous work but instead refine and extend it, emphasizing that persuasive communication must be tailored to audience characteristics to be effective.

Another possible reason for the absence of significant effects from the framing manipulations is that the messages used in this study may have lacked sufficient salience,

intensity or clarity to provoke differentiated reactions. Prior research suggests that framing variations which are subtle or insufficiently evocative may not effectively influence individuals' willingness to change behaviour (Stapel et al., 1998, p. 881). Although participants were generally able to recognize the differences among the four conditions, as indicated by the cross-tabulation data, the manipulations may not have been compelling or emotionally engaging enough to measurably shift intentions. One contributing factor may be the inclusion of multiple arguments within a single message. Presenting three distinct arguments types simultaneously (health, environment and animal welfare or taste, cost and convenience) may have diluted the impact of each individual argument, resulting in messages that felt overly general or lacking a clear, focused direction. This may have hindered participants' ability to form strong associations with their pre-existing beliefs or experiences.

Finally**,** the perceived credibility of the message source could have played a role in the lack of significant effects**.** Given that the messages were brief and delivered by an unfamiliar source (the researcher), participants may have questioned their reliability. Prior studies highlight that the persuasiveness of framed messages—and specifically the intention to adopt a plant-based diet—can depend greatly on how credible the source is perceived to be (Ball et al., 2014, p. 15). Comparable messages about dietary drivers might have led to different outcomes if delivered by a source considered more trustworthy or familiar (Lehman, 2025, p. 1). A study conducted in Germany on omnivores' willingness to shift toward a more plant-based diet, for instance, assessed the perceived impact of various sources of dietary advice. Indeed, willingness to change differed depending on the source: participants were more open to dietary change when the recommendation came from medical doctors, and least willing when the advice came from scientists or politicians (Lehman, 2025, pp. 5-6). This variance in influence has been linked to differing levels of trust in the source as people tend to prefer receiving dietary guidance from their general practitioners, because they view them as trustworthy and familiars (Ball et al., 2014, p. 14).

5.2. Role of covariates

The findings showed that meat attachment and food choice motives played a central role in predicting participants' willingness to try a plant-based diet. These covariates significantly explained the variance in responses and influenced outcomes more than the experimental manipulations themselves.

Meat attachment emerged as the strongest predictor. This supports prior findings by Graça et

al. (2015, pp. 122- 123), who showed that meat attachment is a stable, multidimensional construct—grounded in enjoyment, emotional closeness, perceived entitlement, and dependence—that resists change even in the face of rational arguments.

Food choice motives also contributed significantly, especially concerns related to health and the environment. Participants who prioritized these motives were more likely to show interest in plant-based diets. Although their influence was smaller compared to meat attachment, these motives still played a meaningful role. This reflects earlier research (e.g., Steptoe et al., 1995) indicating that health-conscious and environmentally concerned consumers are generally more open to sustainable dietary practices.

Taken together, the findings highlight that pre-existing beliefs and motivations can overshadow the impact of message framing. Interventions aimed at encouraging dietary change may therefore benefit from a more tailored approach that accounts for individuals' baseline attitudes, particularly their emotional relationship with meat and the personal values guiding their food choices.

5.3. Overview of the study and key findings

This study explored how different persuasive communication strategies influence individuals' willingness to adopt a plant-based diet. Specifically, it examined the effects of two message features: the type of argument (social vs. individual arguments) and the framing of the message (gain vs. loss). The phenomenon under investigation was whether and how these variations in message design could affect intentions to reduce meat consumption and shift toward more plant-based eating patterns.

The findings of the study suggested that neither the type of argument nor the framing of the message significantly influenced participants' willingness to adopt a plant-based diet. In contrast, individual differences, especially meat attachment, were far more influential. Therefore, the main thesis question is answered as follows: argument types and message framing alone may not effectively shape dietary intentions when strong personal attitudes are present.

5.4. Limitations and future studies

The present study was conducted after a thorough review of existing literature, alongside careful methodological planning. Despite these efforts, some main limitations should be

acknowledged when interpreting the findings.

First, the study relied on general self-reported measures, which are inherently subject to social desirability bias. People often over report their intention to engage in socially approved behaviours, such as reducing meat consumption or adopting plant-based diets (Bryant, 2019, p. 4). However, in this study, the opposite may have occurred. The phrasing of the two items used to assess willingness to try a plant-based diet *(*"I am willing to reduce my daily meat consumption" and "I am willing to try a vegan diet"*)* might have introduced unnecessary abstraction or psychological distance, leading to lower or more uncertain responses. Research suggests that behavioural intentions are more accurate and predictive when framed within specific, short-term contexts (Bryant, 2019, p. 4). Perhaps, asking "How many days per week would you consider eating a vegan diet?"(Conor et al., 2018, p. 11) might yield more meaningful insights into intentions and willingness than abstract or hypothetical wording.

Second, the persuasive messages were delivered by a generic and unfamiliar source (the researcher). This may have reduced the perceived credibility and trustworthiness of the message thereby weakening its potential impact. Future research could explore whether the effectiveness of the same types of arguments and message framing varies depending on the type of source delivering the message, such as healthcare professionals, NGOs, or influencers with established credibility in the dietary or sustainability domains. Testing the same messages across sources with different perceived levels of trust and familiarity would help determine to what extent source characteristics moderate the persuasive impact of framed arguments. This could provide practical guidance for designing more effective communication strategies that leverage trusted voices to encourage dietary behaviour change.

Third, participants were only briefly exposed to the message stimuli, potentially limiting their ability to cognitively and emotionally engage with the content. Participants completed the entire questionnaire in approximately five minutes. This short duration may not have allowed for sufficient cognitive or emotional engagement with the stimuli. As Chong and Druckman (2007, p. 110) note, repeated exposure to a frame enhances the accessibility of the associated belief, thereby increasing the likelihood of its influence. Future research could improve upon these limitations as well by enhancing the emotional and cognitive engagement of messages, for example through compelling narratives, visual materials, or personal testimonials.

Fourth, presenting three arguments at once may have similarly diluted the persuasive impact of each individual appeal. One of the aims of the present study was to investigate the combined effect of multiple argument types; however, this approach may have resulted in messages that appeared overly broad or lacked a clear and compelling narrative direction. Future research could explore whether structuring the message differently, particularly through the use of a coherent and emotionally engaging narrative, might enhance its effectiveness. Rather than relying on a purely informational text, researchers could test willingness to adopt a plant-based diet using a different narrative format that meaningfully integrates multiple arguments, highlighting their shared foundation. For example, a personal story describing someone's transition to a plant-based lifestyle could simultaneously touch on improved personal health, reduced environmental impact, and compassionate food choices. This approach could create a unified and persuasive storyline that may resonate more strongly with participants in future studies.

Another avenue for future research arises from a limitation of the current research design. Some scholars argue that the effects of message framing may not be immediate but rather unfold gradually over time. In this way, they could be more likely to influence long-term attitudes or behaviours rather than short-term intentions (Rothman & Salovey, 1997, p. 10, 14). If the effects of message framing may take time to materialize, longitudinal research designs would be appropriate to detect delayed framing effects more accurately.

Finally, further investigation into meat attachment and food choice motives is warranted. Food choice motives are complex and multidimensional psychological drivers that often influence eating behaviour implicitly. Exploring these motives can improve the predictive power of behavioural models and help explain the gap between positive attitudes and actual behaviour (i.e., the intention–behaviour gap). Identifying which motives are most influential across different population segments can support the development of more targeted and persuasive strategies, moving beyond simplistic dichotomies such as health versus environment.

However, findings from the present study suggest that future research should particularly focus on meat attachment factors. Understanding the cultural and psychological roots of meat attachment may provide insights into which types of messages are most effective at challenging its central role, especially in Western societies. Exploring the connection with identity, tradition, and emotional comfort, future research could define the kinds of messages

that trigger defensive responses and the ones that help reduce resistance. This deeper investigation could enable scholars to stratify participants by their level of meat attachment and assess which message formats are most persuasive for different subgroups.

5.4.1. Practical implications of the study

The framing and argument manipulations did not produce significant effects; nonetheless, the study offers valuable practical insights for those involved in promoting plant-based diets, including marketers, NGOs, and public agencies.

The principal consideration is that the central role played by meat attachment and food choice motives highlights the need for tailored communication strategies. These constructs represent meaningful dimensions of individuals' pre-existing beliefs, emotional ties, and motivational drivers. In practical terms, these two psychological scales could form the foundation for audience segmentation. Instead of adopting a "one-size-fits-all" approach, stakeholders should design targeted interventions that reflect different levels of involvement, openness to change, and identity-based concerns.

For instance, food choice motives such as health and environmental concern were positively associated with willingness to adopt a plant-based diet. Communicators can leverage these motives in their messaging. For example, individuals who prioritize health may respond better to messages highlighting the nutritional and preventative benefits of plant-based diets. Meanwhile, those motivated by environmental concerns may be more receptive to messages emphasizing the ecological sustainability of reducing meat consumption. These audience-specific appeals may enhance message relevance and increase persuasive impact.

However, the most critical segmentation factor appears to be meat attachment, which emerged as the strongest predictor of willingness to adopt a plant-based diet. Individuals with high levels of meat attachment were significantly less open to dietary change. Creating a continuum of attachment levels to stratify the population could help identify which groups are more or less receptive. This, in turn, would allow stakeholders to direct their efforts more efficiently.

Groups with strong ties to tradition and higher meat attachment scores may respond defensively or with skepticism to messages that emphasize the similarity of plant-based

alternatives to meat in terms of taste or texture. For these individuals, focusing on the individual argument taste may be counterproductive. Instead, plant-based food brands could present plant-based diets as an enhancement to traditional meals. This means celebrating familiar flavors, cultural heritage, and communal eating, and positioning plant-based options as additions rather than replacements.

In contrast, NGOs with limited budgets might choose not to target groups with extreme levels of meat attachment. Given the effort required to reach them, it may be more efficient to focus on moderately attached or already receptive segments. This would help maximize the impact of limited resources.

Those with the highest levels of attachment, however, may be more appropriately addressed by governments, which have greater capacity to invest in long-term, multi-touchpoint strategies. These efforts should aim to reshape the broader cultural and environmental landscape surrounding meat consumption. In this case, a shift in narrative must be accompanied by a shift in the food environment. For example, governments could invest in school, hospital, and public canteen programs that offer appealing plant-based meals by default. Rather than relying solely on rational or informational arguments, these interventions should engage with the symbolic and emotional dimensions of meat consumption. The focus of such interventions should be on creating new discourses around tradition, enjoyment, and identity. Reframing plant-based diets as compatible with these values could reduce resistance and foster acceptance over time.

Lastly, this study highlights the importance of both message credibility and narrative appeal. Campaigns may be more effective when they employ communicators who are trusted by specific audience segments. Similarly, they could benefit from emotionally engaging narratives that weave different arguments into a unified and compelling storyline, rather than presenting them as isolated points.

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Appendix A

Start of Block: Intro + consent request

Q30 Dear participant, Welcome to this survey! Your time and effort are greatly appreciated. I am conducting a study on consumers' perception of a vegan diet. I am interested in understanding how people make decisions regarding different foods, particularly vegan ones compared to animal-based options. You will be asked some questions in order to explore your eating habits, opinions about specific foods, and how these influence your daily decisions. The questionnaire will take approximately ten minutes to complete. All data collected will remain completely confidential and anonymous. The researcher will not be able to identify you based on your responses. Your participation in this study involves no risk or financial cost for you. Participation is entirely voluntary. You can refuse to participate without justification. You can withdraw at any time without justification and without consequences. If you have any question, feel free to contact the researcher Giulia Dentice, 749401gd@eur.nl. To proceed with the survey, please click on 'I agree'. With this you indicate that you are at least 18 years old, you have read this consent form and you voluntarily agree to participate in this research study.

- ○ I agree (4)
- ○ I disagree (5)

Skip To: End of Survey If Dear participant, Welcome to this survey! Your time and effort is greatly appreciated. I am condu... = I disagree

End of Block: Intro + consent request

Start of Block: TEXT A - Gain Frame Social arguments

Page Break

TEXT A **Please read this carefully, as you won't to be able to read it again.** Did you know that 6 out of 8 billion people in the world are **omnivores**? That means 75% of the global population consumes all types of food, *from both animal and plant sources*, without specific dietary restrictions. However, in recent years, more and more people have been reducing their meat consumption or adopting plant-based diets, such as vegetarianism, veganism, or flexitarianism. Specifically, 79 million people worldwide identify as **vegan**. A vegan diet consists of *grains, legumes, vegetables, fruits, and nuts*, and excludes all animal-derived foods, such as meat, fish, eggs, milk, dairy products, and honey. In January 2025 alone, 25.8 million people tried veganism and 28% of them decided to stick with it! That's because adopting a **vegan diet** is a **rewarding choice**! Here are the three benefits of a vegan diet: 1. **Health**. By choosing a vegan diet, you're actively **reducing your risk** of developing any type of cancer by 18%. You're also reducing your risk of chronic diseases like **heart disease** (-53%), **diabetes** (-77%), and **obesity** (-15%). 2. **Environment**. Compared to a omnivorous diet, a vegan diet requires 54% **less water** and 75% **less land**, while producing 50% **fewer greenhouse gases.** *Overall, its environmental impact is 4.63 times lower than an omnivorous diet—that's a 463% reduction!* 3. **Animal welfare**. Nonhuman animals experience emotions like fear, anxiety, joy, and stress, and have nervous systems capable of sensing pain—just like humans do. *It is estimated that in just one year, a vegan can save the lives of **105** animals.* A vegan diet is a rewarding choice for your health, the environment and the animals! And you? **Could you see yourself eating a vegan diet?**

End of Block: TEXT A - Gain Frame Social arguments

Start of Block: TEXT B - Loss Frame + Social arguments

Page Break

TEXT B **Please read this carefully, as you won't be able to read it again.** Did you know that 6 out of 8 billion people in the world are **omnivores**? That means 75% of the global population consumes all types of food, *from both animal and plant sources*, without specific dietary restrictions. However, in recent years, more and more people have been reducing their meat consumption or adopting plant-based diets, such as vegetarianism, veganism, or flexitarianism. Specifically, 79 million people worldwide identify as **vegan**. A vegan diet consists of *grains, legumes, vegetables, fruits, and nuts*, and excludes all animal-derived foods, such as meat, fish, eggs, milk, dairy products, and honey. In January 2025 alone, 25.8 million people tried veganism and 28% of them decided to stick with it! That's because an **omnivorous diet** is a **regrettable choice!** Here are the three disadvantages of an omnivorous diet: 1. **Health**. By not adopting a vegan diet, you're missing out on the opportunity of **reducing your risk** of developing any type of **cancer** by 18%. You're also missing out on the opportunity to reduce your risk of chronic diseases like **heart disease** (-53%), **diabetes** (-77%), and **obesity** (-15%). 2. **Environment**. Sticking to an omnivorous diet means using 54% **more water**, occupying 75% **more land**, while producing 50% **more greenhouse gases** compared to a vegan diet. *Overall, its environmental impact is 4.63 times higher than a vegan diet—that's a 463% increase!* 3. **Animal welfare**. Nonhuman animals experience emotions like fear, anxiety, joy, and stress, and have nervous systems capable of sensing pain—just like humans do. *It is estimated that in just one year, an omnivore can be responsible for the death of **105** animals.* An omnivorous diet is a regrettable choice for your health, the environment and the animals! And you? **Could you see yourself eating a vegan diet?**

End of Block: TEXT B - Loss Frame + Social arguments

Start of Block: TEXT C - Gain Frame + Individual arguments

Page Break

Q34 **Please read this carefully, as you won't be able to read it again.** Did you know that 6 out of 8 billion people in the world are **omnivores**? That means 75% of the global population consumes all types of food, *from both animal and plant sources*, without specific dietary restrictions. However, in recent years, more and more people have been reducing their meat consumption or adopting plant-based diets, such as vegetarianism, veganism, or flexitarianism. Specifically, 79 million people worldwide identify as **vegan**. A vegan diet consists of *grains, legumes, vegetables, fruits, and nuts*, and excludes all animal-derived foods, such as meat, fish, eggs, milk, dairy products, and honey. In January 2025 alone, 25.8 million people tried veganism and 28% of them decided to stick with it! That's because adopting a **vegan diet** is a **rewarding choice!** Here are the three benefits of a vegan diet: 1. **Taste**. A vegan diet opens door to new **flavours** and **recipes**. By embracing vegan ingredients, you open yourself to explore the rich, vibrant world of vegan cuisines. 2. **Convenience**. The vegan products market is projected to reach $61.3 billion by 2028. Major food chains, restaurants and supermarkets now offer a wide range of vegan options and food delivery services often include filters for vegan dishes. Today it's **easier than ever** to find vegan alternatives to animal products, both in restaurants and grocery stores! 3. **Price**. Vegan foods, like beans, grains, and vegetables, are often **cheaper** than animal-based products. *By adopting a vegan diet you'll be saving up to 34% on your grocery bills.* A vegan diet is a rewarding choice in terms of taste, convenience and price! And you? **Could you see yourself eating a vegan diet?**

End of Block: TEXT C - Gain Frame + Individual arguments

Start of Block: TEXT D - Loss Frame + Individual arguments

Page Break

Q35 **Please read this carefully, as you won't be able to read it again.** Did you know that 6 out of 8 billion people in the world are **omnivores**? That means 75% of the global population consumes all types of food, *from both animal and plant sources*, without specific dietary restrictions. However, in recent years, more and more people have been reducing their meat consumption or adopting plant-based diets, such as vegetarianism, veganism, or flexitarianism. Specifically, 79 million people worldwide identify as **vegan**. A vegan diet consists of *grains, legumes, vegetables, fruits, and nuts*, and excludes all animal-derived foods, such as meat, fish, eggs, milk, dairy products, and honey. In January 2025 alone, 25.8 million people tried veganism and 28% of them decided to stick with it! That's because an **omnivorous diet** is a **regrettable choice**! Here are the three disadvantages of an omnivorous diet: 1. **Taste**. Sticking to a omnivorous diet means you're missing out on the opportunity to try new **flavours** and **recipes**. By limiting yourself to animal-based ingredients, you might miss the chance to explore the rich, vibrant world of vegan cuisines. 2. **Convenience**. The vegan products market is projected to reach $61.3 billion by 2028. Major food chains, restaurants and supermarkets now offer a wide range of vegan options and food delivery services often include filters for vegan dishes. Those who stick to an omnivorous diet today risk missing out on an **unprecedented ease in finding vegan alternatives**, both in restaurants and grocery stores. 3. **Price**. Animal-based products are often **more expensive** than vegan foods, like beans, grains, and vegetables. *By sticking to an omnivorous diet, you'll be paying up to 34% more on your grocery bills.* An omnivorous diet is a regrettable choice in terms of taste, convenience and price! And you? **Could you see yourself eating a vegan diet?**

End of Block: TEXT D - Loss Frame + Individual arguments

Start of Block: Meat attachment factors + willingness to adopt a plant based diet

Q21 You will now answer a series of questions. For each of the following statements, please indicate your level of agreement by selecting one of the options on the 7-point scale. There are no right or wrong answer: I am sincerely interested in your opinion. Thank you for your honesty.

	Totally disagree (13)	Disagree (14)	Somewhat disagree (15)	Neither agree nor disagree (16)	Somewhat agree (17)	Agree (18)	Totally agree (19)
I love meals with meat (17)	○	○	○	○	○	○	○
I'm a big fan of meat (19)	○	○	○	○	○	○	○
By eating meat I'm reminded of the death and suffering of animals (20)	○	○	○	○	○	○	○
I feel bad when I think of eating meat. (4)	○	○	○	○	○	○	○
According to our position in the food chain, we have the right to eat meat (5)	○	○	○	○	○	○	○

End of Block: Meat attachment factors + willingness to adopt a plant based diet

Start of Block: Block 10

Q31 For each of the following statements, please indicate your level of agreement by selecting one of the options on the 7-point scale. There are no right or wrong answer: I am sincerely interested in your opinion. Thank you for your honesty.

	Totally disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Totally agree (7)
Eating meat is a natural and undisputable practice (1)	○	○	○	○	○	○	○
I DON'T picture myself without eating meat regularly (2)	○	○	○	○	○	○	○
Meat is irreplaceable in my daily diet (3)	○	○	○	○	○	○	○
It is important to me that the food I eat on a typical day keeps me healthy (4)	○	○	○	○	○	○	○
It is important to me that the food I eat on a typical day contains a lot of vitamins and minerals (5)	○	○	○	○	○	○	○

End of Block: Block 10

Start of Block: Block 9

Q17 For each of the following statements, please indicate your level of agreement by selecting one of the options on the 7-point scale. There are no right or wrong answer: I am sincerely interested in your opinion. Thank you for your honesty.

	Totally disagree (6)	Disagree (7)	Somewhat disagree (8)	Neither agree nor disagree (9)	Somewhat agree (10)	Agree (11)	Totally agree (12)
It is important to me that the food I eat on a typical day has been prepared in an environmentally friendly way (4)	○	○	○	○	○	○	○
It is important to me that the food I eat on a typical day has been produced in a way which has NOT disrupted the balance of nature (5)	○	○	○	○	○	○	○
I am willing to reduce my daily meat consumption (6)	○	○	○	○	○	○	○
I am willing to try a vegan diet (7)	○	○	○	○	○	○	○

End of Block: Block 9

Start of Block: attention check

Q17 Which of the following statements best describes the text you read at the beginning?

○ The text highlights how adopting a vegan diet can be beneficial (1)

○ The text highlights how NOT adopting a vegan diet can be a loss in benefits (2)

○ I don't remember (3)

Q16 Which of the following statements best describes the text you read at the beginning?

- ○ The text describes the health, environmental and animal welfare implications of a vegan diet (1)
- ○ The text describes the cost, convenience and taste implications of a vegan diet (2)
- ○ I don't remember (3)

End of Block: attention check

Start of Block: Sample characteristics

age How old are you? Please enter your age as a whole number (18, 19, 20...)

_____

_____

_____

_____

_____

educational level Education level

- ○ Less than high school (36)
- ○ High school graduate (37)
- ○ Bachelor's degree (38)
- ○ Master's degree (39)
- ○ Doctorate (42)
- ○ Prefer not to say (43)

gender What's your gender?

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)
- ○ Prefer not to say (4)

Page Break

diet How would you define yourself?

- ○ Omnivore (you eat all types of food, from both animal and plant sources) (1)
- ○ Vegetarian (you don't eat meat, poultry, and fish) (2)
- ○ Lacto-vegetarian (you eat a vegetarian diet that includes dairy products but excludes eggs) (6)
- ○ Ovo-vegetarian (you eat a vegetarian diet that includes eggs but excludes dairy products) (7)
- ○ Vegan (3)
- ○ Flexitarian (generally plant-based, occasionally eating meat, fish, or other animal products) (4)
- ○ Pescatarian (you eat fish, excluding only meat and poultry) (5)
- ○ Carnivore (you exclusively eat animal-based foods) (9)
- ○ Other (8)

End of Block: Sample characteristics

Start of Block: debrief

Q30 **Thank you for taking the time to complete this survey**. Your participation is greatly appreciated. Please note that your responses were completely anonymous and confidential. WANT TO KNOW MORE? I would now like to provide you with a full explanation of the purpose of the experiment. While the initial description stated that the study aimed to explore individuals' perceptions of a vegan diet and their decision-making processes regarding food choices, the true objective was to examine the effectiveness of different framing strategies in influencing people's willingness to try a vegan diet. Specifically, this experiment investigated how varying the presentation of information about a vegan diet could impact participants' openness to consider adopting it. Your participation has contributed valuable insights into consumer behaviour. Thank you. DO YOU HAVE ANY OTHER QUESTIONS? If you have any questions, feel free to contact the researcher: Giulia Dentice, 749401gd@eur.nl.

End of Block: debrief