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Value activation in sustainability communication: how marketing communication relates to sustainable consumer behavior through the perceived importance of sustainability

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Introduction: Understanding the psychological mechanisms underlying sustainable consumer behavior remains a major challenge, particularly due to the persistent gap between pro-sustainability attitudes and actual actions. This study examines how marketing communication relates to sustainable consumer behavior through selected psychological factors and proposes a communication-based Value Activation Model, in which communication strengthens the perceived personal importance of sustainability in everyday consumer decisions and practices.

Methods: A quantitative survey of 502 Slovenian consumers, representative of post-transition Central and Eastern European markets, was analyzed using multiple regression, bootstrapped mediation, and moderation techniques.

Results: The results indicate that sustainability importance is the only significant mediator of the relationship between cognitive-informational marketing communication and sustainable consumer behavior, accounting for approximately one-third of the total effect. Moral obligation toward sustainable development does not directly predict behavior but significantly moderates the effectiveness of marketing communication, with its impact increasing among consumers with stronger moral convictions. Informing was the strongest driver of sustainability importance, while negative emotional appeals reduced moral obligation.

Discussion: These findings provide preliminary empirical support for the proposed communication-based Value Activation Model, which should be interpreted as an exploratory communication-based framework. They suggest that sustainability communication operates primarily by activating the personal relevance of sustainability rather than through emotional or efficacy-based pathways. The study contributes to sustainability communication research by identifying value activation as a potential psychological mechanism linking marketing communication and sustainable consumer behavior, offering practical implications for marketers and policymakers seeking to reduce the attitude-behavior gap.

KEYWORDS

attitude–behavior gap, marketing communication, moral obligation, sustainability communication, sustainability importance, sustainable consumer behavior, value activation model

1 Introduction

Promoting sustainable consumer behavior remains a major challenge for marketers and policymakers. Although many consumers express willingness to purchase sustainably, the market share of sustainable products remains disproportionately low (White et al., 2019a). This discrepancy between pro-environmental attitudes and purchasing behavior, commonly referred to as the attitude–behavior gap, has been widely documented (Kollmuss and Agyeman, 2002; Vermeir and Verbeke, 2006). However, the mechanisms through which marketing communication may help narrow this gap remain insufficiently understood.

Marketing communication is an important mechanism through which firms shape consumer attitudes and behavior toward sustainability (Kim et al., 2020; White et al., 2019a). Yet relatively few studies examine the psychological pathways through which communication is associated with sustainable consumer behavior. Existing research has largely focused either on psychological antecedents of sustainability-oriented behavior or on the persuasive effects of communication, while the interaction between these domains remains less explored (Nguyen et al., 2019). Moreover, most empirical evidence derives from Western European and North American contexts, while Central and Eastern European (CEE) markets remain underrepresented. Slovenia therefore provides a useful context for examining how marketing communication interacts with psychological factors in a setting where sustainability norms are still evolving.

To address these gaps, the present study investigates the mediating role of four psychological factors, namely the perceived personal importance of sustainability, felt moral obligation toward sustainable development, emotional involvement, and perceived self-efficacy, in the relationship between marketing communication and sustainable consumer behavior. It also examines whether these factors moderate the effectiveness of communication. The study draws on three complementary theoretical frameworks: the Theory of Planned Behavior (TPB; Ajzen, 1991), Value–Belief–Norm theory (VBN; Stern, 2002), and Social Cognitive Theory (SCT; Bandura, 1986), which together provide a comprehensive perspective on cognitive, normative, and efficacy-related determinants of behavior. While TPB traditionally conceptualizes behavioral intention as the most proximal predictor of behavior, the present study focuses specifically on psychological activation mechanisms through which marketing communication strengthens sustainability importance. The study therefore does not examine intention formation directly, but rather investigates value salience and moral engagement as communication-related mechanisms associated with self-reported sustainable consumer behavior.

The study pursues three objectives: (1) to examine whether marketing communication relates to sustainable consumer behavior through the perceived personal importance of sustainability, felt moral obligation, emotional involvement, and perceived self-efficacy; (2) to identify which communication attributes, including informational content, emotional appeals, advertisement attractiveness, and perceived trust, are most strongly associated with sustainable behavior; and (3) to assess whether psychological factors mediate or moderate the marketing communication–behavior relationship. A quantitative survey of 502 Slovenian consumers was analyzed using multiple regression, bootstrapped mediation (Hayes, 2022), and moderation analyses.

This study contributes to literature in several ways. First, it examines both mediating and moderating roles of psychological factors in the marketing communication–sustainable behavior relationship. Second, it provides evidence on the differential effectiveness of communication attributes. Third, it offers empirical insights from a CEE context that complements existing findings from Western markets. Fourth, it offers a preliminary communication-focused extension of value-based explanations of sustainable consumer behavior by examining whether marketing communication strengthens the personal relevance of sustainability in everyday consumer decisions and practices.

Finally, the study proposes a reconceptualization of how psychological factors operate within the marketing communication–sustainable behavior relationship. While VBN theory conceptualizes values as relatively stable antecedents of pro-environmental behavior, the present study adopts a communication-oriented perspective by examining how marketing communication may make sustainability more personally salient in everyday consumer decisions and practices. In this sense, value activation refers to the process through which communication strengthens sustainability importance and thereby increases its relevance for sustainable consumer behavior. In addition, whereas VBN theory conceptualizes moral responsibility as a mediating link in the value–belief–norm–behavior chain, the present study examines an alternative configuration in which felt moral obligation toward sustainable development functions as a boundary condition (moderator), while sustainability importance represents the primary mediating pathway. This configuration suggests a communication-based Value Activation Model, in which sustainability communication promotes behavior primarily by strengthening the perceived personal importance of sustainability.

2 Theoretical framework

This study draws upon three established behavioral frameworks—TPB (Ajzen, 1991), VBN (Stern, 2002), and SCT (Bandura, 1986)—to examine the psychological mechanisms through which marketing communication relates to sustainable consumer behavior. While TPB and VBN provide the primary theoretical foundations of the model, SCT contributes the construct of self-efficacy, capturing consumers' perceived ability to perform sustainable actions. Integrating these frameworks provides a comprehensive perspective on the cognitive, normative, and affective dimensions of sustainable decision-making (Bamberg and Möser, 2007; Klöckner, 2013). Rather than testing these theories in their entirety, the present study uses them as complementary theoretical lenses for selecting psychological factors that may explain how sustainability-oriented marketing communication is associated with sustainable consumer behavior.

2.1 Theory of planned behavior (TPB)

TPB proposes that behavioral intention is shaped by attitudes, subjective norms, and perceived behavioral control (PBC; Ajzen, 1991). Conceptually aligned with self-efficacy (Bandura, 1986), PBC is particularly relevant here because it reflects consumers' confidence in performing sustainable actions despite situational constraints. Meta-analyses confirm that PBC influences sustainable consumer behavior both directly and indirectly (Armitage and Conner, 2001; Bamberg and Möser, 2007). In the context of sustainability communication, perceived control is relevant because consumers may be more likely to act sustainably when they believe that their individual choices can contribute meaningfully to environmental or societal outcomes. Emotional engagement may further strengthen this pathway: positive emotions enhance motivation and perceived control, while guilt and fear can increase perceived urgency to act (Kim et al., 2020; White et al., 2019b). However, TPB has been criticized for insufficiently accounting for internalized moral norms (Sniehotta et al., 2014), a limitation addressed by VBN theory. Accordingly, this study draws on TPB primarily to justify the inclusion of self-efficacy and psychologically grounded decision processes, rather than to test the full intention-based TPB sequence.

2.2 Value–belief–norm theory (VBN)

VBN theory explains pro-environmental behavior through a causal chain linking personal values, ecological worldview, awareness of consequences, and ascription of responsibility to personal norms that generate a moral obligation to act (Schwartz, 1977; Stern, 2002). Biospheric values are consistently identified as strong predictors of sustainable consumer behavior (Al Mamun et al., 2022), and personal norms often exert greater influence than external incentives (Han et al., 2010). Within sustainability communication, this perspective is relevant because marketing messages may make environmental consequences more visible, strengthen the personal relevance of sustainability, and evoke a sense of moral obligation toward sustainable development. Marketing communication may activate this process by combining evidence-based information about environmental consequences with emotionally resonant appeals that evoke pride or moral responsibility (David and Rundle-Thiele, 2018; Kim, 2023). In the present study, VBN is used as a theoretical lens for examining the perceived personal importance of sustainability and felt moral obligation as communication-relevant psychological factors.

2.3 Social cognitive theory (SCT)

SCT conceptualizes behavior as the product of reciprocal interactions among personal cognitions, environmental influences, and behavioral responses (Bandura, 1986). In the present study, SCT primarily provides theoretical grounding for perceived self-efficacy, defined as individuals' beliefs about their ability to perform behaviors that contribute to desired outcomes. In sustainability contexts, self-efficacy captures consumers' perceived capacity to contribute to sustainable development through their consumption choices (Islam et al., 2025; Mansoor and Wijaksana, 2022). This is particularly relevant for sustainable consumer behavior, where individuals may support sustainability in principle but refrain from action if they believe their personal choices are too small, costly, or ineffective to make a meaningful difference.

2.4 Attitude-behavior gap

The three frameworks converge on the idea that psychological factors, such as values, moral responsibility, emotional involvement, and self-efficacy, play an important role in translating pro-environmental attitudes into behavior. However, the persistent attitude–behavior gap (Kollmuss and Agyeman, 2002; Vermeir and Verbeke, 2006) suggests that favorable attitudes do not automatically translate into sustainable consumer behavior. Prior research highlights the role of values in sustainable consumer behavior (Casalegno et al., 2022; Tanner and Wölfing Kast, 2003) and shows that sustainability communication can sometimes produce unintended effects (Acuti et al., 2022). However, the mechanisms through which marketing communication interacts with psychological factors in relation to sustainable consumer behavior remain insufficiently explored.

Several strands of evidence suggest that moral responsibility may function differently across behavioral contexts. Moral norms do not always translate into behavior, particularly when structural barriers constrain sustainable consumption (Carrington et al., 2010; Gupta and Ogden, 2009; Harring et al., 2011). Moreover, insights from the elaboration likelihood model (Petty and Cacioppo, 1986) suggest that personal relevance, for example moral conviction, may increase the depth of processing of persuasive messages. Similarly, research on sustainability communication indicates that responses to green appeals vary across consumer segments defined by their moral and value orientations (White et al., 2019a).

Building on these insights, this study proposes a communication-based Value Activation Model, in which marketing communication is expected to relate to sustainable consumer behavior primarily through the perceived personal importance of sustainability, while felt moral obligation toward sustainable development functions as a boundary condition that may strengthen consumers' responsiveness to sustainability communication. Rather than acting as a mediating step in a causal chain, felt moral obligation may therefore operate as a readiness factor that amplifies the relationship between marketing communication and sustainable consumer behavior.

While VBN research consistently shows that environmental values predict pro-environmental behavior, the present study advances this literature by conceptualizing marketing communication as a potential mechanism that activates the perceived importance of sustainability in everyday consumer decisions and practices. Instead of treating values solely as stable antecedents of behavior, the proposed Value Activation Model emphasizes how communication stimuli may strengthen value salience and thereby support sustainable behavioral engagement.

2.5 Hypotheses

Based on the integrated theoretical framework, the following hypotheses are proposed:

> *H_1: Marketing communication (information, emotional appeals, advertisement attractiveness, and trust) is positively associated with consumers' psychological factors.*

This hypothesis proposes that exposure to sustainability-oriented marketing communication is positively associated with consumers' psychological factors, namely perceived personal importance of sustainability, felt moral obligation toward sustainable development, emotional involvement, and perceived self-efficacy, which are expected to shape sustainable consumer behavior.

> *H_2: The perceived personal importance of sustainability, felt moral obligation toward sustainable development, emotional involvement, and self-efficacy mediate the relationship between marketing communication and sustainable consumer behavior.*

Drawing on VBN and TPB, this hypothesis proposes that marketing communication influences sustainable consumer behavior indirectly by activating psychological factors.

> *H_3: Felt moral obligation toward sustainable development, emotional involvement, and self-efficacy moderate the effect of marketing communication on sustainable consumer behavior.*

Grounded in SCT and TPB, this hypothesis proposes that the effectiveness of marketing communication varies depending on consumers' existing levels of these psychological factors.

3 Materials and methods

A quantitative cross-sectional research design was employed to examine the relationship between marketing communication, psychological determinants, and sustainable consumer behavior among Slovenian consumers. The study was conducted between February and March 2024 using a self-administered online questionnaire distributed to a quota-sampled population. The research complied with the principles of the Declaration of Helsinki and was approved by the Human Research Ethics Committee. Informed consent was obtained from all participants prior to data collection.

3.1 Instrument

The questionnaire was developed based on established theoretical frameworks and empirical research in consumer behavior, sustainability marketing, and behavioral psychology (Ajzen, 1991; Bandura, 1986; Mason et al., 2023; Nguyen et al., 2019; Stern, 2002; White et al., 2019a). It consisted of four sections.

The first section captured socio-demographic characteristics (gender, age, education, income, and geographic region) to contextualize demographic variation in sustainability-related attitudes and behaviors (Afshar Jahanshahi et al., 2017).

The second section measured self-reported sustainable consumer behavior using five items adapted from Verplanken and Orbell (2022), covering consideration of sustainability impacts in purchasing decisions, preference for environmentally friendly products, label-checking for sustainability, purchase of recycled materials, and selection of more sustainable alternatives. Responses were recorded on a five-point scale (1 = never, 5 = always). One additional item concerning post-use recycling was removed during measurement validation due to a near-zero factor loading ($\lambda < 0.10$), resulting in a five-item scale ($\alpha = 0.851$).

The third section assessed four psychological factors using items adapted from De Jesus et al. (2021), Piligrimienė et al. (2020), and Pandey (2021). The perceived personal importance of sustainability (hereafter: sustainability importance) was measured using a single item capturing the extent to which respondents considered concern for sustainable development personally important ("Concern for sustainable development is important to me"; adapted from Stern, 2002). Felt moral obligation toward sustainable development (hereafter: moral obligation) was measured using a single item assessing respondents' perceived moral obligation to support sustainable development goals. Emotional involvement was measured using two items capturing positive affective responses to sustainable purchasing ($\alpha = 0.780$), while perceived self-efficacy was measured with two items assessing beliefs about one's capacity to contribute to sustainable development through consumption choices ($\alpha = 0.760$).

Sustainability importance and felt moral obligation toward sustainable development were initially operationalized using two items for each construct. However, the extremely low inter-item correlations ($r = 0.033$ and $r = -0.011$) indicated that the paired items did not capture a coherent underlying construct, suggesting potential issues with item content validity rather than measurement reliability alone. The items most closely aligned with the intended conceptual meanings were therefore retained: perceived importance of sustainability as an indicator of sustainability-related value salience and felt moral obligation as an indicator of normative responsibility toward sustainable development. Although single-item measurement limits the assessment of reliability and measurement error, single-item indicators may be appropriate for concrete and easily interpretable evaluations (Bergkvist and Rossiter, 2007). Accordingly, the retained items are interpreted as focused indicators of sustainability importance and moral obligation rather than as comprehensive measures of broader value and norm constructs. Nevertheless, this represents a limitation of the study, and future research should employ validated multi-item scales, such as the New Ecological Paradigm scale (Dunlap et al., 2000) for environmental values and established VBN personal norm measures (Stern et al., 1999), to provide a more comprehensive assessment of these constructs.

The fourth section assessed the perceived impact of marketing communication using items adapted from Anggraeni and Islamy (2021) and Stampa et al. (2020). Informing was measured with five items capturing the cognitive-informational role of

marketing communication, assessing the extent to which marketing communication informs consumers about sustainability-related problems, provides expected sustainability-related information, presents potential positive actions, communicates possible consequences, and strengthens consumers' knowledge of sustainable products and services ($\alpha = 0.890$). Positive emotional appeals were measured with two items assessing the motivational impact of positive emotions such as pride and optimism ($\alpha = 0.858$), while negative emotional appeals captured responses to emotions such as fear, guilt, and sadness ($\alpha = 0.848$). Advertisement attractiveness was measured with two items capturing the perceived appeal of sustainability advertising ($\alpha = 0.674$). Perceived trust was measured with one item assessing the perceived truthfulness of sustainability advertising claims. Items used a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). For the direct regression analyses, these communication attributes were examined separately. For the mediation and moderation analyses, the cognitive-informational marketing communication index — operationalized as the five-item Informing scale — served as the primary independent variable, as it represents the cognitive-informational pathway central to the proposed Value Activation Model. Supplementary parallel mediation analyses were conducted for the other four communication dimensions (positive and negative emotional appeals, advertisement attractiveness, and perceived trust) to empirically validate the selection of the cognitive-informational dimension as the focal predictor.

3.2 Sample

Quota sampling based on age, gender, and place of residence was employed to approximate the demographic composition of the Slovenian population. The final sample consisted of 502 participants. As shown in Table 1, the sample displayed a balanced gender distribution (52.1% male, 47.9% female). Age groups were well represented, particularly respondents aged 35–44, 45–54, and 55 and above.

The sample was predominantly well educated, with most respondents holding either a college or undergraduate degree. In terms of income, the largest group reported a monthly net income between €1,000 and €1,999, followed by those earning between €2,000 and €2,999. Higher-income respondents (above €3,000) represented a smaller proportion of the sample, while a portion of participants chose not to disclose their income.

The quota design was intended to approximate the demographic structure of the Slovenian population, thereby supporting the contextual relevance of the findings for Slovenian consumers. However, because the study used a quota-based non-probability sampling approach, the findings should not be interpreted as fully representative of the Slovenian population.

3.3 Reliability and validity

Measurement quality was assessed through internal consistency, convergent validity, and discriminant validity analyses. Table 2 reports on the reliability and validity statistics for all multi-item constructs. Because sustainability importance and moral obligation were measured with single items, reliability coefficients, AVE, CR, Fornell–Larcker values, and HTMT ratios could not be calculated for these indicators.

Convergent validity was supported by AVE values above 0.50 and factor loadings ranging from 0.715 to 0.936 (Fornell and Larcker, 1981; Hair et al., 2019). Internal consistency was

TABLE 1 Sociodemographic characteristics ($N = 502$).

Attribute	Category	Share of total respondents (in %)
Gender	Male	52.1
	Female	47.9
Age	18–24	10.6
	25–34	18.5
	35–44	23.4
	45–54	22.9
	≥ 55	24.7
Highest education level	Primary school or below	1.7
	Secondary school	10.8
	College degree	43.9
	Undergraduate degree	37.2
	Master's degree/ specialization	3.9
	Doctoral degree	2.4
Monthly net income	< €500	5.8
	€500–€999	11.1
	€1,000–€1,999	32.2
	€2,000–€2,999	22.1
	€3,000–€3,999	7.3
	> €4,000	6.2
	I do not want to answer	15.1

TABLE 2 Measurement reliability and validity.

Construct	Items	α	CR	AVE	Factor loadings
Sustainable behavior (SB)	5	0.851	0.895	0.631	0.771–0.821
Emotional involvement (EI)	2	0.780	0.901	0.820	0.905–0.905
Self-efficacy (SE)	2	0.760	0.894	0.809	0.900–0.900
Informing (INF)	5	0.890	0.922	0.704	0.715–0.885
Positive emotions (POS)	2	0.858	0.934	0.876	0.936–0.936
Negative emotions (NEG)	2	0.848	0.929	0.868	0.932–0.932
Ad attractiveness (AA)	2	0.674	0.860	0.754	0.869–0.869

α, Cronbach's alpha; CR, composite reliability; AVE, average variance extracted. Sustainability importance and moral obligation are single-item measures, and are therefore not included in the reliability, CR, AVE, and factor loading calculations. All factor loadings exceed 0.50, CR values exceed 0.70, and AVE values exceed 0.50, meeting established thresholds (Fornell and Larcker, 1981; Hair et al., 2019).

satisfactory for all multi-item constructs ($\alpha \geq 0.674$; CR ≥ 0.860). The lower Cronbach's alpha for advertisement attractiveness ($\alpha = 0.674$) is attributable to the two-item scale; however, composite reliability (0.860) and AVE (0.754) indicate acceptable convergent validity and composite reliability.

Discriminant validity was assessed using the Fornell–Larcker criterion (Table 3) and the heterotrait–monotrait (HTMT) ratio. The square root of AVE exceeded inter-construct correlations for all construct pairs, supporting discriminant validity according to the Fornell-Larcker criterion. HTMT ratios were below 0.85 except for positive emotions and advertisement attractiveness (HTMT = 0.906), indicating empirical overlap. Despite the elevated HTMT value, the constructs were retained because they represent conceptually distinct dimensions: positive emotions capture affective responses elicited by the advertising message, whereas advertisement attractiveness reflects evaluative perceptions of the advertisement as a communication stimulus. Nevertheless, the elevated HTMT value suggests that the distinction between positive emotional appeals and advertisement attractiveness should be interpreted with caution.

3.4 Data analysis

Statistical analyses were performed using IBM SPSS Statistics with statistical significance set at $p < 0.05$. Multiple linear regression was used to examine the direct effects of marketing communication attributes on psychological factors and sustainable consumer behavior. Multicollinearity was assessed using variance inflation factors (VIF), with all values below 2.0, indicating no multicollinearity concerns (Hair et al., 2019). Effect sizes were evaluated using Cohen's f^2 (Cohen, 1988), with values of 0.02, 0.15, and 0.35 interpreted as small, medium, and large effects.

For the mediation and moderation analyses, the five-item Informing scale served as the primary independent variable, capturing the cognitive-informational dimension of marketing communication that is central to the proposed Value Activation Model. The scale demonstrated strong psychometric properties (Cronbach's $\alpha = 0.890$; standardized $\alpha = 0.893$), with an exploratory principal-components analysis confirming its unidimensionality (KMO = 0.876; Bartlett's test $\chi^2 = 1{,}471.4$, $p < 0.001$; single factor explaining 70.4% of the total variance; factor loadings between 0.722 and 0.882). Direct regression analyses examined all six marketing communication attributes separately, whereas the main mediation and moderation analyses used the Informing scale to test the broader cognitive communication–psychology–behavior relationship posited by the Value Activation Model. To empirically validate the choice of Informing as the focal predictor, four supplementary parallel mediation analyses were additionally conducted, with each of the remaining communication dimensions (positive emotional appeals, negative emotional appeals, advertisement attractiveness, and perceived trust) entered as alternative independent variables predicting sustainable consumer behavior through sustainability importance. Mediation analyses were conducted using bootstrapped confidence intervals (5,000 replications) with the PROCESS macro for SPSS (Model 4; Hayes, 2022). The main mediation analysis used the cognitive-informational marketing communication index (operationalized as the Informing scale) as the independent variable, sustainable consumer behavior as the dependent variable, and sustainability importance, felt moral obligation toward sustainable development, emotional involvement, and perceived self-efficacy as parallel mediators. Four supplementary single-mediator analyses additionally examined whether each of the remaining communication dimensions (positive emotional appeals, negative emotional appeals, advertisement attractiveness, and perceived trust) was associated with sustainable consumer behavior through sustainability importance as a single mediator.

Moderation analyses were conducted using PROCESS Model 1 (Hayes, 2022) to test whether the relationship between the cognitive-informational marketing communication index and sustainable consumer behavior varied across levels of felt moral obligation, emotional involvement, and self-efficacy. Significant interaction effects were further examined using the Johnson–Neyman technique.

A paired-sample *t*-test was used to assess the attitude–behavior gap by comparing perceived environmental responsibility with self-reported sustainable consumer behavior. Cohen's d was calculated to evaluate the magnitude of the difference.

Because all variables were collected through the same self-reported instrument at a single point in time, common method bias is an inherent concern of the present design and cannot be ruled out empirically. As an ancillary descriptive check, Harman's single-factor test was conducted. The first unrotated factor accounted for 28.4% of the total variance. However, this procedure has well-documented diagnostic limitations and is not considered sufficient evidence against common method bias

TABLE 3 Discriminant validity: Fornell–Larcker criterion.

Construct	SB	EI	SE	INF	POS	NEG	AA
SB	**.794**						
EI	.022	**.906**					
SE	−.053	−.045	**.900**				
INF	.334	.059	.020	**.839**			
POS	.256	−.005	.014	.411	**.936**		
NEG	.194	−.024	−.072	.288	.667	**.932**	
AA	.247	.002	−.015	.411	.690	.604	**.869**

Diagonal values (bold) represent $\sqrt{\text{AVE}}$; off-diagonal values represent inter-construct correlations. SB, sustainable behavior; EI, emotional involvement; SE, self-efficacy; INF, informing; POS, positive emotions; NEG, negative emotions; AA, advertisement attractiveness. Sustainability importance and moral obligation are single-item measures and are therefore excluded from this matrix.

(Podsakoff et al., 2003). The results should therefore be interpreted with caution, and future research should apply more rigorous procedures such as marker variables or latent method factor approach within structural equation modelling frameworks.

3.5 The research framework

Figure 1 illustrates the proposed conceptual model guiding the empirical analysis. Building on the integration of the TPB, VBN theory, and SCT, the model proposes a communication-based Value Activation Model of sustainability communication. In this framework, marketing communication is expected to relate to sustainable consumer behavior primarily through the activation of sustainability importance, which functions as the central mediating mechanism linking communication exposure and behavioral outcomes.

In addition, felt moral obligation toward sustainable development is conceptualized as a boundary condition that strengthens the effectiveness of marketing communication. Specifically, it moderates the relationship between marketing communication and sustainable consumer behavior, such that communication effects are expected to be stronger among consumers with higher levels of felt moral obligation. Emotional involvement and perceived self-efficacy are also included as psychological factors derived from TPB and SCT to allow a broader examination of potential mediating and moderating pathways. However, the conceptual model emphasizes sustainability importance as the central mediating mechanism, with emotional involvement and self-efficacy serving exploratory roles within the empirical analysis.

4 Results

4.1 Direct effects of psychological factors on sustainable consumer behavior

Multiple regression analysis was conducted to examine the direct associations between psychological factors and sustainable consumer behavior (Table 4). The model was statistically significant, $F(4, 497) = 19.120$, $p < 0.001$, explaining 13.3% of the variance in sustainable behavior ($R^2 = 0.133$).

Sustainability importance emerged as the sole significant predictor ($\beta = 0.364$, $p < 0.001$, $f^2 = 0.152$), representing a medium effect size. Neither emotional involvement ($\beta = 0.033$, $p = 0.530$), felt moral obligation ($\beta = 0.012$, $p = 0.819$), nor self-efficacy ($\beta = -0.002$, $p = 0.959$) significantly predicted sustainable behavior. These results indicate that sustainability-related value salience, reflected in perceiving sustainability as personally important, is the primary psychological factor of sustainable action, whereas affective and moral factors do not exert significant direct effects.

4.2 Direct effects of marketing communication on sustainable consumer behavior

A second regression examined the direct associations between marketing communication attributes and sustainable consumer behavior (Table 5). Two conceptually

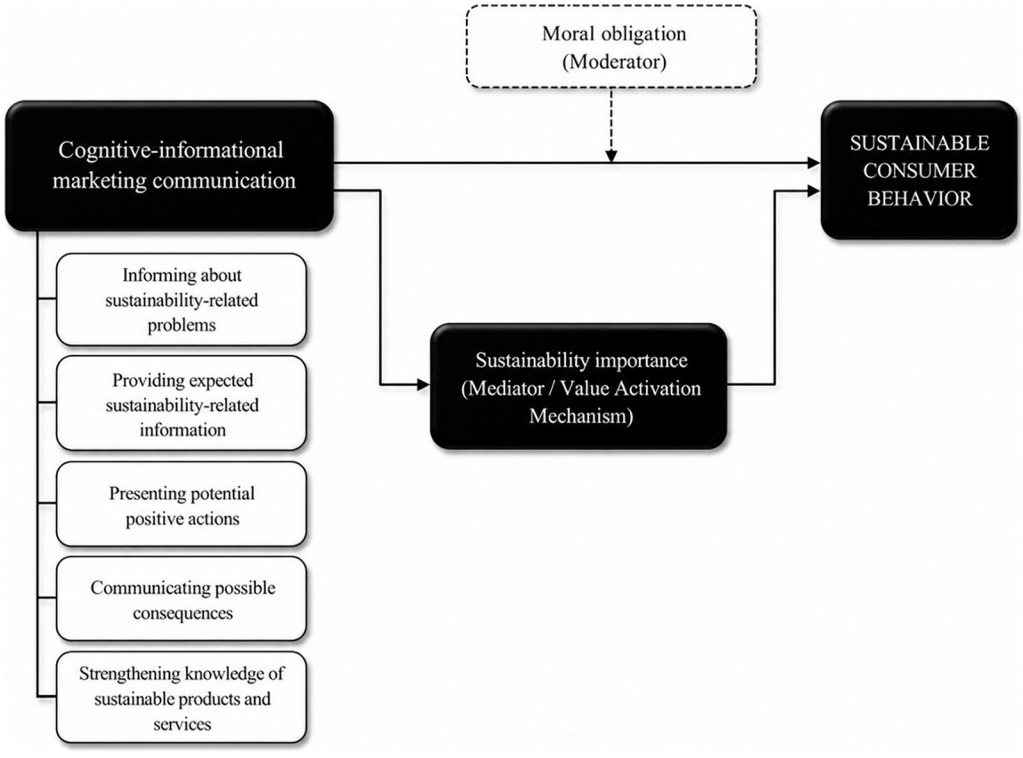

FIGURE 1
Communication-based value activation model.

TABLE 4 Effects of psychological factors on sustainable behavior.

Predictor	B	SE	β	t	p-value	VIF	f^2
Constant	2.345	0.258	—	9.074	<0.001***	—	—
Sustainability importance	0.307	0.035	0.364	8.685	<0.001***	1.01	0.152
Emotional involvement	0.026	0.041	0.033	0.628	0.530	1.55	0.001
Moral obligation	0.009	0.038	0.012	0.229	0.819	1.55	0.000
Self-efficacy	−0.002	0.036	−0.002	−0.051	0.959	1.01	0.000

$R^2 = 0.133$, Adj. $R^2 = 0.126$. VIF, variance inflation factor; f^2, Cohen's f^2 effect size (0.02 = small, 0.15 = medium, 0.35 = large). All VIF values < 2.0, indicating no multicollinearity. .
***$p < 0.001$.

related but distinct variables were included in the analysis. Informing captures the perceived informational role of sustainability communication, whereas information content reflects respondents' perceptions that sustainability advertising contains concrete factual environmental information. Including both variables allows the analysis to distinguish between the general informational function of communication and the perceived presence of specific environmental information within advertising messages. The model was significant, $F(6, 495) = 12.106$, $p < 0.001$, $R^2 = 0.128$.

Information content was the strongest predictor ($\beta = 0.216$, $p < 0.001$), followed by negative emotions ($\beta = 0.118$, $p = 0.037$). Perceived trust approached significance ($\beta = 0.091$, $p = 0.053$). Informing, positive emotions, and advertisement attractiveness did not reach significance ($p > 0.05$). These findings indicate that marketing communication is associated with sustainable consumer behavior primarily through cognitively oriented content (informational quality) and, to a lesser extent, through negative emotional appeals.

4.3 Effect of marketing communication on psychological factors

To test H_1, which posits that marketing communication is positively associated with consumers' psychological factors, separate regression analyses were conducted to examine the associations between communication attributes and each psychological construct.

4.3.1 Effect on moral obligation toward sustainable development

The model including all marketing communication attributes as predictors of moral obligation was statistically significant, $F(2, 499) = 4.861$, $p = 0.008$, $R^2 = 0.019$. In the final stepwise model (Table 6), positive emotional appeals were positively associated with moral obligation ($B = 0.127$, $p = 0.008$), while negative emotions were negatively associated with it ($B = -0.124$, $p = 0.005$). Informing, advertisement attractiveness, and perceived trust showed no significant effects ($p > 0.05$).

4.3.2 Effect on emotional involvement and perceived self-efficacy

Marketing communication did not significantly predict emotional involvement; the overall model was not significant ($R^2 = 0.005$, $F = 2.728$, $p = 0.099$). For self-efficacy, the model was marginally significant ($R^2 = 0.027$, $F = 2.323$, $p = 0.032$). Positive emotions emerged as the only significant predictor, but with a negative coefficient ($\beta = -0.164$, $p = 0.003$), suggesting that positive emotional appeals in advertising may paradoxically reduce feelings of personal efficacy.

4.3.3 Effect on sustainability importance

The model was significant, $F(2, 499) = 49.421$, $p < 0.001$, $R^2 = 0.166$ (Table 7). Informing was the strongest predictor ($\beta = 0.373$, $p < 0.001$), suggesting that clear, factual messages are positively associated with the perceived personal importance of

TABLE 5 Association between marketing communication attributes and sustainable consumer behavior.

Predictor	B	SE	β	t	p	VIF	f^2
(Constant)	2.355	0.163	—	14.423	<0.001***	—	—
Information content	0.178	0.047	0.216	3.803	<0.001***	1.82	0.029
Negative emotions	0.070	0.033	0.118	2.094	0.037*	1.80	0.009
Perceived trust	0.062	0.032	0.091	1.942	0.053	1.23	0.008
Informing	0.059	0.046	0.072	1.282	0.200	1.79	0.003
Positive emotions	0.017	0.028	0.031	0.610	0.542	1.49	0.001
Ad attractiveness	−0.027	0.031	−0.048	−0.874	0.383	1.69	0.002

$R^2 = 0.128$, Adj. $R^2 = 0.117$. VIF, variance inflation factor; f^2, Cohen's f^2 effect size. All VIF values < 2.0.
***$p < 0.001$.
*$p < 0.05$.

TABLE 6 Association between marketing communication attributes and moral obligation.

Predictor	B	SE	β	t	*p*-value
Constant	−0.053	0.158	–	−0.333	0.739
Positive emotions	0.127	0.048	0.140	2.649	0.008**
Negative emotions	−0.124	0.044	−0.148	−2.807	0.005**

Moral obligation was measured with a single item. $R^2 = 0.019$, $F(2, 499) = 4.861$, $p = 0.008$.
** $p < 0.01$.

TABLE 7 Association between marketing communication attributes and sustainability importance.

Predictor	B	SE	β	t	*p*-value
Constant	0.001	0.041	–	0.021	0.983
Informing	0.373	0.044	0.373	8.466	<0.001***
Emotional appeals	0.080	0.044	0.080	1.82	0.069

Sustainability importance was measured with a single item. $R^2 = 0.166$, $F(2, 499) = 49.421$, $p < 0.001$.
*** $p < 0.001$.

sustainability. Emotional appeals approached significance ($\beta = 0.080$, $p = 0.069$).

4.3.4 Assessment of H_1

H_1 receives partial support. Marketing communication is significantly associated with sustainability importance (through informing) and felt moral obligation toward sustainable development (through emotional appeals) but does not significantly affect emotional involvement or self-efficacy. These differential pathways—where informational content is associated with stronger perceived sustainability importance, positive emotions enhance felt moral obligation, and negative emotions undermine it—underscore the importance of message design in sustainability communication.

4.4 Mediation analysis: the role of psychological factors in the relationship between marketing communication and sustainable consumer behavior

To test H_2, which proposes that psychological factors mediate the relationship between marketing communication and sustainable behavior, a bootstrapped mediation analysis was conducted (PROCESS Model 4; Hayes, 2022; 5,000 replications). The cognitive-informational marketing communication index served as the independent variable, sustainable behavior as the dependent variable, and four psychological factors as parallel mediators (Table 8). To empirically validate the selection of the cognitive-informational dimension as the focal predictor, supplementary parallel mediations were additionally conducted with each of the other four communication dimensions (positive emotional appeals, negative emotional appeals, advertisement attractiveness, and perceived trust) entered as alternative independent variables predicting sustainable consumer behavior through sustainability importance.

The results provide partial support for H_2. Sustainability importance significantly mediated the relationship between the cognitive-informational marketing communication index and sustainable consumer behavior [indirect effect = 0.131, 95% CI (0.075, 0.196)]. The cognitive-informational marketing communication index was positively associated with perceived sustainability importance ($a = 0.436$, $p < 0.001$), which in turn predicted sustainable behavior ($b = 0.299$, $p < 0.001$). In contrast, felt moral obligation toward sustainable development, emotional involvement, and perceived self-efficacy did not serve as significant mediators, as their bootstrap confidence intervals included zero.

The significant direct effect ($c' = 0.243$, $p < 0.001$) alongside the significant indirect effect indicates partial mediation: the cognitive-informational marketing communication index is associated with sustainable consumer behavior both directly and indirectly through the perceived personal importance of sustainability. The indirect effect accounted for approximately 35% of the total effect (0.131/0.374).

Supplementary parallel mediations were conducted to empirically validate the selection of Informing as the focal predictor. All five communication dimensions yielded statistically significant indirect effects through sustainability importance, indicating that each dimension may contribute to sustainable behavior at least partially through value activation. However, the magnitudes differed markedly. Informing produced an indirect effect (0.131) that was 2.3–3.4 times larger than those obtained for advertisement attractiveness (0.056), positive emotional appeals (0.052), negative emotional appeals (0.047), and perceived trust (0.039). Likewise, the cognitive-informing marketing communication index accounted for 14.7% of the variance in sustainability importance, compared with 3.9% for advertisement attractiveness, 3.8% for positive emotional appeals, 3.2% for negative emotional appeals, and 1.5% for perceived trust. These findings provide direct empirical support for the conceptual decision to position the cognitive-informational dimension as the focal predictor in the proposed Value Activation Model, consistent with the elaboration likelihood model's central-route processing of substantive information (Petty and Cacioppo, 1986). The affective, evaluative, and credibility-related dimensions of marketing communication appear to contribute to value activation only secondarily.

4.5 Moderation analysis

Three separate moderation analyses were conducted to test H_3, which proposes that psychological factors moderate the relationship between the cognitive-informational marketing communication index and sustainable consumer behavior (Hayes, 2022). Table 9 summarizes the results.

Felt moral obligation significantly moderated the relationship between the cognitive-informational marketing communication index and sustainable consumer behavior ($\beta = 0.126$, $p = 0.016$, $\Delta R^2 = 0.010$). The Johnson–Neyman analysis (Table 10) revealed that the effect of cognitive-informational marketing communication index on sustainable consumer behavior was positive and significant for 92.2% of the sample and increased in

TABLE 8 Mediation analysis.

Effect	Path	Coefficient (B)	SE/ BootSE	T	*p*	95% CI	
(LLCI—ULCI)	Sig.						
Direct effect (c')	Cognitive-informational MC index → Sustainable behavior	0.243	0.049	4.975	<0.001	0.147–0.339	Significant
Indirect effect	Cognitive-informational MC index → Sustainability importance → Sustainable behavior	0.131	0.031	–	–	0.075–0.196	Significant
	Cognitive-informational MC index → Moral obligation → Sustainable behavior	−0.001	0.003	–	–	−0.006–0.008	Not significant
	Cognitive-informational MC index → Emotional involvement → Sustainable behavior	0.001	0.003	–	–	−0.008–0.006	Not significant
	Cognitive-informational MC index → Perceived self-efficacy → Sustainable behavior	0.000	0.004	–	–	−0.010–0.007	Not significant
Total effect (c)	Cognitive-informational MC index → Sustainable behavior	0.374	0.047	7.913	<0.001	0.281–0.466	Significant
Supplementary indirect effect	Ad attractiveness → Sustainability importance → Sustainable behaviour	0.056	0.019	–	–	0.020–0.095	Significant
	Positive emotional appeals → Sustainability importance → Sustainable behaviour	0.052	0.017	–	–	0.020–0.088	Significant
	Negative emotional appeals → Sustainability importance → Sustainable behaviour	0.047	0.016	–	–	0.018–0.082	Significant
	Perceived trust → Sustainability importance → Sustainable behaviour	0.039	0.020	–	–	0.002–0.079	Significant

Indirect effects estimated using bias-corrected bootstrap with 5,000 replications (Hayes, 2022; PROCESS Model 4). The cognitive-informational marketing communication index was operationalized as the five-item Informing scale. Sustainability importance and moral obligation were measured with single items. SE is reported for total and direct effects, while BootSE is reported for indirect effects. Confidence intervals excluding zero indicate significant mediation. c = total effect; c' = direct effect controlling for mediators.

TABLE 9 Moderation analysis results.

Moderator	Direct effect (β)	Interaction effect (β)	t	*p*	R^2	F	Sig.
Moral obligation	0.366	0.126	2.41	0.016	0.122	22.9885	Significant
Emotional involvement	0.367	0.033	0.55	0.583	0.112	20.9304	Not significant
Perceived self-efficacy	0.375	−0.059	−0.82	0.411	0.113	20.9809	Not significant

PROCESS Model 1 (Hayes, 2022). Variables were mean-centered prior to analysis. The focal predictor was the marketing communication index. The cognitive-informational marketing communication index was operationalized as the five-item Informing scale. All overall models (*F*-tests) significant at $p < .001$; "Sig." column refers to the interaction effect specifically.

magnitude from low ($\beta = 0.277$) through average ($\beta = 0.402$) to high ($\beta = 0.528$) levels of felt moral obligation, with the effect nearly doubling between the lowest and highest moral obligation values observed in the sample.

Neither emotional involvement ($\beta = 0.033$, $p = 0.583$) nor self-efficacy ($\beta = -0.059$, $p = 0.411$) significantly moderated the relationship. H_3 is therefore partially supported: the cognitive-informational marketing communication index is more strongly associated with sustainable consumer behavior among consumers with stronger felt moral obligation, but this relationship does not depend on emotional involvement or perceived self-efficacy.

TABLE 10 Conditional effects of marketing communication index at different levels of moral obligation.

Level of moral obligation	Effect (β)	t-value	*p*-value	Confidence interval (95%)
Low moral obligation (16th percentile)	0.277	4.474	<0.0001	[0.1553; 0.3986]
Average moral obligation (50th percentile)	0.402	8.274	<0.0001	[0.3068; 0.4980]
High moral obligation (84th percentile)	0.528	6.642	<0.0001	[0.3717; 0.6840]

The cognitive-informational marketing communication index was operationalized as the five-item Informing scale. Conditional effects were estimated using PROCESS Model 1. Moral obligation was mean-centered prior to analysis.

4.6 Attitude-behavior gap

A paired-sample *t*-test was conducted to assess the discrepancy between perceived environmental responsibility and self-reported sustainable consumer behavior (Table 11).

The analysis revealed a statistically significant discrepancy [mean difference = 0.28, $t(501) = 6.301$, $p < 0.001$, Cohen's $d = 0.28$], indicating the presence of an attitude–behavior gap. The correlation between perceived responsibility and self-reported behavior was negligible ($r = 0.017$, $p = 0.705$), indicating that self-assessed environmental responsibility is essentially unrelated to reported behavioral enactment. These findings corroborate the theoretical premise of the study and underscore the importance of identifying mechanisms that can help reduce this gap, such as value activation through marketing communication.

4.7 Summary of hypothesis testing

The summary of hypothesis testing is presented in Table 12. The results indicate that sustainability importance plays a central mediating role in the relationship between the cognitive-informational marketing communication index and sustainable consumer behavior, while felt moral obligation acts as a significant moderator. Other proposed mediating and moderating effects were not supported.

5 Discussion

This study examined psychological mechanisms through which marketing communication relates to sustainable consumer behavior among Slovenian consumers. The findings suggest that cognitive-informational aspects of sustainability communication are associated with sustainable behavior partly by strengthening sustainability importance, while moral obligation functions as a boundary condition that amplifies communication effectiveness.

5.1 Perceived sustainability importance as the central mechanism

A central finding is the pivotal role of sustainability importance in explaining sustainable consumer behavior. This finding is consistent with the Value–Belief–Norm framework (Stern, 2002), which conceptualizes values as the foundational drivers of environmentally significant behavior. Prior research

TABLE 11 Results of the paired sample *t*-test for attitude-behavior gap.

Measure	Mean	Std. dev.	Correlation	t	*p*-value
Perceived responsibility	3.98	0.77	0.017	6.301	<0.001***
Self-reported sustainable behavior	3.70	0.65	$p = 0.705$		
Mean difference	0.28	1.002			

***$p < 0.001$.

TABLE 12 Summary of hypothesis testing.

Hypothesis	Result
H_1: Marketing communication is positively associated with psychological factors	Partially supported. MC was significantly associated with sustainability importance through informing and moral obligation through positive emotions, but not with emotional involvement or self-efficacy.
H_{2a}: Sustainability importance mediates the relationship between marketing communication and sustainable behavior.	Supported. Sustainability importance significantly mediates the relationship between cognitive-informational marketing communication and sustainable behavior.
H_{2b}: Moral obligation mediates the relationship between marketing communication and sustainable behavior.	Not supported.
H_{2c}: Emotional involvement mediates the relationship between marketing communication and sustainable behavior.	Not supported.
H_{2d}: Self-efficacy mediates the relationship between marketing communication and sustainable behavior.	Not supported.
H_{3a}: Moral obligation moderates the relationship between marketing communication and sustainable behavior.	Supported. Moral obligation significantly moderates the relationship between cognitive-informational marketing communication and sustainable behavior, with the effect of marketing communication being stronger at higher levels of moral obligation.
H_{3b}: Emotional involvement moderates the relationship between marketing communication and sustainable behavior.	Not supported.
H_{3c}: Self-efficacy moderates the relationship between marketing communication and sustainable behavior.	Not supported.

demonstrates that biospheric values are among the strongest predictors of pro-environmental action across consumption contexts (Al Mamun et al., 2022; Onel, 2023; Saari et al., 2021).

The results further indicate that cognitive-informational marketing communication is associated with sustainable consumer behavior primarily through stronger perceptions of the personal relevance of sustainability. Communication that emphasizes factual environmental information appears particularly effective in reinforcing sustainability importance, consistent with social marketing research highlighting the role of informational content in shaping cognitive evaluations of sustainability (David and Rundle-Thiele, 2018; Eagle et al., 2013).

These findings highlight value activation as a potential mechanism linking cognitive-informational marketing communication and sustainable consumer behavior. Nevertheless, given the exploratory operationalization of several psychological constructs and the use of regression-based analyses, the proposed model should be interpreted as a preliminary explanatory framework rather than a fully validated theoretical model. Moreover, the mediation effect explains only approximately one-third of the total effect, indicating that a substantial proportion of the communication–behavior relationship remains unexplained and may involve additional psychological or contextual factors.

5.2 The differential roles of psychological factors

Contrary to expectations derived from the theoretical framework, several psychological factors traditionally associated with sustainable consumer behavior did not exert direct behavioral effects. In particular, moral obligation, emotional involvement, and perceived self-efficacy did not independently predict sustainable consumer behavior nor mediate the cognitive-informational communication–behavior relationship. This finding also suggests that the role of SCT within the present model is limited primarily to the construct of self-efficacy rather than to the broader theoretical framework proposed by Bandura (1986).

The absence of a direct behavioral effect of moral obligation highlights an important nuance in the application of VBN theory. Although personal norms are often described as central drivers of pro-environmental action (Stern, 2002), empirical studies have increasingly shown that moral responsibility alone does not consistently translate into behavioral change, particularly in consumption contexts where structural barriers may limit behavioral expression (Carrington et al., 2010; Gupta and Ogden, 2009; Harring et al., 2011). The present findings support this interpretation, suggesting that moral conviction may require additional triggers to translate into action, such as persuasive communication or contextual incentives.

Emotional involvement and perceived self-efficacy also did not directly predict behavior, suggesting that situational constraints may attenuate the behavioral impact of psychological dispositions.

The modest explanatory power of behavioral models should be interpreted in light of the complexity of sustainable consumption decisions. The relatively low R^2 values indicate that cognitive-informational marketing communication and psychological factors explain only a limited portion of variance in sustainable consumer behavior. This suggests that behavioral outcomes are also shaped by structural constraints such as price, product availability, convenience, and habitual consumption patterns. Consequently, models focusing solely on psychological variables typically explain a limited share of behavioral variance, as documented in prior meta-analyses of pro-environmental behavior (Bamberg and Möser, 2007; Klöckner, 2013). The present findings therefore align with existing research indicating that psychological determinants represent only one component of a broader set of factors influencing sustainable consumption behavior.

5.3 Moral obligation as a moderator

Although moral obligation did not directly predict sustainable consumer behavior, it played a significant moderating role in the relationship between cognitive-informational marketing communication and behavioral outcomes. Consumers with stronger moral convictions toward sustainability were more responsive to communication messages encouraging environmentally responsible consumption.

Although the interaction effect explains only a small additional proportion of variance, small moderating effects are common in behavioral research, particularly when examining psychological boundary conditions (Aguinis et al., 2005). The importance of the finding lies in how moral obligation shapes responsiveness to sustainability communication.

This pattern suggests that moral obligation functions less as a behavioral driver and more as a contextual condition shaping the effectiveness of persuasive communication. This interpretation is consistent with the elaboration likelihood model (Petty and Cacioppo, 1986), which proposes that personal relevance increases individuals' motivation to process persuasive information through central cognitive routes.

From a theoretical perspective, this finding offers a refinement of the traditional VBN causal chain. Rather than functioning as a mediating link that directly transmits values into behavior, moral obligation may operate as a readiness factor that amplifies the impact of external communication stimuli. This reinterpretation helps explain why moral norms sometimes display inconsistent behavioral effects in empirical studies and highlights their potential role as moderators in persuasion-based contexts.

Practically, the result implies that sustainability communication strategies may be particularly effective among consumer segments characterized by stronger moral engagement with environmental issues. For audiences with weaker moral orientations, communication efforts may need to first increase awareness of environmental responsibility before behavioral appeals can be effective.

5.4 Marketing communication: informing vs. emotional appeals

The findings provide insight into how specific communication attributes are associated with psychological responses to sustainability messaging. Informing emerged as a particularly

important driver of perceived sustainability importance, suggesting that consumers respond positively to communication that clearly explains the environmental implications of consumption choices. Prior research similarly suggests that clear and transparent sustainability information enhances consumer understanding and behavioral motivation (White et al., 2019a).

Emotional appeals also shape psychological responses to sustainability communication, although their effects operate through different mechanisms. Positive emotions such as pride and inspiration can reinforce consumers' moral obligation toward sustainability, whereas negative emotional appeals may sometimes produce defensive reactions that undermine moral motivation. Previous studies have similarly shown that guilt- and fear-based messages can trigger psychological resistance when individuals perceive the message as threatening or accusatory (Antonetti and Maklan, 2014; Brennan and Binney, 2010). However, the positive association between negative emotional appeals and sustainable consumer behavior observed in the regression analysis suggests that emotions such as concern or guilt may also function as behavioral triggers when they highlight the consequences of unsustainable consumption. In such cases, moderate levels of negative emotion may increase perceived urgency and motivate pro-environmental action.

Interestingly, the present findings suggest that positive emotional appeals may be associated with lower perceived self-efficacy. One possible explanation is that highly inspirational sustainability messages may inadvertently create the impression that meaningful environmental change requires substantial individual effort or resources. When sustainability challenges are framed as large-scale societal problems, individuals may perceive their personal contribution as limited, which can reduce perceived self-efficacy (White et al., 2019a).

These findings suggest that effective sustainability communication may require a balanced combination of informational clarity and positive emotional framing. Integrating cognitive and affective elements appears to allow communication strategies to simultaneously reinforce sustainability importance and strengthen moral obligation.

5.5 The attitude–behavior gap

The results support the persistence of the attitude–behavior gap widely documented in sustainability research. Although respondents expressed strong environmental responsibility, this orientation did not translate into consistent self-reported sustainable consumption behavior. The absence of a meaningful relationship between perceived responsibility and reported behavior illustrates the difficulty of converting favorable attitudes into concrete behavioral action.

This discrepancy has long been recognized in sustainable consumption research (Kollmuss and Agyeman, 2002; Vermeir and Verbeke, 2006). Consumers may support environmental goals in principle while facing practical constraints that limit behavioral change, including price differentials, limited product availability, or habitual purchasing patterns.

The mediation findings of this study suggest a potential pathway for narrowing this gap. Cognitive-informational marketing communication that strengthens the perceived personal importance of sustainability appears capable of translating diffuse pro-environmental attitudes into more concrete behavioral orientations. By activating values that make sustainability personally meaningful, communication may facilitate the psychological transition from passive support to active behavioral engagement.

5.6 Contextual considerations: Slovenia and the CEE region

The findings should be interpreted within the socio-economic context of Slovenia and the broader Central and Eastern European (CEE) region, where evolving consumer cultures and varying levels of institutional trust shape responses to sustainability communication. Previous research suggests that consumers in CEE markets may display greater skepticism toward corporate sustainability claims than consumers in Western markets (Ur Rahman et al., 2023; Van Mierlo and Beers, 2020).

At the same time, the positive moderating role of moral obligation observed in this study may reflect the continuing importance of collective values within post-socialist societies. Cultural orientations that emphasize social responsibility and collective well-being may reinforce the role of moral considerations in shaping responses to sustainability communication.

5.7 Practical implications

The findings offer several implications for marketing practitioners and policymakers. First, sustainability communication strategies should prioritize cognitive-informational clarity. Communication that explains the environmental consequences of consumption choices and highlights the tangible benefits of sustainable alternatives is likely to be more effective than purely emotional messaging.

Second, positive emotional framing can complement informational content by strengthening consumers' moral obligation toward sustainability. Appeals that evoke pride, optimism, and a sense of contribution may be more effective than fear- or guilt-based messaging, which can sometimes trigger defensive responses.

Third, segmentation strategies may enhance the effectiveness of sustainability campaigns. Consumers with stronger moral obligation toward sustainability appear particularly receptive to communication messages, suggesting that targeted communication strategies could increase behavioral impact.

Finally, the results highlight the limits of communication alone. Structural interventions, such as improving the accessibility, affordability, and availability of sustainable products, remain essential for translating psychological motivation into consistent behavioral change.

5.8 Limitations and future research

Several limitations of the study should be acknowledged. The cross-sectional design restricts causal inference, and future

research should employ longitudinal approaches to examine how sustainability communication relates to behavior change over time. In addition, the reliance on self-reported measures introduces the possibility of social desirability bias. Incorporating objective behavioral indicators, such as purchase records or consumption tracking, would provide stronger behavioral validation.

Because all variables were collected through the same self-reported questionnaire at a single point in time, common method bias cannot be ruled out and constitutes an inherent limitation of the present design. As noted in Section 3.4, Harman's single-factor test was conducted as an ancillary descriptive check; however, this procedure has well-documented diagnostic limitations and is not considered sufficient evidence against common method bias (Podsakoff et al., 2003). Future research should apply more rigorous procedures such as marker variables or latent method factor approaches within a structural equation modelling frameworks.

Another limitation concerns measurement. Sustainability importance and moral obligation were assessed using single-item indicators after multi-item scales failed to demonstrate internal consistency. Although these items captured focused evaluative and normative dimensions relevant to the study, single-item measurement limits the ability to assess reliability and measurement error. Future research should employ validated multi-item scales, such as the New Ecological Paradigm scale (Dunlap et al., 2000) for environmental values and established VBN personal norm measures (Stern et al., 1999), to provide a more comprehensive assessment of these constructs.

Furthermore, the present study focused on value salience and moral engagement as communication-related mechanisms and did not directly measure behavioral intention. Future research should integrate behavioral intention and test whether sustainability importance operates upstream of, parallel to, or alongside intention in shaping sustainable consumer behavior.

The study relied on PROCESS-based mediation and moderation analyses rather than structural equation modelling (SEM). While PROCESS provides robust estimation of conditional effects, it does not allow simultaneous estimation of the full structural and measurement model. Consequently, the proposed Value Activation Model was tested through a series of regression-based analyses rather than through a unified structural model. Although the cognitive-informational marketing communication index was operationalized as the five-item Informing scale and supplementary mediation analyses showed that Informing produced a stronger indirect effect through sustainability importance than the other communication dimensions, the present design did not estimate the joint and unique contributions of all communication dimensions and psychological mechanisms simultaneously. Future research should therefore employ validated multi-item measurement scales and apply SEM to assess measurement validity, structural relationships, and potentially overlapping or distinct psychological pathways.

The study was also conducted within a single national context. Cross-cultural research comparing Western and Central–Eastern European markets would provide valuable insights into how cultural and institutional contexts influence the effectiveness of sustainability communication.

Finally, future research should incorporate structural variables such as price sensitivity, product availability, and convenience. Integrating psychological and structural determinants within a single analytical framework could provide a more comprehensive explanation of sustainable consumer behavior.

5.9 Contribution to literature

This study contributes to the sustainability communication literature in three ways.

First, by directly comparing five communication dimensions in supplementary mediation analyses, the study empirically identifies the cognitive-informational dimension of marketing communication as the primary pathway through which marketing communication activates sustainability importance. Although affective, evaluative, and credibility-related dimensions also produced statistically significant indirect effects, their magnitudes were 2.3–3.4 times smaller than those observed for Informing. This empirical differentiation extends prior research on the role of values in predicting pro-environmental behavior by clarifying which type of marketing communication is most effective in activating the perceived importance of sustainability.

Second, the findings refine the role of moral obligation within the sustainability communication framework. Rather than acting as a direct driver of behavior, moral obligation appears to function as a boundary condition that amplifies the effectiveness of sustainability communication.

Third, the study proposes a parsimonious conceptual framework—the Value Activation Model—in which cognitive-informational marketing communication activates sustainability importance, which in turn relates to sustainable behavior, while moral obligation moderates this relationship. By conceptualizing sustainability communication as a mechanism that activates value salience in everyday consumer decisions and practices, the study offers a communication-focused extension of the value-based explanations of sustainable consumer behavior.

6 Conclusions

This study examined how marketing communication relates to sustainable consumer behavior through psychological factors among Slovenian consumers. The findings provide preliminary support for a Value Activation Model in which cognitive-informational marketing communication is associated with sustainable consumer behavior primarily by strengthening sustainability importance. Sustainability importance reflects the perceived personal importance of sustainability, while moral obligation functions as a boundary condition that amplifies communication effectiveness.

Three key findings emerge. First, sustainability importance represents the central psychological mechanism linking cognitive-informational marketing communication and sustainable consumer behavior. Communication that strengthens sustainability importance, particularly through informational content, appears most effective in translating pro-environmental concern into behavioral commitment.

Second, moral obligation does not directly predict behavior but moderates the effectiveness of sustainability communication. Consumers with stronger moral convictions are more responsive to sustainability messages, suggesting that moral obligation functions as a readiness factor for persuasion rather than a direct behavioral driver.

Third, the results support the persistence of the attitude–behavior gap: favorable environmental attitudes do not automatically translate into consistent sustainable consumer behavior. The findings suggest that this gap may be partially reduced when cognitive-informational marketing communication is associated with stronger sustainability importance that makes sustainability personally meaningful to consumers.

The study contributes to sustainability communication research by identifying value activation as a potential psychological mechanism linking cognitive-informational marketing communication and sustainable consumer behavior. For practitioners, the results suggest that sustainability campaigns should prioritize clear informational messaging, reinforce moral engagement through positive emotional framing, and emphasize transparency and credibility—particularly in Central and Eastern European markets where institutional trust may be lower.

These conclusions should be interpreted in light of the study's limitations, including the cross-sectional design, reliance on self-reported measures, single-item indicators for sustainability importance and moral obligation, and the use of regression-based rather than structural-equation analyses. Accordingly, the proposed Value Activation Model should be understood as an exploratory and communication-focused framework rather than a fully validated theoretical model. Future research should employ longitudinal designs, objective behavioral indicators, validated multi-item scales, structural equation modelling, and cross-cultural samples to further test and extend the proposed Value Activation Model.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Human Research Ethics Committee, University of Novo mesto, Slovenia (UNM 31/2024). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SK: Writing – review & editing, Methodology, Writing – original draft, Investigation, Conceptualization, Visualization, Validation, Formal analysis, Data curation. KE: Writing – original draft, Writing – review & editing, Supervision.

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