

Explaining Green Skincare Purchase Intention: The Role of Attitudes and Usage Barriers

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ABSTRACT

This study aims to explain the formation of green skincare purchase intention among Generation Z consumers in Indonesia by examining the roles of environmental values and perceived health benefits in shaping consumer attitudes, and the moderating effect of usage barriers on the attitude–intention relationship. This study adopted a quantitative approach and surveyed 263 Indonesian Generation Z consumers with prior experience using green skincare products. The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the proposed hypotheses. The Results indicate that both environmental values and perceived health benefits significantly and positively influence consumer attitudes toward green skincare, with health benefits exerting a more potent effect. Consumer attitudes are found to be strong determinants of purchase intention. Crucially, the structural model exhibits high predictive power, explaining a substantial proportion of purchase intention ($R^2 = 0.642$) alongside high predictive relevance ($Q^2_{predict} = 0.598$). Moreover, usage barriers significantly and negatively moderate the relationship between attitude and purchase intention, weakening the translation of positive attitudes into buying intentions. This study contributes to the green consumption literature by integrating the theory of planned behavior (TPB) and innovation Resistance Theory (IRT) to demonstrate that usage barriers function as a boundary condition rather than a direct predictor, thereby offering a nuanced explanation of the attitude intention gap in high-involvement green products. Therefore, the findings suggest that managers should prioritize the credible communication of health benefits while simultaneously reducing functional barriers to use. Policymakers are advised to strengthen standards and transparency for green skincare claims to support informed, confident consumer decision-making.

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1. INTRODUCTION

The green attitude–intention gap becomes critical within developing markets like Indonesia, where rapid skincare growth occurs within an underdeveloped institutional environment characterized by a high risk of greenwashing and limited standardization of sustainable assertions (Chin et al., 2018; Dewi et al., 2020; Maslikhah et al., 2024). Unlike developed markets governed by unified frameworks like the European Union's Ecolabel or the United States' FTC Green Guides, Indonesia's regulatory landscape for personal care remains fragmented and highly ambiguous. The National Agency of Drug and Food Control (BPOM) evaluates skincare products predominantly through a baseline lens of safety and consumer toxicity without possessing a dedicated statutory framework to verify ecological or organic marketing claims (BPOM, 2024), while the Ministry of Environment and Forestry's national eco-label (*Ekolabel Swadeklarasi*) remains voluntary, underutilized in the personal care sector, and structurally focused on industrial packaging rather than cosmetic formulation sourcing (KLHK, 2020). This institutional deficit permits a market proliferation of unregulated, self-declared green claims, forcing consumers to navigate heightened information complexity and psychological distrust regarding product performance (Maslikhah et al., 2024). Because skincare products are applied directly to the body and entail elevated perceived personal health risks, this regulatory fragmentation directly amplifies contextual frictions (Aprilia et al., 2022), providing a unique empirical setting to observe why positive consumer attitudes fail to translate linearly into actionable purchase intentions.

The global green skincare industry has exhibited steady growth, reflecting a structural shift in personal care consumption toward practices that increasingly prioritize sustainability and health protection (Nemchenko et al., 2024; Testa et al., 2024). The global market value of green and natural beauty products is projected to

reach USD 43.95 billion in 2025 and expand to USD 54.19 billion by 2030, with a compound annual growth rate (CAGR) of 4.3% (The Business Research Company, 2026a). This trend signals sustained consumer demand for products positioned as safer and more environmentally friendly. Within this landscape, green skincare has emerged as the most dominant category, accounting for approximately 38% of total demand by product type (FMI, 2026). In value terms, the global green skincare market is estimated to reach USD 13.32 billion in 2025 and increase to USD 22.7 billion by 2030, driven by a robust CAGR of 11.3% (The Business Research Company, 2026a), substantially outperforming other green cosmetic categories. These dynamics indicate that green skincare is not only growing rapidly but is also consolidating its position as a high-involvement product category, in which purchase decisions involve simultaneous considerations of personal health benefits and environmental responsibility (Couceiro et al., 2025).

Despite this positive trajectory, the growth of green skincare remains disproportionate to the overall skincare market. In 2025, the global conventional skincare market is projected to reach USD 150.15 billion (The Business Research Company, 2026b), nearly ten times larger than the green skincare market in the same period. This disparity suggests that rising environmental and health awareness has not yet translated into widespread and consistent consumer adoption (Maslikhah et al., 2024). In the green consumer behavior literature, this condition is commonly conceptualized as the green attitude–intention–behavior gap, referring to situations in which consumers normatively support environmentally friendly products but hesitate or delay actual purchase decisions (Chu, 2020). This phenomenon becomes particularly salient in the context of green skincare as a high-involvement product, where purchase intentions are shaped by personal health risk assessments, price sensitivity, and perceptions of the credibility of sustainability claims (Maslikhah et al., 2024).

The attitude–intention gap becomes even more critical when examined within developing country contexts, particularly Indonesia. As one of the largest and most dynamic skincare markets in Southeast Asia, Indonesia has experienced rapid growth in skincare consumption, especially among younger consumers (Inkwood Research, 2025). However, the development of green skincare in Indonesia occurs within an institutional environment that remains relatively underdeveloped, characterized by limited standardization of green claims, a high risk of greenwashing, and inconsistent product quality and information transparency (Chin et al., 2018; Dewi et al., 2020; Maslikhah et al., 2024). The nature of green skincare amplifies these challenges, as products applied directly to the body entail higher perceived personal health risks than other green product categories (Aprilia et al., 2022). In this context, Indonesian Generation Z consumers are positioned at the intersection of strong environmental and health-oriented ideals and structural constraints such as premium pricing, limited product availability, and uncertainty regarding product performance (Setiawan et al., 2023). Consequently, Indonesia offers a particularly relevant empirical setting for understanding why positive attitudes toward green skincare do not always translate into strong and consistent purchase intentions.

The green consumer behavior literature has extensively employed the Theory of Planned Behavior (TPB) as a primary framework for explaining purchase intentions for environmentally friendly products, including cosmetics and skincare (Anand & Sharma, 2023; Andika, Nadia, et al., 2023; Ngo-Thi-Ngoc et al., 2024). Empirical studies consistently demonstrate that consumer attitudes toward green skincare are shaped by evaluations of environmental values and perceived health benefits, both of which play significant roles in shaping purchase intentions (Anand & Sharma, 2023; Aprilia et al., 2022; Mamun et al., 2020). These findings underscore those environmental values and health considerations function as complementary evaluative foundations, with their relative influence varying across market contexts and consumer segments (Aprilia et al., 2022; Oliveira et al., 2023; Testa et al., 2024). Nevertheless, although the attitude–intention relationship is generally reported as robust, most studies continue to conceptualize this relationship as linear and relatively stable. Usage-related constraints such as premium pricing, limited accessibility, and uncertainty regarding the credibility of sustainability claims are often modeled as direct predictors of purchase intention rather than as boundary conditions that shape the extent to which positive attitudes can be translated into intention (Dlamini & Mahowa, 2024; Maslikhah et al., 2024; Zahan et al., 2024). This limitation points to a conceptual gap, particularly in developing markets, and highlights the need to integrate TPB with Innovation Resistance Theory (IRT) to more comprehensively explain the dynamics of purchase intention for high-involvement green skincare products.

Addressing this gap, the present study aims to explain the mechanism underlying green skincare purchase intentions among Generation Z consumers in Indonesia by positioning consumer attitude as the central evaluative mechanism within the TPB framework (Ajzen, 1991). Specifically, this study examines how environmental values and perceived health benefits shape attitudes toward green skincare, and assesses whether usage barriers function as boundary conditions that weaken the translation of positive attitudes into purchase intentions. This approach is enriched by the IRT perspective (Ram & Sheth, 1989), which conceptualizes barriers such as value–cost considerations, perceived risk, and usage complexity as systematic inhibitors of adoption rather than merely additional predictors. By doing so, this study extends the application of TPB in sustainable consumption research by elucidating the conditions under which the attitude intention relationship

becomes fragile, while simultaneously providing empirical evidence from a developing market context. The findings offer practical implications for green skincare adoption strategies that move beyond fostering pro-environmental attitudes to directly addressing the tangible barriers that lead consumers to postpone purchase decisions.

Literature Review and Hypotheses

Integration of the Theory of Planned Behavior (TPB) and Innovation Resistance Theory (IRT)

Consumption behavior toward environmentally friendly products, including green skincare, cannot be understood as a spontaneous or purely impulsive response. Rather, such decisions typically emerge from an evaluative process that considers values, perceived risks, and expected benefits (Aprilia et al., 2022; Chin et al., 2018; Kim & Kim, 2025). In the context of green skincare, this process becomes more complex because consumers are confronted with sustainability and health-related claims that are not always easily verifiable, as well as the consequences of products applied directly to the body (Testa et al., 2024). These conditions position purchase intention as the outcome of a relatively reflective psychological assessment, thereby necessitating a theoretical framework that explains how such evaluations are formed and under what conditions they are translated into behavioral tendencies.

This study adopts the TPB as the primary framework for explaining green skincare purchase intentions among Generation Z consumers in Indonesia. TPB conceptualizes intention as the most proximal determinant of behavior, formed through individuals' evaluations of the behavior in question (Ajzen, 1991). In consumption contexts, this evaluation primarily manifests as consumer attitudes, defined as subjective appraisals of the extent to which a purchase decision is perceived as favorable or unfavorable (Koay & Ahmed, 2025). Attitude, therefore, functions as a key psychological mechanism that bridges consumers' beliefs and values with their readiness to act.

A partial TPB approach is employed by focusing specifically on the attitude–intention mechanism. This approach is justified because the study's objective is not to test the full TPB structure comprehensively, but rather to gain deeper insight into how attitudes toward green skincare are formed and why their influence on purchase intention is not always consistent (Chu, 2020). Consistent with practices in the green consumption literature, this deliberate restriction of constructs is intended to enhance explanatory precision by concentrating on the core evaluative mechanism (Andika et al., 2023; Luthfiana et al., 2024). Social norms and behavioral control are acknowledged conceptually but not explicitly modeled, as the analytical focus is on contextual constraints specific to the characteristics of green skincare products and the conditions of developing markets.

The relevance of TPB in this context lies in its capacity to explain strongly value-laden consumption behavior. Purchasing green skincare is not merely a utilitarian decision but also involves cognitive and affective reflection on personal health implications and environmental responsibility (Testa et al., 2024). Compared with technology adoption frameworks such as the Technology Acceptance Model (Davis, 1989), TPB offers greater conceptual flexibility for capturing the moral, health-related, and trust-based dimensions embedded in green product consumption. Accordingly, TPB is considered a more appropriate framework for explaining the complexity of green skincare purchase intentions.

Within the TPB framework, attitudes toward green skincare are understood as the result of evaluations of the consequences of engaging in this consumption behavior (Aprilia et al., 2022). Following expectancy value logic, individuals tend to develop more favorable attitudes when the behavior under consideration is perceived to generate outcomes that are valuable and personally relevant (Fishbein & Ajzen, 1975). In the context of green skincare, these evaluations primarily stem from two key considerations: environmental values and perceived health benefits. Together, these factors represent normative value orientations and personal interests that simultaneously shape the cognitive foundation of consumer attitudes (Anand & Sharma, 2023; Aprilia et al., 2022).

With respect to environmental values, attitude evaluations toward green skincare are linked to the extent to which consuming such products is perceived as consistent with consumers' commitments to sustainability and environmental responsibility (Anand & Sharma, 2023). For Generation Z, this dimension is often symbolic, as consumption choices also function as expressions of personal values and identity (Sonkar et al., 2025). However, because environmental consequences are indirect and collective, the strength of environmental values in shaping attitudes is highly context-dependent (Baltacı et al., 2025). When the credibility of sustainability claims is perceived as low or product information is viewed as ambiguous, the contribution of environmental values to attitude formation tends to weaken (Mansoor et al., 2022).

In contrast, perceived health benefits are more directly connected to consumers' personal interests. In the skincare category, consumers directly bear the risks associated with applying products to their bodies, making safety, comfort, and product compatibility central to the evaluative process (Alyahya et al., 2025). The perception that green skincare offers a safer, more skin friendly alternative creates value that is both utilitarian and emotional (Maslikhah et al., 2024). Consumer behavior research consistently indicates that self-oriented

benefits exert a more substantial influence on attitude formation than altruistic benefits, particularly for products characterized by high involvement and personal risk (Yu & Han, 2021).

Attitudes formed through evaluations of environmental values and perceived health benefits are subsequently expected to influence green skincare purchase intentions. The attitude–intention relationship constitutes a central proposition of TPB and has been widely supported in the green consumption literature (Andika et al., 2023; Koay & Ahmed, 2025; Mamun et al., 2020). Nevertheless, empirical evidence also indicates that positive attitudes toward environmentally friendly products do not always translate into purchase intentions or actual behavior (CG & G, 2025; Wang et al., 2022; Wijekoon & Sabri, 2021). This phenomenon, commonly referred to as the green attitude–intention gap, suggests that while positive attitudes are a necessary condition, they are not always sufficient to drive purchase intention (Chu, 2020).

To address this gap, the present study integrates IRT by introducing usage barriers as a boundary condition in the relationship between attitude and purchase intention (Ram & Sheth, 1989). Within the IRT framework, barriers related to product and market characteristics, such as premium pricing, limited accessibility, information complexity, and uncertainty regarding sustainability claims, serve as sources of functional and psychological resistance (Maslikhah et al., 2024). As a result, favorable attitudes toward green skincare may not be translated linearly into strong purchase intentions, as consumers encounter contextual frictions that inhibit adoption despite positive initial evaluations.

Unlike perceived behavioral control in TPB, which captures individuals' general perceptions of their ability to perform a behavior, usage barriers represent structural and situational constraints that are more specific to product characteristics and market conditions (Dlamini & Mahowa, 2024). In the still-developing and insufficiently standardized Indonesian green skincare market, consumers particularly those from Generation Z may hold positive attitudes toward green skincare yet remain hesitant to form purchase intentions when confronted with such barriers (Maslikhah et al., 2024). Accordingly, usage barriers are conceptualized as a negative moderator that weakens the relationship between attitude and purchase intention.

Environmental Values and Consumer Attitude

Environmental values reflect individuals' value orientations toward environmental protection and serve as a normative framework for evaluating consumption choices (Testa et al., 2024). In the context of green skincare, this value orientation manifests in consumers' tendency to perceive the use of environmentally friendly products as responsible consumption, for instance, through preferences for natural ingredients, sustainable production processes, and eco-friendly packaging (Maslikhah et al., 2024). Within the TPB, attitudes toward a behavior are formed through individuals' evaluations of behavioral consequences based on beliefs about the outcomes (behavioral beliefs) and assessments of the desirability of those outcomes (Ajzen, 1991). Accordingly, environmental values are positioned as a background factor that enhances the salience and evaluative weight of the environmental consequences associated with green skincare consumption, thereby fostering more positive attitudes toward such products.

Empirical evidence supports this relationship. In the Indonesian context of green skincare, Aprilia et al. (2022) demonstrate that environmental values positively and significantly influence consumer attitudes. However, the magnitude of this effect is weaker than that of more self-oriented determinants such as perceived health benefits. Anand and Sharma (2023) report consistent findings on sustainable personal care products in India, confirming that environmental values are a significant predictor of consumer attitudes toward sustainable products and align with the TPB's evaluative logic. Based on this theoretical rationale and empirical support, the following hypothesis is proposed:

H1: Perceived environmental values positively influence consumer attitudes toward green skincare

Health Benefit and Consumer Attitude

Perceived health benefits refer to consumers' beliefs that using a product yields positive consequences for their health and personal well-being, particularly by minimizing risks associated with exposure to synthetic chemical ingredients (Setiawan et al., 2023). In the context of green skincare, health benefits are commonly associated with the use of natural ingredients, greater safety for sensitive skin, and lower potential long-term adverse effects on skin health (Dini & Laneri, 2021). According to TPB, attitudes toward a behavior are formed through evaluations of perceived consequences, especially when those consequences are direct and personally relevant (Ajzen, 1991). Because skincare products are applied directly to the body, health-related outcomes are highly proximate, making positive evaluations of health benefits a primary foundation for the formation of consumer attitudes toward green skincare (Szaban et al., 2024).

Empirical support for this relationship is well documented in prior studies. Aprilia et al. (2022) in their examination of green skincare consumption in Indonesia, found that health value has a positive and significant effect on consumer attitudes. Similar results are reported by Szaban et al. (2024) in Poland, showing that

perceived health benefits play a significant role in shaping positive consumer attitudes toward green personal care products. The consistency of these findings underscores the central role of health benefits in determining consumer attitudes toward green skincare. Based on this theoretical rationale and empirical evidence, the following hypothesis is proposed:

H2: Perceived health benefits positively influence consumer attitudes toward green skincare

Consumer Attitude and Purchase Intention

Within the TPB framework, attitude is conceptualized as an individual's overall evaluation of a behavior, formed through cognitive and affective considerations of the extent to which the behavior is perceived as beneficial, valuable, or pleasurable (Ajzen, 1991). Attitude serves as a proximal determinant of intention because it reflects individuals' internal "pros-cons" assessment of the behavior to be performed (Laheri et al., 2024). In the context of green skincare consumption, a positive attitude indicates the belief that purchasing and using such products represents an appropriate and worthwhile choice, both in terms of functional benefits and alignment with personal preferences and values (Ghazali et al., 2017). Accordingly, consistent with TPB logic, more favorable attitudes toward green skincare are expected to increase consumers' propensity to form purchase intentions, reflecting behavioral readiness.

The relationship between attitude and purchase intention in the context of environmentally friendly personal care products has received consistent empirical support. In a study of green skincare consumers in Malaysia, Al Mamun et al. (2020) found that attitudes toward green skincare products positively and significantly influence purchase intention. This finding is consistent with evidence from Indonesia, where Andika et al. (2023) demonstrated that attitudes toward green cosmetics significantly drive purchase intention, reinforcing the role of attitude as a key mechanism through which consumer evaluations are translated into intentional decisions. Furthermore, Koay and Ahmed (2025) reported that attitude has a positive and significant effect on green cosmetic purchase intention, even after controlling for the influence of social norms and other external factors. The consistency of findings across contexts and time strengthens the theoretical argument that attitude constitutes a primary psychological foundation for the formation of green skincare purchase intention. Based on this theoretical rationale and empirical support, the following hypothesis is proposed:

H3: Consumer attitudes toward green skincare positively influence green skincare purchase intention

The Moderating Role of Usage Barriers

Usage barriers reflect consumers' perceptions of obstacles that hinder product use, including limited accessibility, difficulty obtaining reliable information, relatively high prices, and uncertainty about product performance (Maslikhah et al., 2024). In the consumer behavior and IRT literature (Ram & Sheth, 1989), usage barriers are conceptualized as sources of functional and psychological resistance that can inhibit the adoption of innovations, including environmentally friendly products. Within TPB, attitude is positioned as a key determinant of intention; however, the relationship between attitude and intention is not always linear or unconditional (Wijekoon & Sabri, 2021). The translation of positive attitudes into intention may be contingent upon situational and structural boundary conditions (Hsu et al., 2017). Accordingly, usage barriers can be understood as boundary conditions that modify the strength of the attitude–intention relationship, such that higher perceived barriers weaken the ability of positive attitudes to translate into green skincare purchase intention.

Empirically, prior studies have predominantly positioned usage barriers as direct predictors of attitudes, adoption, or resistance toward environmentally friendly beauty products (Dlamini & Mahowa, 2024; Maslikhah et al., 2024; Zahan et al., 2024). Nevertheless, these findings implicitly suggest that the presence of usage barriers can disrupt the consistency between positive attitudinal evaluations and actual behavioral tendencies. Several studies in the context of green products and sustainable innovations further report that consumers may hold relatively positive attitudes toward environmentally friendly products yet delay or avoid forming purchase intentions when confronted with practical constraints such as premium pricing, limited availability, or heightened concerns regarding greenwashing practices (Luthra et al., 2025; Margariti et al., 2024; Widodo et al., 2025). This pattern of evidence indicates that usage barriers are likely to function as a factor that modifies the attitude–intention relationship, although this moderating role has rarely been tested explicitly in the green skincare context. By adopting this perspective, the present study proposes a moderation approach to explain the attitude–intention gap in green skincare consumption. Based on this theoretical rationale and empirical indications, the following hypothesis is proposed:

H4: Usage barriers moderate the relationship between consumer attitudes and green skincare purchase intention, such that the effect of attitude on purchase intention becomes weaker when perceived usage barriers are high

2. METHOD

Sampling Size and Sampling Procedure

This study employs a quantitative, cross-sectional research design to examine relationships among variables at a single point in time. This design is considered appropriate given the study's objective of testing the structural relationships among perceived benefits, consumer attitudes, and purchase intention toward green skincare, as well as the moderating role of usage barriers, without attempting to capture longitudinal changes in consumer behavior.

Within the context of this study, no clearly defined sampling frame exists regarding the number of Generation Z individuals in Indonesia who are interested in or have used green skincare products. The absence of such a sampling frame renders the application of the probability sampling methodologically infeasible. Consequently, this study adopts a non-probability sampling approach, namely purposive sampling, which is commonly employed in consumer behavior research when the target population is specific and intricate to identify precisely. To ensure rigorous data quality, a specific experience threshold was enforced, requiring respondents to have utilized green skincare products for a minimum duration of three months or at least three times prior to the survey.

Respondents were selected based on predefined criteria to ensure alignment with the research context. First, respondents had to be members of Generation Z, with a minimum age of 17. This age threshold was established based on the assumption that individuals at this age possess sufficient cognitive capacity and autonomy to make independent consumption decisions (Andika et al., 2025). Second, respondents were required to have prior experience with green skincare products, ensuring they had firsthand experience to evaluate perceived benefits, attitudes, and usage barriers. Responses that failed to meet either criterion were excluded from the analysis.

Sample size was determined a priori using G*Power software. This analysis aimed to ensure that the sample size provided adequate statistical power to detect the expected effects. The parameters specified included a statistical power of 0.95, a significance level of $\alpha = 0.05$, an effect size of $f^2 = 0.15$ representing a medium effect (Cohen, 1988; Hair et al., 2010), and five predictors in the research model. Based on these parameters, the recommended minimum sample size was 138 respondents.

Prior to the main data collection, a pilot test was conducted with 30 respondents who met the study criteria. The pilot test aimed to assess item clarity, preliminary validity, and internal consistency of the measurement instrument. The results indicated that all items exhibited significant item total correlations and Cronbach's alpha values exceeding 0.70, suggesting adequate instrument reliability. Based on these results, the instrument was deemed suitable, and the main data collection proceeded.

The main data collection was conducted between June and August 2024. The questionnaire was administered via an online Google Forms survey to facilitate accessibility and participation. Survey links were distributed via social media platforms, particularly Instagram and WhatsApp, to potential respondents who were likely to meet the research criteria. This approach was selected because Generation Z in Indonesia widely uses both platforms.

In total, 298 responses were collected during the data collection period. Following data screening, several responses were removed for failing to meet the research criteria or for being identified as outliers. As a result, 263 responses were retained for the final analysis. This sample size not only meets but exceeds the minimum requirement recommended by the power analysis, thereby providing a robust empirical basis for testing the proposed research model.

Measures

All measurement items used in this study were adapted from prior research instruments that have demonstrated satisfactory validity and reliability in the context of consumer behavior and environmentally friendly products. The original items were developed in English and subsequently translated into Indonesian following established translation procedures to ensure conceptual equivalence and linguistic appropriateness, such that each item continued to represent the intended construct from the original studies (Brislin, 1986).

All scales were carefully contextualized to the green skincare product category in Indonesia to ensure empirical relevance and respondent comprehension. These adaptations were minimal and primarily involved product-related terminology and usage context, without altering the substantive meaning of the items, thereby maintaining conceptual consistency for Generation Z respondents in Indonesia.

Overall, the research questionnaire comprised 16 items measuring five key constructs in the proposed model. Perceived health benefits were measured using three items adapted from Setiawan et al. (2023) that capture consumers' perceptions of product safety and its impact on skin health. Environmental values were assessed using three items adapted from Zollo et al. (2021) that reflect the extent to which consumers perceive green skincare as contributing to environmental protection.

Usage barriers were measured using three items adapted from Kurnia and Mayangsari (2020) that capture consumers' perceptions of obstacles encountered when using green skincare products. Consumer attitudes toward green skincare were measured using three items adapted from Singhal and Malik (2018), while purchase intention toward green skincare was assessed using four items adapted from Shanbhag et al. (2023), capturing respondents' tendencies and readiness to engage in purchase behavior.

All measurement items were rated on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The five point scale was selected because it provides an appropriate balance between measurement sensitivity and response simplicity and is well-suited for online surveys in consumer behavior research without compromising the variability required for advanced statistical analysis (Dawes, 2008). A complete list of measurement items and their adaptation sources is provided in Table 2 to enhance methodological transparency and facilitate research replicability.

Data Analysis

This study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS version 4 to test the proposed conceptual model. The selection of PLS-SEM is grounded in its methodological suitability for the study objectives. As a variance-based and prediction-oriented SEM technique, PLS-SEM is particularly appropriate when the research focus is on explaining and predicting key endogenous constructs namely, green skincare purchase intention and evaluating structural relationships among constructs, rather than solely assessing model fit to a population covariance matrix as in covariance-based (Hair et al., 2019; Hair et al., 2022).

The research model is both predictive and explanatory, with purchase intention as the primary outcome variable, influenced by multiple predictors and incorporating a moderating effect of usage barriers on the relationship between attitude and intention. Methodological literature emphasizes that PLS-SEM is well suited for models that prioritize the explanatory power of endogenous constructs and the estimation of interaction effects, particularly in consumer behavior research and in emerging market contexts characterized by moderate to high model complexity (Hair et al., 2017; Hair Jr. et al., 2017).

PLS-SEM analysis was conducted following a two-stage evaluation procedure recommended in recent methodological literature. The first stage involved assessing the measurement model, including indicator reliability, internal consistency, and convergent and discriminant validity. The second stage focused on evaluation of the structural model, encompassing the examination of path coefficients, significance testing via bootstrapping (including moderation effects), and assessment of explanatory power using coefficients of determination (R^2) and effect sizes (f^2). In line with PLS-SEM's predictive orientation, the model's predictive capability was further evaluated using the PLSpredict procedure, including the assessment of Q^2_{predict} values and the comparison of predictive performance with a linear benchmark model. In addition, the standardized root mean square residual (SRMR) was reported as a supplementary diagnostic indicator of overall model fit. All analyses were performed using SmartPLS 4 to ensure procedural consistency, transparency, and replicability of the results (Hair et al., 2019; Hair et al., 2022; Ringle et al., 2024).

Overall, the conceptual framework of this study (see Figure 1) integrates TPB with the IRT perspective to explain green skincare purchase intentions among Generation Z consumers in Indonesia. By positioning attitude as the core evaluative mechanism, environmental values and perceived health benefits as sources of attitude formation, and usage barriers as boundary conditions, the model offers a more comprehensive understanding of how, and under what conditions, positive attitudes toward green skincare evolve, or fail to evolve, into purchase intentions.

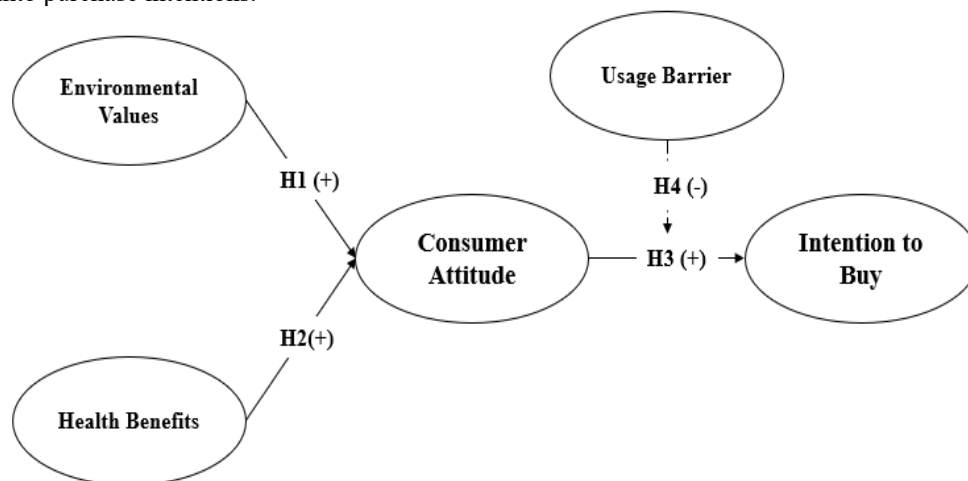


Figure 1. Conceptual Model

3. RESULT AND DISCUSSION

Respondent Characteristics

Based on the 263 respondents summarized in Table 1, the sample profile indicates a predominance of female respondents (69.6%), which aligns with the characteristics of the skincare market, where female participation is generally higher than male participation (30.4%). All respondents were aged 17–28, representing Generation Z in accordance with the study criteria. In terms of educational background, the majority of respondents held a diploma or undergraduate degree (D-III/S1; 57.0%), while the remaining respondents had an educational level below senior high school (43.0%). This distribution corresponds with respondents' employment status, which was primarily dominated by students (73.0%), helping to explain why monthly income levels were concentrated in the category below IDR 2,000,000 (66.5%).

From a consumption behavior perspective, the most common skincare purchasing frequency was once per month (62.7%), suggesting that skincare products are treated as routine necessities rather than impulse purchases. Consistent with this pattern, most respondents allocated a monthly skincare budget of IDR 100,000–500,000 (51.0%), followed by those allocating a budget below IDR 100,000 (40.3%). This spending distribution reflects the dominance of mass-market consumers within the study sample.

Table 1. Characteristic Respondents

Category	Subcategory	Frequency	Percent
Sex	Male	80	30.4
	Female	183	69.6
Age (years old)	17-28	263	100
Educational Level	≤ Senior high school	113	43
	Diploma/Undergraduate (D-III/S1)	150	57
Current Employment Status	Entrepreneur	6	2.3
	Lecturer/Teacher	3	1.1
	Employee	58	22.1
	Student	192	73
	Others	4	1.5
Monthly Income Level	IDR <1.000.000	90	34.2
	IDR 1.000.000–2.000.000	85	32.3
	IDR 3.000.000–5.000.000	47	17.9
	IDR 6.000.000–8.000.000	15	5.7
	IDR >8.000.000	26	9.9
Skincare Purchase Frequency	Twice a month	47	17.9
	Once a month	165	62.7
	Three times a month	16	6.1
	More than three times	6	2.3
	Others	29	11
Monthly Skincare Budget	IDR < 100.000	106	40.3
	IDR 100.000–500.000	134	51
	IDR 500.000–1.000.000	13	4.9
	IDR > 1.000.000	10	3.8
Total		263	100%

Common Method Bias (CMB)

Given that this study relies on self-reported data collected via a single survey instrument, the potential for common method bias (CMB) was assessed. To address this issue, the study employed a full collinearity assessment as recommended by [Kock \(2015\)](#), which evaluates CMB by examining inner variance inflation factor (VIF) values in the structural model. This approach is particularly suitable for PLS-SEM, as it allows simultaneous detection of CMB across all latent constructs.

The results indicate that all inner VIF values range from 1.192 to 2.360, which are well below the recommended threshold of 3.3 ([Kock, 2015](#)). These findings suggest that CMB is not a significant concern in this study. Accordingly, the data are deemed appropriate for further analysis, with minimal influence from common method variance.

Evaluation of Measurement Models

The measurement model was evaluated by assessing construct reliability and validity in accordance with PLS-SEM guidelines recommended in the contemporary methodological literature (Hair et al., 2019; Hair et al., 2022). Indicator reliability was examined using outer loadings, which ranged from 0.822 to 0.922, as reported in Table 2. All loadings exceed the recommended threshold, indicating that the indicators strongly represent their respective latent constructs.

Internal consistency reliability was assessed using Composite Reliability (CR), which is considered more appropriate than Cronbach's alpha in the PLS-SEM context. As shown in Table 2, CR values range from 0.878 to 0.901, demonstrating a high level of internal consistency across all constructs. Convergent validity was also established, as evidenced by Average Variance Extracted (AVE) values exceeding 0.50 for all constructs, indicating that each construct explains the majority of variance in its indicators

Table 2. Measurement Model Assessment

Construct	Items Measurement	Loading	CR	AVE
Environmental Values (EV) (reflective)	Green skincare is an environmentally friendly skincare product	0.911	0.900	0.820
	Using green skincare supports environmental conservation	0.922		
	Green skincare is better for the environment than conventional skincare products	0.883		
Health Benefits (HB) (reflective)	Green skincare products do not contain harmful synthetic ingredients	0.829	0.878	0.788
	Green skincare products are beneficial for my health	0.915		
	Green skincare products use natural ingredients	0.917		
Consumer Attitude (CA) (reflective)	Using green skincare products is good for me	0.902	0.882	0.808
	I find using green skincare products enjoyable	0.895		
	I feel happy when purchasing green skincare products	0.899		
Intention to Buy (ITB) (reflective)	I am likely to buy green skincare products	0.910	0.897	0.823
	If I need skincare again, I will choose green skincare	0.913		
	I will buy green skincare products when my skincare runs out	0.897		
Usage Barrier (UB) (reflective)	I find it difficult to obtain information about green skincare products	0.885	0.901	0.770
	I find it challenging to find stores that sell genuinely green skincare products	0.905		
	Green skincare products are challenging to find in the market	0.895		
	Green skincare products are more expensive than conventional skincare products	0.822		

Discriminant validity was subsequently assessed using the heterotrait monotrait ratio (HTMT), which is considered the most stringent criterion for evaluating discriminant validity in PLS-SEM (Henseler et al., 2015). As shown in Table 3, all HTMT values fall below the recommended threshold of 0.90, confirming that each construct is empirically distinct and does not exhibit conceptual overlap. Therefore, all criteria for construct reliability and validity are satisfied, and the measurement model is deemed adequate for proceeding to structural model evaluation.

Table 3. Discriminant Validity Assessment (HTMT)

	CA	EV	HB	ITB	UB
Consumer Attitude (CA)					
Environmental Values (EV)	0.781				
Health Benefits (HB)	0.844	0.858			
Intention to Buy (ITB)	0.894	0.852	0.832		
Usage Barrier (UB)	0.401	0.356	0.363	0.318	

Evaluation of Structural Models

After the measurement model satisfied all reliability and validity criteria, the analysis proceeded to the evaluation of the structural model. Prior to hypothesis testing, the model was assessed for its explanatory power, predictive relevance, and overall fit to ensure that the proposed relationships among constructs demonstrated

adequate empirical support. In accordance with current PLS-SEM guidelines, this evaluation employed several key indicators, including the coefficient of determination (R^2), Q^2_{predict} , $PLSpredict$, and the standardized root mean square residual (SRMR) (Hair et al., 2019; Hair et al., 2022). A summary of the structural model evaluation results is presented in Table 4.

The results indicate that environmental values and health benefits jointly explain a substantial proportion of variance in Consumer Attitude, with an R^2 value of 0.592, which is classified as moderate. Furthermore, Consumer Attitude explains a considerable proportion of the variance in intention to buy, with an R^2 of 0.642, which is categorized as moderate, suggesting that the predictor constructs exhibit strong explanatory power within the model (Hair et al., 2019). In terms of predictive relevance, the Q^2_{predict} values were 0.581 for Consumer Attitude and 0.598 for Intention to Buy, both indicating high predictive relevance and confirming the model's predictive capability (Hair et al., 2019).

To further assess out-of-sample predictive performance, a $PLSpredict$ analysis was conducted by comparing the PLS-SEM model's predictive accuracy with that of a linear model (LM) as a benchmark. The results show that most root mean square errors (RMSEs) and mean absolute errors (MAEs) for the PLS-SEM model are lower than those for the LM, indicating superior predictive performance and a moderate level of predictive power (Hair et al., 2019). In addition, overall model fit was evaluated using SRMR, which yielded a value of 0.075, below the recommended threshold of 0.08 (Henseler et al., 2014), thereby indicating an acceptable level of global model fit.

Overall, the combined evaluation of R^2 , Q^2_{predict} , $PLSpredict$, and SRMR demonstrates that the structural model exhibits adequate explanatory power, strong predictive relevance, and acceptable overall fit. With all evaluation criteria satisfied, the analysis proceeded to hypothesis testing.

Table 4. Structural Model Evaluation and Predictive Assessment Results

		PLS- SEM_RMSE	PLS- SEM_MAE	LM_RMSE	LM_MAE	R2	Q2 predict	SRMR
Consumer Attitude	CA1	0.685	0.499	0.695	0.51	0.592	0.581	0.075
	CA2	0.72	0.502	0.739	0.526			
	CA3	0.66	0.481	0.685	0.486			
Intention to Buy	ITB1	0.611	0.466	0.603	0.449	0.642	0.598	
	ITB2	0.649	0.494	0.656	0.468			
	ITB3	0.727	0.549	0.733	0.525			

Hypothesis Testing

Hypothesis testing was conducted using a bootstrapping procedure with 5,000 subsamples, as recommended in the PLS-SEM literature to obtain stable parameter estimates and reliable statistical inference (Hair et al., 2019; Hair et al., 2022). Because normality tests indicated that several indicators exhibited skewness and kurtosis values outside the ± 2 range, significance testing was performed using the bias-corrected and accelerated (BCa) bootstrap method, which is more robust to violations of normality assumptions (Hair et al., 2022). The significance level was set at $\alpha = 0.05$, corresponding to a critical t-value of 1.96. A summary of path coefficients, t-values, p-values, effect sizes (f^2), and hypothesis decisions is presented in Table 5, while the structural relationships are illustrated in Figure 2.

The results of the direct effects analysis indicate that Environmental Values have a positive and significant effect on Consumer Attitude ($\beta = 0.318$; $t = 3.801$; $p < 0.001$). Health Benefits also exert a more substantial positive effect on Consumer Attitude ($\beta = 0.499$; $t = 5.874$; $p < 0.001$). The f^2 values for both relationships fall within the low-to-moderate range, indicating that perceived benefits, particularly health benefits, make a substantive contribution to the formation of consumer attitudes toward green skincare. Accordingly, H1 and H2 are supported.

Furthermore, Consumer Attitude demonstrates a positive, highly significant effect on Intention to Buy ($\beta = 0.736$; $t = 17.745$; $p < 0.001$), with an f^2 value in the high range. This finding underscores the central role of attitude as the primary determinant of purchase intention within the TPB framework and provides strong support for H3.

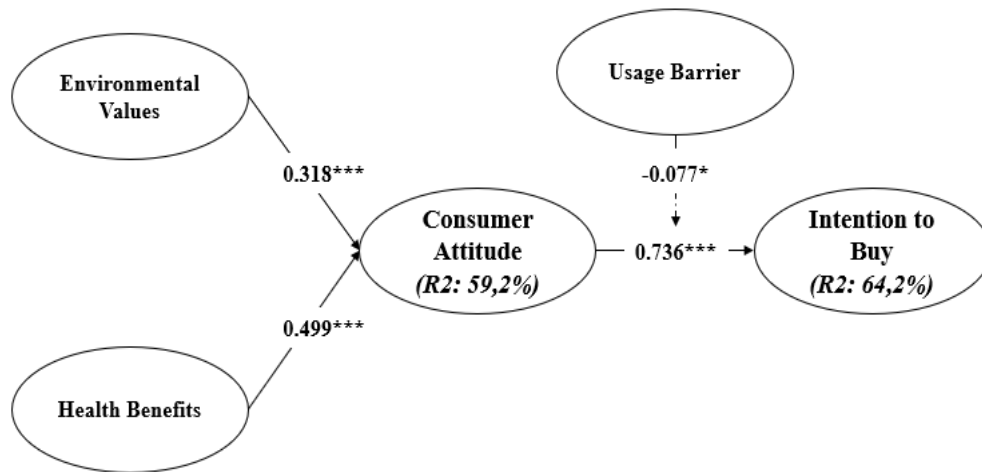


Figure 2. Structural Model Results

Table 5. Hypothesis Testing Results

Hypothesized/Paths	Coeff	t-value	p-value	Decision	f ²
H1 EV → CA	0.318	3.801	< 0.001	Supported	0.105
H2 HB → CA	0.499	5.874	< 0.001	Supported	0.259
H3 CA → ITB	0.736	14.745	< 0.001	Supported	0.925
H4 UB X CA → ITB	-0.077	2.258	< 0.05	Supported	0.020

The moderation analysis reveals that Usage Barriers significantly and negatively moderate the relationship between Consumer Attitude and Intention to Buy ($\beta = -0.077$; $t = 2.258$; $p < 0.05$), with an f^2 value in the small range (0.020), thereby supporting H4. To visualize this interaction, Figure 3 (UB $\times$ CA) illustrates the relationship between Consumer Attitude and Intention to Buy across three levels of Usage Barriers: low (-1 SD), mean, and high ($+1$ SD). Although the relationship between attitude and purchase intention remains positive across all levels, the slope is strongest when Usage Barriers are low and progressively weakens as Usage Barriers increase. This pattern clearly demonstrates that higher perceived usage barriers attenuate the strength of the attitude–intention relationship. Crucially, while the interaction effect size ($f^2 = 0.020$) appears small, its theoretical significance remains paramount ; it demonstrates that even a minor incremental increase in structural and practical resistance can systematically destabilize the psychological conversion of pro-environmental attitudes into actionable consumption tendencies, thereby providing a crucial nuance to the heavily-debated green attitude–intention gap.

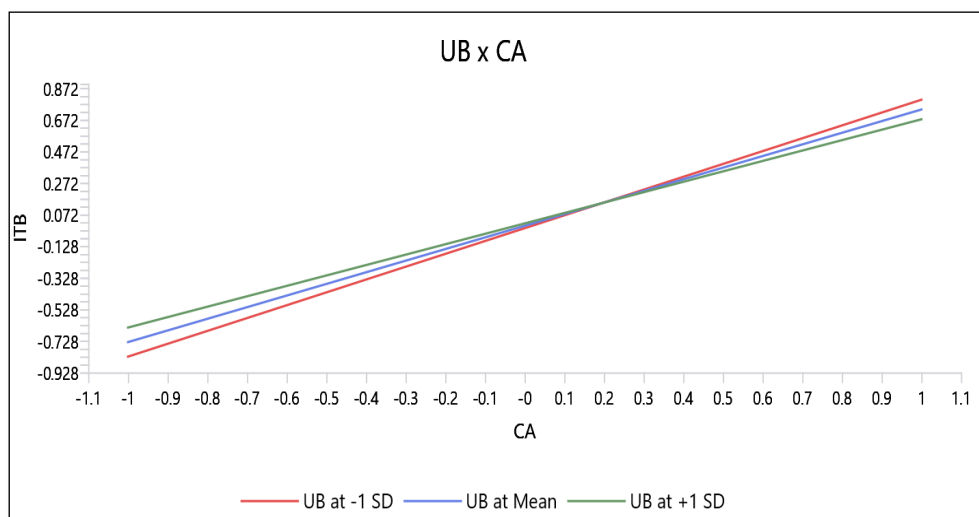


Figure 3. Moderating Effect of Usage Barrier

Discussion

The Drivers of Consumer Attitude Toward Green Skincare (Evaluating H1 and H2)

The findings of this study indicate that both environmental values and perceived health benefits exert significant positive effects on Generation Z consumers' attitudes toward green skincare, with health benefits exerting a relatively greater influence. These results are consistent with prior studies highlighting the joint contribution of environmental and health-related considerations in shaping attitudes toward environmentally friendly products (Anand & Sharma, 2023; Aprilia et al., 2022; Szaban et al., 2024). However, they diverge from other findings that identify environmental values as the dominant determinant of consumer attitudes (Aprilia et al., 2022; Testa et al., 2024). This discrepancy suggests that the relative weight of behavioral beliefs in attitude formation is not universal but contingent upon generational characteristics and the socio-cultural context in which consumption occurs. Within the TPB framework, these findings reinforce the role of behavioral beliefs, particularly perceptions of personal benefits, as the primary cognitive mechanism underlying attitude evaluation. Generation Z consumers appear to be more responsive to consequences they directly experience than to abstract, long-term collective benefits. The dominance of perceived health benefits thus indicates that Generation Z's sustainability orientation in consumption remains instrumental mainly, with environmental values functioning as a complementary attribute rather than an intrinsic driver of attitude formation.

Translating Attitudinal Judgment into Purchase Intention (Evaluating H3)

Consistent with these findings, the study also demonstrates that Generation Z consumers' attitudes have a significant positive effect on green skincare purchase intention, confirming the role of attitude as a proximal mechanism that translates cognitive evaluations into behavioral intention. This result aligns with previous research that has consistently validated the strength of the attitude–intention relationship in green consumption contexts (Andika, Nadia, et al., 2023; Koay & Ahmed, 2025; Mamun et al., 2020), while extending its empirical validity to the Generation Z segment and the green skincare product category. From a TPB perspective, the findings reaffirm that attitude is a direct determinant of behavioral intention, with a favorable evaluation of environmentally friendly products serving as a critical prerequisite for the formation of purchase intention. In the Indonesian context, this result is particularly meaningful, as it suggests that increasing green skincare purchase intention among Generation Z consumers depends strongly on the development of positive, credible attitudes toward such products. Consequently, the effectiveness of sustainable consumption strategies targeting this segment hinges on the ability to foster convincing evaluative judgments regarding green skincare.

The Boundary Condition of Innovation Resistance: The Moderating Role of Usage Barriers (Evaluating H4)

Furthermore, the study reveals that usage barriers negatively moderate the relationship between Generation Z consumers' attitudes and purchase intention, indicating that positive attitudes do not always translate into intention when perceived usage barriers are high. This finding indirectly supports prior research identifying usage barriers as inhibitors of environmentally friendly beauty product adoption (Dlamini & Mahowa, 2024; Maslikhah et al., 2024; Zahan et al., 2024). However, while earlier studies predominantly position usage barriers as direct predictors, the present study highlights their conditional role in weakening the attitude–intention relationship. Within the TPB framework, this finding extends understanding of the attitude–behavioral intention link by demonstrating that the effectiveness of attitude as a driver of purchase intention is contingent on perceived practical constraints during product use. From an IRT perspective, the result underscores that usage barriers represent a form of functional resistance that does not reject innovation ideologically but rather constrains the realization of intentions through operational obstacles embedded in the usage experience. In the Indonesian context, this insight is significant, as it indicates that Generation Z consumers' green purchase intentions are strongly influenced by product convenience and compatibility with daily routines. Failure to manage usage barriers may therefore widen the gap between positive attitudes and sustainable consumption behavior.

4. CONCLUSION

Based on the results and discussion, this study concludes that the formation of green skincare purchase intention among Generation Z consumers in Indonesia is a staged, conditional process, beginning with behavioral beliefs and culminating in behavioral intention. Environmental values and perceived health benefits both play significant roles in shaping attitudes, with the dominance of health benefits suggesting that Generation Z's sustainability orientation in consumption remains primarily driven by directly perceived personal benefits. The resulting attitudes subsequently function as the primary determinant of purchase intention, thereby

confirming the core mechanism of TPB in the context of environmentally friendly product consumption. However, the attitude–intention relationship is not entirely linear, as usage barriers weaken the ability of positive attitudes to translate into purchase intention. This finding suggests that resistance to environmentally friendly products among Indonesian Generation Z consumers does not stem solely from a rejection of sustainability values, but rather from functional barriers inherent in the usage experience, as explained by IRT. Overall, this study contributes to the literature by demonstrating that increasing green skincare purchase intention among Generation Z consumers in Indonesia requires not only the formation of positive attitudes but also the effective management of usage barriers to minimize the gap between attitudes and sustainable consumption intentions.

This study offers several theoretical implications for advancing the sustainable consumer behavior literature, particularly within the TPB and IRT frameworks. First, the finding that both environmental values and perceived health benefits significantly influence attitudes—with health benefits exerting a more substantial effect enriches the understanding of behavioral beliefs within TPB. The results support the view that attitudinal belief structures do not carry uniform weight across contexts, as reflected in variations across prior studies that identify either environmental values or health benefits as the dominant attitudinal determinant. Accordingly, this study underscores the contextual nature of behavioral beliefs and their sensitivity to consumer characteristics and product categories, particularly among Generation Z consumers and in the context of green skincare. Second, the significant positive effect of attitude on green skincare purchase intention reinforces the core TPB mechanism, which positions attitude as a direct determinant of behavioral intention. While the attitude–intention relationship has been extensively documented in green consumption literature, the theoretical contribution of this study lies in extending its validity to Generation Z consumers and the environmentally friendly personal care category, which differs substantively from utilitarian green products. Thus, the findings support the applicability of TPB in explaining purchase intentions for personal, routine green products closely linked to health considerations. Third, by demonstrating that usage barriers negatively moderate the relationship between attitude and purchase intention, this study provides an important extension of TPB in the context of sustainable consumption. The findings indicate that the predictive strength of attitude is not absolute but depends on consumers' perceived usage conditions. In doing so, the study advances understanding of the attitude intention gap by showing that practical constraints can undermine the effectiveness of positive attitudes in shaping intention, without positioning such barriers as direct determinants within the TPB. Fourth, from an IRT perspective, this study contributes by confirming the role of usage barriers as a form of functional resistance in the adoption of environmentally friendly products. Unlike prior research that predominantly treats usage barriers as direct predictors of adoption or resistance, this study demonstrates that functional resistance may operate conditionally by constraining the translation of positive attitudes into purchase intention. This finding extends the application of IRT by positioning innovation resistance as an indirect mechanism influencing decision-making processes, particularly at the stage of converting attitudes into intentions.

Overall, this study contributes to the literature by offering a more integrated understanding of the formation of green skincare purchase intention among Generation Z consumers. A contextual structure of behavioral beliefs shapes attitudes, while their effectiveness is constrained by usage barriers. By linking TPB and IRT in a complementary manner, the study demonstrates that sustainable consumption behavior is determined not only by positive cognitive evaluations but also by functional conditions that enable or inhibit the realization of intentions.

Practical Implications

The findings of this study provide actionable managerial implications for increasing green skincare purchase intention among Generation Z consumers. First, the more decisive influence of perceived health benefits over environmental values in shaping attitudes suggests that green skincare marketing strategies should prioritize communicating concrete, verifiable health benefits. Industry practitioners are therefore encouraged to emphasize claims related to ingredient safety, dermatological benefits, and positive effects on skin health, supported by indicators relevant to the Indonesian regulatory context, such as compliance with BPOM standards, transparent labeling of active ingredients, and science-based educational content on digital platforms. This approach positions environmental values as a reinforcing attribute that strengthens a value proposition grounded in directly perceived personal benefits. Second, given the central role of attitudes in determining green skincare purchase intention, a critical managerial implication is to build credible, consistent, and positive attitudes. Operationally, firms must ensure alignment between sustainability claims and actual consumer experiences, particularly to reduce uncertainty surrounding environmental claims often associated with green products. This can be achieved through simplified sustainability messaging, the use of specific and verifiable claims, and the avoidance of overly abstract or normative narratives, as ambiguous claims may weaken positive attitudes even when interest in environmentally friendly products already exists.

Third, the negative moderating role of usage barriers indicates that fostering positive attitudes alone is insufficient to stimulate purchase intention when consumers face practical constraints. Firms should therefore actively manage the most salient usage barriers for Generation Z consumers, including perceptions of premium pricing, limited accessibility, and information complexity. Practical strategies may include offering more affordable product sizes, leveraging readily accessible digital distribution channels, and presenting product information in concise, user-friendly formats to reduce consumers' cognitive and economic burdens. Fourth, in the Indonesian context—where purchasing power and market access vary considerably—companies are advised to align green skincare launch strategies with local usage conditions. A phased approach, such as pilot launches targeting urban Generation Z segments or an online-first strategy, can be used to test price sensitivity, product accessibility, and consumer understanding of sustainability claims before broader market expansion. Overall, the managerial implications emphasize that increasing green skincare purchase intention requires an integrated approach combining attitudinal strengthening with a proactive reduction of functional and economic barriers.

From an academic and theoretical perspective, this research offers significant implications for scholars and researchers in the field of sustainable consumer behavior. By successfully integrating the Theory of Planned Behavior (TPB) and Innovation Resistance Theory (IRT), this study provides a robust theoretical blueprint for unpacking the green attitude–intention gap without merely treating practical hurdles as direct independent variables. Academics can utilize this integrated framework as a novel conceptual lens to investigate high-involvement eco-friendly products in other highly volatile emerging markets where regulatory standardizations remain fragmented. Furthermore, this study challenges the traditional assumption of universal altruism in green consumption by empirically demonstrating that self-oriented, proximal beliefs (health benefits) yield higher explanatory power in attitude formation than collective, abstract values (environmental values) among the younger generational cohort. This provides a fresh empirical baseline for future behavioral scientists to further model and refine generational-specific boundaries in sustainable personal care literatures.

Limitations and Future Research

This study has several limitations that should be considered when interpreting the findings. First, the use of a cross-sectional design limits the ability to capture changes in attitudes, perceived benefits, and green skincare purchase intentions over time, rendering the identified causal relationships static. Second, the study relies on purposive sampling because there is no clearly defined sampling frame for Generation Z green skincare users in Indonesia, which constrains the generalizability of the findings to a broader population. Third, the study focuses on purchase intention without directly observing actual purchasing behavior, thereby limiting the ability to empirically assess the real-world intention–behavior gap. Fourth, usage barriers are measured as an aggregate construct, preventing an examination of the relative, granular influence of specific barriers such as premium pricing, limited access, or information complexity. Finally, by focusing exclusively on Generation Z consumers and the green skincare category, the empirical findings have limited applicability to other generational cohorts or distinct environmentally friendly product categories.

To address these constraints, future research should embrace several distinct agendas to extend the literature. First, future studies are encouraged to employ longitudinal designs to examine the stability of relationships among variables and the long-term dynamics of attitude-to-intention conversion among consumers. Second, researchers may consider region-based stratified sampling or tracking consumer panel data to enhance sample representativeness and strengthen external validity. Third, future research is encouraged to incorporate measures of actual behavior, such as purchase frequency or usage intensity, to provide a more comprehensive, behavioral understanding of sustainable consumption. Fourth, future studies may model usage barriers as a multidimensional, second-order construct to systematically identify which specific operational barriers most critically weaken the attitude–intention relationship. Finally, future research may extend the analytical context by conducting cross-generational or cross-category comparisons to test the robustness of the behavioral and resistance mechanisms identified in this study.

5. REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Alyahya, R. S., AlHasson, M. A., & Alhsaon, M. A. A. (2025). Assessing the Adverse Effects and Safety Concerns Related to Cosmetic and Skincare Products: A Systematic Review. *Cureus*, 17(4). <https://doi.org/10.7759/cureus.81759>
- Anand, A., & Sharma, M. (2023). Unveiling the Impact of Environmental Factors on Consumer Purchase

- Intention for Sustainable Products. *International Journal of Environmental Sciences(IND)*, 9(2), 88–101.
- Andika, A., Ernestivita, G., Anisah, T. N., Hidayati, L., & Joshi, M. C. (2025). The Role of Social Media in Sustainable Fashion Adoption: Examining Psychological Mechanisms and Financial Constraints. *Journal of Sustainable Marketing*, 6(1), 114–143. <https://doi.org/10.51300/JSM-2025-144>
- Andika, Luthfiana, D. N., Nadia, & Kartinah. (2023). Green purchase behavior: The role of green advertising, green awareness, and eco-literacy. *IOP Conference Series: Earth and Environmental Science*, 1181(1). <https://doi.org/10.1088/1755-1315/1181/1/012025>
- Andika, Nadia, Najmudin, M., & Hasibuan, A. B. (2023). Green Cosmetics In Indonesia: Unraveling Attitude-Behavior Gap And Gender Moderation. *Jurnal Aplikasi Bisnis*, 21(4), 1134–1152. <https://doi.org/http://dx.doi.org/10.21776/ub.jam.2023.021.04.20>.
- Aprilia, S. P., Anggraeni, A., Ramadhan, A. S., & Putra, S. (2022). Perceived Value of Consumers Towards Buying "Green" Skincare Products. *ACM International Conference Proceeding Series, February*, 116–121. <https://doi.org/10.1145/3556089.3556098>
- Baltacı, D. Ç., Durmaz, Y., & Baltacı, F. (2025). The mediating role of attitudes in the effect of human and environment-centered value orientation on green cosmetic product purchasing behavior: comparison of different countries. *Environment, Development and Sustainability*. <https://doi.org/10.1007/s10668-025-06173-9>
- Brislin, R. W. (1986). The Wording and Translation of Research Instruments. In *Cross-Cultural Research and Methodology Series, Vol. 8* (pp. 137–164). Sage publications.
- CG, M. K., & G, A. (2025). A study on environmental prosocial attitudes to green consumption values, openness to green communication, and its relationship with buying behavior. *Cogent Business and Management*, 12(1). <https://doi.org/10.1080/23311975.2024.2443050>
- Chin, J., Jiang, B. C., Mufidah, I., Persada, S. F., & Noer, B. A. (2018). The investigation of consumers' behavior intention in using green skincare products: A pro- environmental behavior model approach. *Sustainability (Switzerland)*, 10(11). <https://doi.org/10.3390/su10113922>
- Chu, K. W. K. (2020). The green gap of high-involvement purchasing decisions: an exploratory study. *Asian Journal of Business Ethics*, 9(2), 371–394. <https://doi.org/10.1007/s13520-020-00115-6>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum.
- Couceiro, B., Hameed, H., Vieira, A. C. F., Singh, S. K., Dua, K., Veiga, F., Pires, P. C., Ferreira, L., & Paiva-Santos, A. C. (2025). Promoting health and sustainability: exploring safer alternatives in cosmetics and regulatory perspectives. *Sustainable Chemistry and Pharmacy*, 43(January). <https://doi.org/10.1016/j.scp.2024.101901>
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/http://www.jstor.org/stable/249008>
- Dawes, J. (2008). Do data characteristics change according to the number of scale points used? An experiment using 5-point, 7-point and 10-point scales. *International Journal of Market Research*, 50(1), 61–77. <https://doi.org/10.1177/147078530805000106>
- Dewi, W. W. A., Avicenna, F., & Meideline, M. M. (2020). Purchase intention of green products following an environmentally friendly marketing campaign: Results of a survey of instagram followers of innisfreeindonesia. *Asian Journal for Public Opinion Research*, 8(2), 160–177. <https://doi.org/10.15206/ajpor.2020.8.2.160>
- Dini, I., & Laneri, S. (2021). The new challenge of green cosmetics: Natural food ingredients for cosmetic formulations. *Molecules*, 26(13). <https://doi.org/10.3390/molecules26133921>
- Dlamini, S., & Mahowa, V. (2024). Investigating factors that influence the purchase behaviour of green cosmetic products. *Cleaner and Responsible Consumption*, 13(May), 100190. <https://doi.org/10.1016/j.clrc.2024.100190>
- Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and*

- Research* (Social Psy). MA: Addison-Wesley. <https://people.umass.edu/aizen/f&a1975.html>
- FMI. (2026). *Natural Cosmetics Market Forecast and Outlook 2026 to 2036*. <https://www.futuremarketinsights.com/reports/natural-cosmetics-market>
- Ghazali, E., Soon, P. C., Mutum, D. S., & Nguyen, B. (2017). Health and cosmetics: Investigating consumers' values for buying organic personal care products. *Journal of Retailing and Consumer Services*, 39, 154–163. <https://doi.org/10.1016/j.jretconser.2017.08.002>
- Hair, Hult, Ringle, & Sarstedt. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). In *Asia-Pacific Pte. Ltd* (Second). SAGE Publications, Inc. <http://lccn.loc.gov/2016005380>
- Hair, J. F. J., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (7th Ed). Pearson Prentice Hall.
- Hair, J. F. J., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) Third Edition. In L. Fargotstein, K. Offley, N. Tiwari, & G. Mahindra (Eds.), *Sage* (Third edit). SAGE Publications, Inc.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hair Jr., J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2), 107. <https://doi.org/10.1504/IJMDA.2017.10008574>
- Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., Ketchen, D. J., Hair, J. F., Hult, G. T. M., & Calantone, R. J. (2014). Common Beliefs and Reality About PLS: Comments on Rönkkö and Evermann (2013). *Organizational Research Methods*, 17(2), 182–209. <https://doi.org/10.1177/1094428114526928>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hsu, C. L., Chang, C. Y., & Yansritakul, C. (2017). Exploring purchase intention of green skincare products using the theory of planned behavior: Testing the moderating effects of country of origin and price sensitivity. *Journal of Retailing and Consumer Services*, 34(October 2016), 145–152. <https://doi.org/10.1016/j.jretconser.2016.10.006>
- Inkwood Research. (2025). *Indonesia Skin Care Market Forecast 2025-2032*. <https://www.marketresearch.com/Inkwood-Research-v4104/Indonesia-Skin-Care-Forecast-42109123/>
- Kim, B., & Kim, D. (2025). Understanding the Drivers of Sustainable Consumption in China: Role of Green Self-Identity, Subjective Norm, and Demographics. *SAGE Open*, 15(4), 1–16. <https://doi.org/10.1177/21582440251390627>
- Koay, K. Y., & Ahmed, H. I. (2025). Understanding consumers' purchase intentions for green cosmetic products: an integrated perspective. *Social Responsibility Journal*, June. <https://doi.org/10.1108/SRJ-04-2025-0382>
- Kock, N. (2015). *Common method bias in PLS-SEM: A full collinearity assessment approach*. 1–10.
- Kurnia, S. N., & Mayangsari, L. (2020). Barriers in Purchasing Green Cosmetic Products Among Indonesian Women. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 5(8), 72–84. <https://doi.org/10.47405/mjssh.v5i8.465>
- Laheri, V. K., Lim, W. M., Arya, P. K., & Kumar, S. (2024). A multidimensional lens of environmental consciousness: towards an environmentally conscious theory of planned behavior. *Journal of Consumer Marketing*, 41(3), 281–297. <https://doi.org/10.1108/JCM-03-2023-5875>
- Luthfiana, D. N., Andika, A., & Bidayati, U. (2024). Unraveling the complexity of the organic food market: Indonesian consumer perspective on price and product knowledge. *Asian Management and Business*

- Review*, 4(1), 73–89. <https://doi.org/10.20885/AMBR.vol4.iss1.art5>
- Luthra, C., Deshwal, P., Kushwah, S., & Gokarn, S. (2025). Exploring barriers towards green personal care products purchase: an integrated ISM-MICMAC approach. *International Journal of Pharmaceutical and Healthcare Marketing*, 19(3), 618–646. <https://doi.org/10.1108/IJPHM-05-2024-0045>
- Mamun, A. Al, Nawir, N. C., Hayat, N., & Zainol, N. R. B. (2020). Predicting the purchase intention and behaviour towards green skincare products among Malaysian consumers. *Sustainability (Switzerland)*, 12(24), 1–18. <https://doi.org/10.3390/su122410663>
- Mansoor, M., Saeed, A., Rustandi Kartawinata, B., & Naqi Khan, M. K. (2022). Derivers of green buying behavior for organic skincare products through an interplay of green brand evaluation and green advertisement. *Journal of Global Fashion Marketing*, 13(4), 328–343. <https://doi.org/10.1080/20932685.2022.2085597>
- Margariti, K., Hatzithomas, L., & Boutsouki, C. (2024). Elucidating the Gap between Green Attitudes, Intentions, and Behavior through the Prism of Greenwashing Concerns. *Sustainability (Switzerland)*, 16(12), 1–13. <https://doi.org/10.3390/su16125108>
- Maslikhah, Andika, Tampubolon, N. K. T., Harahap, J. B., & Luthfiana, D. N. (2024). Stay or Switch: How Usage Barriers Influence Consumer Transition to Green Skincare Products in Indonesia Using Push-Pull-Mooring Framework. *International Journal of Environmental Impacts*, 7(4), 603–614. <https://doi.org/10.18280/ije.070401>
- Nemchenko, A., Mishchenko, V., Nazarkina, V., Sliptsova, N., & Mashtaler, V. (2024). Analysis and Main Trends of the World and Ukrainian Organic and Natural Cosmetics Market. *Pharmakeftiki*, 36(4), 48–58. <https://doi.org/10.60988/p.v36i4.87>
- Ngo-Thi-Ngoc, H., Nguyen-Viet, B., & Hong-Thach, H. (2024). Purchase Intention for Vegan Cosmetics: Applying an Extended Theory of Planned Behavior Model. *SAGE Open*, 14(1), 1–11. <https://doi.org/10.1177/21582440241240548>
- Oliveira, Z., Teixeira, S., Teixeira, S., & Teixeira, S. F. (2023). The Attitude of Portuguese Consumers of Green Cosmetics. In M. M. Carvalho & M. Rodrigues (Eds.), *Sustainable Consumption Experience and Business Models in the Modern World* (pp. 165–189). IGI Global Scientific Publishing. <https://doi.org/10.4018/978-1-6684-9277-2.ch008>
- Ram, S., & Sheth, J. N. (1989). Consumer resistance to innovations: The marketing problem and its solutions. *Journal of Consumer Marketing*, 6(2), 5. <https://doi.org/10.1108/EUM00000000002542>
- Ringle, C. M., Wende, S., & Becker, J.-M. (2024). *SmartPLS 4*. SmartPLS. <https://www.smartpls.com/>
- Setiawan, M., Widjojo, R., & Purnama Alamsyah, D. (2023). Consumers' reasonings for intention to purchase natural personal care products in Indonesian market. *Cogent Business and Management*, 11(1). <https://doi.org/10.1080/23311975.2023.2289205>
- Shanbhag, P. R., Pai, Y. P., Kidiyoor, G., & Prabhu, N. (2023). Development and initial validation of a theory of planned behavior questionnaire: Assessment of purchase intentions towards products associated with CRM campaigns. *Cogent Business and Management*, 10(2). <https://doi.org/10.1080/23311975.2023.2229528>
- Singhal, A., & Malik, G. (2018). The attitude and purchasing of female consumers towards green marketing related to cosmetic industry. *Journal of Science and Technology Policy Management*, 12(3), 514–531. <https://doi.org/10.1108/JSTPM-11-2017-0063>
- Sonkar, S., Singh, P., & Singh Dubey, R. (2025). Examining the Consumer Behavior and Preferences of Generation Y and Generation Z Toward Green Cosmetics in the Indian Market. *Journal of Global Marketing*, 1–22. <https://doi.org/10.1080/08911762.2025.2518091>
- Szaban, M., Szymkowiak, A., & Caniëls, M. C. J. (2024). Unraveling green personal care: Exploring the shift in consumer values and stages of change toward green consumption. *Global Business and Organizational Excellence*, 43(4), 45–64. <https://doi.org/10.1002/joe.22244>
- Testa, R., Vella, F., Rizzo, G., Schifani, G., & Migliore, G. (2024). What drives and obstacles the intention to purchase green skincare products? A study of the Italian market of green skincare products. *Journal of*

- Cleaner Production*, 484(November), 144358. <https://doi.org/10.1016/j.jclepro.2024.144358>
- The Business Research Company. (2026a). *Natural Cosmetics Market Report 2026*. <https://www.thebusinessresearchcompany.com/>.
[https://www.thebusinessresearchcompany.com/report/natural-cosmetics-global-market-report#:~:text=Natural Cosmetics market size,Collagen Boosting And Radiant Skin](https://www.thebusinessresearchcompany.com/report/natural-cosmetics-global-market-report#:~:text=Natural%20Cosmetics%20market%20size,Collagen%20Boosting%20And%20Radiant%20Skin)
- The Business Research Company. (2026b). *Skincare Market Report 2026*. <https://www.thebusinessresearchcompany.com/>.
<https://www.thebusinessresearchcompany.com/report/skincare-global-market-report>
- Wang, D., Weisstein, F. L., Duan, S., & Choi, P. (2022). Impact of ambivalent attitudes on green purchase intentions: The role of negative moods. *International Journal of Consumer Studies*, 46(1), 182–199. <https://doi.org/10.1111/ijcs.12663>
- Widodo, A., Rubiyanti, N., & Madiawati, P. N. (2025). Investigating the influence of eco-labels on consumer behavior in Indonesia's developing green market. *Management & Sustainability: An Arab Review*. <https://doi.org/10.1108/MSAR-02-2025-0054>
- Wijekoon, R., & Sabri, M. F. (2021). Determinants that influence green product purchase intention and behavior: A literature review and guiding framework. *Sustainability (Switzerland)*, 13(11), 1–40. <https://doi.org/10.3390/su13116219>
- Yu, A., & Han, S. (2021). Social exclusion and effectiveness of self-benefit versus other-benefit marketing appeals for eco-friendly products. *Sustainability (Switzerland)*, 13(9). <https://doi.org/10.3390/su13095034>
- Zahan, I., Kaium, M. A., & Rahman, M. S. (2024). Accept or Reject? Investigating Customers' Attitudes Toward Green Cosmetics in Bangladesh. *Journal of Sustainability Research*, 6(2), e240025. <https://doi.org/10.20900/jsr20240025>
- Zollo, L., Carranza, R., Faraoni, M., Díaz, E., & Martín-Consuegra, D. (2021). What influences consumers' intention to purchase organic personal care products? The role of social reassurance. *Journal of Retailing and Consumer Services*, 60(December 2020). <https://doi.org/10.1016/j.jretconser.2020.102432>