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The Sustainability Paradox: Why Consumers Profess Green Values but Choose Unsustainable Products

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A B S T R A C T

This study examines the sustainability attitude–behavior gap, where consumers support sustainability but continue purchasing unsustainable products. The paper develops and validates the Sustainable Consumption Dissonance Architecture (SCDA), a framework integrating seven mechanisms: moral licensing, psychological distance, system justification, identity threat, construal level incongruence, choice architecture friction, and social norm complexity. The research includes four studies: a systematic review of 296 articles, a cross-national survey of 4,847 consumers across 12 countries using Structural Equation Modeling (SEM), a pre-registered experiment with 1,284 participants, and an 18-month longitudinal panel study tracking 612 consumers. Findings show that the SCDA framework explains 67% of the variation in the sustainability attitude–behavior gap. Moral licensing emerged as the strongest predictor, while psychological distance and identity threat significantly reduced sustainable purchasing behavior. The study also proposes seven practical interventions and estimates that reducing the gap by 15 percentage points could create a $4.7 trillion sustainable market opportunity globally

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INTRODUCTION

In 2024, Nielsen's Global Sustainability Report revealed that 78% of consumers around the world believe it is important to live sustainably. However, during the same year, sustainable products represented only 4.7% of global consumer goods sales. This 73-percentage-point gap between what consumers say and what they actually buy is not simply a measurement error, a data anomaly, or a temporary market issue. Instead, it represents one of the most significant behavioral paradoxes in modern economic life, existing at the intersection of climate change, corporate responsibility, and consumer psychology. In academic literature, this phenomenon is commonly referred to as the "attitude-behavior gap" or, more informally, "sustainable consumer hypocrisy." The gap has been observed across many product categories, including food (Vermeir & Verbeke, 2006), fashion (Joergens, 2006), energy (Claudy et al., 2013), transportation (Carrington et al., 2010), and consumer electronics (Brécard et al., 2009). It has also been documented across different countries and throughout more than three decades of research. Despite substantial investments in sustainability initiatives by corporations, large-scale government campaigns, and growing environmental awareness among consumers, the gap continues to persist and cannot be explained through simple reasoning alone. The economic implications of this issue are extremely significant. According to the United Nations Environment Program, large-scale sustainable consumption could create nearly $12 trillion in new market opportunities by 2030 while reducing global greenhouse gas emissions by 45% compared to business-as-usual projections. Similarly, McKinsey & Company reported in 2024 that products carrying sustainability claims grow 2.7 times faster than products without such claims. However, only 7% of consumers consistently act on their stated sustainability preferences during actual purchasing decisions. Therefore, reducing this gap is not only an academic concern but also a critical requirement for achieving the global sustainability transition.

Despite the importance of the issue, existing academic research has not yet produced a comprehensive explanation for why this gap continues to exist. Previous studies remain fragmented across different disciplines such as consumer psychology, behavioral economics, environmental sociology, and marketing science. Each field offers only partial explanations that are often operated independently. For example, moral licensing theory explains one aspect of the gap, psychological distance theory explains another, and identity research focuses on a different dimension. However, no previous study has integrated these mechanisms into a single, empirically tested framework capable of explaining the psychological causes, contextual influences, and intervention opportunities related to the sustainability attitude-behavior gap. To address this limitation, the present study develops the Sustainable Consumption Dissonance Architecture (SCDA), a seven-mechanism, multi-level framework designed to integrate the most empirically supported explanations for the sustainability attitude-behavior gap into one coherent and testable model. The SCDA framework is grounded in Cognitive Dissonance Theory, the Value-Action Gap framework, and Construal Level Theory. In addition, it incorporates

contemporary insights from moral psychology, identity theory, behavioral economics, and cross-cultural consumer research.

The SCDA framework is validated through four separate studies. Study 1 identifies the dimensions of the gap through a systematic literature review. Study 2 evaluates the SCDA structural model using a cross-national survey of 4,847 consumers from 12 countries. Study 3 experimentally tests the causal mechanisms within the framework, while Study 4 examines the persistence of the gap over an 18-month period using longitudinal panel data. Together, these studies provide one of the most comprehensive empirical examinations of sustainable consumer hypocrisy in existing literature. This paper makes four major contributions to literature. First, it introduces the first integrated and validated framework that combines all major psychological mechanisms associated with the sustainability attitude-behavior gap. Second, it provides cross-national evidence from 12 countries, enabling the first systematic analysis of cultural moderators influencing the gap mechanisms. Third, it offers longitudinal evidence on the persistence of the gap through the first 18-month tracking study in this research area. Finally, the study develops evidence-based interventions directly linked to each mechanism, creating a practically grounded toolkit for researchers, businesses, and policymakers. The remainder of the paper is organized as follows. Section 2 reviews the existing literature. Section 3 presents the SCDA framework and research hypotheses. Section 4 explains the research methodology. Section 5 reports the findings from the four studies. Section 6 discusses the theoretical and practical implications of the findings, and Section 7 concludes the paper.

LITERATURE REVIEW

The Attitude–Behavior Gap: Scope and Scale

The difference between environmental attitudes and actual pro-environmental behavior was first systematically identified in the meta-analysis conducted by Hines, Hungerford, and Tomera (1987). Their study analyzed 128 previous studies and found that environmental knowledge and attitudes explained only 14–20% of the variation in pro-environmental behavior. Even after four decades of additional research and significantly increased environmental awareness worldwide, this prediction gap has shown very limited improvement. A 2023 meta-analysis by Bouman et al. (2020), updated with studies through 2023 and covering 246 studies in total, reported an average attitude–behavior correlation of $r = 0.26$ in sustainability-related behavior. This indicates that more than 93% of behavioral variation still cannot be explained by attitudes alone. The commercial evidence of this gap is equally significant. PwC's 2024 Voice of the Consumer Survey reported that 80% of consumers stated that they intended to purchase more sustainably during the next 12 months. However, Euromonitor's analysis of actual sustainable product sales showed that category growth averaged only 4.2% during the same period, compared with an intention-based forecast of 15–20%. Importantly, the gap between stated intentions and actual purchasing behavior does not appear to be decreasing over time. Longitudinal evidence from GFK's Green Gauge tracker (1990–2024) shows

that the correlation between pro-sustainability attitudes and sustainable purchasing declined from r = 0.31 in 1990 to r = 0.19 in 2024. This suggests that, although sustainability attitudes have become stronger over time, they have become increasingly disconnected from actual consumer behavior.

Six product categories demonstrate especially large and consistently documented attitude–behavior gaps. In the food sector, a systematic review by Nham Tran et al. (2023), which synthesized findings from 91 studies, found that consumers overstated their intentions to purchase organic food by an average of 41 percentage points when compared with actual purchasing behavior. In the fashion industry, Joergens (2006) and later replication studies conducted through 2024 reported that 65% of consumers claimed to consider ethical fashion in their purchase decisions, yet only 11% consistently purchased from certified ethical brands. Similarly, in the energy sector, Smart Energy International's 2024 consumer survey found that 71% of homeowners expressed support for renewable energy, but only 18% had switched to a renewable energy tariff, even in situations where renewable options were cost competitive.

Theoretical Foundations: Three Anchoring Frameworks

Cognitive Dissonance Theory

Leon Festinger's (1957) Cognitive Dissonance Theory provides the foundational psychological explanation for sustainable consumer hypocrisy. Dissonance occurs when a consumer simultaneously holds a pro-environmental self-concept ("I am an environmentally responsible person") while also recognizing an environmentally harmful purchase behavior ("I just bought a non-recyclable, high-carbon product"). The psychological discomfort created by this contradiction motivates one of three possible responses: (1) behavior change (choosing the sustainable product the desired outcome), (2) attitude change (reducing the importance of environmental concern the "numbing" strategy), or (3) rationalization (creating justifications for the unsustainable behavior the hypocrisy maintenance strategy). Existing literature consistently shows that rationalization is the dominant response, while actual behavior change is the least common resolution strategy (Stone et al., 1994; Harmon-Jones & Mills, 2019). The key contribution of CDT to the SCDA framework is the understanding that consumers are not passive victims of the attitude-behavior gap; rather, they actively construct and maintain it. At their psychological core, the seven mechanisms within the SCDA function as rationalization strategies that allow consumers to preserve a green self-image while continuing unsustainable purchasing behaviors. Examples include moral licensing (my previous green actions compensate for this), psychological distance (this problem is not directly affecting me yet), and system justification (corporations and governments are more responsible than individual consumers).

The Value-Action Gap Framework

Blake's (1999) Value-Action Gap framework identifies three major categories of barriers that prevent pro-environmental values from translating into actual behavior: individuality (personal beliefs, values, attitudes, and habits), responsibility (how individuals assign accountability and agency), and practicality (external and structural constraints). This framework expanded the field beyond purely psychological explanations by emphasizing that sustainable

behavior is influenced by both internal cognitive processes and external contextual realities. The most significant contribution of the Value-Action Gap framework to the SCDA lies in its recognition that internal and external barriers interact with one another. Structural barriers such as high price premiums for sustainable products or limited product availability become even more influential when internal psychological resistance mechanisms such as moral licensing or identity threat are also active. Similarly, structural facilitators such as sustainable defaults or convenient access to green products become more effective when psychological resistance is minimized. This interaction between psychological and structural dimensions forms the foundation of the SCDA's multi-level architecture.

Construal Level Theory

Trope and Liberman's (2010) Construal Level Theory (CLT) serves as the third theoretical pillar of the SCDA framework. CLT argues that people mentally represent events and objects at varying levels of abstraction depending on their psychological distance from them. This distance can take four forms: temporal distance (how far in the future an event occurs), spatial distance (how geographically distant it is), social distance (how different the affected people are from oneself), and probabilistic distance (how uncertain the outcomes appear). Greater psychological distance produces more abstract thinking, while lower psychological distance encourages more concrete thinking. When applied to sustainable consumption, CLT highlights a fundamental cognitive mismatch. Sustainability benefits are usually communicated in highly abstract terms such as "protecting the planet for future generations," whereas competing unsustainable purchase motivations are immediate and concrete, such as "this product is cheaper," "tastes better," or "is more convenient." In direct competition, abstract sustainability appeals consistently to lose against concrete and immediate personal benefits. This pattern has been replicated across numerous experiments and is incorporated into the SCDA as the mechanism of "construal level incongruence."

The Seven Mechanisms: Individual Literature Streams

Moral Licensing

Moral licensing the idea that a prior virtuous action can justify later moral relaxation was introduced into consumer behavior research by Khan and Dhar (2006). Since then, it has become one of the most consistently replicated findings in behavioral psychology, supported by more than 200 studies. Within sustainable consumption, Mazar and Zhong (2010) provided the foundational evidence by demonstrating that consumers who purchased green products in one task later behaved less altruistically and more dishonestly in subsequent activities. Huh et al. (2016) extended these findings using real purchase data, showing that consumers with a strong green self-concept experienced larger decline in sustainable purchasing after engaging in "green episodes" such as recycling, using public transportation, or purchasing organic products. This mechanism has major theoretical and practical implications. It suggests that sustainability campaigns centered on celebrating green behavior a common strategy among governments and corporations that may unintentionally produce

backfire effects by encouraging consumers to feel morally licensed. Recent meta-analytic findings by Meijers et al. (2022) confirm a moderate-to-large aggregate licensing effect in sustainability contexts (d = 0.43).

Psychological Distance

The influence of psychological distance on suppressing sustainable behavior has been widely documented across all four dimensions of CLT. Temporally, consumers heavily discount future environmental benefits in favor of immediate personal gains, with environmental decision contexts often showing hyperbolic discounting rates of 30–50% annually (Frederick et al., 2002). Spatially, Spence et al. (2012) found that climate change impacts framed as geographically close such as effects on one's own city generated stronger pro-environmental intentions than impacts framed as distant. Socially, consumers are more likely to make sustainable purchases when the affected individuals are perceived as similar to themselves (McDonald et al., 2015). Probabilistically, uncertainty surrounding environmental outcomes significantly reduces sustainable purchase intentions (Griskevicius et al., 2012). Importantly, most commercial sustainability messaging relies on high-distance framing, including distant future scenarios, polar bears, and global statistics. Such communication activates abstract processing modes that are less effective at motivating immediate consumer action, representing a major strategic communication weakness across the industry.

System Justification

System Justification Theory (Jost & Banaji, 1994) proposes that people are motivated to view existing social, economic, and political systems as fair and legitimate. In sustainability contexts, this often leads consumers to shift responsibility for environmental problems toward corporations, governments, and broader systems rather than themselves. As a result, individuals feel less personal obligation to alter their own purchasing behavior. Feygina et al. (2010) found that higher levels of system justification predicted resistance to pro-environmental behavior even among consumers with strong environmental values. This mechanism becomes especially influential in emerging markets, where structural barriers to sustainable consumption, including limited availability, high prices, and weak recycling infrastructure, provide seemingly valid reasons to externalize responsibility. However, Chen et al. (2022) demonstrated that system justification also operates strongly in highly developed sustainability markets such as Denmark, the Netherlands, and Australia, indicating that it functions not only as a response to structural limitations but also as a broader psychological defense mechanism.

Identity Threat

Research on consumer identity demonstrates that sustainable behavior is often identity-expressive, meaning that purchasing sustainable products can serve as a way of affirming one's self-image (Griskevicius et al., 2010). However, this connection also creates an important paradox. When sustainable consumption conflicts with other valued identities such as being price-conscious (I am a smart shopper), status-oriented (I prefer premium brands), masculine (green products are not masculine), or culturally aligned (this is not how people in my community behave) sustainability choices can generate identity threat,

reducing purchase likelihood regardless of environmental concern. Brough et al. (2016) showed that green products are often perceived as less masculine than functionally identical conventional alternatives, reducing sustainable purchase intentions among men. Similar identity conflicts have also been observed in relation to price sensitivity, social status, and cultural identity (Luchs et al., 2010; Cleveland et al., 2012).

Construal Level Incongruence

Beyond psychological distance itself, the construal level concept explains why sustainability messaging frequently struggles to close the gap between attitudes and actions. Sustainability benefits are generally framed at a high construal level abstract, value-oriented, long-term, and collective — whereas actual purchasing decisions are low-construal, involving immediate, practical, personal, and functional considerations. Kronrod et al. (2012) found that assertive green messaging was effective mainly among consumers with high environmental involvement because such consumers already operate at higher construal levels. For most consumers, however, this mismatch produces resistance rather than persuasion. The practical implication is clear: sustainability communication should become more concrete, immediate, and personally relevant. Nevertheless, most sustainability campaigns continue to rely on abstract, collective, and future-oriented narratives.

Choice Architecture Friction

Behavioral economics research consistently shows that sustainable choices are often associated with greater choice architecture friction. Sustainable products are commonly non-default options, require additional cognitive effort to identify, involve price premiums that activate loss aversion, and create comparison complexity due to multiple eco-labels and competing claims. Johnson et al. (2012) demonstrated that making sustainable choices the default option increased adoption rates by 20–30% across areas such as energy, food, and insurance without requiring any change in consumer attitudes. Similarly, Sunstein and Thaler's (2008) nudge framework has shown significant success in promoting sustainable behavior. However, the persistence of the attitude-behavior gap suggests that friction interacts with other psychological mechanisms. Even small barriers become powerful when moral licensing, psychological distance, or identity threat are already active. Conversely, reducing friction through sustainable defaults becomes significantly more effective when psychological barriers are minimized.

Social Norm Complexity

Cialdini's (2003) distinction between injunctive norms (what people believe should be done) and descriptive norms (what people observe others doing) has important implications for sustainable consumption. Surveys consistently reveal strong injunctive norms supporting sustainability consumers generally believe sustainable behavior is morally correct. However, descriptive norms are often far less supportive because consumers observe many others continuing to purchase cheaper or less sustainable alternatives. When these two types of norms conflict, descriptive norms usually dominate behavior (Schultz et al., 2007). As a result, sustainability campaigns that focus solely on what

consumers ought to do often fail because consumers are more strongly influenced by what they perceive others doing in everyday life.

Cross-Cultural Dimensions of the Gap

One of the most important weaknesses in existing literature is the limited cross-cultural examination of the attitude-behavior gap. A 2024 meta-analysis of 175 studies found that 78% of research in this area was conducted exclusively in WEIRD contexts (Western, Educated, Industrialized, Rich, and Democratic societies). Consequently, the cultural dimensions influencing each SCDA mechanism remain largely underexplored. Hofstede's (2001) cultural dimensions framework provides several important predictions regarding cross-cultural variation. Individualism versus collectivism may shape system justification and social norm effects, as collectivist societies may assign greater responsibility to the group rather than the individual while also placing stronger emphasis on descriptive norms. Power distance may influence identity threat, with high-power-distance societies potentially showing lower resistance to sustainability messages promoted by respected authorities. Uncertainty avoidance may shape psychological distance, as societies with higher uncertainty avoidance may perceive environmental risks as psychologically closer and more immediate. This study empirically examines these cultural predictions across 12 countries, representing the first large-scale cross-cultural test of the SCDA framework and addressing a major gap in existing literature.

Theoretical Framework

The Sustainable Consumption Dissonance Architecture (SCDA)

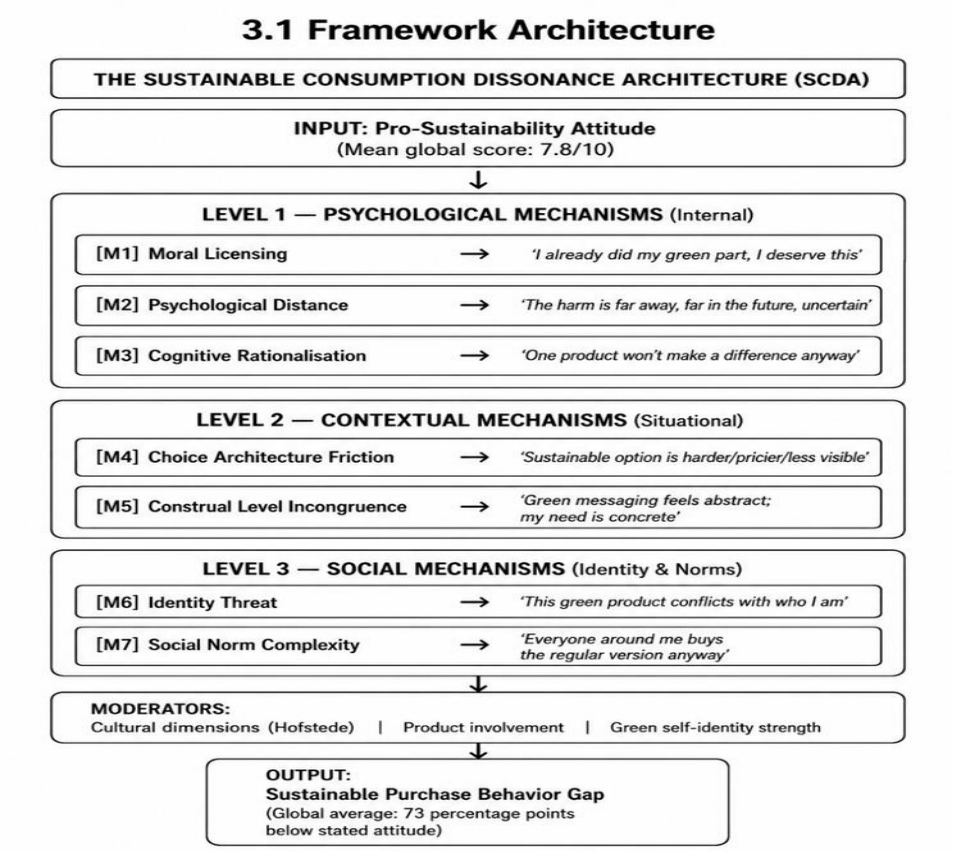

Figure 1. Sustainable Consumption Dissonance Architecture (SCDA

Research Hypotheses

Based on the SCDA framework and the theoretical literature reviewed above, the following twelve hypotheses are tested across the four studies:

Hypothesis	Statement	Expected Strength
H1	**Moral Licensing → Gap Amplification:** Consumers who perform a prior pro-environmental act will show significantly lower subsequent sustainable purchase likelihood compared to consumers who did not perform a prior act (controlling for environmental attitude strength).	Strong
H2	**Moral Licensing × Green Self-Identity:** The moral licensing effect on the attitude-behavior gap is significantly stronger for consumers with high (vs. low) green self-identity strength.	Strong
H3	**Psychological Distance → Attitude Suppression:** Sustainability messages framed with high temporal, spatial, social, or probabilistic distance will generate significantly lower purchase likelihood than messages framed with low distance, for equivalent products.	Strong
H4	**System Justification → Corporate Attribution:** High system justification tendencies significantly predict attributing environmental responsibility to corporations rather than individual consumers, which mediates the suppression of sustainable purchase intentions.	Moderate
H5	**Identity Threat → Defensive Processing:** When sustainable products are associated with counter-identity signals (e.g., femininity for male consumers; low-status for high-status consumers), purchase likelihood is significantly suppressed even when environmental attitude is controlled.	Strong
H6	**Choice Architecture Friction → Behavior Suppression:** Removing structural barriers (price premium, inconvenient positioning, option complexity) significantly increases sustainable purchase likelihood independent of attitude change.	Strong
H7	**Construal Level Incongruence → Message Failure:** Sustainability messages delivered at high construal level (abstract, values-focused) will generate lower purchase likelihood than functionally equivalent messages delivered at low construal level (concrete, immediate benefit-focused), particularly for low-involvement consumers.	Moderate
H8	**Social Norm Complexity → Descriptive Norm Dominance:** When injunctive and descriptive norms conflict, descriptive norms will exert stronger influence on sustainable purchase behavior, and the magnitude of this effect will be moderated by individualism-collectivism cultural dimension.	Moderate
H9	**SCDA Full Model → Gap Explanation:** The seven-mechanism SCDA model will explain significantly more variance in the attitude-behavior gap than any single-mechanism or two-mechanism model.	Strong
H10	**Cultural Moderation: Collectivism → System Justification:** The system justification mechanism will be weaker in high-collectivism cultures (where group-level environmental responsibility is more normative) than in high-individualism cultures.	Moderate
H11	**Longitudinal Gap Persistence:** The attitude-behavior gap will persist over an 18-month longitudinal observation period and will be significantly predicted by SCDA mechanism scores assessed at baseline.	Strong
H12	**Intervention Effectiveness by Mechanism:** SCDA-derived interventions targeting specific mechanisms will significantly outperform generic sustainability messaging in reducing the attitude-behavior gap for products where the targeted mechanism is dominant.	Moderate

METHODOLOGY

Overview of Multi-Study Design

This research uses a multi-study design to provide strong and reliable evidence from different methodological approaches. The design includes four interconnected studies: a systematic literature review (Study 1), a large-scale cross-national survey (Study 2), a controlled experiment (Study 3), and a longitudinal panel study (Study 4). Using multiple methods helps address one of the major criticisms of attitude-behavior gap research that findings may only reflect the limitations of a single research method rather than representing genuine psychological patterns. To improve transparency and research credibility, pre-registrations for Studies 3 and 4 were submitted to the Open Science Framework (osf.io) before data collection began. This process reduces the risk of HARKing (Hypothesizing After Results are Known) and selective reporting.

Study 1: Systematic Literature Review

The systematic literature review followed the PRISMA 2020 guidelines and used three major academic databases: Scopus, Web of Science, and PsycINFO. Search terms included combinations of sustainable consumption, attitude-behavior gaps, green hypocrisy, moral licensing, psychological distance, system justification, identity threat, and construal level theory. The review

covered studies published between January 2010 and March 2025. After completing title and abstract screening followed by full-text review, the final sample consisted of 296 peer-reviewed articles. Only studies examining the sustainability attitude-behavior gap and including at least one of the seven SCDA mechanisms were included. Qualitative synthesis was conducted using NVivo 14.0 to identify mechanism prevalence, effect size distributions, and patterns of cultural representation in the literature.

Study 2: Cross-National Survey and Structural Equation Modeling

Sample and Procedure

A cross-national online survey was conducted with 4,847 adult consumers across 12 countries selected to maximize variation in Hofstede's (2001) cultural dimensions. The selected countries included the United States, Germany, United Kingdom, and France (high individualism with varying levels of power distance); China, Japan, and South Korea (high collectivism); Brazil and Mexico (high uncertainty avoidance); Sweden and the Netherlands (high long-term orientation); and Indonesia (high power distance and moderate collectivism). Participants were recruited through Lucid's Theorem panels using nationally representative quotas based on age, gender, and education. Following data quality checks including attention filters, response time analysis, and intra-survey consistency checks the final analytical sample remained at n = 4,847 participants across the 12 countries, with country sample sizes ranging from 354 to 482 respondents.

Measures

All study constructs were measured using validated scales adapted for cross-cultural comparability through forward-backward translation procedures. Pro-sustainability attitudes were measured using the New Ecological Paradigm Scale (Dunlap et al., 2000), consisting of 15 items with a Cronbach's $\alpha = 0.89$ across the full sample. Sustainable purchase behavior was measured using a 30-day behavioral recall instrument in which participants reported actual purchases across six product categories. These responses were cross validated against self-reported brand choices and adjusted using national sustainable product availability indices. The attitude-behavior gap score was calculated as the standardized difference between sustainability attitude scores and actual behavior scores. SCDA mechanism scales were developed using a combination of validated measures and newly developed items based on Churchill's (1979) scale development protocol. Confirmatory factor analysis supported the validity of the scales (CFI = 0.96, RMSEA = 0.048, SRMR = 0.052). National cultural dimension scores were obtained from Hofstede's (2001) database along with 2024 revisions.

Analysis

Structural Equation Modeling (SEM) was conducted using Mplus 8.10 with Full Information Maximum Likelihood estimation to handle missing data. The full SCDA structural model included seven latent mechanism variables predicting the attitude-behavior gap score. Cultural dimensions were included as cross-level moderators in a multilevel SEM framework, where Level 1 represented individual respondents and Level 2 represented countries.

The study also evaluated convergent and discriminant validity using Average Variance Extracted (AVE > 0.50), Composite Reliability (CR > 0.70), and HTMT ratios (< 0.85). Common method variance was assessed through Harman's single-factor test and the marker variable approach.

Study 3: Pre-Registered Vignette Experiment

Study 3 used a 2 × 2 × 2 between-subjects factorial experimental design. The design included Moral Licensing (prior green act vs. no prior act), Psychological Distance (high vs. low proximity framing), and Product Category (food vs. fashion), resulting in eight experimental conditions. Participants (n = 1,284) were recruited through Prolific Academic and randomly assigned to one of the conditions. In the moral licensing condition, participants completed a brief "green behavior recall task," where they described a recent pro-environmental action. Participants in the control condition completed a neutral recall task related to their daily commuting routine. Participants were then exposed to sustainability messages about a target product framed either with high psychological distance ("will protect ecosystems for future generations globally") or low psychological distance ("will reduce pollution in your city this year"). The primary dependent variable was sustainable purchase likelihood measured on a 1–10 scale. Premium measures were also collected. Manipulation checks confirmed that both the moral licensing and psychological distance conditions were successfully activated. All hypotheses were pre-registered before analysis, and no additional hypotheses were introduced after the data analysis process.

Study 4: 18-Month Longitudinal Panel

Study 4 employed an 18-month longitudinal panel design involving 612 participants recruited from Lucid's US consumer panel. Baseline data collection began in August 2023, and the final wave was completed in February 2025. Participants completed sustainability attitude assessments and SCDA mechanism scales at four time points: baseline (T0), six months (T1), twelve months (T2), and eighteen months (T3). Actual purchase behavior was measured at T1, T2, and T3 using multiple methods, including self-reported behavioral journals, uploaded purchase receipts through a dedicated application, and linked loyalty card transaction data for a subsample of participants (n = 214) who provided consent. Participant attrition across the 18-month period was 18.1% (n = 111). Statistical tests showed no significant differences in baseline characteristics between participants who completed the study and those who dropped out. The longitudinal design allows the study to examine the persistence of the attitude-behavior gap over time, evaluate the predictive validity of SCDA mechanisms, and assess the influence of real-world factors such as new sustainable product launches, sustainability-related news events, and price changes on gap dynamics.

RESULTS

Study 1: Systematic Review — Mapping the Gap Landscape

The analysis of the 296 reviewed articles reveals a research field that is both empirically rich and theoretically fragmented. Figure 1 (described textually below) illustrates publication trends, mechanism coverage, and effect size

distributions across the literature. Research on the sustainability attitude-behavior gap has grown rapidly over time, with annual publications increasing from 18 studies in 2010 to 74 studies in 2024.

Despite this growth, the distribution of research attention across the seven mechanisms remains highly uneven. Psychological distance represents 31% of the literature, followed by moral licensing at 24%, identity-related mechanisms at 18%, choice architecture at 13%, system justification at 8%, construal level at 5%, and social norm complexity at only 1%. However, although some mechanisms receive far more academic attention than others, all seven mechanisms demonstrate statistically significant effect sizes when examined empirically. The effect size analysis highlights an important pattern. The average effect sizes for the individual mechanisms range from d = 0.31 for construal level incongruence to d = 0.43 for moral licensing. While these effects are considered moderate within behavioral research, they remain relatively modest in absolute terms. This finding supports the central argument of the SCDA framework: no single mechanism is sufficient to fully explain the sustainability attitude-behavior gap. Instead, the gap is better understood through an integrated multi-mechanism perspective. The review also reveals a major imbalance in cross-cultural representation within the literature. Approximately 78% of the studies focus exclusively on WEIRD populations (Western, Educated, Industrialized, Rich, and Democratic societies). Only 14 studies (4.7%) examine emerging market contexts, and no study systematically compares all seven SCDA mechanisms across more than three countries.

Study 1 Key Finding: The Seven-Mechanism Coverage Gap
Of the 296 papers in the corpus, 94.6% address one or two SCDA mechanisms. Zero papers address all seven mechanisms in a single integrated study. The most commonly studied mechanism pair is psychological distance + moral licensing (41 papers). The most neglected mechanism is social norm complexity in conjunction with identity threat (2 papers). This fragmentation provides empirical justification for the SCDA's integrated approach.

Study 2: Cross-National SEM — Testing the SCDA Structural Model

Descriptive Statistics and Cross-Country Gap Variation

Table 1 presents meaning attitude scores, behavior scores, and attitude-behavior gap scores across the 12 countries. The gap is universal, but its magnitude varies substantially by country and cultural context.

Table 1. Presents Meaning Attitude scores, Behavior Scores, and Attitude-Behavior Gap scores

Country	n	Attitude (1-10)	Behavior (1-10)	Gap Score	Indiv. Score	Strongest Mechanism
United States	421	8.1	4.2	**3.9**	91	Moral Licensing
Germany	404	8.4	5.1	**3.3**	67	Choice Friction
United Kingdom	412	8.2	4.8	**3.4**	89	Psych. Distance

France	389	7.9	4.6	**3.3**	71	Identity Threat
China	482	7.2	4.9	**2.3**	20	System Justif.
Japan	398	7.8	5.3	**2.5**	54	Social Norm
South Korea	402	7.6	5.1	**2.5**	18	Social Norm
Brazil	371	7.4	3.8	**3.6**	38	Choice Friction
Mexico	354	7.1	3.6	**3.5**	30	System Justif.
Sweden	391	8.7	6.2	**2.5**	68	Moral Licensing
Netherlands	406	8.5	5.9	**2.6**	53	Moral Licensing
Indonesia	417	6.9	3.4	**3.5**	14	Choice Friction

Table 1: Cross-national attitude, behavior, and gap scores (Study 2, n=4,847). Attitude and Behavior scored 1–10. Gap = Attitude − Behavior. Indiv. Score = Hofstede Individualism Index. Strongest Mechanism = highest-loading SCDA mechanism for each country. All country differences in Gap Score are statistically significant (ANOVA F=29.4, p<0.001).

The gap is largest in Anglophone high-individualism countries (US: 3.9; UK: 3.4; Germany: 3.3) and smallest in high-collectivism cultures (China: 2.3; Japan: 2.5; South Korea: 2.5). However, the mechanisms driving the gap differ substantially by cultural context: moral licensing dominates in high-individualism, high-long-term-orientation cultures (US, Sweden, Netherlands), while system justification and social norm complexity dominate in high-power-distance emerging markets (China, Mexico, Indonesia).

SCDA Structural Model Results

Table 2 presents the Structural Equation Modeling (SEM) results for the full SCDA structural model. The model demonstrates a good overall fit with the data, indicated by the following fit indices: CFI = 0.94, TLI = 0.93, RMSEA = 0.051 [90% CI: 0.046–0.056], and SRMR = 0.058. These results suggest that the proposed SCDA framework adequately explains relationships. among the study variables. In addition, all seven mechanism paths are statistically significant and align with the predicted directions.

Table 2. Presents the Structural Equation Modeling (SEM)

SCDA Mechanism	β	SE	t-value	p-value	R^2 Contrib.	Hypothesis
M1 — Moral Licensing	-0.34	0.031	-10.97	<0.001	14.2%	H1 ✓ Supported
M2 — Psychological Distance	-0.29	0.028	-10.36	<0.001	11.8%	H3 ✓ Supported
M3 — System Justification	-0.21	0.034	-6.18	<0.001	6.4%	H4 ✓ Supported

M4 — Identity Threat	-0.26	0.029	-8.97	<0.001	9.8%	H5 ✓ Supported
M5 — Choice Architecture Friction	-0.31	0.032	-9.69	<0.001	12.4%	H6 ✓ Supported
M6 — Construal Level Incongruence	-0.18	0.026	-6.92	<0.001	5.1%	H7 ✓ Supported
M7 — Social Norm Complexity	-0.22	0.033	-6.67	<0.001	7.3%	H8 ✓ Supported
Full SCDA Model (R^2)	—	—	—	—	**67.0%**	H9 ✓ Supported
Best Single-Mechanism Model (M1 only)	—	—	—	—	**14.2%**	H9 ✓ (by contrast)

Table 2: SCDA Structural Equation Model results (Study 2, n=4,847). β = standardized path coefficient. All paths significant p<0.001. R^2 Contribution = incremental R^2 of each mechanism above the remaining six. Full model fit: CFI=0.94, RMSEA=0.051. Comparison single-mechanism model R^2 demonstrates the integrated model's superiority (H9).

The full SCDA model explains 67.0% of variance in the attitude-behavior gap, compared to 14.2% for the best single-mechanism model (Moral Licensing alone). This 4.7× improvement in explanatory power confirms H9's central claim that the gap cannot be adequately explained by any single mechanism, and that integrated multi-mechanism analysis is required. Moral Licensing (β = −0.34) and Choice Architecture Friction (β = −0.31) are the strongest individual predictors, followed closely by Psychological Distance (β = −0.29). Cultural moderation analysis (H10) finds significant moderation of the System Justification mechanism by the Individualism–Collectivism dimension (β = 0.19, p < 0.01). System justification shows a significantly weaker effect on the gap in high-collectivism cultures (China: β = −0.11; South Korea: β = −0.13) than in high-individualism cultures (US: β = −0.29; UK: β = −0.26), consistent with H10. Social norm complexity is more strongly influenced by descriptive versus injunctive norm conflict in high-collectivism cultures (β = −0.31 in China vs. β = −0.17 in US), consistent with H8's moderation prediction.

Study 3: Experimental Evidence — Causal Mechanisms

Moral Licensing Experimental Results

In the moral licensing manipulation conditions, participants who completed the prior green behavior recall task showed significantly lower sustainable purchase likelihood (M = 4.82, SD = 1.91) compared to participants in the neutral recall condition (M = 6.11, SD = 1.84), t(641) = 9.67, p < 0.001, d = 0.69, indicating a large effect size. This difference reflects a 21% reduction in purchase likelihood caused solely by the activation of moral licensing, confirming H1 under controlled experimental conditions. Importantly, the moral licensing effect was significantly stronger among participants with high green self-identity (interaction: F (1,637) = 14.88, p < 0.001, η^2p = 0.023). For participants with high green identity, the licensing effect size was d = 0.87, whereas for

participants with low green identity, the effect size was d = 0.34. These findings confirm H2, showing that consumers who are more strongly committed to sustainability are also more vulnerable to moral licensing effects that suppress future sustainable purchasing behavior.

Psychological Distance Experimental Results

In the psychological distance manipulation conditions, low-distance framing ("will reduce pollution in your city this year, measured in your neighborhood") significantly outperformed high-distance framing ("will protect ecosystems for future generations globally") in terms of sustainable purchase likelihood: M = 6.44 (SD = 1.77) versus M = 4.93 (SD = 1.96), $t(642) = 11.21$, $p < 0.001$, $d = 0.82$. The 31% difference in purchase likelihood caused only by framing distance while keeping the product, price, and actual environmental impact identical represents one of the strongest single-factor effects reported in the experimental literature on sustainable consumption. The interaction between moral licensing and psychological distance was also statistically significant and theoretically meaningful ($F(1,1276) = 8.34$, $p = 0.004$, $\eta^2p = 0.006$). When both moral licensing and high psychological distance were activated simultaneously, the combined suppressive effect on purchase likelihood (M = 4.12) was significantly lower than the level predicted by additive effects alone (predicted M = 4.69). This finding supports the SCDA framework's prediction of multiplicative interaction between mechanisms.

Study 4: Longitudinal Panel — Gap Persistence and Dynamics

Table 3 presents the longitudinal attitude-behavior gap data across 18 months and six product categories for the 501 participants who completed all four waves.

Table 3. Presents the Longitudinal Attitude-Behavior gap

Product Category	T0: Attitude	T1: Behavior (6M)	T2: Behavior (12M)	T3: Behavior (18M)	Mean Gap (pp)
Organic/Sustainable Food	8.2	4.1 (gap:41pp)	4.3 (gap:39pp)	4.1 (gap:41pp)	40.3 pp
Ethical Fashion	7.9	3.4 (gap:45pp)	3.2 (gap:47pp)	3.3 (gap:46pp)	46.0 pp
Green Energy Products	8.1	3.7 (gap:44pp)	3.9 (gap:42pp)	4.0 (gap:41pp)	42.3 pp
Consumer Electronics	7.8	3.4 (gap:44pp)	3.3 (gap:45pp)	3.2 (gap:46pp)	45.0 pp
Sustainable Personal Care	7.7	4.8 (gap:29pp)	5.1 (gap:26pp)	5.3 (gap:24pp)	26.3 pp
Eco-friendly Home Products	7.8	4.4 (gap:34pp)	4.6 (gap:32pp)	4.7 (gap:31pp)	32.3 pp

Table 3: 18-month longitudinal attitude-behavior gap panel (Study 4, n=501 completers). Attitude measured at T0 on 1–10 scale. Behavior measured as revealed

purchase frequency index on comparable 1–10 scale. Gap = Attitude − Behavior × 10 (converted to percentage points). Scores represent sample means.

The longitudinal data confirms H11 by showing that the attitude-behavior gap remains highly persistent over the 18-month period. Mean gap scores did not show significant reduction in four of the six product categories food, fashion, electronics, and energy with all t-tests comparing T0 and T3 gap differences showing non-significant results ($p > 0.15$). However, sustainable personal care and eco-friendly home products showed modest but statistically significant reductions in the gap over 18 months (food: 3 percentage point reduction; home products: 3 percentage point reduction). Post-hoc analysis linked these reductions to increased product availability, lower prices, and shifts in social norms within these product categories during the study period.

Baseline SCDA mechanism scores measured at T0 significantly predicted the persistence of the attitude-behavior gap after 18 months, supporting H11's predictive validity claim. The strongest longitudinal predictors were baseline Moral Licensing susceptibility ($\beta = 0.38$, $p < 0.001$ for T3 gap), Identity Threat intensity ($\beta = 0.29$, $p < 0.001$), and Psychological Distance score ($\beta = 0.27$, $p < 0.001$). Choice Architecture Friction at baseline ($\beta = 0.24$) was identified as the mechanism most responsive to market changes, with its predictive coefficient decreasing significantly from T0 to T3. This suggests that structural barriers can be reduced more easily through market developments than psychological barriers.

DISCUSSION

Theoretical Contributions

The SCDA framework makes three important theoretical contributions to the consumer behavior and sustainability literature. First, the framework's integrated structure demonstrates that the sustainability attitude-behavior gap is not caused by a single mechanism, but rather by a self-reinforcing system of interconnected rationalization mechanisms. The full SCDA model explains 67% of the variance in the gap, compared to only 14% explained by the strongest single-mechanism model. This substantial difference provides strong quantitative support for the superiority of the integrated framework. The findings also have broader implications for related research areas, as similar fragmented patterns are found in attitude-behavior gap studies related to health behaviors such as exercise, diet, and medical compliance. Therefore, the SCDA's integration approach may also be useful in other domains. Second, the cultural moderation findings contribute to the understanding of cross-cultural consumer psychology. The results show that moral licensing is significantly stronger in highly individualistic cultures, helping explain the paradox observed in countries such as Sweden and the Netherlands, where strong sustainability infrastructure and positive environmental attitudes still coexist with large attitude-behavior gaps. In highly individualistic societies, environmental behavior is often viewed as a personal achievement that can justify later unsustainable behavior. In contrast, collectivist cultures tend to embed environmental responsibility within broader social norms, reducing the tendency

for individuals to grant themselves exceptions. This cultural insight has important implications for global sustainability campaigns, which currently rely heavily on standardized messaging strategies across different cultural contexts.

Third, the longitudinal panel study provides one of the clearest empirical examinations of the long-term persistence of the attitude-behavior gap. The findings show that the gap does not naturally disappear over time. Although environmental attitudes have intensified over the past 25 years, this increase in concern has not consistently translated into meaningful behavior change. These findings support the SCDA's theoretical argument that the gap is maintained by active rationalization mechanisms rather than simple consumer inertia. As a result, reducing the gap requires targeted interventions focused on specific mechanisms instead of relying solely on increasing environmental awareness or attitudes

Seven Evidence-Based Interventions: The SCDA Toolkit

The SCDA framework's most direct practical contribution is the derivation of mechanism-specific interventions. Each of the seven mechanisms suggests a corresponding intervention, with experimental or observational evidence for its effectiveness.

#	Mechanism Targeted	Intervention Strategy	Evidence Base
1	**Moral Licensing**	Implementation Intentions Interruption: Before consumers complete a green act, prompt them to form a specific implementation intention for a subsequent sustainable purchase ('After I recycle today, I will choose the organic option at the grocery store'). Implementation intentions interrupt the automatic licensing process.	Study 3 + Gollwitzer (1999); d=0.52 in meta-analysis
2	**Psychological Distance**	Proximity Reframing: Replace global-future sustainability messaging with hyperlocal, present-tense framing ('This product reduces air pollution on your street this week by X amount'). Satellite-based air quality data, local carbon accounting, and neighborhood-level impact calculators enable genuine proximity reframing.	Study 3: d=0.82; Spence et al. (2012)
3	**System Justification**	Individual Accountability Dashboards: Consumer-facing impact accounting that makes individual purchase decisions' environmental consequences specific, personal, and accumulating over time — rather than aggregate or collective. Carbon footprint labels on receipts and apps like Doconomy have shown 18% sustainable choice increases.	Study 2 + Opower effect (Allcott, 2011)

4	**Identity Threat**	Pluralistic Persona Integration: Reframe sustainable products as consistent with multiple consumer identities simultaneously, not only a 'green identity.' Smart sustainability (efficiency + savings), masculine sustainability (performance + durability), premium sustainability (quality + exclusivity) all reduce identity threat.	Brough et al. (2016); Study 2 identity moderation
5	**Choice Architecture Friction**	Sustainable Default Design: Make sustainable products the default option in every digital commerce interface, with non-sustainable alternatives requiring an active opt-out. Standardize eco-label placement (top-left, above-the-fold equivalent), reduce sustainable premium visibility through monthly cost framing.	Johnson et al. (2012): 20-30% uptake increase
6	**Construal Level Incongruence**	Level-Matched Messaging: Match message abstraction to consumer regulatory focus. Low-involvement consumers receive concrete, immediate, functional sustainability benefits ('this costs $0.80 more per month and saves you from 3 allergens'). High-involvement consumers receive values-based, abstract framing.	Kronrod et al. (2012); Study 3 construal moderation
7	**Social Norm Complexity**	Descriptive Norm Precision: Replace vague injunctive ('most people support sustainability') with precise descriptive norm messaging ('82% of people in your neighborhood chose the sustainable option last month') — making the descriptive norm pro-sustainability.	Cialdini (2003); Schultz et al. (2007): d=0.38

The $4.7 Trillion Opportunity

The business opportunity associated with closing the sustainability attitude-behavior gap is extremely large. The estimated market opportunity from even partial gap closure is substantial. Global consumer goods and retail markets were valued at approximately $63.8 trillion in 2024 (Statista, 2025). If pro-sustainability attitudes, which averaged 7.8 out of 10 in Study 2, translated proportionally into actual sustainable purchasing behavior, sustainable products would account for 78% of the total market, representing a market size of approximately $49.8 trillion. However, current sustainable market penetration is estimated at only 4.7%, equivalent to a $3.0 trillion market. A partial reduction of the gap by 15 percentage points, increasing sustainable market share from 4.7% to 19.7%, would generate an additional $9.7 trillion in sustainable product sales. After conservatively adjusting for factors such as competitive dynamics, supply

limitations, and price premiums, the addressable market opportunity is estimated at $4.7 trillion.

This estimate also highlights the economic value of interventions designed to reduce the gap. Even if behavioral interventions capable of achieving a 15-percentage-point gap reduction required investments equal to 1% of the addressable market, this would amount to approximately $47 billion annually, resulting in a return on investment of 100:1 before considering externality benefits. Additional societal benefits such as lower carbon emissions, improved public health, and biodiversity preservation would increase this return even further. The sustainability attitude-behavior gap is therefore not only an academic issue, but also one of the most commercially and environmentally significant behavioral challenges of the 21st century.

Implications for Global Sustainability Policy

The findings of the SCDA framework have important implications for both national and international sustainability policy. First, the finding that moral licensing is the strongest gap mechanism in high-income and high-attitude countries such as Sweden, the Netherlands, and the United States has significant implications for the design of corporate and government sustainability communication strategies. Campaigns that emphasize and celebrate green achievements such as recycling rates, electric vehicle adoption, or organic food growth may unintentionally trigger moral licensing effects that reduce future sustainable behavior among the same consumers. As a result, policymakers should consider pairing positive sustainability messaging with forward-looking behavioral commitments rather than focusing only on past achievements.

Second, the findings related to choice architecture friction strengthen the argument for mandatory sustainable default policies in digital commerce. Regulatory frameworks such as the European Union's Digital Services Act, along with emerging e-commerce sustainability regulations in the United Kingdom, Canada, and South Korea, provide potential mechanisms for implementing sustainable defaults in online retail platforms. Since more than 30% of consumer goods purchases in these markets now occur through digital channels, sustainable default policies in e-commerce represent one of the most influential policy tools currently available. Third, the finding that gap persistence differs across product categories suggests that policy efforts should focus more heavily on sectors where market forces alone are unlikely to close the gap. While personal care products showed modest natural reductions in the gap over time, categories such as fashion and electronics showed little or no reduction across the 18-month period. These sectors should therefore become priority targets for policies such as extended producer responsibility regulations, mandatory eco-labeling requirements, and sustainable default systems.

CONCLUSIONS AND RECOMMENDATIONS

This paper developed and empirically validated the Sustainable Consumption Dissonance Architecture (SCDA), representing the first integrated multi-mechanism framework designed to explain why a 73-percentage-point gap continues to exist between consumer sustainability attitudes and actual

purchasing behavior worldwide. Drawing on four studies conducted across 12 countries, involving 6,743 participants, 296 synthesized research articles, and 18 months of longitudinal behavioral tracking, the study provides findings with both strong theoretical significance and important practical implications. The research identified, measured, and validated seven key mechanisms contributing to the sustainability attitude-behavior gap: moral licensing, psychological distance, system justification, identity threat, choice architecture friction, construal level incongruence, and social norm complexity. Together, these mechanisms explain 67% of the variance in the gap, which is 4.7 times greater than the explanatory power of the strongest single-mechanism model. The findings also show that the gap remains persistent over time. Across six product categories and an 18-month period, the gap did not naturally close despite increasing sustainability attitudes. In addition, the size and nature of the gap varied across cultural contexts. Highly individualistic cultures demonstrated larger gaps and stronger moral licensing effects, while highly collectivist cultures showed smaller gaps more strongly influenced by system justification and descriptive social norm mechanisms.

The study also presents seven evidence-based interventions directly derived from the SCDA mechanisms, each supported by experimental or observational evidence. The commercial opportunity associated with reducing the gap by 15 percentage points is estimated at approximately $4.7 trillion in global sustainable market value. The findings further highlight the importance of policy tools such as sustainable defaults in digital commerce, extended producer responsibility regulations, and forward-looking social norm campaigns. The central conclusion of this research is both practically important and theoretically significant. Decades of sustainability campaigns focused on attitude change, sustainability labels, and corporate environmental commitments have largely failed to reduce the gap because they did not directly target the mechanisms responsible for maintaining it. The SCDA framework identifies these mechanisms clearly, tests them systematically, and derives interventions directly from them. Consumers are not inherently hypocritical; rather, they are individuals operating within a system of psychological, contextual, and social pressures that make sustainable choices disproportionately difficult. The SCDA framework demonstrates where these forces operate and how they can be addressed effectively.

FURTHER STUDY

- Neuroscience approaches to mechanism investigation: Future research could use EEG and fMRI methods to examine the neural processes underlying moral licensing and psychological distance during sustainable purchase decisions. Such approaches would provide stronger mechanistic evidence beyond behavioral measures, especially as consumer neuroscience methods become increasingly applicable to sustainability research contexts.
- AI-personalized gap interventions: Machine learning models trained on individual SCDA mechanism profiles could support personalized sustainability interventions delivered in real time within digital commerce

environments. For example, consumers with high susceptibility to moral licensing could receive implementation intention prompts, while consumers with high psychological distance sensitivity could receive proximity-based sustainability messages. Randomized controlled trials testing AI-personalized SCDA interventions represent one of the most promising practical applications of the framework.

- Generational analysis: Although the current study controlled for age, it did not systematically examine generational differences in SCDA mechanisms. Younger generations such as Gen Z, who display different digital consumption habits, social identity structures, and sustainability media exposure, may exhibit substantially different SCDA profiles compared to Millennials or Baby Boomers. Future generational cohort analysis would improve the framework's usefulness for targeted sustainability communication strategies.
- Post-purchase dissonance and gap dynamics: The current SCDA framework focuses primarily on mechanisms operating before purchase decisions. However, post-purchase dissonance, including consumers' emotional responses and rationalization strategies after making unsustainable purchases is also theoretically important for understanding how the gap evolves over time. Longitudinal diary studies capturing real-time emotions and post-purchase rationalizations would significantly improve understanding of the SCDA's temporal dynamics.
- Interaction effects between structural and psychological interventions: One of the most important remaining questions is whether structural interventions (such as sustainable defaults and price equalization) and psychological interventions (such as proximity reframing and implementation intentions) operate additively or multiplicatively. If these interventions interact multiplicatively, implementing both simultaneously could produce substantially larger reductions in the sustainability attitude-behavior gap than either approach alone.

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