



The Role of Environmental Concern in Shaping Sustainable Clothing Choices among Generation Z: An Extended Theory of Planned Behavior

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Abstract.

Research purpose:

This study investigates the drivers of Generation Z's purchase intention for sustainable clothing in Indonesia, extending the Theory of Planned Behavior (TPB) by integrating environmental concern (EC) as a key antecedent of attitude, subjective norms, and perceived behavioral control (PBC).

Research motivation:

Although Gen Z is widely recognized for its environmental awareness, a gap persists between stated values and actual purchasing behavior. Prior studies often overlook cultural context, making this research valuable for understanding sustainable fashion decisions within a collectivist society.

Research design, approach, and method:

A quantitative survey of 399 Indonesian Gen Z respondents (aged 18–27) was conducted using purposive sampling. The proposed model was tested through variance-based Structural Equation Modeling (PLS-SEM) in SmartPLS4, with mediation analysis performed to examine indirect relationships.

Main findings:

Attitude and PBC significantly predict purchase intention, whereas subjective norms do not. EC indirectly influences purchase intention through attitude and PBC but shows no direct effect. These results highlight the importance of personal beliefs and self-efficacy over social influence in sustainable consumption behavior.

Practical/managerial implications:

The findings provide actionable insights for policymakers and sustainable fashion brands to drive adoption through incentives, regulations, and transparent marketing strategies that emphasize environmental benefits.

Keywords: sustainable consumption, sustainable clothing, Theory of Planned Behavior, environmental concern, purchase intention, Generation Z

1. INTRODUCTION

The fashion industry faces increasing scrutiny for its environmental and social impacts, as it is one of the world's most polluting sectors, contributing heavily to carbon emissions, water consumption, and waste (Palomo-Domínguez *et al.*, 2023.; Harris *et al.* 2016). Within this context, Generation Z—those born between 1997 and 2012—has emerged as a vocal advocate for sustainability, demonstrating strong ethical values and environmental awareness (McKinsey & Company, 2019).

In Indonesia, Gen Z is the largest generational group, around 27,94 % of the country's population (Databoks, 2023), making them a powerful consumer group and a significant market segment for the fashion industry. Known for its environmental consciousness and willingness to engage in eco-friendly practices (Dimmock, 2019; Dabija, 2019). However, despite increasing awareness and availability of sustainable fashion, a persistent gap remains between consumers' stated values and actual purchasing behaviors, which often continue to favor fast fashion (McKinsey & Company, 2019; Nielsen Company, 2015). Understanding the drivers behind this intention-behavior gap is essential for both policymakers and fashion brands seeking to promote sustainability.

This study contributes to the literature by extending the Theory of Planned Behavior (TPB) to include environmental concern (EC) as an antecedent of attitude, subjective norms, and perceived behavioral control (PBC). While TPB has been widely used to explain sustainable consumption (Ajzen, 1991; Scalco *et al.*, 2017), this study focuses on

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Indonesian Gen Z, offering a culturally specific perspective and addressing inconsistencies in prior findings regarding subjective norms and the direct role of environmental concern.

Guided by this framework, the study seeks to answer the following research questions:

RQ1: How does environmental concern influence attitudes, subjective norms, and perceived behavioral control?

RQ2: To what extent do these factors mediate the relationship between environmental concern and purchase intention?

By addressing these questions, this study aims to provide both theoretical insights and actionable implications for promoting sustainable fashion consumption among Indonesian Gen Z consumers.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Sustainable Consumption

Sustainable consumption refers to the use of products and services that meet current needs without compromising the ability of future generations to meet theirs (Huynh *et al.*, 2021). Thomas (2008) explains that sustainable or eco-friendly clothing consumption is a broad concept encompassing ethical, green, and environmentally conscious fashion initiatives adopted by companies to appeal to responsible consumers.

Sustainable clothing consumption goes beyond environmental considerations, addressing social issues such as labor exploitation in the textile industry (Joergens, 2006). Many garment factories, particularly in countries with low wage standards, rely on underpaid labor and poor working conditions to meet fast fashion demands. As a result, sustainable consumption carries both environmental and social significance (Akenji, 2014).

This study builds on previous work linking sustainable consumption with the Theory of Planned Behavior (TPB), which has been widely used to explain green purchasing decisions (Liobikiene *et al.*, 2016; Scalco *et al.*, 2017); ; Schwartz, 2009).

2.2. Sustainable Clothing

Sustainable clothing (SC) refers to apparel produced with minimal environmental and social harm, ensuring the well-being of both the planet and consumers (Brandão & Costa, 2021). SC is typically analyzed across three dimensions: environmental, focusing on reducing pollution and waste; social, ensuring fair treatment and safety of workers; and economic, supporting economic growth without harming the environment (Ganatra *et al.*, 2021). Aesthetic and cultural aspects also play a role, as sustainable clothing should be durable, stylish, and ethically produced (Kozłowski *et al.*, 2019).

Companies can strengthen their sustainability practices by using natural fibers like cotton, silk, and wool, or adopting sharing-based strategies such as clothing swaps and rental services (Ozanne & Ozanne, 2011; Razzaq *et al.*, 2018). SC also includes eco-labeled apparel, second-hand clothing, and durable garments (Chang & Watchravesringkan, 2018). Previous studies show Gen Z and Gen Y are more environmentally conscious, making them a key demographic for sustainable fashion (Manley *et al.*, 2023; Harris *et al.*, 2016). However, research linking fashion involvement with sustainable apparel purchasing remains limited (Johnstone & Lindh, 2022).

2.3. Theory Planned Behavior

The Theory of Planned Behavior (TPB), developed by Ajzen (1991), is a well-established framework for predicting behavior across various contexts, including sustainable consumption. TPB posits that three constructs—attitude, subjective norms, and perceived behavioral control (PBC)—directly influence behavioral intention.

Attitude reflects individuals' evaluations of sustainable clothing and is strongly linked to purchase intentions (Bong Ko & Jin, 2017; Zhang *et al.*, 2019).

H1: Attitude positively influences purchase intention toward sustainable clothing.

Subjective norms represent social pressure from peers, family, or society, and may carry significant weight in collectivist cultures like Indonesia (Wijaya *et al.*, 2023; Chan, 2021).

H2: Subjective norms positively influence purchase intention.

PBC reflects individuals' confidence in their ability to perform a behavior and is strongly associated with sustainable product adoption (Ajzen, 1991; Kumar *et al.*, 2022).

H3: PBC positively influences purchase intention.

Recent studies extend TPB by incorporating **environmental concern (EC)**, which shapes pro-environmental attitudes and behaviors (Scalco *et al.*, 2017; Zhang *et al.*, 2019).

2.4. Environmental Concern and TPB Constructs

Environmental concern (EC) is the extent to which individuals prioritize environmental protection in their decision-making (Fransson & Gärling, 1999). Gen Z is recognized for its strong environmental values, making EC an essential

driver of sustainable consumption (Manley *et al.*, 2023). Prior studies show EC significantly influences attitude, subjective norms, and PBC Kumar *et al.* (2022). This study tests the following hypotheses:

- H4: EC positively influences attitude toward sustainable clothing.
- H5: EC positively influences subjective norms.
- H6: EC positively influences PBC.

2.5. Direct and indirect effects of Environmental Concern

Environmental Concern influences purchase intention both directly and indirectly through the mediating roles of Attitude, Subjective Norms, and PBC. While some studies suggest a weak direct relationship between EC and behavioral intentions, the indirect pathways through the TPB constructs are well-supported (Scalco *et al.*, 2017; Chen *et al.*, 2020). This dual pathway approach allows for a comprehensive understanding of how EC drives sustainable fashion consumption.

- H7: Environmental concern has a direct positive influence on purchase intention.
- H8: Environmental concern influences purchase intention indirectly through attitude.
- H9: Environmental concern influences purchase intention indirectly through subjective norms.
- H10: Environmental concern influences purchase intention indirectly through perceived behavioral control.

2.6. Proposed Conceptual Model

The extended TPB model integrating Environmental Concern is depicted in Figure 1. This model illustrates the pathways from EC to Purchase Intention, mediated by Attitude, Subjective Norms, and PBC, providing a comprehensive framework for analysing sustainable consumption behaviors

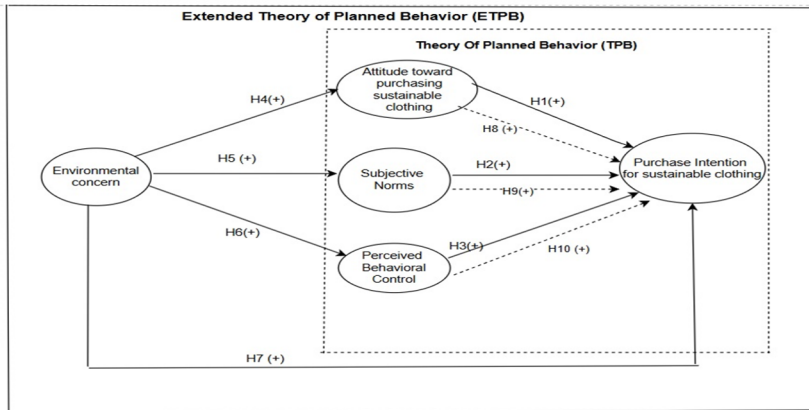


Figure 1. Conceptualization of Research Model

Source: Authors' elaboration (2025)

By integrating Environmental Concern into the TPB framework, this study provides a robust basis for examining the determinants of sustainable clothing purchase intentions among Generation Z in Indonesia. It addresses critical gaps in the literature, offering theoretical and practical insights to promote sustainable consumption practices effectively.

3. METHODOLOGY

3.1. Data and sample

This study adopts a quantitative research design to examine the factors influencing Generation Z's purchase intention toward sustainable clothing in Indonesia. The Extended Theory of Planned Behavior (TPB) serves as the guiding framework for hypothesis development and testing. A quantitative approach was chosen for its ability to provide generalizable findings and enable rigorous statistical testing of relationships among variables.

Data were collected through a structured online survey administered to Indonesian Gen Z respondents aged 18–27. This age group was selected because of its growing influence as a consumer cohort and its potential to shape sustainable consumption trends. To focus on emerging consumers, the survey specifically targeted individuals who had not previously purchased sustainable clothing.

The minimum required sample size was calculated using Hair *et al.* (2019) ten-times rule for variance-based Structural Equation Modeling (VB-SEM). With five constructs (7 items for attitude, 5 for subjective norms, 4 for

PBC, 5 for purchase intention, and 7 for environmental concern, totaling 28 items), the minimum recommended sample size was 280 respondents. This study collected 399 valid responses, exceeding the requirement. A purposive sampling technique was applied, ensuring demographic diversity across gender, region, education level, and income.

3.2. Instrument

The study examines environmental concern (EC) as the independent variable; attitude toward sustainable clothing (AT), subjective norms (SN), and perceived behavioral control (PBC) as mediating variables; and purchase intention (PI) as the dependent variable. All constructs were measured using validated scales adapted from previous research, with minor contextual adjustments for the Indonesian market.

To ensure linguistic and cultural appropriateness, the questionnaire was translated from English into Indonesian through a careful adaptation process, making necessary refinements to align with local expressions and cultural nuances. The final instrument was reviewed to ensure clarity and ease of understanding. All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), which was chosen to capture nuanced responses while minimizing participant fatigue.

3.3. Measurement and analysis

The conceptual model integrates environmental concern as an antecedent of TPB constructs (attitude, subjective norms, and PBC) and examines both its direct and indirect effects on purchase intention. Variance-based Structural Equation Modeling (SEM) was performed using SmartPLS 4, chosen for its ability to handle complex models and its suitability for both exploratory and confirmatory analyses.

Model evaluation followed a two-step procedure: (1) measurement model assessment, evaluating internal consistency, convergent validity, and discriminant validity; and (2) structural model assessment, testing hypothesized relationships and examining the significance of direct, indirect, and total effects through bootstrapping with 5,000 resamples. Model adequacy was assessed using fit indices such as the Standardized Root Mean Square Residual (SRMR). Variance Inflation Factor (VIF) values were also examined to ensure no multicollinearity issues.

This methodological approach ensures rigor and reliability, offering robust empirical evidence and actionable insights for researchers, policymakers, and practitioners. By combining a well-defined theoretical framework with advanced statistical techniques, the study contributes to a deeper understanding of sustainable fashion consumption among Indonesian Gen Z consumers.

Table 1 *Characteristics of respondents*

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	164	41.10
	Female	235	58.90
Age	18-27	261	65.41
	27-30	138	34.59
Educational level	High School	261	65.41
	Undergraduate	132	33.08
	Postgraduate	6	1.51
Income-monthly	< IDR 3 Million	261	65.41
	> IDR 3 Million to 5 Million	105	26.31
	> IDR 5 Million	33	8.28

Source: Authors' own work

From descriptive statistics, Table 1 revealed that the majority of respondents in the sample are female, predominantly possessing a high school education. They are presently university students in Indonesia, aged between 18 and 27 years old. Their monthly salary is less than IDR 3 million per individual.

4. RESULTS AND DISCUSSION

4.1. Result

This study used variance-based Structural Equation Modeling (SEM) with SmartPLS 4 to test the extended TPB model. PLS-SEM was chosen for its predictive focus and ability to handle complex models with multiple indicators and relationships. The analysis was conducted in two stages: (1) assessment of the measurement model (outer model) to evaluate the reliability and validity of the constructs, and (2) assessment of the structural model (inner model) to test the study's hypotheses..

4.1.1. Measurement Model Test

1. Test of Construct Validity and Reliability

The first step involved evaluating factor loadings, with a minimum acceptable threshold of 0.50 (Hair *et al.*, 1998). As shown in Table 2, all indicators exceeded this threshold, confirming their adequacy. Reliability was assessed through Cronbach's alpha and composite reliability (CR). Following Hair *et al.* (2019) Cronbach's alpha values between 0.60–0.70 are acceptable, and values above 0.70 indicate strong reliability; CR values above 0.70 and higher than Cronbach's alpha are considered ideal. In this study, both Cronbach's alpha and CR scores exceeded 0.90, demonstrating excellent reliability.

Convergent validity was examined using Average Variance Extracted (AVE), with a recommended threshold of 0.50 (Hair *et al.*, 2019). All constructs had AVE values above 0.50, confirming that the measurement items are valid. Based on these results, the measurement model is both valid and reliable.

Table 2 *Validity & reliability of constructs*

Construct	Question items	Loading Factor	Cronbach's alpha	Composite reliability (CR)	Average variance extracted (AVE)
Attitude toward purchasing sustainable clothing	ATT1	0.819	0.927	0.942	0.698
	ATT2	0.882			
	ATT3	0.846			
	ATT4	0.867			
	ATT5	0.839			
	ATT6	0.824			
	ATT7	0.765			
Subjective Norm	SN1	0.868	0.894	0.922	0.704

		SN2	0.893			
		SN3	0.823			
		SN4	0.854			
		SN5	0.749			
Perceived Control	Behavioral	PBC1	0.859	0.860	0.905	0.705
		PBC2	0.820			
		PBC3	0.896			
		PBC4	0.780			
Purchase intention for sustainable clothing		PI1	0.886	0.942	0.956	0.813
		PI2	0.928			
		PI3	0.925			
		PI4	0.880			
		PI5	0.888			
Environmental Concern		EC1	0.699	0.853	0.888	0.532
		EC2	0.637			

EC3	0.706
EC4	0.785
EC5	0.764
EC6	0.768
EC7	0.738

Source: Authors' own work

2. Test of Discriminant Validity

In addition to assessing construct reliability and convergent validity, discriminant validity was evaluated to ensure that each construct is conceptually distinct. Three approaches are commonly used in PLS-SEM: the Fornell–Larcker criterion, cross-loadings, and the Heterotrait–Monotrait (HTMT) ratio (Hair *et al.*, 2019). Because the Fornell–Larcker criterion may be less reliable when indicator loadings are similar across constructs, this study followed Hair *et al.*'s (2019) recommendation to use the HTMT ratio. An HTMT value below 0.90 indicates satisfactory discriminant validity. As shown in Table 3, all HTMT values in this study were below the threshold, confirming that discriminant validity is established.

Table 3 Discriminant Validity (HTMT)

	ATT	EC	PBC	PI	SN
ATT					
EC	0.715				
PBC	0.722	0.532			
PI	0.760	0.526	0.830		
SN	0.653	0.448	0.760	0.641	

Source: Authors' own work

The final step to assess discriminant validity and confirm that the variances of shared items differ from those of other items within each construct is to examine the cross-loading, as seen in Table 4. In this model, all shared variance values exceed those of other constructs, hence confirming the presence and validity of discriminant validity.

Table 4 Cross Loadings

	ATT	EC	PBC	PI	SN
ATT1	0.819	0.559	0.495	0.556	0.407
ATT2	0.882	0.614	0.531	0.601	0.448
ATT3	0.846	0.533	0.547	0.594	0.556
ATT4	0.867	0.507	0.602	0.637	0.589
ATT5	0.839	0.570	0.547	0.603	0.443
ATT6	0.824	0.519	0.548	0.590	0.510
ATT7	0.765	0.448	0.501	0.573	0.547
EC1	0.486	0.699	0.368	0.395	0.312
EC2	0.433	0.637	0.425	0.416	0.339

EC3	0.414	0.706	0.251	0.248	0.165
EC4	0.549	0.785	0.363	0.358	0.392
EC5	0.469	0.764	0.297	0.305	0.243
EC6	0.429	0.768	0.331	0.309	0.297
EC7	0.472	0.738	0.288	0.375	0.266
PBC1	0.537	0.386	0.859	0.603	0.570
PBC2	0.576	0.406	0.820	0.656	0.641
PBC3	0.544	0.375	0.896	0.653	0.597
PBC4	0.504	0.390	0.780	0.596	0.426
PI1	0.607	0.429	0.640	0.886	0.468
PI2	0.653	0.450	0.690	0.928	0.506
PI3	0.661	0.455	0.661	0.925	0.511
PI4	0.624	0.400	0.701	0.880	0.570
PI5	0.656	0.432	0.678	0.888	0.606
SN1	0.486	0.311	0.550	0.470	0.868
SN2	0.475	0.300	0.561	0.490	0.893
SN3	0.477	0.372	0.537	0.485	0.823
SN4	0.602	0.407	0.583	0.557	0.854
SN5	0.440	0.295	0.567	0.463	0.749

Source: Authors' own work

4.1.2. Structural Model Test

After confirming the validity and reliability of the measurement model and verifying the absence of multicollinearity ($VIF < 5$), the structural model was assessed to test the study's hypotheses. Bootstrapping with 5,000 resamples and a 95% confidence interval was used to evaluate direct, indirect, and mediating effects, with paths considered significant at $p < 0.05$.

Figure 2 presents the structural model, showing both the measurement and structural relationships, including p -values and R^2 values for each construct. According to Hair et al. (2019), R^2 values of 0.25, 0.33, and 0.67 represent low, moderate, and substantial explanatory power, respectively. In this study, the model explains **65% of the variance in purchase intention (PI)**, indicating substantial predictive accuracy. Environmental concern (EC) demonstrates a **strong influence on attitude (41.4%)**, while its effects on subjective norms (16.5%) and perceived behavioral control (21.5%) are weaker but noteworthy.

These findings confirm the structural model's robustness and support hypothesis testing to examine the proposed relationships between environmental concern, TPB constructs, and purchase intention.

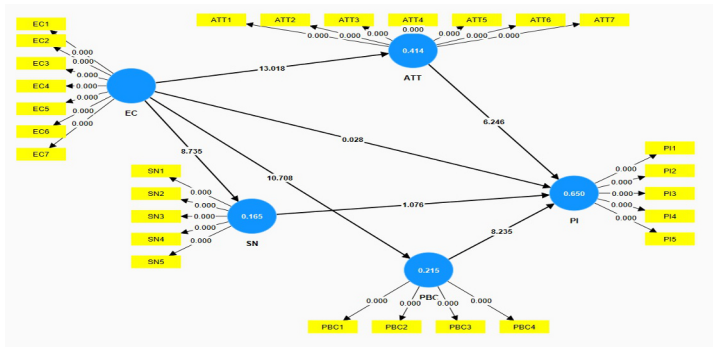


Figure 2. Structural Model
Source: Authors' own work

1. Hypotheses testing of Direct Effect

Table 5 presents the outcomes of the hypothesis test about the direct influence link among the variables. According to the results of the direct influence test, five out of seven direct relationship hypotheses are supported, with the exception of hypothesis 2 (H2), which pertains to the effect of subjective norm on purchase intention (the p-value 0.282 > 0.05) and hypothesis 7 (H7), which concerns the impact of environmental factors on purchase intention (the p-value 0.978 > 0.05).

Table 5 Direct Effect Testing

Hypotheses	Hypotheses Statement	Path Coefficient	T ((O/STDEV))	statistics	P values	Decision
H1	ATT -> PI	0.376	6.246		0.000	Supported
H2	SN -> PI	0.053	1.076		0.282	Not Supported
H3	PBC -> PI	0.471	8.235		0.000	Supported
H4	EC -> ATT	0.643	13.018		0.000	Supported
H5	EC -> PBC	0.464	10.708		0.000	Supported
H6	EC -> SN	0.406	8.735		0.000	Supported
H7	EC -> PI	-0.001	0.028		0.978	Not Supported

Source: Authors' own work

2. Hypotheses testing of Moderation Effect

Subsequently, following the assessment of the direct association test results, the researchers examined the mediating link or the indirect influence among the variables in this model. The outcomes of the mediation analysis are presented in Table 6. The results demonstrate that of the three presented hypotheses, two are supported while one, specifically the ninth hypothesis (H9), concerning the mediating relationship between EC and PI via subjective norm, is not supported (the p-value 0.290 > 0.05).

Table 6 Indirect effect Testing

Hypotheses	Hypotheses Statement	Path Coefficient	T ((O/STDEV))	statistics	P values	Decision
H8	EC -> ATT -> PI	0.242	5.502		0.000	Supported
H9	EC -> SN -> PI	0.022	1.059		0.290	Not Supported
H10	EC -> PBC -> PI	0.219	6.196		0.000	Supported

Source: Authors' own work

4.2. Discussion

This study offers important insights into the factors influencing Indonesian Generation Z's intention to purchase sustainable clothing, analyzed through the Extended Theory of Planned Behavior (ETPB). Findings highlight that attitude and perceived behavioral control (PBC) are strong predictors of purchase intention, while subjective norms show no significant effect. Moreover, environmental concern (EC) indirectly influences purchase intention through its effects on attitude and PBC, underscoring the interconnectedness of these constructs. These findings are consistent with Sousa *et al.* (2022), who emphasized the dominant role of personal evaluations and perceived control in shaping sustainable consumption decisions.

Interestingly, the lack of influence from subjective norms diverges from research conducted in other collectivist contexts, where social influence often plays a stronger role (Kumar *et al.*, 2022; Rausch & Kopplin, 2021). This suggests that Indonesian Gen Z consumers may rely more on personal values and self-efficacy than on external expectations when making sustainable fashion choices. Similar observations have been reported in studies exploring young consumers' environmentally responsible behaviors across different cultural settings (Kamalanon *et al.*, 2022; Tommasetti *et al.*, 2018).

The mediating role of environmental concern further reinforces its importance as a driver of sustainable behavior. By shaping attitudes and perceived control, EC indirectly increases purchase intentions, aligning with previous findings that highlight its significance in pro-environmental decision-making (Zhang *et al.*, 2019; Kaur *et al.*, 2020). This study also adds a valuable cultural dimension to the discussion, as Gen Z—Indonesia's largest generational group—demonstrates evolving consumption patterns that prioritize environmental values over social pressure.

Overall, the results extend the TPB framework by incorporating environmental concern as a key antecedent, offering theoretical and practical implications for promoting sustainable fashion consumption. These contributions enrich the growing body of literature on green purchase behavior and provide a robust foundation for future studies on sustainable consumption in emerging markets.

5. CONCLUSION

This study provides a comprehensive analysis of the factors influencing Indonesian Generation Z's intention to purchase sustainable clothing, using the Extended Theory of Planned Behavior (TPB). The findings confirm that attitude and perceived behavioral control (PBC) are key predictors of purchase intention, while subjective norms exert no significant influence. Environmental concern plays a pivotal role as an indirect driver, shaping attitudes and perceived control, which in turn impact purchase behavior. These results highlight the importance of personal values and self-efficacy in fostering sustainable consumption practices among young consumers in Indonesia.

5.1 Implications of The Study

5.1.1. Theoretical Implications

This study extends TPB by incorporating environmental concern as an antecedent of attitudes, subjective norms, and PBC, thereby enhancing its applicability in the context of sustainable fashion consumption. The findings clarify inconsistencies in previous studies regarding subjective norms and emphasize the importance of individual-level factors over external pressures in shaping sustainable purchasing behavior. The study also demonstrates the relevance of the extended TPB framework in a collectivist society, offering deeper insight into the socio-cultural dynamics influencing pro-environmental behavior.

5.1.2. Practical Implications

For policymakers, the findings underscore the need for campaigns that emphasize the ecological and functional benefits of sustainable apparel while addressing barriers such as price and accessibility. Initiatives like tax incentives, subsidies for sustainable brands, and stricter eco-friendly regulations can accelerate the adoption of sustainable fashion. Incorporating sustainability education into school curricula can also instill pro-environmental values early.

For businesses, this study highlights the importance of building positive consumer attitudes and empowering consumers through transparent marketing strategies. Fashion industry should emphasize product quality, affordability, and authenticity while leveraging influencer partnerships and targeted campaigns to engage Gen Z consumers.

5.2. Limitations & Recommendation for Future Research

Despite its contributions, this study has limitations. Its cross-sectional design limits the ability to track changes in attitudes and behaviors over time, and its focus on Indonesian Gen Z may restrict generalizability to other demographics or cultural settings. Future studies could employ longitudinal designs. Comparative studies across age

groups or countries would also enrich the understanding of the Extended TPB framework, while tracking changes in environmental concern over time could provide valuable insights into evolving consumer behaviors.

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