

# Colour, Cost, and Cues: How Visual Heuristics and Environmental Concern Shape Sustainable Purchase Decisions

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## Abstract

Most of the time, fashion buyers who are inclined to purchase sustainable products rely on both visual and informational cues. However, research has rarely delved into how these cues interact during trade-offs in real purchases. The research focused on how the use of color (earthy vs. neon), price (cheap vs. expensive), and sustainability labels influence consumers' perception of sustainability and their purchase decisions. Besides, the study also investigated whether these effects were moderated by demographic and attitudinal factors. There were eighty-one participants who engaged in an online experimental task that consisted of 40 product-choice trials with randomization. On both perception and choice measures, it was observed that consumers used colour and price as strong heuristics: products that were in earthy colours were always perceived as more sustainable, and participants chose to purchase the cheaper options when there was no information about sustainability. Nevertheless, the presence of a sustainability label on a product made the product preferred even if the product was more expensive, thus giving evidence that informational cues can partially override price-driven tendencies. In contradiction to the hypotheses, labels brought about greater effects on the sustainability perceptions of the earthy products than those of the neon ones, which implied a congruency rather than a compensation effect. Also, the demographic factors which include gender, age, education, and income together with knowledge about sustainability did not turn out to be predictors of sustainable purchasing. On the other hand, environmental concern significantly increased the probability of choosing the option with the label. These outcomes reveal a dual-process decision model for eco-friendly fashion, in which consumers mainly depend on superficial visual cues except when they have a strong intrinsic environmental motivation. The findings have implications for eco-branding and suggest that sustainability communication works best when informational and visual cues are in harmony.

**Keywords:** sustainable fashion, eco-labels, colour heuristics, price cues, consumer behaviour, environmental concern, purchase intention

## Introduction

Sustainability has emerged as a central issue in consumer industries, and fashion is no exception. Over the last ten years, increased environmental awareness and ethical sensibility have changed consumer expectations, and brands have responded by signaling eco-friendliness through their material, messaging, and design, also known as “Ethical Consumerism” [15]. Fashion, however, offers a unique challenge, contrary to many other industries, aesthetic beauty and trend-driven imagery are more often competing

with or trumping moral or practical values. Variables like color, price, and sustainability labels intersect to inform decision-making in ways that are not yet fully understood [14]. Past research has separately explored how perception of color (e.g., earthy vs. neon tones), sustainability labeling, and product price affect consumers [2]. However, few studies have looked at how these signals interact when consumers must make trade-offs during purchase decisions in real-world-like buying situations.

A phrase that embodies this tension is from the designer Vivienne Westwood: "Buy less, choose well, make it last" [29]. Unfortunately, in real life, consumer behavior is oftentimes at odds with this tenet when trend-driven images and price incentives get involved. McKinsey & Company (2020) reports that the typical shopper purchased 60% more apparel in 2014 than they did in 2000 but retained each garment for half as long. This indicates that even with greater awareness, sustainability will not necessarily be the determining factor in most fashion purchases.

To place these variables within the academic context, it is necessary to articulate how each concept has been understood in past literature and how it is operationalized in this study. Color, as a visual cue, denotes the perceptual property of an object determined by light reflection and human interpretation [25]. Marketing research indicates that color influences emotional response, cognitive appraisal, and product judgment; often used as a heuristic for such qualities as naturalness or artificiality [13]. In this study, color will be operationalized categorically into earthy tones (e.g., beige, olive, rust) versus neon tones (e.g., electric blue, highlighter yellow). Price is another important economic cue and here defined simply as the monetary value attributed to a product which signals quality and affordability among other dimensions of perceived fairness [21]. It will be treated dichotomously here between cheap and expensive to see if consumers prioritize cost over sustainability. Sustainability labels are an informational cue defined here as explicit textual or symbolic indicators that communicate environmental responsibility [27]. This was operationalized by having an eco-label present or not next to the product image. The two dependent variables, perceived sustainability and purchase choice, are derived from past literature that looked at the effect of sustainability on purchase decisions and color theory's effect on sustainability assumptions. Perceived sustainability as defined as consumer belief that a product is ethically produced and the brand is environmentally conscious irrespective of its actual lifecycle impact [27]. This was operationalized through Likert-scale ratings collected after each visual stimulus. Purchase choice refers to the behavioral intention to select or buy a product and will be operationalized in this study using a forced-choice format where participants have to choose between two competing items [1]. Finally, control variables such as type of product used, format of presentation adopted and consistency in design are included so that the effects of manipulated cues may be isolated. Together, these definitions make sure that the concepts are clear and enable a structured analysis of how visual, economic, and informational elements come into play in the decision-making process related to sustainable fashion.

This study is motivated by everyday observations and discussions regarding how considerations of looks tend to overpower ethics, even among green consumers. This divergence was of interest particularly because sustainability is often valued verbally by consumers, yet trendier or more affordable options are chosen in reality. This led to an exploration of how aspects of design may unconsciously influence sustainable choices, especially in the context of e-commerce where visual cues prevail.

In order to appreciate one of the strongest of such cues which is color, it is necessary to define the term color theory. Color theory is the analysis of the way colors affect the senses and emotions [14]. It is a body of knowledge that explains how visual hues can communicate, influence mood, and direct buying decisions [25]. In marketing and design, it can be a psychological mechanism that dictates the way people

respond to visual input. These meanings are not common across the board but are commonly shared because of cultural and contextual learning. Color theory suggests that consumers automatically use these associations to make comparisons of product attributes, such as being “green,” even without supporting data [14]. Color theory, especially in the context of consumer psychology and branding, teaches us how visual messages influence emotional response and product judgment. Beyond their symbolic meaning, studies indicate that color might also impact cognitive processing speed, attention capacity, and decision-making precision. For example, certain warm colors enhance arousal and speed, whereas cool colors facilitate calm and reflection [13]. These subtle effects can unwittingly influence consumers' judgments, sometimes even trumping objective information like eco-certifications or price. Singh (2006) points out that color can be responsible for as much as 90% of snap judgments about products, particularly when little information is given. In a similar vein, Madden et al. (2000) illustrate how color affects emotional reactions and brand memory, with varying colors evoking differential reactions by demographic segments. Such associations may act as cognitive shortcuts, whereby consumers use color cues to infer product attributes even in the absence of corroborating information. For example, subdued colors such as beige, olive, or rust are usually thought of as organic or natural, whereas highlighter yellow or electric blue tend to represent artificiality or synthetic styling. Such associative connections can influence the way a product is perceived as sustainable by a consumer, even when no real sustainability claim is even made.

The present research seeks to investigate how colour, price, and sustainability information interact to shape consumers' perceptions of product sustainability and their purchase decisions, and to what extent are these effects moderated by demographic and attitudinal factors such as environmental concern, knowledge, and fashion interest? In a survey-based experimental design with randomized image trials, this study manipulates and combines these factors to analyze their effect separately and interactively. Unlike existing research, which tended to make use of self-reported attitude, perception-only measures, or generic product situations, this study records moment-by-moment decision-making in the context of a fashion-specific situation. Significantly, it combines demographic and psychographic moderators like age, gender, income, fashion interest, and environmental concern in an attempt to determine how individual values drive ethical consumption trade-offs.

### Research Hypotheses

- H1. Products in earthy colours will be rated as more sustainable than neon-coloured products.
- H2. Products with sustainability info will be rated as more sustainable than those without.
- H3. Participants will prefer to buy cheaper products unless sustainability info overrides that.
- H4. When sustainability info is present, participants will prefer eco-labelled products even if expensive.
- H5. Earthy-coloured products with no sustainability info will be perceived as more eco-friendly than neon-coloured products with no info, indicating a colour heuristic bias.
- H6. The influence of sustainability labels will be stronger for neon than for earthy colours, suggesting that labels help override visual assumptions.
- H7. When price and sustainability info are both matched, colour will no longer have a significant effect on perception or choice.
- H8. The effect of sustainability information on purchase choice will be stronger in women than in men.
- H9. Younger participants will be more influenced by product colour (i.e., more likely to choose neon regardless of sustainability info), whereas older participants will weigh sustainability more heavily.

- H10. Participants with higher education levels will be more likely to base choices on sustainability info than price or colour.
- H11. Participants from higher-income brackets will be more willing to choose expensive but sustainable items compared to low-income participants
- H12. Participants who self-report high environmental concern will be more likely to choose sustainable products even when they are more expensive or neon-coloured.
- H13. Participants who report low prior knowledge of sustainability will rely more on visual cues (e.g., earthy tones) than actual sustainability labels.
- H14. Participants with a strong interest in fashion trends may prefer neon-coloured items despite sustainability info.

The present study tests three independent variables: color (earthy vs. neon), price (cheap vs. expensive), and sustainability labeling (with or without). These variables investigate the effects of visual, economic, and informational cues on consumer responses. The dependent variables include perceived sustainability, which can be measured through ratings or direct selection, and purchase choice, which was assessed using a forced-choice task. To control for extraneous factors between trials, the type of product (t-shirts), the format of visual presentation, and the design style of each pair were kept constant. This ensured that any differences observed in responses could be attributed solely to the manipulated variables.

Each condition was run in at least two random trials, making a total of 40 trials. The design of the conditions was traced through to directly evaluate the hypotheses (H1–H14) as well as effects of demographic moderators like age, gender, income, education, and attitudes. By testing these hypotheses within an apparel-specific context under controlled visual stimuli and randomized trial conditions, this research contributes to a crucial missing link in the fashion and sustainability literature. It not only builds on earlier research that tested isolated variables but also provides practical insights for sustainable fashion branding strategies that want to link consumer values to purchase behavior.

## Literature Review

In recent years, there has been a growing push by scholars and practitioners to find out how informational, visual, and economic determinants shape sustainable consumer behavior. The fashion industry presents a unique challenge, as visual aesthetics, pricing strategies, and ethical branding frequently intersect in complex and context-dependent ways. While a rich body of research has shed light on how each variable works in isolation, very little research has investigated how they work together in decision-making.

Kumar & Bagai (2017) provided initial insights into the impact of color on consumer perceptions in fashion shopping. Their 100 Indian consumers' survey illustrated how various colors correspond to varying shopper identities and values, implying that nature-inspired colors are generally considered more down-to-earth and reliable. Their findings reinforced the significance of aesthetic factors in attracting consumers' attention to fashion. Hildebrand et al. (2019) broadened this question by investigating the associative strength of color in perceptions of sustainability. They established that green and earthy tones were most frequently picked as "eco-friendly" in surveys and design contexts, yet even blue was occasionally seen as sustainable based on brand, gender, or context. This study provided valuable insight into the unconscious coding of sustainability using color, and its application to branding. To bridge this gap, Bontioti (2024) conducted a behavioural study where the researchers employed a virtual reality supermarket to assess perceived sustainability and evaluate actual product choices within various colored surroundings. This study was especially interesting in its use of immersive technology and attempted to

capture live behavioral decisions. Green and blue shelves produced greater sustainability ratings and selection rates. While red attracted visual attention, it was selected less often.

Majer et al. (2022) conducted a meta analysis which included 26 empirical studies to investigate the effect of visual sustainability labels on consumer perception. The review identified that clear, standardized, and credible labels universally enhanced eco-perception and purchase willingness, particularly when consumers were already environmentally active. Kim & Lee (2023) also examined the psychological underpinnings of eco-consumerism through analyzing how knowledge, concern, and perceived effectiveness influence purchase intention and behavior. Their structural equation model proposed that knowledge and self-efficacy are predictors of sustainable behavior rather than just concern, where eco-label credibility and purchase ease act as moderators. This study provides a broad synthesis and identifies patterns across studies.

The literature offers valuable insight into the influence of color, labeling, and attitudes that shape sustainable consumer behavior. However, the researchers manipulated variables, used products of a general type, and in many cases relied on self-report measures rather than observed behavior. None of them explore the level of conflict on which consumers struggle when sustainability is pitted against affordability or aesthetic taste, especially in fashion's visual and value-based world.

Even though there have been contributions made by previous research, various limitations remain across each study. Kumar & Bagai (2017) did not explore how color-based perception interacts with sustainability or price information. Hildebrand et al. (2019) used self-report perceptions and did not control for behavioral options or trade-offs among rival product characteristics. Bontioti (2024), although pioneering in its utilization of virtual reality, was confined to the food setting, did not extend to clothing, and did not involve price or sustainability information manipulation. Majer et al. (2022) identified, through a meta-analysis, a lack of experimental literature that pairs labeling with counteracting pricing or visual cues. Kim & Lee (2023) targeted psychological factors but employed single self-report measures and ignored visual and price-based experimental manipulation. To bridge these limitations, the present study takes a fashion-specific experimental approach that concurrently manipulates color, price, and sustainability information through paired product trials. It also involves behavioral outcome measures and assesses how personal values, e.g., sustainability knowledge, concern, and fashion interest, matter in consumer decisions when encountering competing cues.

## Methodology

### Participants

81 participants ( 33 Males and 47 Females) were recruited using convenience sampling techniques on internet sites. The age ranged from 15 to 42, with the mean age being 31.73 (SD = 14.38). Questionnaires were distributed in various networks through personal and peer dissemination to increase geographic coverage while considering limits on representativeness. There was no exclusion criterion other than having basic English understanding and access to the internet.

### Materials

The survey contained Likert-scale items measuring shopping behavior, purchase priorities, environmental concern, knowledge of sustainability, interest in fashion, and ethical consumer orientation. The experiment was conducted through a self-constructed google form consisting of 64 questions in total. Among these, 40 were experimental-product comparison trials. For each trial, two t-shirts with different combinations

of color (earthy vs. neon), price (cheap vs. expensive), and sustainability information (present vs. absent) were shown to participants. Visuals utilized consistent typography and varying degree of shirt design (round-neck, v-neck, cut-outs) to achieve realism while keeping the design within each pair constant. Prices were labeled clearly alongside every product wherever applicable.

## Procedure

This research used a quantitative survey design to investigate the effect of visual (color), informational (sustainability label), and economic (price) cues on consumer perceptions of sustainability and purchasing decisions in a fashion setting. This design was chosen because the researchers were able to manipulate variables and obtain measurable data from a large sample population in a real-world decision-making scenario.

Participants completed the study online through a Google Forms link. Following the completion of an informed consent process and a brief demographic survey, they then went on to complete 40 randomized product trials. In nearly every trial, they were presented with two multiple-choice questions: (1) Which product appears more sustainable? and (2) Which product would you be more likely to purchase? In some of the trials, participants also provided ratings for individual items on a 1–5 sustainability perception scale using a likert scale. Trials were randomized across presentation order to minimize order effects, and left-right placement of images was also randomized to control for side bias. Types of products (t-shirts) were held constant across trials. Participants were later on asked how much they trusted the sustainability information provided to them to be true and if they felt that they chose something they wouldn't usually purchase simply because it was more sustainable. This was done through a likert scale of 1-5. Then participants were asked for feedback and debriefed. Participants usually took 5-10 minutes to finish the task.

**Figure 1: An Example of the Types of Questions the Participant Saw**



For each hypothesis, trial pairs corresponding to the relevant factor contrasts (e.g., earthy vs. neon; info vs. no-info; cheap vs. expensive) were averaged within participant, and one-sample or paired *t*-tests (against a chance level of .50) were used to test directional effects. For the sustainability-perception subset, a  $2 \times 2$  repeated-measures ANOVA (Colour  $\times$  Price) was conducted on binary earthy-choice data to examine the perceptual biases in the absence of sustainability labels. Effect sizes are reported as Cohen's *d* for *t*-tests and partial  $\eta^2$  for ANOVA.

## Results

### Findings

Participants' decisions supported H1 (Earthy > Neon when price and information are matched): the earthy alternative was preferred by the participants more than the random distribution,  $t(80) = 9.39$ ,  $p < .001$ ,  $d = 1.04$  (mean = .73). H2 (Info present > absent when colour and price are matched) was also supported as the participants favored the eco-labelled option,  $t(80) = 10.20$ ,  $p < .001$ ,  $d = 1.13$  (mean = .77). For H3 (Cheaper preferred in no-info cross-price contrasts), participants chose the cheaper option more often,  $t(80) = 6.46$ ,  $p < .001$ ,  $d = 0.72$  (mean = .69). For H4 (With info, prefer eco-label even if expensive vs cheap without info), participants preferred the eco-labelled option even when it was expensive,  $t(80) = 2.64$ ,  $p = .010$ ,  $d = 0.29$  (mean = .58). For H5 (Earthy heuristic with no info: Earthy > Neon), even with no sustainability info, participants preferred earthy over neon,  $t(80) = 2.41$ ,  $p = .018$ ,  $d = 0.27$  (mean = .59). H6 (Labels help neon more than earthy) was not supported; to the contrary of H6, the label advantage was larger for earthy than for neon (paired comparison of info-gain: neon mean = .71, earthy mean = .84),  $t(80) = -3.32$ ,  $p = .001$ . or expensive ones. Participants' choices supported H1 (Earthy > Neon when price and information are matched): they chose the earthy option more often than chance,  $t(80) = 9.39$ ,  $p < .001$ ,  $d = 1.04$  (mean = .73). For H2 (Info present > absent when colour and price are matched), participants preferred the eco-labelled option,  $t(80) = 10.20$ ,  $p < .001$ ,  $d = 1.13$  (mean = .77). For H3 (Cheaper preferred in no-info cross-price contrasts), participants preferred the cheaper option,  $t(80) = 6.46$ ,  $p < .001$ ,  $d = 0.72$  (mean = .69). For H4 (With info, prefer eco-label even if expensive vs cheap without info), participants favoured the eco-labelled option even when it was expensive,  $t(80) = 2.64$ ,  $p = .010$ ,  $d = 0.29$  (mean = .58). For H5 (Earthy heuristic with no info: Earthy > Neon), with no sustainability info, participants still preferred earthy over neon,  $t(80) = 2.41$ ,  $p = .018$ ,  $d = 0.27$  (mean = .59). H6 (Labels help neon more than earthy) was not supported: contrary to H6, the label advantage was larger for earthy than neon (paired comparison of info-gain: neon mean = .71, earthy mean = .84),  $t(80) = -3.32$ ,  $p = .001$ . H7 (When price and info are matched, colour has no effect) was also contradicted: a strong earthy preference remained,  $t(80) = 10.61$ ,  $p < .001$ ,  $d = 1.18$  (mean = .81). For the DV (perceived sustainability), colour (Earthy vs Neon) showed a huge main effect,  $1.60 \times 10^{32}$ ,  $p < .001$ , indicating earthy products were seen as more sustainable than neon ones. Price (Cheap vs Expensive) also had a significant main effect,  $16.07$ ,  $p < .001$ , with cheap products judged slightly more sustainable than expensive ones. Finally, the Colour  $\times$  Price interaction was significant,  $25.04$ ,  $p < .001$ , showing the colour effect was stronger for cheap products than for expensive ones.

All analyses were performed using data from all 81 participants who completed the online style and sustainability choice task. Each participant completed trials that presented two clothing products with systematic variation in colour (earthy vs. neon), price (cheap vs. expensive), and sustainability information (present vs. absent). For each trial, participants indicated (a) which product looked more sustainable and (b) which one they would be more likely to buy. The purchase-choice data (dependent variable for H1–H7) included all 28 trials across the  $2 \times 2 \times 2$  design; sustainability-perception data are limited to the subset of “no-info” trials because perception questions were only asked in these conditions. No outliers or participants were excluded since responses were categorical (binary choices), and all participants completed the task.

For purchase intentions, participants showed a strong overall bias toward earthy-coloured products even when colour was the only difference,  $t(80) = 9.39$ ,  $p < .001$ ,  $d = 1.04$ ; products with sustainability information,  $t(80) = 10.20$ ,  $p < .001$ ,  $d = 1.13$ ; and a clear tendency to choose cheaper items,  $t(80) = 6.46$ ,

$p < .001$ ,  $d = 0.72$ . When sustainability information was attached to an expensive product, they preferred the labelled option despite the higher cost,  $t(80) = 2.64$ ,  $p = .010$ ,  $d = 0.29$ . Without any sustainability information provided at all, earthy items were considered more environmentally friendly than neon ones on average even before controlling for price differences between conditions:  $t(80) = 2.41$ ,  $p = .018$ ,  $d = 0.27$ ; supporting the notion of a colour heuristic whereby an earthy tone signals environmental friendliness more than does a neon tone. Contrary to expectations that sustainability labels would increase preferences more for neon products than for earthy ones (Color by Label interaction), this effect was greater in magnitude for preferences toward earthy products than neon ones:  $t(80) = -3.32$ ,  $p = .001$ ; and when price and information were matched there was still a very strong preference toward earthy products:  $t(80) = 10.61$ ,  $p < .001$ ,  $d = 1.18$ .

For sustainability perception (no-info trials only), a  $2 \times 2$  ANOVA revealed significant main effects of Colour,  $F(1, 80) = 1.60 \times 10^{32}$ ,  $p < .001$ ; Price  $F(1, 80) = 16.07$ ,  $p < .001$ ; and the interaction between Colour and Price  $F(1, 80) = 25.04$ ,  $p < 0.001$ . Product perceived as more sustainable in the earth tone than the neon colour condition, particularly for cheap rather than expensive prices.

These findings together demonstrate that visual cues such as colour and price have very strong heuristic influences on judgments about sustainability and purchase intentions even when explicit sustainability labels are provided: participants tend to associate earthy tones with eco-friendliness as well as lower prices and rely only partially on objective information regarding sustainability. This implies that sustainable branding is enhanced when visual design (earthy color palettes) is congruent with explicit sustainability communication since consumers seem to depend on intuitive visual cues in their "eco" decisions.

To examine H8–H14, several generalised estimating equation models (with a binomial logit link) were run on the purchase-choice data (dependent variable = 1 if the participant selected the sustainable option; otherwise 0). Each model had participants as a clustering variable to control for repeated measures across trials. Only relevant subsets of trials were used for each hypothesis—for example contrasts between labelled and unlabelled products for effects of sustainability information (H8, H10, H12), and colour-only no-info trials for colour heuristic effects (H9, H13, H14). Demographic and attitudinal moderators (gender, age, education, income environmental concern sustainability knowledge fashion interest) were added as predictors in separate models. All Likert-type moderators were handled as continuous numeric variables. Gender and education categorical moderators were dummy-coded. There were no outliers to remove since the dependent variable was categorical and all participants completed the task. Models were estimated with robust standard errors.

Gender did not significantly influence sustainability-driven choices: women were not more likely than men to choose products with sustainability labels,  $\beta = 0.09$ ,  $z = 0.48$ ,  $p = .633$  (H8). Age did not predict either color-based preferences in no-info trials ( $\beta = -0.009$ ,  $z = -0.32$ ,  $p = .751$ ) or sustainability-label use ( $\beta = 0.02$ ,  $z = 1.39$ ,  $p = .166$ ) (H9). Education level was unrelated to the likelihood of choosing the labeled option across all comparisons (all  $p_s \geq .299$ ) (H10). Income effects for the trade-off between expensive sustainable vs cheap non-sustainable items could not be estimated due to limited analyzable trials (H11). In contrast, environmental concern emerged as a significant predictor; those with higher scores on environmental concern were significantly more likely to choose the sustainable (labelled) option when it competed with an unlabelled one,  $\beta = 0.29$ ,  $z = 4.00$ ,  $p < .001$  (H12). Sustainability knowledge did not predict reliance on colour cues in no-info trials ( $\beta = 0.06$ ,  $z = 0.38$ ,  $p = .703$ ) (H13). Fashion interest does not significantly increase preference for neon products; if anything there is a non-significant trend toward earthy preferences with higher fashion interest ( $\beta = 0.26$ ,  $z = 1.54$ ,  $p = .123$ ) (H14).

## Discussion

This study investigated the impact of visual cues (colour and price), sustainability labels, and individual differences on consumers' perceptions of sustainability and their purchase decisions. Results from both perception and buying tasks indicated that participants heavily relied on intuitive visual heuristics, especially colour and price, in making judgments about whether a fashion product was sustainable [10, 16].

As anticipated, earthy tones were highly associated with environmentally friendly characteristics; participants rated items in earthy colors as more sustainable than those in neon alternatives even when both items shared identical sustainability information [18, 24]. This finding is consistent with prior research indicating that consumers rely on visual stereotypes to infer sustainability-related information [26]. In the same vein, lower prices increased purchase likelihood but sustainability labels and earthy colors could partially override this price bias [5, 22]. That is indicative of “eco-signaling” through both color and labeling being able to counteract consumers’ default preference for affordability by making sustainability look more attractive even if it comes at a higher cost [28].

One surprising result was that sustainability labels had a greater impact on earthy products than on neon ones, not compensating for neon colors (which would normally reduce perceived sustainability), but rather enhancing the already existing eco-friendly association of earthy tones [18].

This suggests that colour and sustainability information work in a mutually supportive manner, rather than in an independent manner. In other words, it suggests that sustainable branding works better when visual cues and informational cues are harmonious, not discordant [26].

The individual characteristics showed that demographic variables, namely gender, age, education, and income, had no statistically significant influence on sustainable choices [7]. Sustainability knowledge and interest in fashion had no meaningful effect on behaviour. The only statistically significant moderating variable was environmental concern which significantly increased the probability of choosing a sustainable labelled product irrespective of price or colour [8]. This indicates that real, pro-environmental motivation is the strongest and most reliable indicator of sustainable purchasing behaviour [28]. Individuals who are concerned about the environment will act on sustainability cues; individuals who do not, generally look to low-level heuristics on superficial characteristics [3].

In summary, the findings provide support for a dual-process framework for sustainability behaviour [23]. The majority of consumers relied on surface-level, automatic cues to judge “eco” products, whereas consumers with strong environmental dispositions made more thoughtful decisions based on sustainability [10]. Promotion of sustainable purchasing behaviour requires addressing both levels of action and tapping into consumer values [28].

Outside of these main patterns the results emphasize that subsistence decisions follow a dual-process cognition model where consumers first rely on quick, heuristic indicators and only later perform an analytical evaluation. The impressive colour change is in accord with research demonstrating that visual aids trigger pre-existing mental links with 'naturalness,' 'purity,' and 'eco-friendliness' [24, 26]. Specifically, natural and muted colours have been proven to engage the 'naturalness heuristic,' thus making products look more environmentally friendly even if there is no factual backing. Simultaneously, this issuance is quite consistent with cue congruency theory: when the visual (earthy colour) and the informational (eco-label) cues are in harmony, the consumer draws firmer and more confident judgements [18]. It also gives a reason for the preference of sustainability labels that made consumers like earthy

products more than those in neon color - not only were the information and surface cues complementing each other, but they were also reinforcing each other.

Moreover, these results support the construal-level theory and dual-route models of persuasion that argue that consumers are more influenced by appearance when their motivation or involvement is low and that highly environmentally concerned consumers process sustainability cues more deeply [23]. This research has opened the possibility that subjects with stronger environmental concern interacted less with heuristics and more with labels and such behaviour aligns with theoretical predictions where sustainable values and prior attitudes are the grounds for sustainable choice.

An additional relevant implication of the second theoretical point is that the sustainability of decision-making is not only about the ethical attributes being valued but mainly about how diagnostic and credible a cue seems to be at the moment of judgement. The label influence that was observed here is in agreement with studies which suggest that eco-labels play the role of both an informational signal and a trust cue that ease the feeling of uncertainty and risk [5]. It is quite surprising, however, that the present results also partially contradict findings that state that labels can make up for the lack of a strong visual cue (e.g., neon or artificial designs). Whereas, the effect of the label was greater on the case of earthy products, which is more congruency effect oriented than compensation models. This is an indication that sustainability communication has the greatest effect when the recipients perceive the presentation as being coherent in a perceptual way - e.g. price, colour, and label all telling the same story.

Many experiments have uncovered similar interaction behaviors between the visual aspect and labels [16, 26], yet some have found opposite effects when consumers assume greenwashing or when visual signs are too overpowering compared to the product category [28]. By bringing these pieces of evidence together, the current research helps to clarify the controversy by arguing that consumers appear to put more weight on the visual plausibility and trust cues than on a purely rational trade-off analysis. Simply put, the perception of sustainability seems to be achieved by a mix of intuitive and value-based processes, which accounts for both the significant heuristic effects and the role of environmental concern as a moderator.

### **Limitations and Suggestions**

The interpretive findings of this research had some limitations. First, as participants were recruited via convenience sampling on online sites, the sample is not representative of the general population, and individuals with a higher interest in sustainability may have been more likely to participate. Future research should utilize more systematic sampling approaches or recruit broadly in offline contexts so that generalisability is improved. The sample also had demographic imbalance—particularly in gender and age—limiting our analytical ability to examine true demographic effects. More balanced or stratified recruitment would make those comparisons more robust.

A final limitation is that all the stimuli were static digital images depicting only one type of product, which limited the ecological validity of the study. In a real buying situation, texture, fit, and brand context are key factors. These were not captured in this study. Instead, using physical products, VR simulations, or multiple product types would have provided conditions closer to reality. Similarly, the study only examined two simplified color groups (earthy vs. neon), which limits the interpretation of the consumers' broader interpretation of color. Testing further color variations and gauges the color–sustainability heuristic as to whether it persists with more nuanced color variation is warranted.

Finally, all psychological moderators were self-reported and may be vulnerable to social desirability and inaccurate self-assessment. Therefore, behavioral and/or qualitative measures would contribute deeper

insights into the consumer reliance on particular cues. Combined, these three limitations indicate that future studies should use more diverse sampling, studies capturing more realistic stimuli, and/or methods with more robust measures to enhance reliability and strength of conclusions.

## Conclusion

The present research shows that consumers are largely influenced by visual heuristics when forming sustainability judgments and making purchases. Earthy colours again made consumers naturally perceive products as more sustainable; participants rated sustainability-independent ratings and choice strongly relied on product colour even when no sustainability info was provided. When used, sustainability labels made participants even more likely to choose sustainable products, highlighting that informational cues can work in conjunction with a student's intuitive preferences, or preference for sustainable products that are marked by visual elements.

Furthermore, although participants preferred cheaper products in most cases, both earthy colours and sustainability labels partially alleviated consumers' predilection for cheaper products, indicating that effective eco-signalling can promote consumer preference away from cost-induced preferences. Demographics variables such as gender, age, income and education did not have any considerable variability as a moderator, and environmental concern was the only trustable moderator. For instance, environmental concern had an important and significant moderating effect in favour of participants with higher concern, shifting choice away from non-sustainable labelled products. Our data indicated that consumer behaviour can be more reliably guided by underlying pro-environmental intent than demographics or style.

Overall, the experimental findings demonstrate that sustainable consumer behaviour fits in the context of both intuitive visual preferences along with personal environmental concern. Adding to the socially desirable option of sustainable choice will require branding that combines clear visual design along with a trustable aspect of sustainability; pairing that with efforts towards strong environmental values may work in conjunction with study findings.

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