Message Framing, Sustainability Labelling and Consumer Judgements of Environmental Sustainability of Food

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Abstract

Promoting sustainable food consumption is an urgent priority. This study surveyed 510 UK adults to test two aspects of sustainability communication. First, it examined behavioural responses to gain versus loss message framing, measuring reactions, intentions, label-checking, and willingness to pay more. Second, it assessed how label presence (organic certification, carbon footprint, and eco-friendly packaging) shapes consumers' judgments of product sustainability. Participants evaluated vignettes and ranked label importance. The analysis involved Welch's t-tests, chi-square tests, correlations and logistic regression with interactions. The findings show that message framing influenced participants' emotional reactions, but it did not lead to significant differences in behavioural intentions. Although loss framing led to a slightly stronger reaction, the evidence is not sufficient to suggest it is more persuasive than gain framing. In contrast, the labelling component produced clear effects. Products with organic certification were significantly more likely to be judged as environmentally sustainable. The absence of the organic label reduced the odds of a positive sustainability judgement by nearly 90%. These results suggest that multi-dimensional labelling and targeted communication for less-informed populations can further support informed and sustainable food choices.

Keywords. Sustainable food, eco-labels, gain-loss framing, consumer choice, food labels

Introduction

Environmental sustainability is a defining concern in global food systems (Hebinck et al., 2021; Stein & Santini, 2022). The growing public awareness about the environmental impact of food production, packaging and distribution is reshaping how consumers engage with food choices (Whittall et al., 2023; Nadricka et al., 2024; Cleland et al., 2025). Governments, non-governmental organizations, and corporate actors have responded by promoting eco-labelling schemes and sustainability-focused messaging to guide and influence consumer behaviour (Sønderskov & Daugbjerg, 2011; Asioli et al., 2020; Sonntag et al., 2023). These efforts typically aim to close the gap between pro-environmental attitudes and actual purchasing decisions. Despite this growing interest, there is little consensus on what strategies most effectively motivate consumers to choose environmentally responsible food products.

One of the common tools in sustainability communication is the framing of environmental messages including how the consequences of consumer action or inaction are presented (Carfora et al., 2022; Florence et al., 2022). Research has shown that people react differently to equivalent information depending on whether it is framed as a potential gain or loss. Drawing from prospect theory (Tversky & Kahneman, 1992), loss-framed messages are theorized to be more compelling when the stakes involve collective risks or uncertain outcomes, such as climate change. At the same time, sustainability communication increasingly relies on product-level cues especially labels that signal environmental credentials (Asioli et al., 2020; Dwyer et al., 2024). These cues are meant to simplify information, reduce decision burden and anchor consumer judgments. However, there is limited clarity on how consumers interpret these claims in combination, or how well stated label preferences align with actual decision-making.

Studies investigating message framing in sustainability contexts have yielded mixed results. Some studies (for example, Wang et al., 2022; Armbruster et al., 2022) have found that loss-framed messages can prompt stronger emotional reactions and increase the urgency of response, particularly in environmental domains where the threat of irreversible damage is prominent. Others (e.g., MacKinnon et al., 2022; Olbermann et al., 2024) have noted that gain-framed messages, which highlight positive outcomes from pro-environmental action, may be more effective at sustaining engagement over time by building a sense of optimism and efficacy. However, these effects are often context-dependent. For instance, people who are

already environmentally concerned may respond similarly to both message types, while less engaged consumers may react negatively to strong emotional appeals.

The literature on sustainability labels also reveals heterogeneity in consumer responses. While consumers generally report high levels of interest in environmentally friendly products, actual responses to labels vary depending on familiarity, perceived credibility and the way multiple claims are presented (Potter et al., 2022; Cook et al., 2023). What remains unclear is how consumers integrate multiple sustainability claims when assessing a product, and whether they treat these claims as additive, redundant, or substitutable.

It is plausible that consumers apply a threshold-based heuristic when evaluating the environmental sustainability of food products such that the presence of two or more sustainability indicators, regardless of their specific type, may be sufficient to prompt a positive sustainability judgment, or that certain labels, for example organic certification, carry more weight and can override the absence of other cues (Sonntag et al., 2023; Cook et al., 2023). Currently, few studies systematically test the relative influence of each claim when one is omitted, nor do they examine how such omissions interact with consumers' stated priorities or broader attitudes toward labelling. Also, there is often a disconnect between how consumers rank sustainability attributes in abstract exercises and how they judge actual products in situ. This inconsistency calls into question the validity of self-reported label importance as a proxy for decision-making in real-world settings.

These limitations point to a need for studies that bring together behavioural framing and sustainability labelling within a coherent analytical framework. There is particular value in examining how consumers respond to combinations of message valence and product cues, and whether these responses vary by demographic or attitudinal factors. Importantly, such studies should go beyond self-report measures of attitude or preference to include behavioural proxies or structured decision tasks that mimic real-world conditions. This study addresses these gaps by combining two experimental approaches within a single research design. The first examines how message framing either gain- or loss-oriented affects consumer responses to sustainability messages about food products. The second assesses how consumers interpret a product's environmental sustainability when specific labelling claims are included or omitted, and whether these judgments align with stated label preferences. By exploring both emotional reactions and product evaluations, the study provides more

comprehensive evidence of how sustainability communication influences consumer decision-making.

Materials and Methods

This study employs an online survey targeting adult consumers in the UK. Participants (510) were recruited via Prolific Academic. The design consists of two complementary components, each capturing a distinct but related aspect of sustainability communication i.e., the effect of message framing on consumer intention and the interpretation of sustainability claims in food labelling. The message framing component employed a between-subjects randomisation, with participants assigned to one of two experimental conditions. In the gain-frame condition, the sustainability message read: *"By choosing products with a low carbon footprint, you help protect the environment and reduce greenhouse gas emissions. Every sustainable choice makes a positive impact."* In the loss-frame condition, the equivalent message read: *"By not choosing products with a low carbon footprint, you contribute to environmental degradation and rising greenhouse gas emissions. Every unsustainable choice harms the planet."*

Both messages were equal in length and content, differing only in the emotional valence of the environmental consequence. Immediately after viewing the assigned message, participants rated their agreement with nine items reflecting emotional reactions, cognitive appraisal, and behavioural intention. These included statements such as "I feel hopeful about making a difference," "I plan to check sustainability labels when shopping," and "I am willing to pay a little more for environmentally friendly products." All responses were recorded on a five-point Likert scale from strongly disagree to strongly agree. The items were combined into a composite reaction score after internal consistency checks using Cronbach's alpha.

The second experimental module, also embedded in the same survey, tested consumer evaluation of product-level sustainability based on the presence or absence of specific claims. This section used a separate randomisation structure. Each participant was shown a single product vignette describing food with a particular combination of three sustainability attributes i.e., organic certification, low carbon footprint and eco-friendly packaging. In one version, all three claims were present. In the second version, the organic claim was omitted. In the third, the eco-packaging claim was removed. Respondents were asked a yes-or-no question: "*Based on this description, would you consider this product environmentally sustainable?*"

Following the scenario, all participants completed a label ranking task where they were asked to order the three sustainability labels (organic, carbon footprint, and eco-packaging) in terms of their personal importance when making environmentally motivated food choices. This allowed for comparison between stated preferences and scenario-based judgments. To complement the experimental data, the survey also included attitudinal items capturing respondents' general concern for environmental impact in food shopping, support for mandatory carbon labelling and agreement with the statement about environmental labels on food products. These items were analysed as moderators to test whether underlying values influenced scenario responses.

The study tested three interrelated hypotheses. First, it was expected that participants exposed to a loss-framed sustainability message would report different emotional and cognitive reactions compared with those exposed to a gain-framed message. Second, the presence or absence of specific sustainability labels (organic certification, carbon footprint, and eco-packaging), was predicted to influence participants' judgments of whether a product is environmentally sustainable. Third, it was anticipated that participants' stated ranking of sustainability labels in terms of importance would correlate with their judgments of products containing those labels, providing insight into the alignment between abstract preferences and applied evaluations.

Descriptive statistics were first used to summarise response distributions. Composite message reaction scores were tested for internal consistency using Cronbach's alpha, with thresholds of 0.7 or higher indicating acceptable reliability. Between-group differences in message framing effects were assessed using Welch's t-tests to account for unequal variances. Individual item contrasts were examined separately. For the vignette task, differences in sustainability endorsement across product descriptions were tested using chi-square tests. Logistic regression models were used to estimate the effect of label omission, controlling for demographics and attitudinal variables. Interaction terms were included to test for moderation effects. Correlations between scenario responses and label rankings were computed to assess the alignment between abstract preference and product-specific sustainability evaluations.

Result

Socio-economic characteristics of the sample

The final sample included 510 adult consumers who reported making household food purchasing decisions. Gender distribution was balanced, with 54% identifying as male and 46% as female. Just under 1% identified as non-binary or other. Age distribution showed that 27% were aged 35–44, 24% were 25–34, and 20% fell within the 45–54 range. Younger adults (18–24) made up just 4%, while those aged 55 and above accounted for around 25%. In terms of employment, nearly three-quarters were either employed or self-employed, 10% were retired and 8% were not currently working. Students comprised a minority. Over 70% of respondents held at least a university degree, and more than one in four had postgraduate qualifications. Only a small number reported no formal education. Household income levels were spread across the middle to upper range. One-third reported income above £60,000, another third earned between £20,000 and £39,999, and about 20% fell between £40,000 and £59,999. Only 12% reported income below £20,000 while 4% did not disclose.

Framing effects on message reception and behavioural intention

The framing experiment tested whether the emotional valence of a sustainability message which were framed either in terms of environmental gains or environmental losses altered consumers' cognitive, emotional or behavioural reactions. The internal reliability of the nine-item composite scale used to measure overall message response was high in both conditions, with Cronbach's alpha scores of 0.89 in the gain-framed group and 0.86 in the loss-framed group. Based on this consistency, an average composite score was calculated for each participant to reflect their general response to the message. The mean composite score in the gain-framed condition was 3.16 (SD = 0.88), while the loss-framed condition yielded a slightly higher mean of 3.28 (SD = 0.86). A Welch's t-test found this difference to be not statistically significant ($t = -1.47$, $p = 0.142$). The corresponding effect size (Cohen's $d = -0.13$) was small and fell below conventional thresholds for interpretative importance. Figure 1 corroborated this finding as the two distributions overlapped almost completely and the bracketed 95 % confidence intervals around group means intersected. Thus, although loss wording trended higher, the evidence is insufficient to claim a persuasive advantage over gain framing in this sample.

[Figure 1 here]

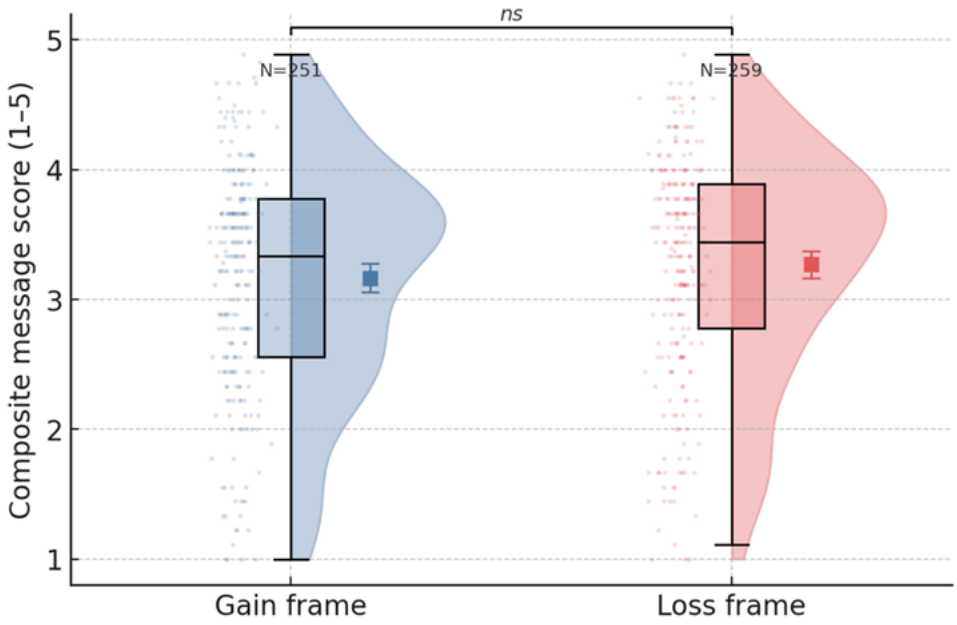

Figure 1. Framing effect on composite message scores

Further item-level analysis, however, show specific areas of divergence between the two conditions (Table 1). The clearest difference emerged in how emotionally charged participants perceived the message to be. On the item "*This message feels too emotional or exaggerated*," those in the loss-framed condition scored significantly higher than those in the gain-framed group. This difference was statistically significant ($t = –7.13$, $p < .001$) and associated with a moderate effect size ($d = –0.64$) that indicates that loss-framed appeals were consistently perceived to have an intense rhetorical tone. Despite this, the elevated emotional tone did not translate into stronger stated behavioural intentions. On two of the most action-relevant items *"I plan to pay more attention to sustainability labels when shopping"* and *"I am willing to pay a little more for environmentally friendly products"* the framing condition made no meaningful difference.

Emotional self-assessments showed more sensitivity to the framing condition. Participants exposed to the gain-framed message reported significantly higher levels of hopefulness (than those who read the loss-framed message and a small-to-moderate effect size ($d = 0.22$). In contrast, the loss-framed group expressed greater concern about their past environmental choices than the gain-framed group, a difference that was also significant ($p = 0.003$, $d = –0.27$). These results indicate that while the gain frame promoted a sense of future-oriented efficacy, the loss frame triggered more retrospective concern. However, neither of these emotional profiles corresponded to significant shifts in the behavioural measures. Ordinary

Least Squares (OLS) regression analysis shows no evidence that the effects of message framing varied systematically by respondent characteristics (Table 2). This indicates that the null results were consistent across sociodemographic subgroups, and not an artefact of differential responsiveness within the sample.

[Table 1 here]

[Table 2 here]

Product judgments based on label presence or absence

The second experiment evaluated how consumers judged the environmental sustainability of a food product based on which sustainability labels were present. Participants were randomly assigned to view one of three product descriptions, each varying in which labels were included. Product A included all three (organic, carbon footprint and eco-packaging). Product B omitted the organic label and Product C omitted the eco-packaging claim. Descriptive results showed strong differences in sustainability judgments across conditions. Among respondents shown Product A (all three labels), 92% judged the product to be environmentally sustainable. For Product B only 53% gave a positive sustainability judgment. For Product C 78% endorsing the product as sustainable. A chi-square test confirmed that these differences were statistically significant ($\chi^2(2) = 81.24$, $p < .001$) which is an indication that the presence or absence of specific labels meaningfully shaped sustainability perceptions.

To further examine the role of individual cues, a logistic regression model was estimated with the sustainable judgment as the binary outcome (Table 3). Relative to the baseline condition (Product A), the absence of the organic label reduced the odds of a positive judgment by nearly 90% (OR = 0.10, $\beta = -2.34$, $p < .001$). The absence of the packaging label had a less dramatic but still significant effect (OR = 0.34, $\beta = -1.07$, $p = 0.004$). These findings confirm that organic certification is the most influential claim in shaping sustainability judgments, followed by packaging, while carbon information (which remained constant across all conditions) served as a perceptual baseline.

[Table 3 here]

Alignment between label rankings and scenario responses

Participants were also asked to rank the three sustainability labels in order of importance to them when making environmentally motivated food choices. Organic certification emerged as the top-ranked label for 47% of respondents, followed by carbon footprint (31%) and eco-

packaging (21%). The average importance rankings were organic (mean rank = 2.17), carbon (2.02), and packaging (1.81), with lower scores indicating higher priority. A Friedman test for related samples showed a significant difference in median importance ranks across the three sustainability labels, $\chi^2(2, N = 509) = 32.47$, $p < .001$. The effect size, expressed as Kendall's W, was 0.03, indicating a small but reliable hierarchy of perceived importance (organic > carbon > packaging). Correlation coefficients between ranking and scenario responses were near zero, and none reached statistical significance. This suggests that abstract preferences do not strongly predict applied judgments when evaluating actual product claims.

Discussion

This study contributes to the literature on environmental behaviour by empirically testing two widely discussed mechanisms in sustainability communication: message framing and heuristic label interpretation. Drawing from prospect theory (Tversky & Kahneman, 1981), which posits that losses loom larger than gains in decision-making, we expected that consumers exposed to loss-framed messages would show stronger emotional and behavioural responses. However, our findings diverge from this prediction. The loss-framed message elicited stronger emotional responses, including heightened concern and increased perceptions of emotional intensity. However, these responses did not result in significant changes in stated behavioural intentions. Measures such as willingness to pay a price premium for environmentally friendly products or intention to engage with sustainability labels remained largely unaffected by message type. This pattern aligns with findings from Dedman & Lee (2023) and Ropret, Homar & Knežević Cvelbar (2024), who argue that the persuasive impact of message valence, particularly in the case of loss-framed messages, is often limited in environmental contexts and highly dependent on situational factors. Also, in the domains of environmental sustainability, where consequences are temporally distant, emotional appeals may influence affective appraisal without necessarily prompting behavioural commitment. This interpretation is supported by construal level theory (Trope and Liberman, 2003), which suggests that distal outcomes are cognitively processed at a higher level of abstraction, thereby weakening the link between emotional resonance and behavioural intention.

The finding that the gain-framed message significantly increased reported hopefulness aligns with previous work by Nabi et al. (2018), who reported that future-oriented emotions such as hope are more effective at sustaining engagement than fear or guilt. Hope, unlike anxiety, is forward-looking and tends to reinforce perceived agency and self-efficacy which are two

constructs that Bandura (1997, 2013) identifies as central to behavioural activation. However, the present results indicate that affective shifts alone do not necessarily lead to changes in behavioural intention. This reinforces the view that while emotional valence can shape how messages are perceived, it does not by itself translate into action. From a practical perspective, this highlights the limits of messaging strategies that rely solely on affective framing. Gain-framed messages that promote hope may be preferable when the aim is to generate a positive emotional tone, but on their own they are unlikely to produce behavioural change. To be effective in promoting environmentally sustainable food choices among consumers, such messages need to be embedded within broader interventions that provide clarity, reduce decision complexity or activate social norms while increasing the visibility and availability of low-impact products as illustrated in prior work on behavioural nudges and normative influence (Thaler and Sunstein, 2008; De Bauw et al., 2022).

The second component of the study found stronger evaluative judgment, particularly around the interpretation of sustainability labels. Product vignettes showed large and statistically significant differences in perceived environmental sustainability depending on which claims were included. This aligns with the theoretical framework of attribute substitution (Kahneman & Frederick, 2002), such that when individuals were faced with a cognitively demanding evaluative question such as to whether a product is environmentally sustainable, they likely tend to replace it with a simpler heuristic-based question, such as whether the product carries an organic label.

Among the three cues tested (organic, carbon footprint, and eco-packaging) organic certification was the dominant driver of sustainability judgments. Its absence reduced the odds of a positive sustainability judgment by nearly 90%. This finding is in line with Bastounis et al. (2021) but suggests that consumers interpret the presence of an organic label as a general signal of environmental responsibility, regardless of the specific sustainability dimensions involved. Such overgeneralisation is consistent with findings on halo effects in food marketing, where a single positive attribute shapes perception of unrelated qualities (Schuldt and Schwarz, 2010). While organic agriculture has clear environmental benefits in some domains it is not a universal proxy for sustainability.

The limited impact of the carbon footprint label may be due to cognitive load or numeracy barriers, as documented by Hartikainen et al. (2014) and Rondoni & Grasso (2021), that found consumers struggle to interpret quantitative carbon information. Alternatively, it may reflect

perceived controllability in which case packaging and organic production are seen as more tangible or within the consumer's sphere of influence, whereas carbon metrics feel abstract or system-level. This aligns with regulatory fit theory (Higgins, 2000), which suggests that persuasive appeals are more effective when they match people's preferred orientation, whether that involves promotion focused on aspirational goals or prevention focused on avoiding harm. From a cognitive processing standpoint, the findings support the view that food sustainability evaluations are largely heuristic-based, and consumers appear to rely on familiar or salient signals rather than integrating multiple attributes into a reasoned evaluation. This helps explain the minimal correlation between abstract label preferences (as ranked in the importance task) and actual scenario-based judgments.

One of the most striking results is the disconnect between stated preferences for sustainability attributes and how these attributes influenced real-time product evaluations. Participants ranked organic, carbon footprint, and eco-packaging in a clear hierarchy of importance, however, these rankings did not predict their responses to the vignette tasks. This phenomenon is consistent with patterns in the attitude-behaviour gap observed in sustainable consumption literature (Terlau & Hirsch, 2015; Yamoah & Acquaye, 2019; Kollmuss & Agyeman, 2002; Munro et al., 2023). Even consumers who claim to value carbon information may fail to apply this value in real choice contexts. This gap can be understood through multiple theoretical lenses. From the perspective of the Theory of Planned Behaviour (Ajzen, 1991), while attitudes toward sustainability may be favourable, the translation of these attitudes into action depends on perceived behavioural control and contextual cues. In the current case, applied judgments were likely shaped more by the visibility and familiarity of specific labels than by internalised importance rankings. Dual-process theories provide a complementary explanation. According to this view, intuitive, heuristic-based processes (System 1) tend to dominate when decisions are made under time constraints, cognitive load, or uncertainty (Kahneman, 2011). In such situations, consumers may fall back on salient cues like organic certification rather than deliberating over which attributes align with their stated values. This helps explain why preference rankings, which rely on reflective reasoning, failed to predict judgments in a scenario-based evaluation task. This highlights a key limitation of stated-preference approaches in sustainability research. Preferences declared in surveys should be interpreted cautiously, particularly when used to predict evaluative judgment in applied contexts such as food purchasing decisions.

Implications for sustainability design and communication

The results of this study point to several practical lessons for improving how sustainability is communicated in food marketing. A key finding is that the type of message framing, gain versus loss, did not produce significant differences in behavioural intention. Although emotional appeals, such as gain or loss frames, affected reactions like hope and concern, these feelings did not translate into stronger purchase intentions. This suggests that persuasive messages require reinforcement through repeated exposure, contextual cues, or visual prompts, especially when the consequences of sustainable or unsustainable behaviour remain abstract or emotionally distant.

Consumers consistently relied on visible, recognisable labels to evaluate product sustainability. Organic certification had the strongest influence, which arguably is not due it representing the most comprehensive measure, but because it is familiar and easy to process. In contrast, carbon labels had limited impact, likely due to their abstract format and low interpretability. Without improvements to their design, the traction for carbon label may be slower to gain traction. These patterns highlight the broader point that accessibility, rather than technical accuracy, often drives consumer judgment. A related implication is the persistent gap between what consumers claim to value in sustainability and how they apply that information during actual product evaluation. This mismatch points to low label literacy. Many consumers may be unfamiliar with the meaning of certain claims or unsure how to weigh them when multiple labels are present. Practical label guidance could help consumers interpret labels more consistently and make better-aligned choices. One strategy to reduce overreliance on any single label is to introduce composite or integrative labelling systems. A unified sustainability rating could summarise multiple environmental dimensions into a single score. This would reduce cognitive burden and help consumers evaluate sustainability more holistically. Especially in retail settings where time and attention are limited, such simplification could support better decision-making.

Although the framing effects did not differ substantially across demographic groups, the salience and interpretation of labels likely vary by consumer segment. Individuals with stronger environmental values, higher food involvement, or greater sustainability knowledge may be more sensitive to certain claims or visual formats. Tailored communication strategies, aligned with these underlying profiles, could enhance impact.

Limitations and Directions for Future Research

The study's reliance on self-reported behavioural intentions limits the extent to which these results can be generalised to real-world behaviour. Future research could strengthen the validity through field experiments, point-of-sale trials or the use of transactional data. The product scenarios used here were also simplified and did not have sufficient competing attributes typical of actual shopping environments. This may have muted some framing or label effects. The study also focused on a limited set of sustainability labels. Other labels may also shape consumer perception and deserve further investigation. There is also scope for methodological innovation. Future work could explore how multiple labels interact across different product types or examine whether framing effects persist over time. Techniques such as eye-tracking can reveal which elements consumers actually attend to. Combining label-based interventions with social norm messaging may also provide new knowledge, particularly in peer-influenced decision environments.

The sample was highly educated, with over 70% holding at least a university degree. This is higher than the general population and suggests that participants may already be familiar with sustainability issues. As a result, the limited differences observed between gain and loss message framing on behavioural intention may reflect prior knowledge or familiarity. Similarly, participants' evaluations of product sustainability based on label presence or absence, particularly organic certification, may be influenced by their prior understanding of environmental claims. Consequently, the findings for both framing and label judgments should be interpreted with caution and may not generalise to populations with lower education.

Conclusion

This study was motivated by a practical and conceptual question. How do consumers respond to different forms of sustainability communication when making food choices? As concerns about environmental sustainability gain prominence, policymakers and market actors are investing in framing techniques and eco-labelling to influence behaviour. However, many interventions rely on assumptions about consumer reasoning that remain under-examined. This study addressed that gap by evaluating two commonly used communication strategies i.e., message valence and product labelling. These were tested in setting that captured both emotional responses and product-level judgments. The goal was to examine how each strategy operates within its respective decision context and whether its influence aligns with consumers' stated priorities.

The evidence shows that neither gain nor loss message framing had a strong influence on participants' stated behavioural intentions. Emotional appeals, whether positive or negative, shaped how messages were perceived and which emotions they evoked, but did not significantly change participants' stated willingness to act. These results challenge the idea that emotional intensity is a reliable driver of behavioural change in environmental contexts, particularly when the costs and benefits of action are perceived as diffuse or distant. While emotional framing can affect how sustainability messages are processed, it is unlikely to shift food purchasing decisions on its own. The presence or absence of specific sustainability labels did produce clear and consistent effects on consumer judgments. Organic certification, in particular, strongly influenced whether a product was seen as environmentally sustainable, even when other claims were present. This pattern suggests that consumers use a rule-of-thumb strategy in sustainability evaluation, prioritising recognisable cues over analytical trade-offs. Despite ranking labels differently in abstract tasks, participants did not apply those preferences in practice. This disconnect points to a gap between what people say matters and how they actually decide and raises questions about the reliability of stated-preference data in sustainability research.

The findings provide insight into how different sustainability communication tools operate within the scope of the outcomes measured in this study. First, they confirm that consumer decision-making around sustainability often involves the use of heuristic cues. This has implications for how communication efforts are designed. Attempts to change behaviour through emotive messages alone are unlikely to succeed unless they are reinforced by changes in the decision environment that make sustainable choices easier and more visible. Second, the dominant role of organic labelling in consumer judgment reveals a skew in perception that may not correspond with actual environmental impact. If consumers continue to equate organic with sustainable in all cases, other important indicators such as carbon footprint may be underweighted or ignored. This has implications for how sustainability claims are prioritised and presented in both policy and retail settings. Going forward, there is a need for more integrative labelling systems that reduce cognitive load while reflecting multiple environmental dimensions. This may involve developing composite indicators, improving label literacy and designing information environments that support consumer choices. Future research should also move beyond intentions and self-reports to observe real-world purchasing behaviour in contexts that include competing incentives, time constraints, and social influences.

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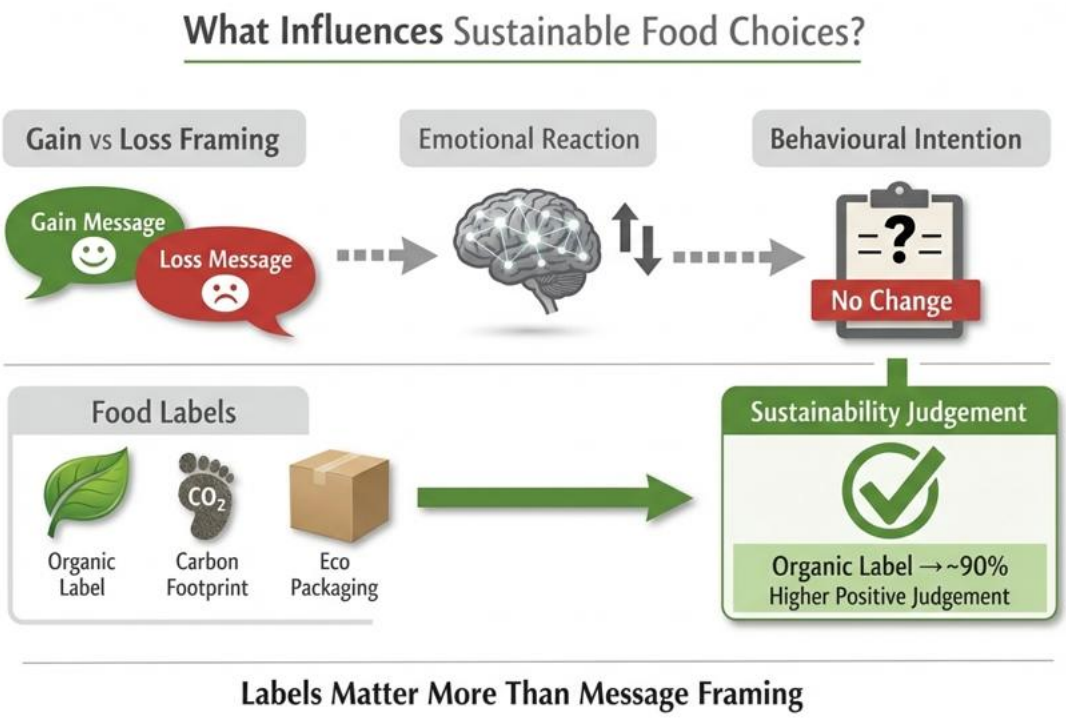

Graphical abstract

Table 1. Item-level contrasts

Reaction item	**Gain frame** (Mean)	**Loss frame** (Mean)	***t***	***p***	***d***
Want to learn more	3.46	3.36	0.95	0.344	0.08
Too emotional / exaggerated	2.15	2.88	–7.13	< .001***	–0.64
Think differently about impact	3.19	3.21	–0.19	0.851	–0.02
Feel more aware	3.44	3.5	–0.65	0.514	–0.06
Feel hopeful	3.46	3.2	2.45	0.015**	0.22
Feel concerned about past choices	2.84	3.19	–3.04	0.003**	–0.27
Feel personally responsible	3.24	3.36	–1.10	0.272	–0.10
Plan to check labels	3.43	3.5	–0.58	0.564	–0.05
Willing to pay more	3.17	3.27	–0.85	0.393	–0.08

Table 2. OLS regression of composite score predicted by frame and demographics

Variables	Coef.	Std.Err.	*p*
Framing (1= loss, 0 otherwise)	0.12	0.08	0.11
Gender (Male)	-0.19	0.08	0.02
Age group (25-34)	-0.10	0.21	0.64
Age group (35-44)	-0.09	0.21	0.68
Age group (45-54)	-0.28	0.21	0.18
Age group (55-64)	-0.38	0.21	0.08
Age group (65 and over)	-0.48	0.24	0.05
Income (Under £20,000)	-0.04	0.24	0.88
Income (£20,000-£39,999)	0.01	0.22	0.98
Income (£40,000-£59,999)	0.08	0.22	0.71
Income (£60,000 and above)	0.04	0.22	0.87
Education (Undergraduate degree)	0.16	0.24	0.50
Education (Postgraduate degree)	0.31	0.11	0.01
Education (Prefer not to say)	-0.13	0.42	0.76
Education (Other)	0.10	0.10	0.32
Intercept	3.30	0.29	0.00

Reference categories are female, 18 – 24 years and High school education.

Table 3. Logistic regression predicting perceived sustainability of food products based on scenario cues, environmental attitudes and demographics

Predictor	log-odds β	SE	p	OR
No-organic (vs all-cues)	–2.34	0.36	<.001***	0.1
No-packaging (vs all-cues)	–1.07	0.37	0.004**	0.34
Environmental importance	0.22	0.15	0.144	1.25
Label-overload agreement	–0.08	0.11	0.458	0.92
Male (vs female)	–0.31	0.28	0.270	0.73
Low income (vs other)	–0.48	0.36	0.181	0.62
Age 35–54 (vs 18–34)	0.19	0.32	0.559	1.21
Age 55 + (vs 18–34)	–0.16	0.39	0.685	0.85
Intercept	2.13	0.42	<.001	8.4