


## Article

# Walking the Talk: Unraveling the Influence of the Sustainability Features of Leather Alternatives on Consumer Behavior toward Running Shoes

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**Abstract:** This study seeks to explore the impact of the sustainable features of running shoes on consumers' inclination to pay a premium price. This research delves into the mediating effect of perceived sustainability and the moderating roles of environmental consciousness and animal conservation in the association between the sustainability features of running shoes and consumers' willingness to pay a premium. Data were gathered through an online survey distributed on Amazon MTurk. This study employed a one-way ANOVA to assess the influence of sustainability features on consumers' willingness to pay a premium for running shoes. Mediation analysis was conducted using PROCESS model 4, and moderation analysis was performed using PROCESS model 1 in SPSS 28.0. The findings revealed the significant impact of sustainability features on consumers' willingness to pay a premium. Perceived sustainability was identified as a partial mediator in the relationship between sustainability features and the willingness to pay a premium. Furthermore, environmental consciousness and animal conservation were identified as moderators influencing the relationship between sustainability features and consumers' willingness to pay a premium.

**Keywords:** perceived sustainability; recycle; vegan; willingness to pay; animal conservation; environmental consciousness; consumer behavior



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## 1. Introduction

Traditionally, the running shoe industry has extensively utilized leather as a predominant material for its durability, flexibility, and aesthetic appeal [1]. Leather's natural properties make it a popular choice for crafting the upper portions of running shoes, providing both structural support and a stylish finish [2]. However, the processing of leather products, such as tanning and finishing, is massively polluting [3]. The waste generated in the tanning process, known as tannery sludge, is classified hazardous [4]. As a result, the leather industry has faced immense criticism for its negative environmental impact and has raised concerns about animal welfare [5]. Animal welfare charities, activist groups, and animal protection groups such as PETA (People for the Ethical Treatment of Animals) have been encouraging the use of sustainable alternatives instead of animal fur [6]. Recent shifts in consumer preferences toward sustainability and ethical sourcing have prompted some manufacturers to reconsider their reliance on leather and explore alternative materials to align with evolving industry and consumer expectations [7].

This growing interest and push toward sustainable alternatives and animal-friendly products have led designers, fashion brands, and retailers to look for alternatives. For example, Stella McCartney, a British fashion designer, has refused to use any leather or fur in any of her designs since launching her business in 2001 [8]. Instead, she has been using 'vegan leather' in her products to replace leather, making a statement on the company's commitment to sustainability and animal well-being [9]. Adidas and Nike have incorporated recycled materials into the upper components of their footwear [10]. Notably,

Adidas' Fluid Trainer is comprised of approximately 50% recycled content in the upper, with 20% and 10% regrinds utilized in the sock liner and soles, respectively [11].

The price of these sustainable alternative products is usually higher compared to the conventional ones for various reasons. Traditional products, having been in production for a long time, receive significant support from the environment, often in the form of readily available resources and lenient environmental regulations. This support might not be fully considered in their overall cost [12]. The use of alternative environmentally friendly raw materials, initial R&D for processing equipment, and certification costs contribute to the slightly higher pricing of sustainable products compared to conventional ones [13]. Therefore, another question arises: will consumers be willing to pay extra for products they perceive as more sustainable?

The extant literature suggests that individual differences affect consumers' response toward sustainable products, such as demographics [14], personality traits [15,16], and the general attitude toward sustainability [17]. In the study by Jaiswal and Singh [18], it was found that individuals with high levels of environmental concerns exhibited a stronger inclination to choose eco-friendly products. Furthermore, Stringer et al. [19] also found that a consumer's elevated level of consideration for animal welfare and environmental well-being positively correlated with the likelihood of them choosing ethically marketed fast fashion products.

Drawing from the Theory of Reasoned Action (TRA), which posits that individuals engage in a rational decision-making process where attribute-based attitude plays a significant role in individual's behavior intention [20], this study aims to explore how consumers react to the sustainable features of leather alternatives in running shoes, focusing on their perceived sustainability and subsequent willingness to pay a premium. An experimental design approach was employed to test the relationships of concern. Consumers inclined toward sustainability often exhibit environmental consciousness, while those adhering to a vegan lifestyle seek products aligned with their values [21,22]. In this study, the moderating effects of environmental consciousness and animal conservation on the influence of sustainability feature descriptions on consumer's willingness to pay a price premium were also examined.

## 2. Literature Review and Hypotheses Development

### 2.1. Theory of Reasoned Action

The Theory of Reasoned Action (TRA) is a psychological framework widely used in understanding the cognitive processes underlying human decision making and behavior. Developed by Fishbein and Ajzen in the late 1960s, TRA posits that individuals engage in a rational decision making process, where their behavioral intentions are influenced by their attitudes toward a particular behavior or subject and the subjective norms surrounding it [20,23]. TRA comprises two central components: beliefs and attitudes. Beliefs refer to an individual's subjective assessment of the attributes of an object, as well as the importance of salient attributes, while attitudes represent the individual's overall evaluation of the object or behavior of concern. Importantly, TRA contends that attitude, in conjunction with subjective norms reflecting perceived social pressures, shapes an individual's behavioral intention toward the object. TRA has found broad applicability across various fields, providing valuable insights into understanding, and predicting human behavior in diverse contexts, including consumer behavior, health practices, and environmental decision making.

The theoretical underpinning of the Theory of Reasoned Action (TRA) significantly enriches the foundation of this study. According to TRA, the acquisition of information and knowledge regarding sustainability features plays a pivotal role in shaping consumers' attitudes toward the product, with a particular focus on the evaluation of sustainability features and perceived sustainability in the context of this study. This, in turn, influences consumers' behavioral intentions, as reflected in their willingness to pay a premium for the product. The TRA framework provides a structured and insightful lens to examine

the interplay between attribute beliefs, attitudes, and behavioral intentions in the context of consumer responses to the different sustainability features of leather alternatives in running shoes.

## 2.2. Sustainability Initiatives in the Running Shoe Industry

Consumer behavior toward sustainable products has undergone a remarkable transformation in recent years, reflecting a growing global consciousness regarding environmental and social concerns [24]. With an increasing awareness of climate change, resource depletion, and ethical considerations, consumers are demonstrating a heightened interest in products and brands that align with their sustainability values [25]. This shift in consumer mindset is characterized by a desire to make eco-conscious choices, seeking products that not only meet their functional needs but also minimize environmental impact [26]. In response to this shift, companies are adapting their strategies to cater to this evolving consumer demand, integrating sustainable practices into their production processes, sourcing ethically, using sustainable materials, and promoting eco-friendly product attributes [27]. Consumers are now more likely to scrutinize product labels and descriptions, looking for certifications, such as organic, Fair Trade, or carbon-neutral labels, as indicators of sustainability [28].

The running shoe industry has undergone a notable transformation in recent years, with an increasing emphasis on sustainability [29]. As consumer awareness regarding environmental impact grows, many leading brands within the industry have pivoted toward adopting eco-friendly practices [30]. This shift encompasses the use of recycled materials [31], energy-efficient manufacturing processes [32], and a commitment to reducing carbon footprints [33]. Sustainable practices in the running shoe sector also extend to ethical sourcing and production, with an increasing number of manufacturers embracing transparent supply chains and fair labor practices [34]. These initiatives align with the broader global push toward environmentally responsible consumerism, recognizing the role of industries in fostering a more sustainable future.

Within this landscape, particular attention has turned to the type of materials used in running shoes, especially considering the environmental implications of traditional leather production [35]. Leather, while a popular and durable material, often involves resource-intensive processes and can contribute to deforestation and environmental degradation [36]. In response to acknowledging these challenges, the industry has increasingly embarked on initiatives to investigate alternative materials, such as vegan leather, as a means to tackle environmental and ethical issues [37]. Vegan leather, derived from plant-based sources or synthetic materials, offers a cruelty-free and more sustainable option, reducing the ecological footprint associated with traditional leather production [38]. This shift underscores a broader commitment within the running shoe industry to balance performance and style with environmental and ethical considerations, marking a pivotal moment in the pursuit of sustainability.

There are two types of vegan leather: petroleum-based and plant-based. Petroleum-based leather, also known as plastic leather, is made from polyurethane (PU) and polyvinyl chloride (PVC) and has been in the market for a long time as a leather alternative [39]. Plant-based leather is made from materials ranging from mushroom, pineapple, and corn to banana, apple, cactus, green tea, coffee grounds, coconut water, and more. A particular plant-based vegan leather is Mylo, a sustainable leather substitute manufactured from mycelium, a mushroom's root-like structure [9]. Mylo has been used by various well-known brands such as Adidas, Lululemon, Stella McCartney, and others. Other plant-based leather alternatives include Muskin<sup>®</sup>, Desserto<sup>®</sup>, Appleskin<sup>®</sup>, SnapPap<sup>®</sup>, Kombucha, Teak Leaf<sup>®</sup>, Pinatex<sup>®</sup>, and Noani<sup>®</sup> [40]. While vegan leather is animal-friendly, depending on the type of vegan leather being petroleum-based versus plant-based, its environmental impact can be quite different [41]. For example, the production and finishing process of plastic leather is still not much more sustainable compared to conventional leather, and it is not biodegradable. In contrast, plant-based vegan leather is more environmentally sustainable.

Another sustainable initiative addressing the environmental impact of conventional manufacturing and non-biodegradable waste in the running shoe field is using recycled materials instead of new ones [42]. This trend emerged as a strategic response to reduce resource consumption and waste generation. Brands are embracing recycled materials, including polyester, ocean plastics, and rubber, aligning with consumer preferences for sustainability [43]. This shift reflects a commitment to a circular economy, emphasizing repurposing and reuse, showcasing the industry's dedication to responsible production and innovation in response to environmental challenges and evolving consumer expectations. Noteworthy examples of recycled materials employed in the production of running shoes include recycled polyester derived from post-consumer plastic bottles, recycled nylon from discarded fishing nets [44], and recycled rubber sourced from used automobile tires [45]. Additionally, some manufacturers have explored the utilization of recycled foam and other recycled textiles to reduce the reliance on virgin materials [46]. These initiatives underscore the industry's endeavor to repurpose materials and contribute to a circular economy, addressing both resource depletion and waste management concerns in line with consumer preferences for eco-conscious products.

### *2.3. Influence of Sustainability Features on Consumer Behavior*

The impact of sustainability features on consumer behavior is an increasingly relevant and multifaceted subject within marketing and consumer research [47]. Product features that provide the environmental and social benefits of a product, such as reduced carbon emissions, ethical sourcing, or contributions to social causes, can serve as compelling triggers for consumer engagement [48,49]. Vanclay et al. [50] delved into consumer preferences regarding products labeled with carbon ratings, reflecting the pivotal role of sustainability features in conveying a product's environmental performance. Cook et al. [51] found that consumers are generally willing to spend a higher price for products that carry sustainability labels, with organic labeling being the most likely to result in a higher willingness to pay. The study conducted by Silva et al. [52] also noted a positive impact on consumers when sustainability information was provided, leading to an increased likelihood of their intention to make a purchase. A study conducted by Denver et al. [53] also suggested that consumers are willing to pay a higher price for sustainable pork. Numerous empirical studies have explored the potential influence of these sustainability features on consumer preferences and subsequent purchasing decisions [54–56]. Also, consumers express a willingness to pay more for products associated with ethical production practices and fair trade [57]. Gan and Kao [58] provided valuable insights by highlighting the inclination of environmentally conscious consumers toward green products, with factors like price, quality, and brand playing primary roles in decision making. Additionally, their research contributes to understanding how consumers assess the sustainability features of a product and the relative importance assigned to different aspects. Simultaneously, consumers are willing to pay a premium for products labeled with carbon information [59]. Numerous scholarly inquiries have substantiated the impact of diverse sustainability attributes, including organic certification, fair trade designations, and other sustainability labels, on shaping consumer preferences [60–62]. This influence is notably observed through consumers' purchase intentions and their willingness to pay a premium for such products. Also, Wang et al. [63] studied consumers' preferences for various sustainability attributes and the results showed that consumers prefer the type of material used in products, availability of eco-labels, and traceability of products.

On the other hand, the impact of sustainability feature descriptions extends beyond mere information provision [64]. The psychological mechanisms underlying these responses are complex. Thus, an understanding of how sustainability features are framed and articulated is pivotal for businesses aiming to navigate this evolving landscape and harness the positive impact of sustainability messaging on consumer choices. Sustainability features pertain to characteristics and attributes that reflect a product's commitment to environmental and ethical considerations, including but not limited to reducing the

environmental footprint, responsible sourcing, and supporting social causes [65]. Effective descriptions of sustainability features serve as a bridge between conscious consumer values and purchasing behavior, as consumers increasingly seek eco-friendly and ethical alternatives [66].

In the context of running shoes, companies focus on different sustainability targets. For example, collaborating with Stella McCartney and Disney, Adidas introduced a vegan sneaker collection, promoting it as ‘Vegan Sneakers’ to highlight their sustainability from the perspective of an ethical animal-friendly commitment [67]. Meanwhile, Nike emphasizes the environmental sustainability of their running shoes by marketing them as ‘sustainable products’ with ‘100% recycled content’ [68]. Both Adidas and Nike describe the sustainability features of their products, and existing research suggests that these labels and product attributes are influential in consumer purchase decisions [69].

In this study, two particular types of sustainable product features related to materials used in running shoes were examined in terms of their impact on consumer behavior, including running shoes made with vegan leather and running shoes made with recycled contents. As a control, another product without any mention of sustainable features was also included in this study. Based on the literature, the following hypothesis was developed in this study:

**Hypothesis 1:** *Sustainable features (vegan and recycled materials) significantly influence consumers’ willingness to pay a price premium for running shoes.*

#### 2.4. Role of Perceived Sustainability

Within the framework of the Theory of Reasoned Action (TRA), it is recognized that different attributes associated with a product contribute to the formation of distinct attitudes. These attitudes, representing an overall evaluation of the product, subsequently influence various behaviors exhibited by consumers [70]. In simpler terms, the way consumers evaluate a product based on its attributes acts as a mediator in shaping the relationship between their attitude toward the product and their subsequent behavioral choices.

In the context of the present study, the primary focus is on sustainability features as the key attributes. The evaluation of these sustainability features is grounded in consumers’ perceived sustainability, emphasizing the pivotal role of their attitudes in shaping behaviors. Specifically, when consumers assess the sustainability features of a product, their perceptions and attitudes regarding the product’s eco-friendliness and ethical attributes become influential factors in determining their subsequent behavior. In this case, the behavior of interest is the willingness to pay a premium for products with sustainability features. Therefore, this study investigates how the perceived sustainability of these features acts as a crucial mediator in the complex interplay between product attributes and consumer behaviors.

In the context of understanding consumers’ willingness to pay a price premium for sustainable products, it is important to consider the role of perceived sustainability as a potential mediator. Perceived sustainability is a critical factor in consumers’ decision-making processes [71]. Sustainability has three dimensions mentioned in the literature: economy, society, and environment [71,72]. In the studies of Chen et al., they focused on product and service sustainability and their impact on customer engagement [73] and defined perceived sustainability as “a customer’s perception of the environment-related characters or performances of a product/services”. On the other hand, perceived sustainability can also be based on social and economic aspects as well [73]. When consumers are presented with specific descriptions of sustainability features, it shapes their perceptions of the product’s eco-friendliness and ethical attributes. For example, Sundar and Kellaris [74] discovered that being exposed to a logo adorned with eco-friendly color, such as green, heightened the perceived ethicality of practices that were ethically ambiguous. Conversely, exposure to a logo featuring a non-eco-friendly color, like red, diminished the perceived ethicality of the same practices. On the other hand, Gomes et al. [75] explored how the perceived benefits



of environmentally friendly attributes, along with the perceived quality, of green products impact consumers' willingness to pay a premium. This sequential process suggests that perceived sustainability can serve as a crucial link in the chain of influence from attributes to behaviors. Therefore, in this study of sustainable running shoes, the following hypothesis was developed in that sustainable features will lead to a perception of sustainability value, which in turn will influence consumers' willingness to pay a price premium for running shoes with those attributes. In other words, sustainable features will influence consumers' willingness to pay a premium price through the perceived sustainability value.

**Hypothesis 2:** *Perceived sustainability mediates the relationship between the sustainability features of running shoes and a willingness to pay a price premium.*

## 2.5. Role of Environmental Consciousness (EC) and Animal Conservation (AC)

In the realm of consumer behavior, personal values play a pivotal role in shaping individuals' purchasing decisions [76,77], particularly within the context of sustainability features and individuals' willingness to pay a price premium [78]. Consumer purchase behavior is intrinsically connected to the values individuals hold dear. Personal values encompass deep-seated beliefs, principles, and ethical standards that guide and reflect one's moral compass [79]. When consumers are presented with a product with sustainability features, their personal values, especially those associated with the sustainability features, act as potent determinants of their subsequent purchase choices. These values serve as lenses through which consumers interpret and evaluate the significance of sustainability attributes in the products they consider. Different sustainability features may resonate differently with various consumer segments, depending on their individual values and concerns [80].

Consumers with a heightened sense of environmental consciousness prioritize environmental preservation and responsible resource management [81]. Commonly, consumers often associate sustainable clothing with materials that are recycled, upcycled, or bio-based, as well as products that are locally manufactured [82–84]. Sustainability features, when explicitly communicated, resonate with individuals who hold such values. They perceive products bearing these features as aligned with their eco-centric beliefs, leading to a heightened perception of sustainability values and according willingness to pay a premium for these offerings [85,86]. For them, the act of purchasing environmentally friendly products becomes a manifestation of their values, affirming their commitment to ecological responsibility [30].

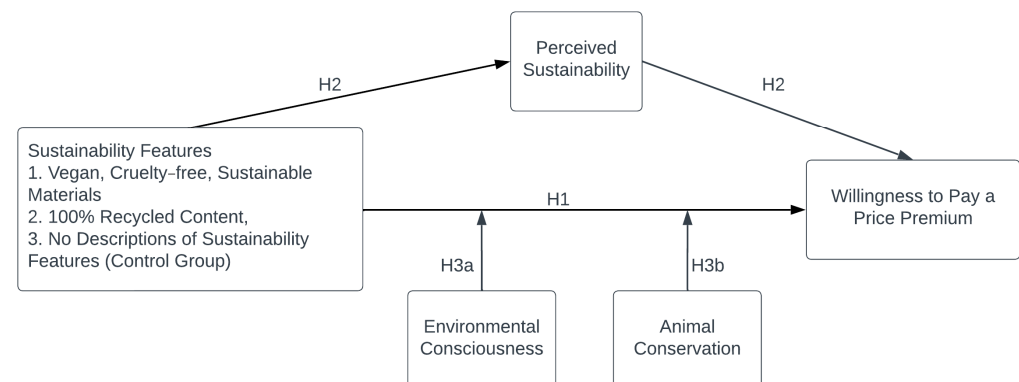
Similarly, personal values related to animal conservation advocate for the humane treatment and welfare of animals [87]. Consumers who embrace these values are likely to be ethically conscious and prioritize products that are endorsed as animal-friendly or cruelty-free [3,88], such as vegan leather which contains no animal components. When a product owns these attributes, consumers whose values center around animal conservation are more inclined to pay a premium, as it aligns with their ethical commitments and reinforces their desire to support ethical practices in product production.

Therefore, it is proposed in this study that the influence of sustainable features on consumers' willingness to pay might be different for consumers with different levels of environmental consciousness or animal conservation. In other words, consumers' individual differences in terms of environmental consciousness and animal conservation will exert moderating effects on consumers' decision making toward running shoes with different sustainable features. Therefore, the following hypotheses were formed:

**Hypothesis 3a:** *Environmental consciousness has a moderating effect on the relationship between running shoes' sustainable features and consumers' willingness to pay a price premium.*

**Hypothesis 3b:** *Animal conservation has a moderating effect on the relationship between running shoes' sustainable features and consumer's willingness to pay a price premium.*

The conceptual framework, representing the hypotheses and the relationships between the variables used in this study, is shown in Figure 1:



**Figure 1.** Conceptual framework.

### 3. Methodology

#### 3.1. Research Design and Data Collection

Data for this study were collected through an online survey posted on Amazon MTurk from a convenience sample aged between 18 and 30 years in the United States. This age group was chosen as the target population of the study as individuals aged 18 to 30 according to the literature have a higher awareness of sustainability and are more conscious about their consumption choices. The questionnaire was developed based on the proposed relationships built upon the literature and the focal sustainable features examined in this study. To reflect the two different product features, as well as a no-sustainability-mentioning control condition, three different product cards were created, reflecting each sustainable feature condition, respectively. All product cards had pictures of running shoes without brand names, with a title saying, “Brand X Running Shoes,” followed by details about color and price. The experimental groups had the descriptions of sustainability features “Vegan, cruelty-free, sustainable materials” and “100% recycled content” mentioned on them. The control group did not mention any sustainability feature. Participants were randomly assigned to one of the products and asked to complete the questionnaire. To ensure an equal distribution of responses for each product card, the desired number of responses for each product card was specified. The questionnaire had three sections. The first section measured consumers’ response toward the assigned product card, including the perceived sustainability and willingness to buy. The next section measured participants’ environmental consciousness and animal conservation. The last section measured participants’ demographics. Existing variables were adopted or contextualized in this study. The perceived sustainability scale was adapted from [89,90]. The environmental consciousness scale represented five items adapted from [91]. The scale measuring animal conservation used three items adapted from [3], and the scale for willingness to pay a price premium consisted of two items, which were adapted from [92,93].

A total of 748 questionnaires were gathered for the study, with 511 deemed suitable for data analysis following a thorough cleaning process. The excluded responses consisted of 107 questionnaires categorized as improperly completed or containing blank responses (rendered unusable), 49 responses with exceptionally brief (less than 1 min) or prolonged (more than 15 min) completion times, 32 responses deemed unusable due to the quality of provided information, and an additional 49 responses identified as exhibiting a straight-line response.

#### 3.2. Data Analysis

SPSS 28.0 was used for data analysis consisting of validity and reliability measures, ANOVA, and mediation and moderation analysis using Process model 4 and Process model

1, respectively. For reliability measures, Cronbach’s alpha was calculated, and all validity and reliability measures were performed via the Confirmatory Factor Analysis in SPSS 28.0. A one-way ANOVA was performed to test hypothesis 1 and 2. The PROCESS model 4 was used to carry out a mediation analysis using 5000 bootstrap samples, and PROCESS model 1 was used to carry out a moderation analysis using 5000 bootstrap samples [94].

## 4. Results

### 4.1. Sample Profile

As illustrated in Table 1, the sample is almost evenly distributed between males (52.45%) and females (46.58%). In the examination of the age distribution, a predominant proportion of respondents, constituting 83.76%, belonged to the 24 to 30 years age bracket, while a notable 16.24% fell within the 18 to 24 years range. Subsequently, additional demographic information, encompassing ethnicity, education levels, dietary preferences, and income levels, was gathered too.

**Table 1.** Sample profile.

Sample Characteristics	Count	Percentage
<b>Gender</b>		
Female	238	46.58%
Male	268	52.45%
Other	5	0.98%
<b>Age</b>		
18–24 years old	83	16.24%
24–30 years old	428	83.76%
<b>Ethnicity</b>		
White	449	87.87%
Black or African American	24	4.70%
Asian/Pacific Islander	19	3.72%
Hispanic or Latino	9	1.76%
Native American or American Indian	2	0.39%
Other	8	1.57%
<b>Education Level</b>		
High School Graduate	36	7.05%
Current College Student	9	1.76%
Graduate	404	79.06%
Postgraduate	62	12.13%
<b>Preferred Price Range for Shoes</b>		
Below USD 50	43	8.41%
USD 50–100	215	42.07%
USD 100–200	219	42.86%
Above USD 200	34	6.65%
<b>Income Level</b>		
Below USD 50,000	153	29.94%
USD 50,000–100,000	317	62.04%
USD 100,000 and above	41	8.02%
<b>Diet</b>		
Keto	41	8.02%
Vegan	108	21.14%
Vegetarian	185	36.20%
None	177	34.64%



#### 4.2. Reliability and Validity Measures

A reliability analysis was conducted to measure the internal consistency of each multi-item construct in the study. As shown in Table 2, the results revealed that the perceived sustainability ( $\alpha = 0.90$ ), environmental consciousness ( $\alpha = 0.92$ ), animal conservation ( $\alpha = 0.86$ ), and willingness to pay price premium scale ( $\alpha = 0.90$ ) were reliable with a Cronbach's alpha value above 0.7 [95].

**Table 2.** Reliability and validity results.

Variables	Items	Statements	FL ( $\lambda$ )	CR	AVE	Cronbach's $\alpha$
Perceived Sustainability	PS1	I think the sustainability level of these running shoes is high.	0.856	0.986	0.731	0.901
	PS2	I think the sustainability level of the materials used in these running shoes is high.	0.827			
	PS3	These running shoes are produced with a minimum effect on the environment and animals.	0.89			
	PS4	These running shoes are made from sustainable and environmentally friendly materials.	0.849			
	PS5	The production of these running shoes adopts environmentally friendly practices.	0.852			
Environmental Consciousness	EC1	I am pleased to purchase green products.	0.855	0.986	0.759	0.920
	EC2	I believe consuming green products is really good for the environment.	0.875			
	EC3	The overall feeling I get about green products is always satisfying.	0.859			
	EC4	The overall feeling I get about green products puts me in an environmentally safe mode.	0.867			
	EC5	I really feel good about green products.	0.899			
Animal Conservation	AC1	I feel guilty that animals have died because of human beings' consumption.	0.912	0.977	0.790	0.863
	AC2	For animal welfare, I think that we should not purchase products made from animals.	0.911			
	AC3	I think we should oppose production involving animal testing processes because animals are important within the ecological system.	0.841			
Willingness to Pay a Price Premium	WPP1	I am willing to pay a higher price for these sustainable running shoes than for other running shoes.	0.954	0.976	0.910	0.900
	WPP2	I am willing to pay a lot more for these sustainable running shoes than for other running shoes.	0.954			

The convergent validities of multi-item constructs were measured by factor loadings ( $\lambda$ ) with 0.5 as the cutoff value [96]. The discriminant validity of the constructs was measured using the average variance extracted (AVE) accounting for the variance explained by a construct in the items loaded against its comparison to the amount of the subsequent measurement error. The AVE for all the constructs was above the recommended value of 0.50 [96] and varied from 0.65 to 0.71 (Table 2), confirming both convergent and discriminant validity through high reliability and AVE.

### 4.3. Hypothesis Testing

A one-way ANOVA analysis was conducted to investigate the relationship between different sustainability features and consumers' willingness to pay a price premium (WPP), as postulated in Hypothesis 1. Three distinct sustainable features were presented to the study participants, namely: (1) Vegan, (2) 100% recycled content, and (3) No description of sustainability features. The results, as outlined in Table 3, demonstrated a statistically significant difference in consumers' willingness to pay a price premium in response to these sustainability features in the context of running shoes ( $F_{2, 508} = 212.993$ ,  $p$ -value  $< 0.001$ ).

**Table 3.** One-way ANOVA results.

			Test of Homogeneity of Variances		ANOVA		
Descriptions of Sustainability Features	Mean	Std. Deviation	Levene's Statistic	Sig.	F	Sig.	
Vegan	3.61	1.11	142.82	<0.001	212.993	<0.001	
100% Recycled content	3.69	1.03					
No Product Description	2	0					
Group Differences							
Descriptions of Sustainability Features	Mean Difference	Sig.	95% Confidence Interval [LL–UL]				
Vegan vs. No Product Description	1.611	<0.001	1.4				1.82
100% Recycled content vs. No Product Description	1.69	<0.001	1.5				1.88
Vegan vs. 100% Recycled Content	−0.078	0.687	−0.3				0.14

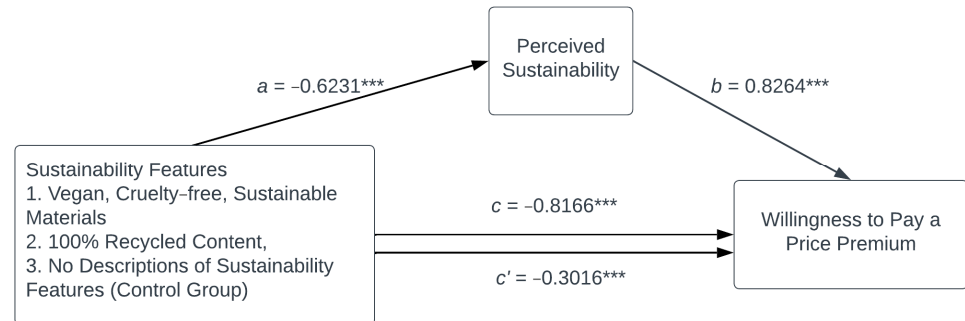
A subsequent post hoc analysis revealed that the mean score for the sustainability feature “Vegan” ( $M = 3.61$ ,  $SD = 1.11$ ) exhibited a significantly higher value than “No description of sustainability features”. Similarly, the mean score for the “100% recycled content” sustainability feature ( $M = 3.69$ ,  $SD = 1.03$ ) was also significantly higher than the “No description of sustainability features” condition. However, the analysis did not detect a statistically significant difference between the sustainability features “Vegan” and “100% recycled content.” These findings underscore the influence of sustainability features on consumers' willingness to pay a price premium, demonstrating that specific descriptions, particularly those emphasizing sustainability and ethical aspects, have a discernible impact on consumer behavior in the context of running shoe purchases. Therefore, H1 was supported.

To examine the mediating effects of the perceived sustainability in the relationship between sustainability features and consumers' willingness to pay price premium, PROCESS model 4 in SPSS was employed. To ensure the robustness of the analysis, PROCESS model 4 was conducted with 5000 bootstrap samples.

The analysis for the mediating role of sustainability is depicted in Figure 2, where  $a$  signifies the impact of the sustainability features on perceived sustainability,  $b$  represents the effect of perceived sustainability on the willingness to pay a price premium, accounting for the influence of the sustainability features,  $c$  denotes the total effect of the sustainability features on the willingness to pay a price premium, and  $c'$  signifies the direct effect of the sustainability features on the willingness to pay a price premium, considering the mediating perceived sustainability [97]. All the tested paths were significant ( $p$ -value  $< 0.000$ ), confirming the robustness of the model and indicating a direct impact and indirect impact of sustainable features on consumers' willingness to pay a price premium, that is, the impact of sustainable features on consumers' willingness to pay a price premium was partially mediated via perceived sustainability. Therefore, H2 was supported.

The moderating role of environmental consciousness on the relationship between sustainability features and consumer's willingness to pay a price premium was examined by using PROCESS model 1, where sustainable features served as the independent variable, willingness to pay a price premium as the dependent variable, and environmental consciousness was entered as the moderator. As shown in Table 4, the interaction between environmental consciousness and sustainability features was significant on consumer's willingness to pay a price premium, with a coefficient of  $\beta = 0.2081$  ( $p = 0.0883$ ). There-

fore, Hypothesis 3a was supported. PROCESS model 1 was also used to investigate the moderation effect of animal conservation. Similarly, the results showed that the interaction between animal conservation and sustainability features was also significant on consumer's willingness to pay a price premium, hence supporting H3b.

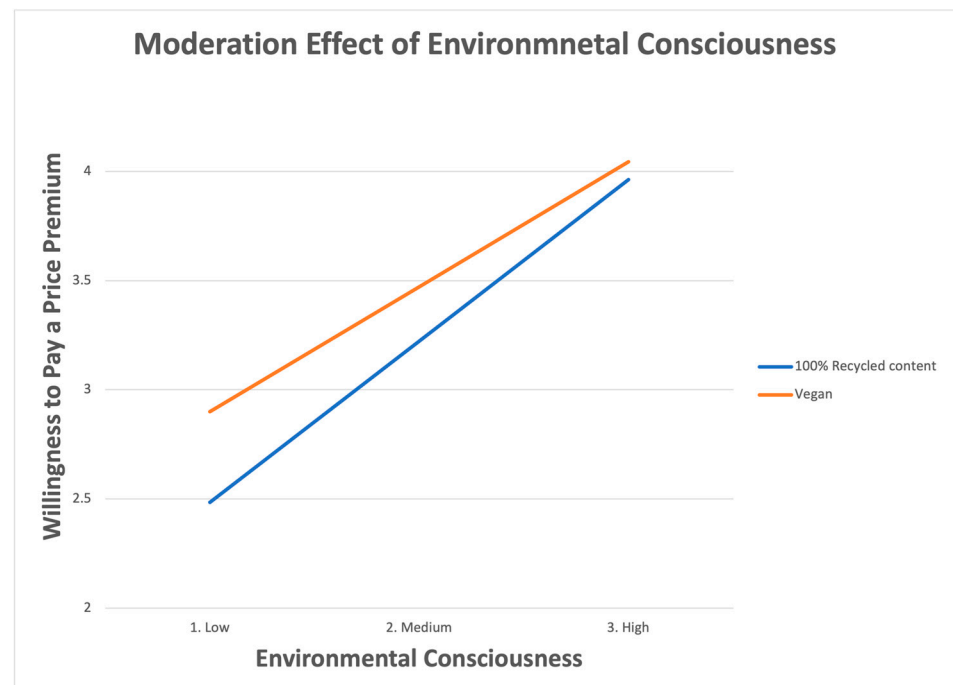


**Figure 2.** Mediation analysis results, \*\*\*  $p$ -value < 0.000.

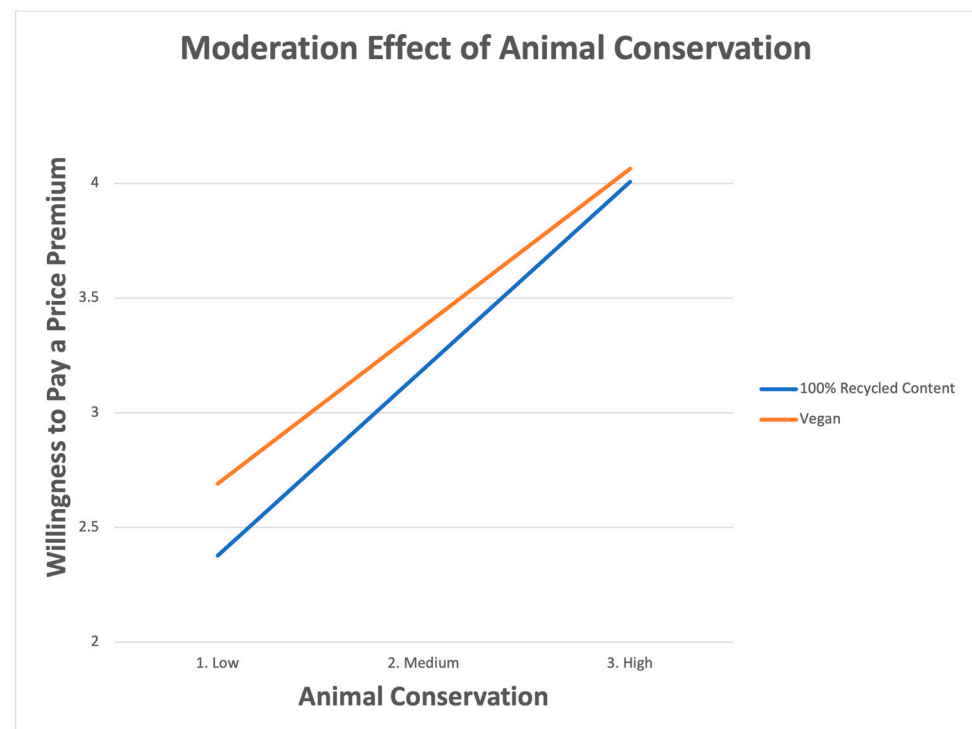
**Table 4.** Results of the moderation analysis.

Hypothesis	$\beta$	t-Statistics	p-Value	LLCI	ULCI	Moderation
H3a	0.2081	0.0785	0.0083	0.0538	0.3624	Supported
H3b	0.1291	0.0554	0.0201	0.0203	0.238	Supported

The moderating effects of environment consciousness and animal conservation were further illustrated in Figures 3 and 4, respectively. The distinct lines on the graph, denoted in blue as “100% recycled content” and in orange as “Vegan”, represent the sustainability features.



**Figure 3.** Moderation effect of environmental consciousness.



**Figure 4.** Moderation effect of animal conservation.

As shown in Figure 3, both sustainability features (100% recycled content and Vegan) delineate the relationship between environmental consciousness and the willingness to pay a price premium. Both features exhibit a positive inclination, indicating that as environmental consciousness increases across its categorized levels, individuals express a heightened willingness to pay a premium for both sustainability features. It was found that individuals with a strong environmental consciousness exhibited similar levels of willingness to pay a price premium for sustainable shoes, with a relatively higher inclination to pay more for the “Vegan” feature. Conversely, those with a lower environmental consciousness demonstrated a significantly greater difference in willingness to pay, indicating a moderating effect. This suggests that consumers with a lower environmental consciousness were more inclined to pay a price premium for vegan shoes compared to those made with recycled materials. As the strength of this relationship between sustainability features and consumers’ willingness to pay a price premium varies at different values of moderator environmental consciousness, this confirms the moderating effect.

Similarly, as shown in Figure 4, both the sustainability features display an upward trajectory, signifying an augmentation in the willingness to pay a price premium as the level of concern for animal conservation ascends from low to high. Animal conservation as the moderator for the relationship between sustainability features and willingness to pay a price premium showed a similar trend. Consumers with higher animal conservation showed a higher willingness to pay for sustainability features, while consumers with lower animal conservation have a lower willingness to pay for sustainability features. Therefore, the strength of the relationship between sustainability features and a willingness to pay a price premium increased as the levels of animal conservation increased, confirming a moderation effect. When comparing within sustainability features, consumers preferred to pay a higher price for vegan shoes over recycled-material ones.

In summary, the results confirmed that both environmental consciousness and animal conservation serve as moderators for the relationship between sustainability features and consumer’s willingness to pay a price premium.

## 5. Discussion and Conclusions

### 5.1. Influence of Sustainability Features on Consumers' Willingness to Pay a Price Premium

The results offer critical insights into the relationship between distinct sustainability features and consumers' willingness to pay a price premium for running shoes. The findings indicate a statistically significant difference among these sustainability features ( $F_{2, 508} = 212.993$ ,  $p\text{-value} < 0.001$ ), underscoring the influential role of sustainability features in shaping consumers' preferences. Specifically, both the "Vegan, sustainable, cruelty-free" and "100% recycled content" features led to a much higher willingness to pay a price premium when compared to the absence of any sustainable feature. These outcomes highlight the pronounced effect of sustainability and ethical considerations conveyed through sustainability features on consumers' willingness to pay a premium price for running shoes. The findings of this study are consistent with the literature where consumers are more willing to pay a high price premium for products with sustainable features such as organic certification, fair trade designations, and other sustainability labels [54–56].

Furthermore, the results also reveal the nuanced dynamics at play within the consumer decision-making process. Notably, the absence of any feature (the "No description of sustainability features" condition) elicited a lower willingness to pay a premium, emphasizing the pivotal role that informative and sustainability-focused features play in enhancing perceived value. However, intriguingly, our analysis did not detect a significant difference between the "Vegan, sustainable, cruelty-free" and "100% recycled content" features, suggesting that both ethical and environmental aspects have a similar impact on consumers' premium price acceptance. These findings underscore the need for running shoe manufacturers and marketers to adopt sustainable and ethical communication strategies to convey the value of their products, as consumers increasingly respond to descriptions that align with their environmental and ethical concerns, thereby influencing their purchase intentions and decisions.

### 5.2. Mediating Role of Perceived Sustainability

In this study, perceived sustainability partially mediated the relationship between sustainability features and the willingness to pay a price premium. This mediation could arise because of various reasons. The first is information processing; when consumers are presented with sustainability-related descriptions of sustainability features, they receive information about the environmental and ethical attributes of the product. This information can influence their perceptions and understanding of how sustainable and ethical the product is. Perceived sustainability serves as a cognitive bridge that connects the information conveyed by the features to consumers' understanding of the product's sustainability features. Consumers frequently assess the value of products through their perceived sustainability, emphasizing the importance of this attribute in their product evaluations. Sustainability features can enhance the perceived value of a product by signaling its positive impact on the environment and society. Perceived sustainability mediates the relationship by helping consumers attribute value to the product due to its sustainable characteristics. When consumers believe a product is more sustainable, they are more willing to pay a premium for it.

On the other hand, consumers vary in their preferences and values, including their concerns for the environment and ethical considerations. Perceived sustainability mediates the relationship by aligning the product's features with these individual preferences. When consumers perceive a product as meeting their sustainability and ethical criteria, they are more likely to be willing to pay a premium for it. Also, the words used in describing sustainability features such as "100% recycled content" or "Vegan, cruelty-free, sustainable materials" creates trust and credibility in a consumer's mind. Thus, consumers may trust these types of sustainability features more than others, which in turn affects their perception of the product's sustainability. When a product's sustainability features come from a trusted



source, perceived sustainability is reinforced, and this impacts consumers' willingness to pay a premium.

In concordance with existing research where exposure to a logo with eco-friendly colors, like green, increased the perceived ethicality of ethically ambiguous practices [74], our findings affirm the sequential process wherein consumers formulate a perception of sustainability subsequent to encountering sustainability features, subsequently influencing their willingness to pay a premium.

In summary, perceived sustainability acts as a mediator because it helps consumers process and interpret the sustainability information conveyed through the descriptions of sustainability features. It aligns this information with their preferences which collectively influence their willingness to pay a premium for sustainable products.

### *5.3. Moderating Effect of Environmental Consciousness and Animal Conservation*

The results suggest that consumers strongly align with the values of environmental consciousness and animal conservation. Individuals with higher levels of environmental consciousness and a strong commitment to animal conservation have more aligned values with sustainability features. When sustainability features emphasize eco-friendly and animal-friendly attributes, consumers with strong environmental and animal conservation values are more likely to resonate with these features, making them more willing to pay a premium. Consumers having these values show intensified ethical concerns, and further, they have a strong commitment to environmental and animal welfare issues. The moderating effect comes into play when sustainability features highlight environmentally friendly and animal-friendly features, intensifying the alignment with these ethical concerns. This alignment, in turn, enhances the willingness of these consumers to invest in products that meet their ethical criteria.

Individuals with high levels of environmental consciousness and animal conservation values may be more sensitive to the ethical messaging in sustainability features. The moderating effect occurs because these consumers are more likely to notice and respond positively to sustainability features, particularly when they involve environmental or animal welfare aspects. As confirmed by the results, consumers having high animal conservation values are triggered with words used in sustainability features such as "Vegan, cruelty-free". A vegan lifestyle is a way of living that excludes the consumption and use of animal-derived products. This includes not only abstaining from meat and animal by-products in one's diet but also avoiding the use of items such as leather, wool, and cosmetics tested on animals. Vegans typically choose this lifestyle for ethical, environmental, and health reasons, emphasizing plant-based alternatives in their diet and daily choices, and further, it leads to consumers' willingness to pay higher for such products.

The results of the moderating analysis also showed that with any level of moderator (environmental consciousness and animal conservation), consumers showed a higher willingness to pay for vegan shoes over recycled materials. This could arise from the aspect that consumers may perceive distinct attributes associated with vegan shoes that contribute to their willingness to pay a premium. These attributes could include superior quality, innovative materials, or a positive association with contemporary fashion trends.

Consumers with a strong commitment to environmental consciousness and animal conservation may actively support sustainable practices and businesses that align with their values. This support can translate into a higher willingness to pay a premium for products that promote sustainability in these areas. The moderating effect amplifies the influence of sustainability features on their purchasing decisions. Also, individuals who are deeply involved in environmental and animal conservation efforts often engage in activism and advocacy for sustainable and ethical products. Their moderating effect is reflected in their advocacy efforts, which can influence their purchasing decisions and their willingness to pay a premium for products that align with their values.

These results highlight the practical significance of tailoring sustainability communication strategies to align with consumers' environmental consciousness and animal con-

servation concerns. As these moderation effects were found to be statistically significant, they suggest that a targeted approach to sustainability messaging can effectively enhance consumers' willingness to pay premium prices for products with perceived sustainability features, considering their specific environmental and ethical priorities.

In essence, the moderating effect of environmental consciousness and animal conservation on the relationship between sustainability features and consumer willingness to pay a premium is driven by the intensity of values, ethical concerns, and sensitivity to ethical messaging. These factors make individuals with strong environmental and animal conservation commitments more responsive to sustainability features, ultimately affecting their purchase decisions and premium pricing acceptance.

## 6. Limitations and Future Research

This study primarily focuses on analyzing consumers' behavior in terms of their willingness to pay a price premium for sustainable products, specifically running shoes. While this examination provides valuable insights into the influence of sustainability features on consumers' intentions to make ethical and environmentally conscious purchasing decisions, it is essential to acknowledge that consumer behavior encompasses a broader spectrum of actions beyond mere intentions. This study employs a convenience sampling approach to recruit subjects from Amazon MTurk. However, it is crucial to acknowledge that convenience sampling from Amazon MTurk may introduce selection bias, as the pool of participants may not be representative of the broader population. Numerous studies have highlighted the existence of a gap between consumer intention and actual behavior, emphasizing the need for a more comprehensive understanding of sustainable purchase decisions. Future research should delve into the dynamics that lead from willingness to pay a premium, as measured in this study, to the concrete action of purchasing sustainable products. By investigating the factors that bridge this intention-behavior gap, researchers can contribute to a more comprehensive understanding of the role of sustainability features in shaping consumer choices.

This study was limited to a specific U.S. demographic group, acknowledging that consumer behavior varies based on demographics such as cultural values, economic conditions, and regional preferences. To enhance the understanding of sustainability features' impact and the role of demographics, future research could broaden its scope by conducting cross-cultural or cross-demographic investigations. Exploring diverse geographic and demographic settings can unveil how factors like location, cultural context, and socioeconomic conditions shape consumers' responses to sustainability features and their willingness to pay a premium for sustainable products.

Future research can delve into exploring additional dimensions that may contribute to the understanding of consumer responses to sustainability features. One avenue for investigation could be the potential influence of brand image on the perceived value of sustainability features. Brand plays a pivotal role in shaping consumer trust and loyalty, influencing consumers' purchasing decisions through the perceived reputation, values, and reliability associated with a particular brand. Examining how consumers associate a brand's image with sustainability could provide valuable insights into the role of brand perception in shaping purchasing behavior.

Moreover, researchers might explore the nuances of how sustainability features are communicated to consumers beyond simply naming the materials used. Investigating the effectiveness of different approaches in describing sustainability features, such as emphasizing specific environmental or social benefits, could offer a more nuanced understanding of the messaging that resonates most with consumers. This exploration could delve into the emotional and social connections established through storytelling, visual representations, or highlighting the broader impact of sustainable practices, creating a more comprehensive understanding of the factors influencing consumers' responses to sustainability communications.

Additionally, the choice of the product category, in this case, running shoes, is an important consideration. It is essential to recognize that the impact of sustainability features on consumers' willingness to pay a premium may vary based on the degree of consumer involvement and interest in sustainable products within a specific product category. Future research can explore whether consumers' level of engagement with sustainability and environmental concerns within a product category influences the effectiveness of sustainability features. By investigating a range of product categories with varying levels of sustainability relevance, researchers can gain a more nuanced understanding of the interplay between sustainability features, consumer involvement, and a willingness to invest in environmentally and ethically responsible products.

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