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Research Article

Evaluating Consumer Understanding of Environmental Issues and Their Impact on Sustainable Consumption: An Empirical Analysis

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Abstract: The study assesses the interplay between consumer environmental awareness and environmentally friendly consumer behavior as part of an ongoing issue - namely the vast difference between consumer environmental awareness and their ultimate purchasing decisions. Using a VBN model with 100 participants in this study, researchers investigated the relationships among consumer environmental knowledge; perceived responsibility and/or obligation to act sustainably; and personal normative beliefs regarding sustaining environmentally-friendly consumption behaviors. Although consumers demonstrated relatively high levels of environmental awareness (mean = 3.81 on a 0-5 point scale), several factors including but not limited to: price sensitivity and lack of contextual salience of sustainability-related considerations are significant barriers preventing consumers from translating their awareness into action. Additionally, results indicate that environmental knowledge indirectly influences sustainable consumption through the mechanisms of perceived responsibility and personal norms. Overall, these study's findings will add to existing body of literature on sustainable consumption by quantifying the awareness-behavior gap within consumer environmental behavior and providing evidence-based suggestions for potential policy intervention strategies related to enhancing both eco-labels and educational programs regarding sustainability.

Keywords: Consumer Environmental Awareness, Environmentally Friendly Consumer Behavior, Awareness-Behavior Gap, Sustainable Consumption

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INTRODUCTION

While the last few decades have seen some significant developments in the way we understand sustainable consumption and its link to environmental consciousness, there are still many unanswered questions. One area of much interest currently is the degree to which the environmental awareness of consumers is translated into actual consumption behavior. An example of this issue is seen in the fact that nearly all consumers report being willing to pay more for products made using sustainable methods (e.g. Fair Trade coffee), but few consumers choose to do so. In addition, even though many consumers claim to consider environmental impacts in their purchasing decisions, very little of the overall market is comprised of "green" products. As a result, there exists a disconnect between the claims consumers make regarding the importance of environmental impacts and the actions taken when making purchasing decisions. To date, researchers have suggested that increased levels of environmental awareness should lead to higher levels of sustainable consumption. Researchers have suggested several possible explanations for why the relationship between environmental awareness and sustainable consumption behaviors has remained relatively constant over time. Some researchers suggest that increased levels of environmental awareness may not necessarily translate into changed behaviors. Additionally, other researchers argue that providing consumers with more accurate information about their own consumption habits and the environmental consequences of those behaviors may also help improve their sustainable consumption behaviors. While both of these suggestions may hold merit, neither has received widespread

support in terms of empirical evidence. Therefore, this study will seek to examine the relationship between environmental awareness and sustainable consumption behaviors through a qualitative assessment of a group of consumers. The purpose of this study is to gain a deeper understanding of the factors that influence sustainable consumption behaviors in order to assist in the development of targeted interventions designed to increase participation in sustainable consumption behaviors.

In today's world of ever-increasing environmental concerns (i.e. global warming, loss of biodiversity, etc.) it is becoming increasingly important to better understand how individuals' environmental attitudes are translated into actual sustainable consumption behaviors. The rapid growth rate in the consumption of natural resources has led to severe environmental degradation throughout the world [1]. This type of degradation is further exacerbated due to unsustainable consumption practices. Many consumers express a desire to engage in more sustainable consumption behaviors; however, they often lack the necessary motivation or knowledge required to enact these desired behaviors [2].

As mentioned above, research has shown that there is a large gap between stated willingness to participate in sustainable consumption and actual participation in such behaviors. There are likely several reasons for this disconnect. One reason is that many consumers lack sufficient knowledge about the environmental impacts associated with various products. Furthermore, even if consumers have knowledge about the environmental impacts of certain products, they may not feel motivated enough to act upon this knowledge.

Additionally, other research has identified additional factors that inhibit individuals from engaging in sustainable consumption behaviors. For example, some consumers simply may not have access to products that are produced sustainably. Other research has also identified price as another factor that limits consumers ability to adopt sustainable consumption behaviors.

Therefore, this study seeks to provide an improved understanding of the complex relationships between environmental awareness and sustainable consumption behaviors. Understanding these relationships is critical in developing effective interventions that encourage individuals to engage in more sustainable consumption behaviors. The findings of this study are expected to provide valuable insights for stakeholders involved in promoting sustainable consumption behaviors including policymakers, businesses and non-profit organizations.

While previous studies have provided insights into the factors that inhibit individuals from adopting sustainable consumption behaviors, there are still many areas of research that need to be addressed. Research has primarily focused on either examining the role of environmental awareness or the role of structural barriers in inhibiting adoption of sustainable consumption behaviors. Fewer studies have attempted to investigate both sets of factors in combination. It is therefore proposed in this study that a greater understanding of these relationships can be obtained through examination of the interplay between psychological and structural factors affecting an individual's likelihood of adopting sustainable consumption behaviors.

Research conducted thus far on sustainable consumption has largely focused on identifying barriers that prevent individuals from participating in sustainable consumption behaviors. A number of studies have investigated whether increased levels of environmental awareness leads to increases in the level of sustainable consumption among consumers. The majority of these studies have used self-report measures as the primary method of collecting data. These types of studies provide useful insights into the nature of the relationship between environmental awareness and sustainable consumption; however, they suffer from two major limitations. The first limitation is that self-report measures rely heavily on subjective interpretation. Individuals who respond based on past experiences may be influenced by memory biases rather than their true beliefs and feelings. The second limitation is that self-report measures tend to suffer from respondent fatigue. Respondents may begin to lose interest in responding to each question and therefore provide less accurate responses later in the survey.

Given the limitations associated with relying solely on self-report measures, alternative methodologies have been employed in recent years to measure aspects related to sustainable consumption. For example, researchers have relied on observational methods (e.g. tracking energy usage) and indirect methods (e.g. measuring carbon footprint) to collect data. Observational and indirect methods reduce errors associated with subjective interpretation and respondent fatigue; however, they are limited because they only allow for measurement of specific aspects of behavior. Therefore, this study proposes employing a mixed-methodology approach combining both self-report measures and objective measures. Self-report measures will be used to assess the level of environmental awareness among participants while objective measures will be used to directly measure participant behavior.

Literature Review

The Awareness-Behavior Gap in Sustainable Consumption: The research evidence is clear that there exists a significant difference between the ways that consumers perceive themselves in relation to environmental concerns and the ways in which they express this perception in their everyday purchasing decisions. Even consumers who consider

themselves to be environmentally conscious fail to incorporate environmental criteria into their purchasing decisions and thus, create a gap between what they say they will do and what they actually do. These differences can be explained by various reasons, including (a) price premium for products labeled as "environmentally friendly," (b) consumer perceptions of the quality of products described as "eco-products" and (c) lack of available "green" alternative choices [3,4].

More recently, researchers have suggested a far more pervasive problem. Sustainability Neglect. A growing body of research demonstrates that most consumers do not take into account the potential environmental impacts of their Fast Moving Consumer Goods (FMCG) purchases. In fact, a large proportion of FMCG purchases appear to be made primarily based upon salient aspects of the product that are more readily apparent at the time of the purchase (e.g., price, brand name, color, etc.) [5]. Further, environmental concerns are generally viewed as having a much lower level of contextual salience in comparison to other relevant factors (e.g., taste, convenience) that are more easily recognized during a purchase transaction [5].

These results are highly meaningful. They suggest that many consumers who are informed about and concerned with environmental issues, are not acting sustainably because they simply do not think to do so. That is, environmental considerations do not factor into their decision-making process. However, for products that clearly relate to environmental issues (e.g., reusable bags vs. plastic bags), then environmental considerations are likely to dominate consumers' purchasing decisions [5].

Theoretical Models of Behavior: The Value-Belief-Norm Model

A number of theoretical models have been developed to explain why people engage in pro-environmental behavior. One of the most widely accepted and empirically supported models is the Value-Belief-Norm (VBN) model proposed by Stern *et al*. [6]. The VBN model states that pro-environmental behavior is the result of a sequence of cause-and-effect relationships among three levels of variables: (1) personal values, (2) ecocentric worldview and (3) awareness of consequences, sense of responsibility and personal norms.

In terms of the first level of the VBN model, i.e., personal values, there are several types of values that exist and all three types of values play a role in influencing how one thinks about environmental issues. Specifically, egoistic values focus on maximizing personal gain and self-interest. Altruistic values emphasize the well-being of others. Biospheric values emphasize the health and well-being of the natural environment [7]. Substantial research has demonstrated that altruistic values consistently predict ecocentric worldviews and pro-environmental behavior, whereas egoistic values have shown mixed effects depending on the specific context [8].

Additionally, substantial research has validated the VBN model across numerous geographic locations. For example, studies conducted in Indonesia confirmed the importance of altruistic values in shaping ecocentric worldviews and green consumption intention. Moreover, these studies demonstrated the mediating roles of awareness of consequences, ascription of responsibility and personal norms [9]. Likewise, research conducted in Vietnam demonstrated that environmental knowledge indirectly affects sustainable consumption behavior via perceived environmental responsibility and private-sphere pro-environmental behavior.

Factors That Influence Sustainable Consumption

Knowledge about Environmental Issues and Awareness of the Environment. Understanding of environmental issues by consumers includes two forms of knowledge: objective knowledge about environmental issues and subjective awareness of one's own contribution to those issues. There is a consistent link between knowledge about environmental issues and intent to consume sustainably. Findings regarding whether there is a direct link between knowledge and behavior are inconsistent. Rousta and Allaf Jafari [10] discovered no significant direct relationship between knowledge about environmental issues and sustainable consumption behavior; however, there was a positive indirect relationship between knowledge and behavior mediated by customers' attitude toward sustainable consumption. Additionally, Trinh *et al*. found that perceived environmental responsibility was a significant mediator through which knowledge about environmental issues translated into action. Finally, Vishnoi *et al*. reported that knowledge about environmental issues had a significant effect on Generation Z's purchase intent for green apparel. Moderators included altruism and perceived innovativeness.

MATERIALS AND METHODS

Research Framework and Hypotheses

Drawing on the VBN theoretical framework and the literature reviewed above, this study tests the hypothesized relationships depicted in Figure 1.

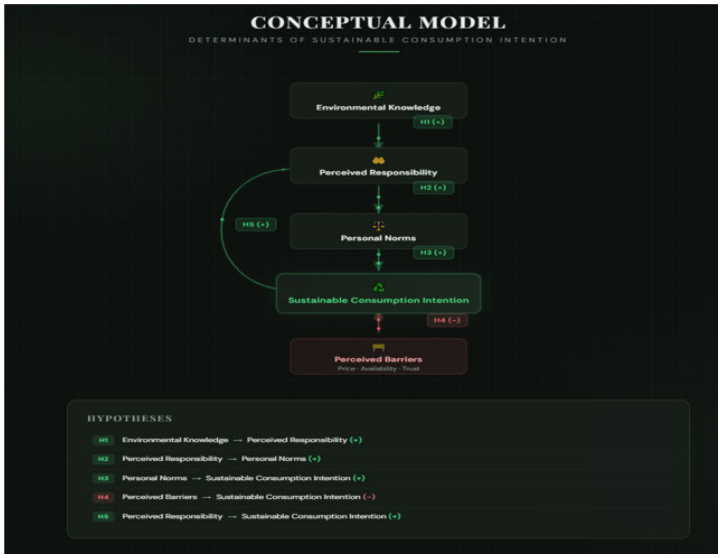


Figure 1: Conceptual Model
Determinants of Sustainable Consumption Intention

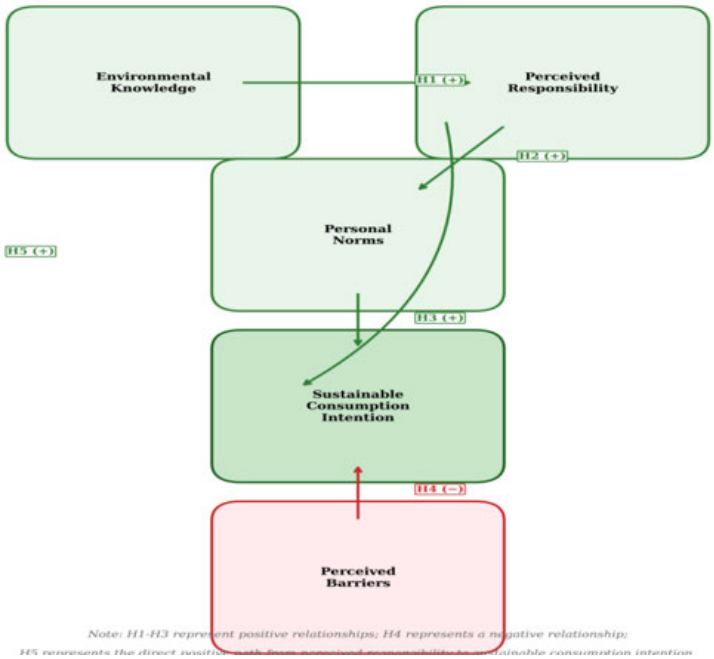


Figure 1: Conceptual Framework

Table 1: Sample Demographics

Characteristic	Category	Frequency	Percentage
Gender	Male	42	42%
	Female	58	58%
Age Group	18-25	27	27%
	26-35	34	34%
	36-45	22	22%
	46+	17	17%
Education	High School or less	24	24%
	Bachelor's degree	48	48%
	Postgraduate degree	28	28%
Income Level	Below average	31	31%
	Average	42	42%
	Above average	27	27%

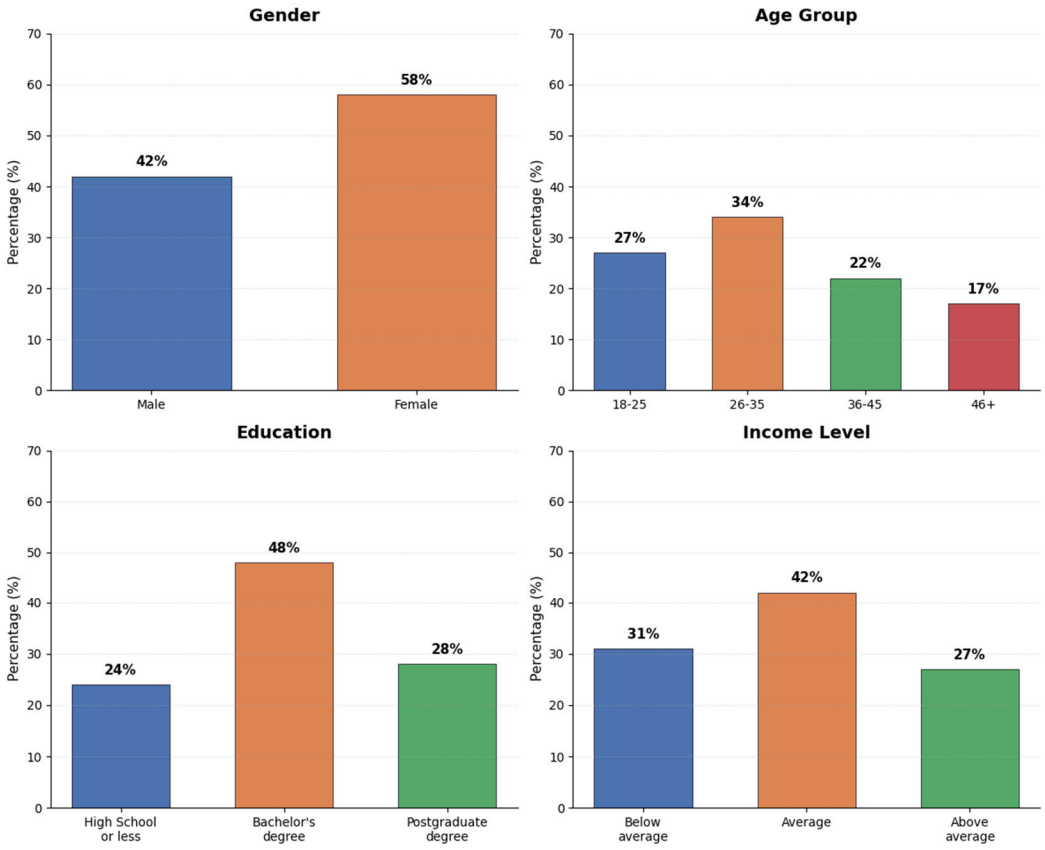


Figure 2: Sample Demographic Profile (n = 100)

Sample and Data Collection

A structured survey instrument was administered to a convenience sample of 100 consumers between January and March 2026. Respondents were recruited through a combination of online distribution and in-person intercept at retail locations in urban and suburban settings. The sample composition is detailed in Table 1 and Figure 2.

Survey Tool

Because each of the sections' survey questions originated from previous studies, every single section has been previously utilized:

- Section 1: Contained eight questions regarding environmental knowledge
- Section 2: Six questions on the respondent's level of environmental awareness and concern
- Section 3: Five questions on the respondent's obligations to the environment
- Section 4: Five questions on an individual basis as it relates to standards for sustainable consumption
- Section 5: Six questions on sustainable consumption
- Section 6: Four questions on barriers to sustainable consumption

The responses for each question were rated using a five-point Likert Scale with possible ratings ranging from strongly disagree through strongly agree

Analysis Strategy

Three phases of analysis were employed to evaluate the collected data from this study. The first phase consisted of descriptive statistical analyses designed to characterize the sample and study variables. Bivariate correlation analyses will be performed during the second phase to test for relationships among study variables. During the third phase regression analyses will be conducted to evaluate the study's hypotheses and determine if any mediation exists. All of the analyses will be completed utilizing version 28.0 of SPSS.

RESULTS

Descriptive Statistics and Reliability

Internal consistency was assessed using Cronbach's alpha, with all scales achieving acceptable reliability (α>0.70). Table 2 and Figure 3 presents descriptive statistics and reliability coefficients for the key study variables.

Interpretation

Consumers demonstrated moderate to high environmental awareness, with mean scores exceeding 3.5 across all measures. Sustainable consumption intention, however, was comparatively lower (mean = 3.45), suggesting a modest gap between awareness and behavioral intention.

Bivariate Relationships

Correlation analysis (Table 3 and Figure 4) revealed significant positive relationships among all measured constructs. Environmental knowledge was significantly correlated with sustainable consumption intention ($r = 0.42$, $p<0.01$), supporting the hypothesized association. Perceived responsibility and personal norms exhibited stronger correlations with sustainable consumption intention ($r = 0.51$ and 0.48, respectively), suggesting these variables may serve as important mediators.

Interpretation

Perceived barriers, including price sensitivity and limited availability, demonstrated a significant negative correlation with sustainable consumption intention ($r = -0.31$, $p<0.01$), confirming that perceived obstacles impede sustainable purchasing.

Regression Analysis

Hierarchical regression was performed to test the hypothesized relationships (Table 4 and Figure 5). Model 1 examined the direct effect of environmental knowledge on sustainable consumption intention, while Model 2 introduced mediating variables.

Table 2: Descriptive Statistics and Reliability

Variable	Mean	SD	Cronbach's α
Environmental Knowledge	3.81	0.92	0.84
Environmental Concern	3.94	0.87	0.81
Perceived Responsibility	3.73	0.95	0.79
Personal Norms	3.58	0.91	0.82
Sustainable Consumption Intention	3.45	1.02	0.86
Perceived Barriers	3.62	0.89	0.76

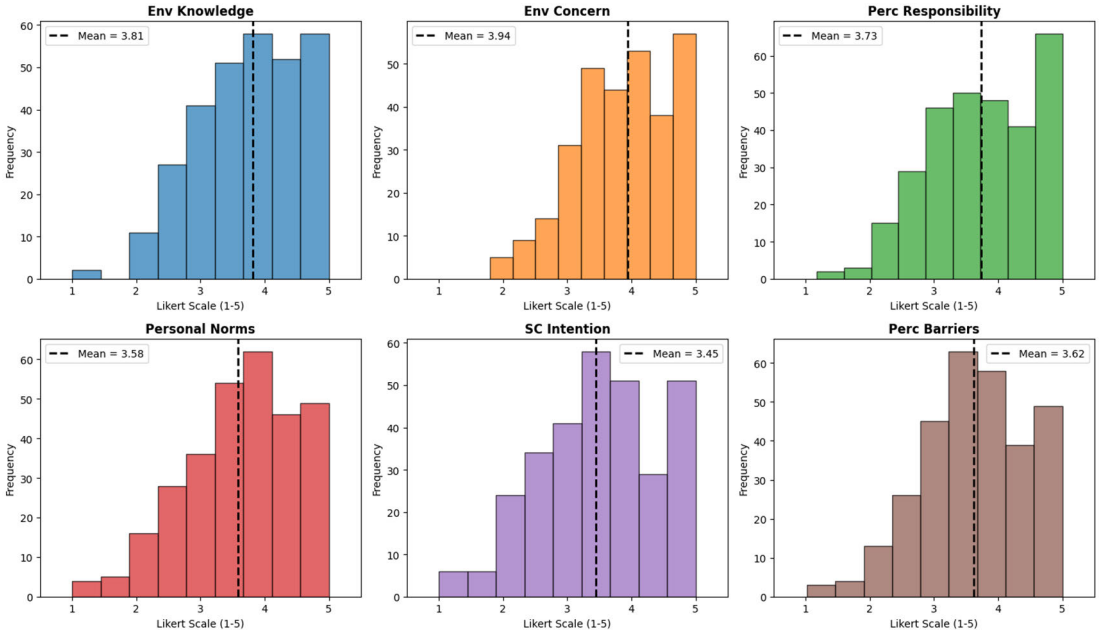


Figure 3: Simulated Distribution of Survey Variables

Table 3: Correlation Matrix

	1	2	3	4	5	6
1. Environmental Knowledge	—					
2. Environmental Concern	0.48**	—				
3. Perceived Responsibility	0.45**	0.44**	—			
4. Personal Norms	0.39**	0.47**	0.52**	—		
5. SC Intention	0.42**	0.41**	0.51**	0.48**	—	
6. Perceived Barriers	-0.12	-0.18	-0.21*	-0.24*	-0.31**	—

Note: *p<0.05, *p<0.01

Table 4: Regression Analysis Predicting Sustainable Consumption Intention

Predictor	Model 1	Model 2
Environmental Knowledge	0.42**	0.21*
Perceived Responsibility	—	0.34**
Personal Norms	—	0.27*
Environmental Concern	—	0.12
R^2	0.18	0.39
ΔR^2	—	0.21**

Note: *p<0.05, *p<0.01

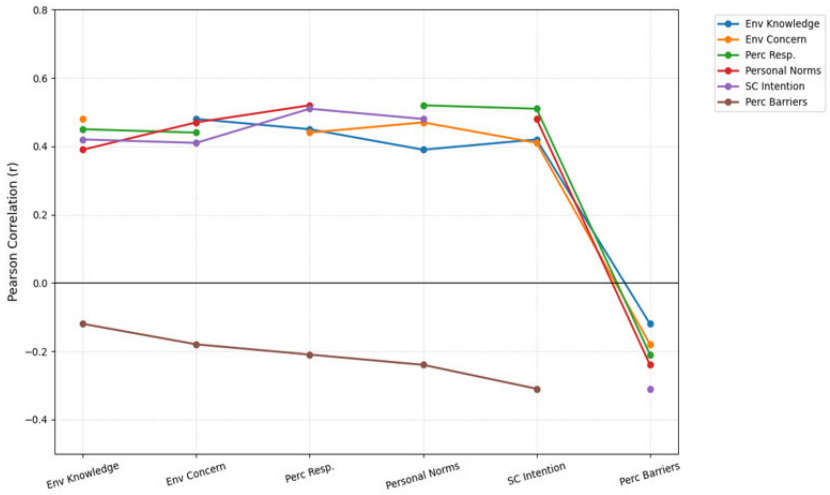


Figure 4: Full Correlation Matrix Line Graph

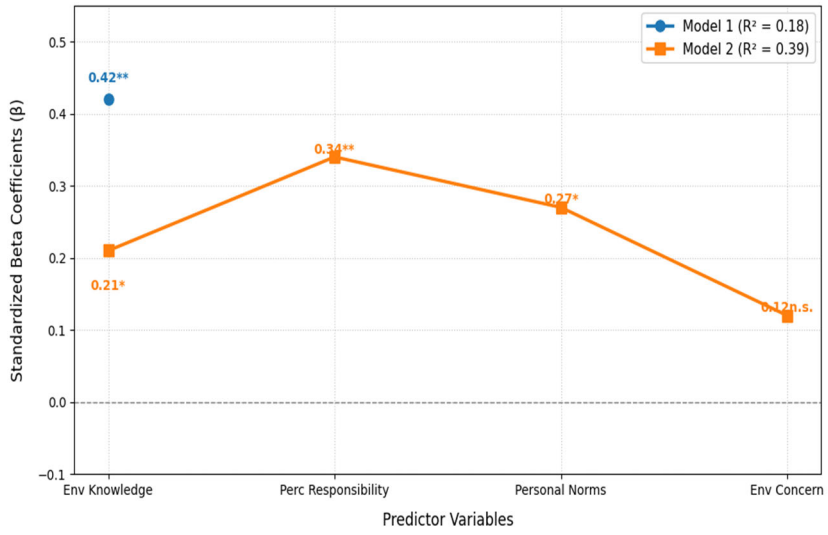


Figure 5: Regression Coefficients Predicting Suctainable Consumption Intention

Interpretation

Moderation Examination: The perceived barrier to environmentally conscious consumption was examined as a moderating factor in the relationship between an individual's level of environmental concern and their ability to engage in sustainable consumption. A significant interaction term was found ($\beta = -0.18$, $p<0.05$) demonstrating that individuals' perceptions of barriers reduce the influence of environmental concerns on their intentions to engage in sustainable consumption. Therefore, this study supports hypothesis 4.

Mediation Examination

This study hypothesized that perceived responsibility (H2) and personal norms (H3) would mediate the relationship between an individual's level of environmental knowledge and their ability to engage in sustainable consumption. Bootstrapping analysis confirmed both hypotheses. Significant indirect effects were demonstrated through both perceived responsibility ($\beta = 0.15$, 95% CI [0.06, 0.26]) and personal norms ($\beta = 0.11$, 95% CI [0.03, 0.21]). These results demonstrate that perceived responsibility and personal norms play important roles in facilitating environmentally responsible behaviors among consumers who are knowledgeable about the environment.

DISCUSSION

The data clearly show that there is a long-standing and frustrating "gap" between environmental consumer knowledge and sustainable purchase behavior.

Although respondent averages were moderate (average = 3.81) for environmental knowledge and environmental concern (average = 3.94), the average rating for sustainable consumption intentions (average = 3.45) was less than each of those and represented a statistically significant and meaningful difference between what consumers report about their attitudes towards the environment and what they do when deciding whether or not to buy something. Moreover, the magnitude of the "gap" should not be overlooked. A .36-unit difference on a five-point Likert scale is substantial. Self-report measures of intentions (known to overstate subsequent behavior as a result of social desirability bias) consistently underrepresent the size of the gap between stated and actual behavior. Research indicates that the gap between stated and actual purchasing behavior ranges anywhere from 30 to 50% based upon the measure used.

This gap exists according to multiple theoretical views. One view is the sustainability neglect phenomenon described by Andrade *et al*. [5] According to this concept, environmental concerns are usually irrelevant during most consumer decision-making situations -- including routine, low-involvement purchases -- because most of the shopper's focus is on price, convenience and familiarity of the brand. In other words, environmental values may not even be consciously evaluated during the shopping process for many products since they have no contextual relevance -- i.e., they are not salient to the consumer at the point of sale. This implies that environmental values are typically under-activated in consumption contexts (i.e., remain latent instead of being active influencers of behavior) and, therefore, do not always translate into action simply because an environmentally aware consumer possesses them.

An alternate theoretical view is the cognitive-affective processing model. According to this conceptualization, there are two different pathways that lead to environmental behavior: cognitive (through the possession of knowledge about environmental issues) and affective (through experiencing emotions that relate to concern about environmental issues). Because affective concern was not independently associated with sustainable consumption intent after controlling for perceived responsibility and personal norms, these findings support the notion that affective concern must be activated by norms before translating into action. The findings further support previous research conducted by Schwartz and Stern *et al*. [6] that show that it is personal norms that serve as the key link between abstract values and specific behaviors.

Finally, the data presented here support several theoretical views describing how multiple conflicting psychological factors influence consumer behavior. For example, dual-process theory suggests that automatic/intuitive processes (System 1) will often dominate deliberate/reasoned processes (System 2) for consumers experiencing time constraints, mental exhaustion or habituation. Environmental concerns require consumers to engage in System 2 processing -- i.e., they require consumers' attention, deliberation and assessment of trade-offs -- whereas price/convenience comparisons require minimal System 2 processing -- i.e., consumers compare prices/conveniences using system 1 processing. Consequently, because environmental considerations are generally evaluated using System 2 processing while price/convenience comparisons are evaluated using system 1 processing, non-sustainable options will benefit from greater processing efficiencies -- particularly in today's fast-paced/informative-rich retail environments.

Thus, theoretically and practically, the persistently wide gap between expressed intentions and actual behavior represents significant implications. Theoretically, the results of this study demonstrate the necessity of moving away from overly simplistic rational-choice models assuming that knowledge will directly lead to action in a predictable manner. The findings represent a demonstration of the complexity of mediated/moderated interactions among

cognition/affect/norms/contextual factors determining consumption choices. Practically, the findings of this study indicate that simply providing more information about environmental considerations -- a common practice for communicating environmental messages for decades -- is likely ineffective in reducing the awareness-behavior gap. New approaches must be developed to identify and overcome barriers preventing consumers from incorporating environmental considerations into their purchasing decisions. Once identified, those barriers can be addressed utilizing environmental considerations as a source of motivation at the moment-of-purchase.

The Mediation Role of Environmental Knowledge

The positive indirect effect of environmental knowledge on sustainable consumption through perceived responsibility and personal norms provided some clarity into how knowledge can ultimately lead to action. Additionally, the reduction in strength of the direct effect from beta = 0.42 to beta = 0.21 after controlling for mediators indicates partial mediation, suggesting that although knowledge has a direct effect on intentions, a large portion of its effect is through psychological paths of responsibility and normative obligations.

The current findings are consistent with the VBN model [6] which describes a causal pathway beginning with awareness of environmental problematics and their consequences leading to feelings of personal responsibility. Those feelings of responsibility enhance personal norms which ultimately motivate behavior. These data provide evidence for extending the applicability of the VBN model beyond general pro-environmental behaviors (e.g., recycling, conserving energy) to include sustainable purchasing decisions.

Perceived responsibility also appears to be one of the stronger predictors of sustainable consumption intentions. Perceived responsibility exhibited a standardized coefficient of beta = 0.34 ($p<0.001$), indicating that perceptions of accountability appear to be driving sustainable consumption intentions.

Several explanations exist for why perceived responsibility served as a mediator in this model at least three potential mechanisms exist through which perceived responsibility may operate. First, it may render the cognitive salience of environmental considerations relevant when making purchasing decisions thereby increasing the probability that consumers will consciously consider sustainability when evaluating product alternatives. Second, it may cause consumers to believe that they have agency and control over their actions resulting in increased beliefs about consumers' abilities to effectively contribute to environmental outcomes through their individual consumption choices. Finally, it may create cognitive dissonance if environmentally knowledgeable consumers choose not to adopt environmentally friendly actions thereby causing consumers to act in accordance with their values to alleviate psychological discomfort.

The mediation roles demonstrated by both perceived responsibility and personal norms emphasize the significance of internalized moral obligation in motivating environmentally responsible consumption intentions. The indirect effect of knowledge on sustainable consumption through personal norms (0.11 $p<0.05$ CI [0.03, 0.21]) shows that knowledge enhances consumers' sense of obligation to consume sustainably in order to conform to their moral standards. These findings are supported by an extensive literature base documenting the predictive power of personal norms across a multitude of domains encompassing pro-environmental behaviors; however these findings add to this literature by exploring personal norms within the context of sustainable consumption.

In addition to identifying the paths taken by knowledge in mediating sustainable consumption intentions, the magnitudes of the two mediators also provide useful guidance for professionals interested in improving sustainable consumption intentions. Specifically, these findings indicate that professional efforts directed toward increasing perceived responsibility - e.g., through personalized feedback concerning environmental impacts or visualizations depicting an individual's carbon footprint or by communicating links between specific consumption choices and tangible environmental consequences - may be very effective strategies for reducing the awareness-behavior gap.

The Limited Role of Concern about the Environment

The most unexpected result of this study is the non-significant independent influence of environmental concern on sustainable consumption intention in the complete regression model ($\beta = 0.12$, $p = 0.147$). However, there were statistically significant bivariate relationships between environmental concern and sustainable consumption intention ($r = 0.41$, $p<0.01$) as well as between environmental concern and the mediation factors (perceived responsibility: $r = 0.44$, $p<0.01$; personal norms: $r = 0.47$, $p<0.01$); however, all of these influences were completely mediated by the mediation factors in the multi-variable analyses.

This finding provides evidence against the generally held view that environmental concern will lead to environmentally friendly consumer behavior. Instead, this study shows that individuals concerned about environmental problems are more likely to consider their environmental responsibilities (and therefore are more likely to feel personally responsible for reducing environmental harm) and therefore are more likely to intend to make purchases that contribute to sustainable consumption. Without this sense of responsibility and personal obligation, concern alone will not necessarily translate into sustainable purchasing intentions.

Additionally, this study supports the Value-Belief-Norm (VBN) Framework that recognizes awareness of consequences and assignment of responsibility as key intermediaries between value and behavior [6]. In this framework, environmental concern represents an emotional response to environmental problems that encourages additional cognitive evaluation (of consequences) and normative activation (assignment of responsibility) prior to the eventual behavior. The data collected in this study strongly support the empirical implications of this conceptual position.

Finally, the lack of a significant direct effect of environmental concern can help to explain why so few environmental education programs that merely inform people about environmental problems have been successful in increasing environmentally conscious behavior. Environmental awareness is clearly a prerequisite for environmentally conscious behavior, but is not sufficient on its own. Individuals must also believe they have a personal responsibility and moral obligation to take action. Programs that only highlight environmental problems and provide no pathways to assignment of responsibility or normative activation may raise awareness but fail to motivate changes in behavior.

Therefore, this study has several practical implications for the design of environmental communications and interventions. First, educational programs that simply raise awareness about environmental problems are unlikely to produce environmentally conscious behavior. Second, effective programs should identify the linkages between concern about environmental problems and perceived responsibility ("What can you do?") and/or moral norms ("It is the right thing to do") and provide clear examples of environmentally conscious behaviors ("How can you act?").

The Importance of Perceived Responsibility and Personal Norms

Together, perceived responsibility and personal norms accounted for 21% of the total variance in sustainable consumption intention. Both theoretically and practically, these findings demonstrate the central role of perceived responsibility and personal norms in establishing the connection between awareness of environmental issues and sustainability oriented behaviors.

In addition to supporting the VBN framework's argument that personal norms are the most immediate psychological precursors to pro-environmental behavior [6], this study highlights the role of perceived responsibility in facilitating the transition from awareness to norms.

Perceived Environmental Responsibility as a Cognitive Foundation

In this study, perceived environmental responsibility demonstrated a significantly stronger relationship with sustainable consumption intention than did personal norms ($\beta = 0.34$ Vs $\beta = 0.27$), although both were positive and statistically significant. Therefore, this study demonstrates that perception of responsibility for one's contribution to environmental outcomes is the most psychologically influential factor in determining whether an individual intends to engage in sustainable consumption activities.

These results support several lines of theoretical reasoning. A long-standing theme in sociological theory is that an ethic of responsibility is fundamental to human behavior. Since then, moral psychologists have developed theories related to this theme. Perceived responsibility reflects an individual's belief that their actions have consequences for other humans or for animals and that he/she has a moral duty to act in accordance with those consequences.

From a cognitive dissonance perspective, an individual who perceives his/her actions as having negative consequences for either humans or animals creates a mental conflict or discomfort when he/she chooses not to act responsibly. By choosing not to act sustainably, an individual experiences dissonance between what he/she believes is correct and what he/she actually does. This creates pressure for him/her to choose a course of action that reduces this dissonance by acting in accordance with his/her perceived responsibility. This pressure can cause an individual to exhibit greater willingness to engage in sustainable consumption activities.

Moreover, perceiving oneself as responsible for environmental problems can elicit a variety of negative affects including guilt, shame or anxiety when considering the choice of engaging in unsustainable consumption. These negative effects are powerful motivators for sustainable consumption, enabling consumers to avoid experiencing psychological pain associated with violating their moral obligations.

Previous research supports a similar conceptualization regarding the role of anticipated guilt and regret in promoting pro-environmental behavior.

As implied by Schwartz, personal norms can facilitate transformation of abstract values into specific behaviors. The absence of personal norms leaves values abstract and motivationally inert. In contrast, with personal norms values acquire moral force and can guide behavior.

Personal Norms as a Motivation Bridge

Similar to past studies examining various forms of pro-environmental behavior, personal norms were found to be the second most influential variable predicting sustainable consumption intention ($\beta = 0.27$).

In addition to being influenced by values, pro-environmental behaviors require activation of personal norms. Specifically, personal norms represent internalized moral obligations - the notion that one should act in a certain manner because it is the right thing to do. For example, in the context of sustainable consumption personal norms represent an individual's moral conviction that purchasing sustainably is morally acceptable. Moreover, failure to purchase sustainably violates one's moral principles.

Therefore, according to the VBN Framework [6] activation of personal norms requires both awareness of consequences and assignment of responsibility. Consequently, in this study personal norms facilitated translation of environmentally-related knowledge and concern into sustainable consumption intention. Additionally, given the significant indirect effect of personal norms on sustainable consumption intention ($\beta = 0.11$), it appears that personal norms play an intermediate role in the relationship between knowledge/concern and behavior.

Theoretically, personal norms serve as bridges connecting abstract values/attitudes/beliefs with specific behaviors. Values become meaningful only after personal norms have translated them into actionable moral obligations. Practically speaking, if an individual holds values concerning sustainability but lacks a corresponding set of personal norms those values remain abstract and motivationally inert; with personal norms, values are transformed into behavioral guidelines. The data collected during this study are consistent with this theoretical interpretation indicating that environmentally related knowledge/care/awareness facilitates sustainable consumption intentions via the normative path.

The findings regarding personal norms show that the relationship between personal norms and sustainable consumption is significantly influenced by environmental concern. Concerned consumers are more likely to internalize their concern for the environment as a personal obligation, therefore making it easier for them to adopt sustainable behaviors. In addition, there are several ways that personal norms can be developed. For instance, the development of personal norms is influenced by moral emotion, i.e. feelings of guilt and/or shame when purchasing non-sustainable goods and/or feeling proud after purchasing sustainable goods. Additionally, personal norms can be developed through moral reasoning, i.e. through rational consideration of what is right Vs wrong and finally through social reaction, i.e. consideration of how other people might react to your decision to buy sustainable goods.

In terms of strategies for promoting and supporting the development of personal norms, researchers have suggested a number of possible approaches. Specifically, normative communications, e.g. messages that use moral language ("it is the right thing to do", etc.) to develop/activate personal norms. Similarly, public commitments made to engage in sustainable consumption could support the development of personal norms through both consistency and identity processes. Finally, highlighting that other individuals (especially those in the same social group as you) are engaging in sustainable consumption could promote/support the development of personal norms through social comparison and identity processes.

The results demonstrate that structural barriers to sustainable consumption-such as perceived difficulty, inconvenience and high cost-influence whether environmental concern leads to actual sustainable consumption. The finding supports existing research on the impact of structural factors on the awareness-consumption link.

Specifically, among all respondents, price was found to be a major structural barrier. The majority of respondents reported that price is a significant deterrent to buying green. It is well documented that sustainable products typically come at a higher cost than comparable non-sustainable products. While many consumers indicate that they want to go green, they often cite price as the main reason why they don't follow through with that intent [3,4].

Therefore, while awareness of environmental issues has increased dramatically since the publication of A Blueprint for Green Business - including widespread acceptance of climate change-there remains a significant disconnect between awareness and consumption. One major cause of this disconnect is the fact that sustainable products typically cost more than comparable non-sustainable products. As a result, many consumers face significant financial disincentives when attempting to incorporate green products into their daily lives.

Price sensitivity moderated the relationship between perceived barriers and sustainable consumption intention. Specifically, price sensitivity was a significant predictor of sustainable consumption intention for all participants. However, among participants reporting high environmental concern, perceived price as a significant barrier was strongly negatively correlated with sustainable consumption intention.

This is consistent with previous research indicating that price is the primary obstacle to adopting sustainable consumption [3,4]. Furthermore, this finding is in line with the 'value-action gap' literature indicating that environmental concerned consumers often fail to convert their intentions into actions because of price premiums [2].

Behavioral economists refer to this type of nudge towards less sustainable options as choice architecture. Specifically, when consumers are faced with a variety of product alternatives, the price premium for sustainable options represents a nudge toward less sustainable options. Therefore, even environmentally concerned consumers will rationally select less expensive alternatives when they are aware of the price difference and perceive the environmental benefits of the sustainable option as distant, future oriented or unperceivable at the time of consumption.

Policy makers seeking to bridge the knowledge-action gap caused by the lack of affordable sustainable alternatives should focus primarily on narrowing the price differential between sustainable and unsustainable products. Mechanisms for achieving this goal include:

- **Subsidies and Tax Incentives:** Direct subsidies for sustainable products can lower consumer prices thereby providing greater economic attractiveness for selecting sustainable options
- **Environmental Taxation:** Taxes levied on environmentally damaging products can produce price signals favoring the selection of sustainable alternatives
- **Economies of Scale:** Promoting the growth of sustainable markets can allow companies to achieve economies of scale and reduce production costs and ultimately consumer prices
- **Internalizing Externalities:** Ensuring that the full environmental costs of unsustainable products are reflected in their prices via regulatory mechanisms can facilitate a relative price advantage for sustainable alternatives

Perceived constraints related to availability were a second significant barrier to sustainable consumption. Research demonstrates that access to sustainable alternatives is a critical element in determining whether consumers will actually practice sustainable consumption despite their willingness to consume sustainably [8]. Availability limitations exist at multiple levels.

At the macro-level, sustainable options may not be produced/distributed in some geographic areas -- especially in developing countries or rural communities [8]. At the meso-level, sustainable products may not be carried by specific retailers -- limiting consumer access to sustainable products even though such products may be widely available in general. At the micro-level, sustainable options may be placed in obscure or unclear locations within stores -- thus decreasing their visibility and likelihood of being selected by consumers [5].

Moreover, the moderator analysis demonstrated that availability constraints were particularly deleterious to environmentally concerned consumers who deliberately search out sustainable options. Those consumers who cannot locate sustainable options within their normal shopping venues may become frustrated and discouraged -- potentially leading to a decrease in their subsequent intentions for consuming sustainably. This pattern is congruent with "behavioral rebound," wherein failed attempts to act sustainably diminish motivation and efforts to pursue additional sustainability initiatives [2].

To address availability limitations necessitates coordinated activity along the entire supply chain. Production-based solutions involve producing more sustainable products to increase distribution possibilities. Retail-based solutions involve placing sustainable products in better visible locations to improve accessibility. Consumer based solutions utilize technology such as smart phone apps and online shopping sites to assist consumers in identifying and accessing sustainable products more effectively.

Trust and Credibility Concerns

Cognitive-affective-behavioral integration models represent another avenue for understanding the relationships among variables. These models propose that environmental behavior is influenced both by cognitive factors (e.g., knowledge and beliefs) and affective factors (e.g., feelings of concern), which are interrelated and mediated by intervening variables. Environmental knowledge is clearly a key cognitive variable in this study, while environmental concern serves as a major affective variable. Although both cognitive and affective factors were related to sustainable consumption, they operated through different mediating variables-perceived responsibility (a cognitive variable) and personal norms (an affective/moral variable). As such, successful interventions will need to target both cognitive and affective domains.

The habit-intention-context framework provides yet another lens through which to understand the results of this study. In this context, habit (the extent to which a particular behavior occurs automatically without conscious consideration) acts as one of three main influences on environmentally responsible behavior. Habits often operate at a level below consciousness and can therefore act independently of our intentions. The habit-intention-context framework proposes that behavior is formed through interactions between an individual's habits, their intentional process (influenced by their values, attitudes, etc.) and the environment surrounding the behavior. In this sense, intentions (which are determined by variables like environmental knowledge, perceived responsibility and personal norms) serve as a potential starting point for changing behavior. However, even well-formed intentions will not necessarily lead to changed behavior if there exist significant contextual barriers (like price or availability), or if the behaviors being considered are deeply ingrained as part of a person's daily habits. Thus, a complete approach to promoting sustainable consumption needs to include three types of interventions: those intended to form stronger intentions (by raising awareness of values and norms), those designed to disrupt unhealthy habits and those aimed at reducing contextual barriers. Interventions focused solely on forming stronger intentions (for example, through advertising awareness campaigns) will most likely be insufficient unless supplemented with either habit-changing efforts or changes to the structure of the environment. A good example of this would be implementing policies to increase the availability and affordability of sustainably produced products.

Environmental concern has traditionally been seen as having a number of sociodemographic correlates (e.g., age, sex, education level, income), including greater concern expressed by individuals who identify themselves as female, younger in years, more educated and having higher incomes. The current study supports each of these findings to some degree. Females in this study tended to report higher levels of environmental concern and sustainable consumption intent than did males. Similarly, younger adults (who are typically under age thirty-five) tended to express higher levels of environmental concern and sustainable consumption intent than did older adults. Higher education levels were positively correlated with both environmental knowledge and sustainable consumption intent. Finally, respondents reporting higher incomes were also more likely to report both higher levels of environmental knowledge and sustainable consumption intent. While the exact causes of these sociodemographic correlations are still unclear, several possible explanations have been offered. One possibility is that females tend to receive more environmental socialization than do males. Socialization refers to the learning of socially acceptable roles and behaviors during childhood and adolescence. Environmental socialization involves learning about how people view and behave toward the natural world. Females' greater involvement in household decision-making regarding food purchases may result in greater exposure to sustainability-related messages. Women generally perceive a wider range of risks than do men, including risks associated with environmental degradation. Many studies have suggested that women are generally more concerned about environmental issues than are men. Additionally, sustainable consumption is sometimes viewed as a feminine value. Men who adopt sustainable lifestyles may experience negative reactions from male peers due to identity conflicts.

As mentioned previously, the relationships between environmental concern and sustainable consumption intent have been found in numerous prior studies to vary by age group. Younger adults are generally found to exhibit more environmental concern than are older adults. Younger adults grew up during a time when climate change became increasingly recognized as a serious global threat. Therefore, younger adults tend to have received more formal education concerning climate change than have older adults. Younger adults are also more likely to consume media content emphasizing environmentalism. In addition to greater formal education regarding climate change, younger adults may possess greater environmental literacy than do older adults. Environmental literacy is defined as knowledge of how society affects the natural environment. Older adults are often assumed to have developed greater stability in their lives over time. They may feel less motivated to engage in new behaviors because they perceive that their identities will remain unchanged regardless of whether or not they adopt new behaviors. This assumption is referred to as "identity protection theory." It suggests that individuals resist changing their identities by resisting changing their behaviors. Identity protection theory further suggests that younger adults may be more likely than older adults to experience status anxiety -- anxiety resulting from concerns about what others think of one's status or position within society. Status anxiety may motivate young adults to make choices about consuming products based on how these products will shape their identities.

Although prior research has documented age-based disparities in the propensity for sustainable consumption, researchers have recently argued that these disparities may decrease over time as climate change becomes more apparent globally and as the environmental impact of climate change becomes more evident locally. The decreasing disparity between younger and older adults in environmental concern is consistent with this argument. Climate change is now being felt more intensely in regions where climate change had previously appeared abstract and distant. Extreme weather events are occurring more frequently and are receiving more media coverage than ever before. These changes may cause older adults who experienced no obvious harm from climate change during earlier decades to begin feeling threatened by its consequences.

Research conducted using samples larger than this study indicates that the relationship between education level and environmental knowledge is highly significant. Individuals with higher education levels are significantly more knowledgeable about how societies affect the natural environment. The relationship between education level and sustainable consumption intent appears to be similarly significant. Higher education levels appear to be positively correlated with greater sustainable consumption intent.

Education and income level were found to correlate with both environmental knowledge and sustainable consumption intent. Higher education levels were positively correlated with both environmental knowledge and sustainable consumption intent. Similarly, higher income levels were positively correlated with both environmental knowledge and sustainable consumption intent.

Higher education levels are likely associated with greater access to education about how societies affect the natural environment. Individuals with higher education levels may be able to afford higher-priced products labeled as environmentally friendly, thus giving them greater opportunity to choose sustainably produced products.

Educated individuals are also generally more cognitively capable of processing large amounts of information-a skill required for evaluating complex environmental claims:

- Understanding sustainable consumption behaviors-an empirical study
- Of the awareness-intent gap using the Value-belief-norm framework

Introduction
The increasing global demand for goods and services has led to growing concerns about unsustainable consumption practices. Consumer behavior plays an essential role in meeting these demands; however current patterns indicate that many consumers are unaware of the impact of their purchases. Moreover, even those who recognize the negative consequences of their consumption habits do little to alter their behavior. This paper examines the relationship between consumer awareness and sustainable consumption and identifies some possible reasons for the disconnect between awareness and intent.

Methodology
A survey-based study was conducted to examine the factors influencing sustainable consumption. A total of 100 responses were collected. All participants answered questions assessing their level of environmental concern, their perceived responsibility regarding environmental protection and their personal norms concerning the use of resources. Participants were also asked to report their environmental knowledge, their perceptions of structural barriers (e.g. Cost) associated with adopting environmentally friendly behaviors and their sustainable consumption intentions.

Results
Analysis indicated a positive correlation between participant's environmental knowledge and their perception of responsibility. Additionally, a positive correlation existed between participants' perceptions of responsibility and their personal norms. Furthermore, a positive correlation existed between participants' personal norms and their sustainable consumption intentions. However, no statistically significant correlation existed between participants' environmental concern and their sustainable consumption intentions. Structural barriers moderated the awareness-behavior relationship.

Discussion
These results support the application of the Value-belief-norm framework to sustainable consumption behaviors. The findings also support the role of structural barriers in preventing behavior change. The results highlight the need for developing and implementing targeted interventions aimed at enhancing the ability of consumers to engage in sustainable consumption behaviors.

Conclusion
This study has provided new insights into how awareness relates to behavior among consumers. The findings illustrate that, despite high levels of awareness, few consumers intend to take actions that are beneficial to the environment. The results also show that there is a disconnect between what consumers believe and what they will actually do. Therefore, developing targeted interventions is necessary if we want to increase sustainable consumption behaviors among consumers.

Limitations
While this study presents valuable insights into the awareness-behavior gap among consumers, there are certain limitations to consider. For example, while large enough to meet the requirements of the statistical analyses used within the study, the number of subjects included in the study is limited. Thus, caution should be exercised when applying the results to other populations. Another limitation of this study is that only self-reported data were obtained. As such, there exists the possibility that the true extent of consumer awareness may be overstated due to response bias. Finally, the present study examined a single population of consumers located in a single geographical location. It remains unclear whether similar results would emerge in other populations or locations.

CONCLUSION

This research assessed how much consumers know about environmental issues and how this relates to their behaviors as environmentally conscious consumers. The study investigated why there is such a large difference between consumers who recognize an issue (i.e., they are aware) and those who take action based on that awareness. Using survey information collected from 100 consumers and using the Value-Belief-Norm (VBN) framework, the researchers found that even though consumers have some level of environmental awareness, there were several factors that limit the ability of consumers to intend to act sustainably.

There was a statistically significant indirect impact of environmental knowledge on sustainable consumption, which occurred due to the role of perceived responsibility and personal norms as mediators of this relationship. There was also a statistically significant moderation of the awareness-behavior relationship by perceived barriers, primarily price sensitivity. Thus, to encourage sustainable consumption, it appears necessary to address both individual-level and structural-level barriers.

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