

Bridging the Green Gap: Millennials and Gen Z's Willingness to Pay More for Eco-Friendly Products in Indonesia

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A B S T R A C T

Sustainable consumption is a substantial obstacle in contemporary society, particularly for millennials and Generation Z. Their sensitivity to pricing distinguishes these demographics, their willingness to make discerning product choices, and their preference for environmentally and socially responsible commodities. It is essential to comprehend their behaviours to formulate strategies that encourage sustainable consumption. This study utilises green signal factors to examine consumers' willingness to pay more. A quantitative research method was employed, surveying 800 Millennials and Gen Z in Indonesia. This research utilises a Structural Equation Model-Partial Least Squares (SEM-PLS) methodology, employing SmartPLS software for data analysis. The results show green future estimation and perceived quality as strong predictors of a willingness to pay for more eco-friendly products. Although environmental concern does not significantly impact this willingness, the relationship remains positive. In contrast, green perceived benefits do not have a significant effect. These results emphasise that, despite a clear preference for sustainable products, consumers' hesitation to pay additional costs reflects the complex interplay between economic considerations and environmental values.



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INTRODUCTION

Contemporary ecological challenges reflect immense pressure on the Earth due to misuse and destruction caused by human activities, which impact almost every aspect of life (Ogboru and Anga, 2015). The relationship between economic development and environmental quality has been a subject of ongoing debate; economic growth, mainly through production and consumption processes, significantly impacts the environment, with these impacts growing alongside increasing economic development (Kahuthu, 2006).

In today's globalised society, it is essential to examine the consumption patterns of various generations and their perceptions of sustainable consumption practices (Haddouche and Salomone, 2018). Younger generations,

particularly Millennials and Generation Z, bear most of the burden for developing sustainability. Generation Z, often called the post-millennial generation, includes individuals born from 1997 to 2012, while Millennials were born from 1981 to 1996 (Dimock, 2019). The 2020 Central Statistics Agency (BPS 2021) census reveals that Generation Z comprises around 74.93 million individuals, making up 27.94% of the total population. Millennials total approximately 69.38 million, representing 25.87%. Collectively, these generations represent the youngest and most active consumer segment; they are one of the fastest-growing and most crucial target markets (Ribeiro et al., 2023).

According to (Reda, 2021), Consumers from Generation Z and the Millennial cohort show a higher tendency to participate in sustainable or ethical purchasing practices when compared to other demographic segments. However, a survey by (Bain & Company, 2023) emphasised that Millennial and Generation Z consumers exercise financial caution in purchasing while strongly preferring products that uphold environmental sustainability. This observation is further supported by prior research, highlighting the inconsistency in Millennials' green purchasing behaviours, with the underlying reasons for this inconsistency remaining inadequately explained (Mabkhot, 2024). This presents a notable obstacle for sustainability efforts aiming to enhance consumers' readiness to invest more in eco-friendly products, especially considering that eco-friendly products are typically costlier than their traditional equivalents (Berger, 2019; Bruderer Enzler, 2015; Drozdenko, Jensen and Coelho, 2011).

Empirical evidence shows that sustainable consumption behaviour has become a major concern. In Indonesia, research on sustainable consumption among Millennials and Generation Z is gaining attention, though studies applying the green signalling hypothesis remain limited. Meanwhile, studies in developed countries have found signalling theory to be an innovative approach that can guide consumers toward a willingness to pay more and promote sustainability ((Berger, 2019; Drozdenko et al., 2011). The theory addresses consumer behaviour, particularly when price and perceived value become critical factors in purchasing sustainable products—an issue especially relevant to younger cohorts.

According to “Signaling Theory,” green products carry intrinsic “signals of benefits” that consumers should be able to perceive (Gomes, Lopes, and Nogueira, 2023). The signals pertain to the motivations that explain a consumer's readiness to pay extra for environmental items, compensating for the additional costs associated with sustainability (Berger, 2019). Prior research has investigated several key factors employing signalling theory;

Initially, environmental concern is understood as an individual's recognition of ecological issues and an impulse to participate in actions designed to address these obstacles (Dunlap & Jones, 2002; Wei et al., 2018). Environmentally, attitudes can manifest through various forms of behaviour, from recycling to consuming eco-friendly products (Choi and Johnson, 2019). (Albayrak, Aksoy, and Caber, 2013) demonstrated that young consumers (ages 18–30) with heightened environmental awareness exhibited a positive attitude toward green products. Similarly, research by (Dangelico, Alvino, and Fraccascia, 2022) on sustainable fashion found that environmental concern positively influenced purchase intentions, regardless of the specific eco-friendly materials used.

Furthermore, consumer behaviour regarding environmentally conscious goods and services dramatically influences the estimation of a green future. An encouraging market reaction to eco-friendly products is expected to drive higher demand. The demand stems from the environmental benefits of green products and their perceived impact on health and overall consumer satisfaction (Nekmahmud and Fekete-Farkas, 2020). Furthermore, ecological marketing is crucial in influencing future demand for sustainable products, especially among low- to middle-income consumers. A study conducted by (Boronat-Navarro and Pérez-Aranda, 2020 Yadav and Pathak 2016) (Yadav and Pathak, 2016) indicates that positive experiences with green products lead Generation Z consumers to increase their willingness to pay extra for these products progressively.

The other element, the perceived benefits of green products, involves consumers' beliefs about the favourable results linked to their purchase, covering six essential dimensions: economic, convenience, value, quality, expression, and entertainment (Chandon, Wansink, and Laurent, 2000). In environmental sustainability, these perceived benefits can significantly influence behaviours in various sectors. For instance, in the automotive industry, (Wu et al., 2024) demonstrated that perceived green benefits positively impacted consumers' eco-friendly vehicle purchases. Similarly, in the agricultural sector, perceived benefits strongly affected farmers'

adoption of organic practices. Previous investigations indicate that the perceived environmental advantages notably affect consumers’ readiness to pay extra for sustainable products. (Shah, P. and Yang, 2022) A product’s eco-friendly image boosts perceived benefits, positively affecting consumer behaviour. Moreover, (Wei et al., 2023) suggest consumers are more willing to pay extra for products with strong practical features. Similarly, it is crucial to acknowledge that functional benefits play a significant role in shaping consumers’ readiness to purchase higher prices for eco-friendly products, particularly when viewed as providing superior performance or additional advantages compared to traditional alternatives (Biswas and Roy, 2015).

Moreover, green perceived quality is a critical determinant of consumer decision-making concerning eco-friendly products. Individuals evaluate eco-friendly products by examining their ingredients, features, and total ecological footprint (Ali et al., 2011). In this context, perceived quality reflects a consumer’s evaluation of the product’s environmental attributes (Chen and Chang, 2013). Studies indicate that consumers are more inclined to pay a higher price for eco-friendly products when they believe the quality is superior. (D’Souza et al., 2007; Shen, B., Cao, Y., & Xu, 2020) Younger consumers, particularly Generation Z, associate high-quality attributes with green products and will likely consider the cost-benefit trade-off when purchasing these goods. Perceived green quality significantly impacts purchasing decisions and consumer satisfaction (Ferguson, V. D., Koca, and Souza, 2009; Mahesh, 2013).

Additionally, green product literacy pertains to the extent of understanding that consumers possess about environmentally friendly products, which subsequently impacts their purchasing choices (Biswas, 2020). Individuals with a strong understanding of eco-friendly products tend to make informed decisions that support sustainable consumption. Moreover, individuals with heightened environmental consciousness tend to increase their green consumption for both themselves and their families (Huang, Yang, and Wang, 2014). Despite the increasing interest in exploring green consumption practices among young consumers in Indonesia, research investigating green product literacy as a moderating variable is limited.

The urgency of this research focuses on identifying sustainable consumption trends across age groups, particularly the willingness of young consumers to pay a premium for green products, applying sustainable goals at consumer levels by using a “signalling theory” approach. The problem under investigation is as follows: (1) How does environmental concern impact the willingness to pay more? (2) How do green future estimations affect the willingness to pay more? (3) How do green perceived benefits influence the willingness to pay more? (4) How does the green perceived quality affect the willingness to pay more? (5) Does green product literacy moderate the relationship between these factors and the willingness to pay more?

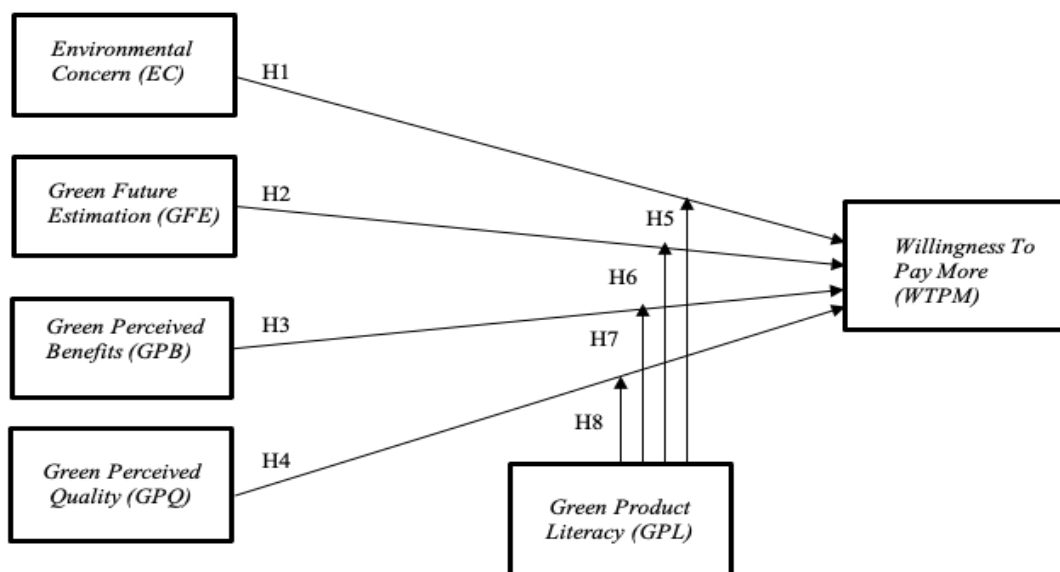


Figure 1. Research framework
Source: Research data (2024)

RESEARCH METHOD

According to the research framework, this study examined eight hypotheses: four direct and four indirect effects. The hypotheses are as follows: (H1) Environmental concern; (H2) Green future estimation (H3) Green perceived benefits (H4) Green perceived quality positively and significantly impacts willingness to pay more for eco-friendly products. Additionally, the study explored the moderating role of green product literacy in the following relationships: (H5) environmental concern, (H6) between green future estimation, (H7) green perceived benefits, and (H8) green perceived quality to a willingness to pay more.

This study focuses on the youth demographic in Indonesia, particularly Millennials (born 1981–1996) and Generation Z (born 1997–2012). The 2020 Central Statistics Agency (BPS 2021) census indicates that Generation Z comprises roughly 74.93 million individuals, accounting for 27.94% of the total population, whereas Millennials amount to approximately 69.38 million, representing 25.87%. This study aims to encompass a target population that surpasses 144 million individuals. Additionally, the sample was established using the Stratified Random Sampling technique to guarantee fair representation between Generation Z and Millennials. The minimum sample size was determined using Slovin's formula (Sevilla, C. G., Ochave, J. A., Punsalan, T. G., Regala, B. P., and Uriarte, 1984) with an error margin set at 0.05 or 5%. The minimum target calculated using the Slovin Formula is 400 respondents. Furthermore, according to (Hair et al., 2018), Structural Equation Modeling (SEM) requires that sample sizes be at least five to ten times the number of indicators in the framework, highlighting the critical need for adequate sample sizing. The minimum target sample size is set at 500 respondents.

This quantitative study employed primary data collected through both online and offline surveys. Data analysis was performed utilising Structural Equation Modeling-Partial Least Square (SEM-PLS) through the SmartPLS software. A comprehensive assessment of the model's goodness-of-fit was conducted before hypothesis testing to ensure validity and reliability. The validity assessment encompassed two primary dimensions: Convergent validity was assessed through the loading factor, average variance extracted, and composite reliability, alongside an evaluation of discriminant validity. A loading factor threshold of ≥ 0.70 was necessary for each construct to establish convergent validity. The reliability was confirmed with Cronbach's alpha values exceeding the recommended threshold of 0.60 (Churchill, Surprenant, and Surprenant, 2013) and composite reliability values surpassing 0.70, as indicated by (Fornell and Larcker F., 1981).

The survey instrument was modified based on earlier studies, specifically focusing on factors like environmental concern, perceived benefits, future green product estimation, and green quality perception (Berger, 2019; Gomes et al., 2023). The green product literacy factor was derived from the work from (Biswas, 2020). Each item in the questionnaire was evaluated on a five-point Likert scale. The questionnaire consisted of two primary sections: demographic inquiries (including gender, age, domicile, occupation, and monthly income) and inquiries about the research variables.

RESULTS AND DISCUSSION

Results

The demographic analysis of the survey results revealed a total of 800 qualified respondents. Among the participants, 53% identified as female, whereas 46% identified as male. A significant portion of the participants, 65%, were from the Millennial generation, falling within the age range of 28 to 43 years, while 35% were identified as Generation Z, aged between 12 and 27 years. The findings reveal that most participants, precisely 35%, were employed in the private sector. This was followed by government employees at 28%, entrepreneurs and professionals each at 11%, students at 9%, and freelancers at 6%. Regarding educational qualifications, 70% of participants had completed a bachelor's degree (S1), 16% were high school graduates, 11% held a master's degree (S2), and 3% achieved a doctoral degree (S3). Table 1 presents a summary of the socio-demographic characteristics of the respondents.

Table 1. Characteristics of respondents by socio-demographic factors (N = 800)

Profile	Frequency	Percentage (%)
Gender		
Male	424	53%
Female	376	47%
Age		
28-43 years	520	65%
12-27 years	280	35%
Occupation		
Private Employees	280	35%
Government Employees	224	28%
Entrepreneurs	88	11%
Professionals	88	11%
Students	72	9%
Freelancers	48	6%

Source: Research data, 2024

The survey additionally inquired about consumers’ preferences concerning the types of sustainable products for which they were prepared to pay a premium. The findings reveal that a significant portion of young consumers expressed a readiness to spend more on food and beverage products (24%), followed by personal care products (19%), electronics or IT (15%), household items (14%), cleaning supplies (12%), sustainable fashion (9%), and children’s products (8%).

A preliminary pilot test was conducted involving 100 respondents selected through convenience sampling before the main study. The evaluation of the pilot test outcomes required the removal of two items. —one about environmental concern and another about green product literacy—due to their factor loadings falling below the recommended threshold of 0.5 (Hair et al., 2010).

This study evaluated the model and its goodness of fit to ensure the findings were reliable and valid. The evaluation of convergent validity included an analysis of the Loading Factor, the average variance extracted (AVE), and the composite reliability (CR). A Loading Factor of 0.70 or higher was deemed acceptable for each construct. To guarantee the reliability, Cronbach’s Alpha needed to exceed the suggested threshold of 0.60, while the Composite Reliability (CR) had to go beyond the defined cut-off value of 0.70 (Fornell and Larcker F, 1981). Table 2 below summarises the findings from the validity and reliability analyses.

Table 2. Factor Loadings, Cronbach’s Alpha, Average Variance Extracted, and Composite Reliability

	Cronbach’s Alpha	rho A	Composite Reliability	Average Variance Extracted (AVE)
Environmental Concern (EC)	0,927	0,928	0,948	0,820
Green Future Estimation (GFE)	0,854	0,856	0,901	0,696
Green Perceived Benefits (GPB)	0,719	0,719	0,877	0,781
Green Perceived Quality (GPQ)	0,995	0,995	0,997	0,990
Green Product Literacy (GPL)	0,988	0,989	0,994	0,988
Moderating Effect 1	1,000	1,000	1,000	1,000
Moderating Effect 2	1,000	1,000	1,000	1,000
Moderating Effect 3	1,000	1,000	1,000	1,000
Moderating Effect 4	1,000	1,000	1,000	1,000
Willingness to Pay More (WTPM)	0,713	0,776	0,836	0,630

Source: Research data, 2024

As shown in Table 2, the loading factor values for all constructs in this study surpassed 0.50, confirming acceptable convergent validity for each construct. Regarding model fit assessments, SRMR values that fall below 0.10 or 0.08 are deemed acceptable. (Hu L.T. and M, 1999). According to (Henseler, Hubona, and Ray, 2016) SRMR was introduced as a measure of goodness of fit for PLS-SEM to reduce model specification errors. In this study, the SRMR value was 0.085 for the saturated model and 0.090 for the estimated model, suggesting a good fit and adherence to the goodness of fit criteria.

This investigation assessed eight hypotheses, including four direct and four indirect effects. Table 3 presents the results of the direct effect hypothesis testing, and Table 4 provides a detailed account of the outcomes from the indirect effect analysis.

Table 3. Path Coefficient (direct effect)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistic (O/STDEV)	P Values
Environmental Concern (EC) -> Willingness to Pay More (WTPM)	0,082	0,083	0,030	2,703	0,007
Green Future Estimation (GFE) -> Willingness to Pay More (WTPM)	0,088	0,085	0,025	3,486	0,001
Green Perceived Benefits (GPB) -> Willingness to Pay More (WTPM)	-0,008	-0,010	0,024	0,330	0,741
Green Perceived Quality (GPQ) -> Willingness to Pay More	0,071	0,070	0,023	3,100	0,002

Source: Research data, 2024

According to Table 3, the analysis indicated that EC showed a positive effect on WTPM, although this effect was not statistically significant ($\beta=0.082$, $p=0.007$). The analysis revealed a positive and significant correlation between GFE and WTPM, with a coefficient of $\beta=0.088$ and a p-value of 0.001. In the meantime, the GPB did not demonstrate a significant impact on WTPM ($\beta=0.008$, $p=0.741$). The findings indicated a notable positive correlation between GPQ and WTPM ($\beta=0.071$, $p=0.002$). The results validate hypotheses H1, H2, and H4, while H3 is not supported.

Table 4. Path Coefficient (indirect effect)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistic (O/STDEV)	P Values
Moderating Effect 1 -> Willingness to Pay More (WTPM)	-0,050	-0,053	0,032	1,540	0,124
Moderating Effect 2 -> Willingness to Pay More (WTPM)	-0,024	-0,020	0,032	0,746	0,456
Moderating Effect 3 -> Willingness to Pay More (WTPM)	-0,039	-0,039	0,025	1,534	0,125
Moderating Effect 4 -> Willingness to Pay More (WTPM)	-0,007	-0,011	0,025	0,302	0,763

Source: Research data, 2024

Based on the results presented in Table 4, the analysis of the indirect effect hypotheses revealed that GPL did not moderate the relationships between any of the predictors. Specifically, no moderating effects were found for EC ($\beta = -0.050$; $p = 0.124$), GFE ($\beta = -0.024$; $p = 0.456$), GPB ($\beta = -0.039$; $p = 0.125$), and GPQ ($\beta = -0.007$; $p = 0.763$). These findings lead to rejecting hypotheses H5, H6, H7, and H8. For a visual representation of the path analysis results, refer to Figure 2.

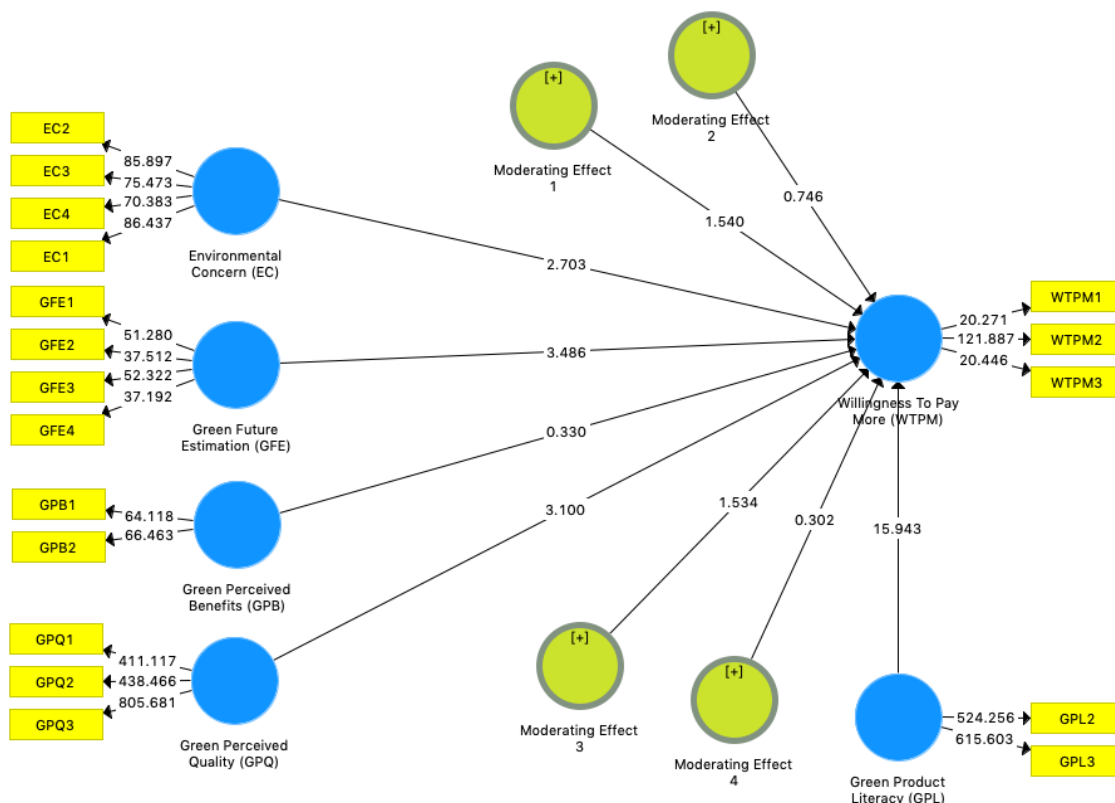


Figure 2. Bootstrapping PLS SEM-Test Result
Source: Research data, 2024

Discussion

This study investigated the impacts of various green signalling factors, including environmental concern, perceived green benefits, future green product estimation, perceived green quality, and the moderating influence of green product literacy. Although it does not significantly impact the willingness to pay more, environmental awareness is still positive. It remains a crucial factor influencing the sustainable behaviour of Millennials and Generation Z to invest more in sustainable products. Previous research in Ghana suggests that consumers’ awareness of environmental issues positively influences their willingness to invest in environmental goods and services and their purchasing decisions. (Mahmoud et al., 2022). Similarly, (Singh et al. 2023) Individuals’ worries about the environment significantly influence their readiness to spend on eco-labelled food items when they recognise the environmental advantages of these labels. Furthermore, study (Dangelico et al., 2022) Italian consumers demonstrated a comparable trend, where environmental concern significantly influenced their readiness to pay higher prices for sustainable fashion items.

Furthermore, the analysis revealed that green future estimation products (GFE) are strong predictors. This finding aligns with earlier studies, which indicated that consumers with positive expectations regarding the future of green products are more inclined to pay a premium for them. (Emma et al. 2021) This illustrates the growing interest in eco-friendly products, influenced by environmental marketing and governmental initiatives promoting sustainable practices. (Lopes et al., 2022).

At the same time, the perceived green quality (GPQ) had a notable impact on consumers’ willingness to pay more. Empirical studies indicate that consumers are ready to pay more for green cosmetics; however, this willingness is significantly affected by price and product attributes (Soon et al., Individuals link premium characteristics with eco-friendly products, which significantly influences their buying choices and overall contentment. (Gomes et al., 2023). The dynamics of consumer behaviour are characterised by swift and unpredictable shifts, highlighting their intricate and context-sensitive essence. Numerous situational and conditional factors shape this phenomenon. Moreover, consumption patterns are significantly influenced by

sociocultural factors, including cultural norms, social stratification, and the effects of prominent roles (Amaliah et al., 2023; Fitri, Herawan, and Febianti, 2022; Onis, Hariani, and Indawati.,2018)

This study also shows that green product literacy does not moderate the relationships between all signals concerning consumers' willingness to pay more for green goods and services. The findings suggest that while eco-literacy is an important component, it may not substantially strengthen these associations. Historical data indicates that eco-literacy has similarly failed to affect consumers purchasing eco-certified products at premium prices significantly. This may be attributed to the divergence between stated preferences and consumer market behaviour. (Jensen, 2003). Environmental literacy might remain foundational in developing countries such as Indonesia, with many individuals lacking essential knowledge about environmental issues and sustainable practices. This gap in understanding significantly impacts their ability to adopt environmentally responsible behaviours. Furthermore, perceptions of green products vary widely, creating confusion regarding what constitutes a sustainable choice. This challenge is compounded by limited access to education and resources, which impedes overall awareness and acceptance of sustainable products within the community.

This research highlights that consumers are prepared to pay a premium and have specific and differentiated expectations concerning value. In such cases, pricing that aligns with the perceived benefits significantly enhances customer satisfaction, reinforcing the appropriateness of the price. (Suci and Hayati, 2023) Emphasise that pricing variables are pivotal in shaping consumer satisfaction. When the price paid matches or exceeds the perceived benefits, it fosters satisfaction, whereas disproportionate pricing relative to perceived advantages leads to dissatisfaction. Additionally, satisfaction with green products is a key driver of repeat purchases, which contributes to the consistent development of sustainable consumption behaviour over time.

This study highlights that some consumers perceive sustainable products as costly, which may hinder their willingness to pay more, revealing a gap between environmental concerns and purchasing behaviour. Young consumers exhibit high environmental concern yet show low levels of real-world action. While strongly prefer sustainable products, their willingness to pay a premium is often limited, demonstrating the complex interaction between economic factors and environmental values. Although Millennials and Generation Z are increasingly concerned with environmental issues, it is essential to consider that some may still prioritise cost over sustainability. This suggests a complex interplay between economic factors and environmental values. Additionally, while perceived green benefits from eco-friendly practices are generally positive, some consumers may remain sceptical, especially if they do not perceive immediate financial gains or have low environmental awareness.

CONCLUSIONS

The research confirmed that direct effects such as environmental concern (H1), green future estimation (H2), and green perceived quality (H4) positively affected the willingness to pay more, while green perceived benefits (H3) were rejected. For the indirect effect, green product literacy moderates the relationships of environmental concern (H5), green future estimation (H6), green perceived benefits (H7), and green perceived quality (H8), with a willingness to pay more also rejected. This study of willingness to pay more for green products in Millennials and Generation Z highlights the importance of signalling consumers by emphasising factors such as environmental concern (EC), future green product estimation (GFE), and perceived green quality (GPQ) that have a proven influence on consumers' willingness to pay more (WTPM).

While consumers generally acknowledge the environmental advantages of sustainable products, the study revealed that many still show reluctance to invest extra for these items. This gap suggests that additional elements, including product availability and trust in green labelling, could significantly influence purchasing behaviours. Future research should investigate further barriers affecting consumers' willingness to pay for environmentally conscious goods, considering broader demographic, cultural influences, longitudinal changes, marketing strategies, additional influencing factors, and practical applications for businesses. This study area can deepen our understanding of consumer behaviour related to green products and contribute to developing effective marketing strategies within a green economy.

To bridge the gap in sustainable purchasing behaviour, this study highlights the need for targeted education and incentives to encourage eco-friendly practices. Educating the public, especially the younger generation, by

stimulating consumer awareness could translate into tangible eco-friendly behaviours. As a practical implication, this study also underscores the importance of understanding consumer preferences and behaviours to develop effective marketing campaigns that resonate with environmentally conscious consumers. Marketers might enhance the attractiveness of environmentally friendly products by focusing on designing identifiable eco-friendly attributes that serve as signals to consumers, emphasising the benefits and quality of green products compared to conventional ones, and educating consumers in ways that affirm the superiority of these products, thus encouraging them to pay a premium. This paper also recommends that businesses focus on transparency in their marketing strategies. Providing transparent and verifiable information about their green practices can help build consumer trust and enhance signalling effectiveness.

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