From Physical Packaging to Digital Engagement: Unpacking the Drivers of Sustainable Fashion Consumption

Shi Haowen, Li Lulin, Zheng Dongquan*

The University of Melbourne, Victoria, 3010, Australia

Abstract: The fashion industry is increasingly prioritizing sustainability, yet a gap persists between consumers' environmental awareness and their actual purchasing behavior. Moving beyond traditional product-centric perspectives, this study employs a quantitative research design to investigate the drivers of sustainable fashion consumption in Australia. Specifically, it examines the influence of Product Attribute Perception and Channel Convenience on consumer behavior, mediated by Eco-friendly Packaging Attitude and Social Media Engagement. Data were collected via an online survey. The results from the parallel mediation analysis indicate that both intrinsic product attributes and extrinsic channel convenience are significant independent drivers of sustainable consumption. Furthermore, the study confirms a dual-pathway mechanism where these drivers indirectly influence behavior by enhancing consumers' attitudes toward eco-friendly packaging and fostering social media engagement. These findings challenge the view that product features alone drive adoption, highlighting the critical role of logistical convenience and interactive marketing. The study provides actionable insights for brand managers to optimize channel strategies and integrate physical and digital touchpoints.

Keywords: Sustainable fashion; Channel convenience; Social Media Engagement; Parallel mediation; Consumer behavior

DOI: 10.62639/sspjiss01.20260301

1. Introduction

The fashion industry stands as one of the world's most significant sectors, generating immense economic value and providing employment for tens of millions(Garcia, 2024). Whilst the rise of e-commerce and digital shopping has fuelled the rapid expansion of fast fashion, it has also precipitated numerous sustainability challenges. Consequently, a growing number of consumers are becoming aware of the environmental impact of consumption patterns and the materials used in production processes. They are actively seeking out clothing produced in sustainable and ethically compliant ways(Grand View Research, 2024). Addressing issues such as water pollution, microplastic waste, and unethical labour practices within the fashion industry, sustainable fashion has emerged as a model aiming to minimise environmental harm and promote ethical production(Marshall, 2022).

Although an increasing number of consumers aspire to purchase mission-driven and sustainable brands, a significant gap persists between consumers' stated willingness to buy sustainable fashion and their actual purchasing behaviour(White et al., 2019). Many consumers lack a clear understanding of the fashion

(Manuscript NO.: JISS-26-1-62016)

About the Author

Shi Haowen (2000-), Gender: Male, Ethnicity: Han Chinese, Place of Origin: Shandong, China, Education: Master of Management Research Area: Marketing Research Methodology, Marketing Management, Internationalization and Corporate Strategy.

Li Lulin (1996-), Gender: Female, Ethnicity: Han Chinese, Place of Origin: Fujian, China, Education: Master of International Business Research Focus: Sustainability Management.

Corresponding Author

Zheng Dongquan (1999-), Gender: Male, Ethnicity: Han Chinese, Place of Origin: Fujian, China, Education: Master of International Business Research Focus: Energy Economics.

industry's actual environmental impact, while concerns over price premiums, product quality, design appeal, and accessibility also hinder sustainable fashion purchases. This discrepancy underscores the imperative of translating sustainability principles into effective fashion offerings.

Existing research on sustainable fashion consumption predominantly adopts a product-centric perspective, primarily explaining consumer adoption behavior by evaluating intrinsic product attributes such as design, durability, and material quality (Dodds et al., 1991; Gam, 2011; Lundblad & Davies, 2016). While this approach provides a solid theoretical foundation, it implicitly assumes that favorable product perceptions alone suffice to drive sustainable consumption. However, mounting evidence indicates that adoption behavior also depends on market accessibility and transaction conditions. Therefore, our research incorporates channel convenience as an external yet indispensable driver, thereby extending product-centered theories. Consequently, this study repositions sustainable fashion consumption as a multidimensional process shaped jointly by product quality, retail convenience, and interactive communication mechanisms, thereby advancing existing theoretical frameworks.

2. Method

(1) Research design

This study employs a quantitative, non-experimental research design to investigate the drivers of consumers' purchase intention toward sustainable fashion. A cross-sectional survey was chosen because the primary objective is to test theoretically derived relationships rather than to manipulate experimental conditions or track behavioral changes over time. The unit of analysis is individual consumers with recent experience purchasing fashion products.

The empirical setting is sustainable fashion consumption in Australia, where consumers increasingly encounter eco-friendly product attributes, diverse retail channels, and sustainability-related marketing communications. Data were collected via a structured, self-administered online questionnaire, which is appropriate for efficiently reaching a dispersed population and for measuring multiple latent constructs through Likert-type items.

The conceptual model specifies product attribute perception and channel convenience/usage as independent variables, eco-friendly packaging attitude and social media engagement as parallel mediators. "Parallel mediators" means that both eco-friendly packaging attitude and social media engagement are assumed to represent distinct mechanisms through which product- and channel-related evaluations influence purchase intention, without imposing a causal ordering between the two mediators. To empirically test this parallel mediation framework, we employ a regression-based analytical strategy, while controlling for relevant socio-demographic variables which can be expressed by the following system of linear regression equations:

$$M_1 = i_1 + a_1 X_1 + a_3 X_2 + e_1 \quad (1)$$

$$M_2 = i_2 + a_2 X_1 + a_4 X_2 + e_2 \quad (2)$$

$$Y = i_3 + c'_1 X_1 + c'_2 X_2 + b_1 M_1 + b_2 M_2 + e_3 \quad (3)$$

Where:

Y: Sustainable Consumption Behavior (Dependent Variable)

X_1: Product Attribute Perception (Independent Variable 1)

X_2: Channel Convenience (Independent Variable 2)

M_1: Eco-friendly Packaging Attitude (Mediator 1)

M_2: Social Media Engagement (Mediator 2)

i_1-i_3: Intercepts

e_1-e_3: Error terms

a_1-a_4, b_1-b_2, c_1,-c_2,: Regression coefficients to be estimated

(2) Sample and data collection

Data collection was conducted via Qualtrics platform targeting consumers in Australia. The survey was distributed to eligible participants who had purchased fashion products in the recent period. To ensure the quality of the data, screening questions were employed to exclude invalid responses.

According to Table 1, a total of 325 valid responses were retained for the final analysis. This sample size meets the statistical requirements for the subsequent regression analysis. The dataset includes key study variables such as Purchase Intention, Product Attribute Perceptions, and relevant control variables including Gender, Age, and Income. The means and standard deviations for all variables are reported in the Results section, confirming the data suitability for hypothesis testing.

Table 1. Descriptive Statistics of Measurement Items

Construct/Variable	Item Code	Item Description (Short)	Mean	Std. Deviation
Product Attribute Perceptions	Q1a	Fashionable design is important	5.38	1.82
	Q1b	I don't care if it's fashionable	5.43	1.66
	Q2a	Eco-friendly materials are important	5.41	1.91
	Q2b	Material quality doesn't matter if cheap	5.23	1.76
	Q3a	Durability is important	5.46	1.86
	Q3b	I don't care how long it lasts	5.37	1.63
	Q4	B-Corp certification influences choice	5.48	1.65
Channel Usage	Q7a	Purchase via online platforms	5.39	1.79
	Q7b	Purchase via physical stores	5.3	1.8
	Q7c	Purchase via second-hand stores	5.38	1.77
Channel Convenience	Q10a	Long delivery times lead to abandonment	5.42	1.78
	Q10b	Complex return processes reduce intention	5.52	1.71
	Q10c	Willing to buy even if inconvenient	5.52	1.79
Eco-friendly Packaging Attitude	Q12a	Eco-packaging enhances favorability	5.46	1.89
	Q12b	Willing to pay premium for eco-packaging	5.5	1.72
	Q12c	Care more about quality than packaging	5.44	1.79
Social Media Engagement	Q17a	Liked/bookmarked sustainable posts	5.3	1.63
	Q17b	Shared/reshared sustainable content	5.38	1.61

	Q17c	Visited brand site due to social media	5.44	1.73
Purchase Intention	Y1a	Will purchase within 6 months	5.52	1.62
	Y1b	Recommend sustainable brands to friends	5.51	1.7
	Y1c	Willing to pay 20% more for sustainable	5.56	1.59
	Y1d	Plan to increase sustainable purchases	5.59	1.68

(3) Measurements

To ensure content validity, all measurement scales were adapted from established studies in the field of sustainable fashion and consumer behavior. All items were assessed using a 7-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7), unless otherwise specified.

Independent Variables Product Attribute Perceptions were assessed using a four-item scale adapted from Gam (2011) and Lundblad & Davies (2016). This scale measures consumers' evaluation of key product features, including fashionable design, durability, and material quality. Channel Convenience was measured by asking respondents to report their purchasing frequency across online, physical, and second-hand channels. Furthermore, Channel Convenience was evaluated using three items based on Seiders et al. (2007), focusing on perceived barriers such as delivery times and the complexity of return processes.

Mediating Variables The study included two parallel mediators. Eco-friendly Packaging Attitude was measured with three items adopted from Steenis et al. (2017), which assess the extent to which sustainable packaging enhances brand favorability and justifies a price premium. Social Media Engagement was operationalized using a three-item scale adapted from Hollebeek et al. (2014). This construct captures active online interactions, such as liking posts, sharing content, and visiting brand websites driven by social media exposure.

Dependent Variable Sustainable Consumption Behavior served as the focal dependent variable. Following the framework of the Theory of Planned Behavior (Ajzen, 1991), this variable was constructed as a composite measure. It combines Purchase Intention (adapted from Dodds et al., 1991) with self-reported Actual Spending on sustainable fashion over the past 12 months, thereby providing a comprehensive view of consumer behavior.

Control Variables To account for potential confounding effects, demographic characteristics including gender, age, education level, and monthly income were included as control variables in the analysis.

(4) Data analysis strategy

Data analysis was conducted using IBM SPSS Statistics 26.0 and the PROCESS macro. The analysis proceeded in two stages.

First, we performed descriptive statistics to summarize the sample characteristics. We then assessed the measurement model by conducting Exploratory Factor Analysis (EFA) and calculating Cronbach's alpha coefficients to verify the construct validity and reliability of the measurement scales.

Second, to test the proposed hypotheses, we employed the PROCESS macro. Specifically, Model 4 was used to examine the mediation effects. To ensure the robustness of the results, the bootstrapping method with 5,000 resamples was applied to estimate the 95% confidence intervals (CI) for the indirect effects. The mediation effect is considered significant if the confidence interval does not contain zero.

3. Results

(1) Reliability and validity

To ensure the robustness of the measurement model, we assessed both the construct validity and reliability of the scales using IBM SPSS Statistics 26.0.First, Exploratory Factor Analysis (EFA) with Principal Component Analysis (PCA) and Varimax rotation was conducted to examine the construct validity. The results indicated a KMO (Kaiser-Meyer-Olkin) value of 0.894, well above the recommended threshold of 0.6. The Bartlett's Test of Sphericity was statistically significant($\chi 2=6490.479$, df=325, $p<0.001$), confirming that the data were suitable for factor analysis.

The EFA extracted six distinct components with eigenvalues greater than 1, which cumulatively explained 77.46% of the total variance. As presented in Table 2, all measurement items exhibited high factor loadings on their respective constructs, ranging from 0.769 to 0.900. This demonstrates strong convergent validity, as all loadings exceeded the 0.50 threshold.

Second, the reliability of the constructs was assessed using Cronbach's alpha. All constructs showed high internal consistency, with alpha values ranging from 0.746 to 0.945, exceeding the critical threshold of 0.70. The detailed statistics for reliability and validity are summarized in Table 2.

Table 2. Reliability and Validity Statistics

Construct	Items	Factor Loading	Cronbach's Alpha
Product Attribute Perceptions	Q1-Q4	0.769 – 0.886	0.945
Channel Usage	Q7	0.880 – 0.900	0.917
Channel Convenience & Eco-Packaging	Q10, Q12	0.807 – 0.883	0.927
Social Media Engagement	Q17	0.816 – 0.865	0.899
Sustainable Consumption Behavior	Y (merged)	0.833 – 0.850	0.922

Note: Factor loadings are based on the Rotated Component Matrix.

(2) Hypothesis testing

The proposed parallel mediation framework was empirically tested using PROCESS Model 4 with 5,000 bootstrap resamples. This analysis aimed to examine how Product Attribute Perception and Channel Convenience influence Sustainable Consumption Behavior through two distinct mechanisms: Eco-friendly Packaging Attitude and Social Media Engagement. The detailed regression coefficients and indirect effect estimates are summarized in Table 3.

Table 3. Summary of Mediation Analysis Results

Hypothesized Path	β	SE	t-value	p	Bootstrap 95% CI
Independent Variable: Product Attribute Perception (X1)					
X1 to Eco-friendly Packaging (M1)	0.293	0.053	5.530	0	-
X1 to Social Media Engagement (M2)	0.362	0.051	7.083	0	-
X1 to Sustainable Behavior (Direct Effect)	0.331	0.046	7.245	0	[0.241, 0.421]
Indirect Effect via Eco-friendly Packaging	0.084	0.024	-	-	[0.042, 0.136]
Indirect Effect via Social Media Engagement	0.095	0.026	-	-	[0.048, 0.152]
Independent Variable: Channel Convenience (X2)					
X2 to Eco-friendly Packaging (M1)	0.203	0.05	4.062	0	-
X2 to Social Media Engagement (M2)	0.247	0.049	5.06	0	-
X2 to Sustainable Behavior (Direct Effect)	0.274	0.043	6.415	0	[0.190, 0.358]

Indirect Effect via Eco-friendly Packaging	0.064	0.022	-	-	[0.026, 0.111]
Indirect Effect via Social Media Engagement	0.074	0.023	-	-	[0.035, 0.122]

Regarding the influence of Product Attribute Perception, the results indicated significant positive associations with both mediators. Specifically, product attributes were found to strongly predict Eco-friendly Packaging Attitude (β=0.293, p<0.001) and Social Media Engagement (β=0.362, p<0.001). Furthermore, a significant direct effect on Sustainable Consumption Behavior was observed (β=0.331 p<0.001), suggesting that favorable product perceptions directly drive consumption. The mediation analysis confirmed that both mechanisms significantly transmit this effect. The indirect path via Eco-friendly Packaging Attitude was estimated at 0.084 (95% CI = [0.042, 0.136]), and the path via Social Media Engagement was 0.095 (95% CI = [0.048, 0.152]). As both confidence intervals exclude zero, partial mediation is supported.Similarly, for Channel Convenience, the analysis revealed significant positive effects on both Eco-friendly Packaging Attitude (β=0.203 p<0.001) and Social Media Engagement (β=0.247 p<0.001). The direct impact of channel convenience on Sustainable Consumption Behavior remained significant (β=0.274 p<0.001) even after controlling for the mediators. The bootstrapping results further substantiated the mediating roles, with significant indirect effects observed through Eco-friendly Packaging Attitude (Effect = 0.064, 95% CI = [0.026, 0.111]) and Social Media Engagement (Effect = 0.074, 95% CI = [0.035, 0.122]). These findings collectively suggest that convenient channels facilitate sustainable behavior not only by reducing transaction barriers but also by enhancing consumers' packaging attitudes and fostering online engagement. The complete path analysis results and standardized coefficients are visualized in Figure 2.

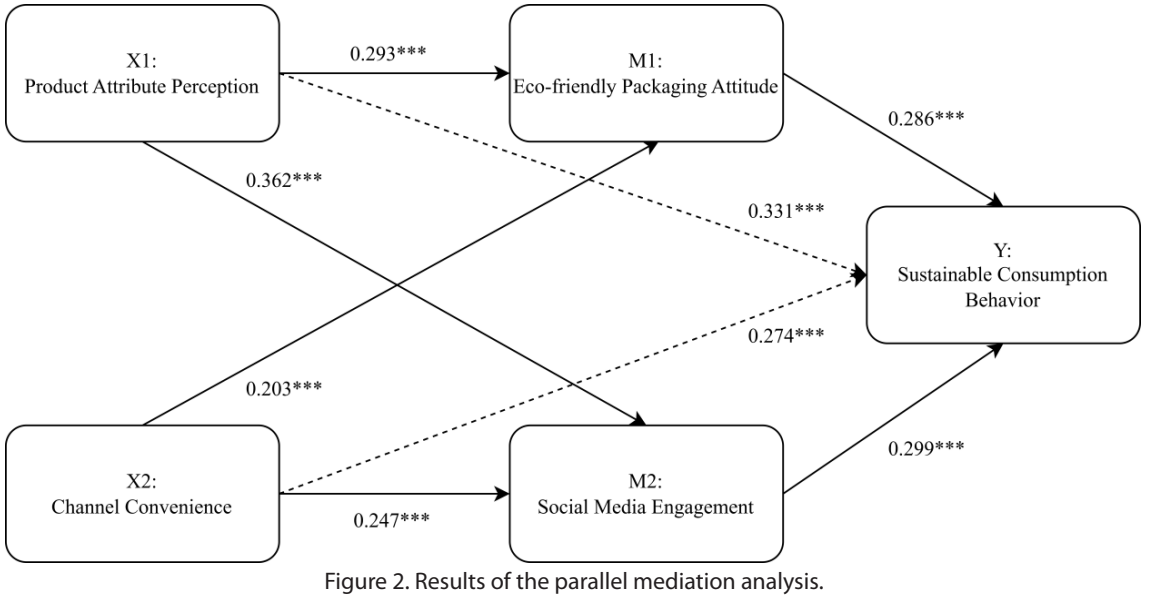

Figure 2. Results of the parallel mediation analysis.

Note: Values represent standardized regression coefficients(β). Solid lines represent indirect paths; dashed lines represent direct paths. ***p < 0.001.

4. Discussion

(1) Key findings

This study aimed to identify the drivers of sustainable fashion consumption in Australia by examining the roles of product attributes, channel convenience, and the mediating mechanisms of eco-friendly packaging and social media engagement. The empirical results, based on a sample of 325 consumers, provide strong support for the proposed parallel mediation framework.

First, the findings reveal that Product Attribute Perception is a dominant driver of sustainable consumption. Consumers are more likely to purchase sustainable fashion when they perceive the products as durable, high-quality, and fashion-forward. Importantly, this study confirms that product attributes not only directly stimulate purchase behavior but also indirectly enhance consumers' attitudes toward eco-friendly packaging and foster their engagement on social media.

Second, Channel Convenience emerged as another critical antecedent. The results demonstrate that removing friction from the purchasing process such as efficient delivery and easy returns that directly boosts sustainable consumption. Furthermore, convenient channels were found to significantly facilitate social media engagement and positively influence packaging attitudes.

Finally, the mediation analysis confirmed the existence of a dual-pathway mechanism. Both Eco-friendly Packaging Attitude and Social Media Engagement successfully mediated the effects of the independent variables. This indicates that sustainable consumption is driven by a combination of tangible product/channel benefits and intangible psychological engagement.

(2) Theoretical implications

This study contributes to the literature on sustainable fashion consumption in two significant ways.

First, this research advances the understanding of sustainable consumption by integrating both product-intrinsic and channel-extrinsic attributes into a holistic framework. Prior studies have predominantly focused on product-related drivers such as quality and design while often overlooking the logistical context of consumption. By demonstrating that Channel Convenience is as critical as Product Attribute Perception in driving behavior, this study bridges the gap between product-centric and retail-centric perspectives.

Second, this study elucidates the novel mediating role of Social Media Engagement, particularly in its relationship with channel convenience. This suggests that reducing transactional friction such as seamless delivery and returns does more than save time; it frees up cognitive resources or creates favorable psychological states that encourage consumers to interact with brands online. This finding enriches the digital marketing literature by identifying logistical convenience as an antecedent to digital engagement.

(3) Practical implications

The findings of this study offer actionable insights for practitioners in the sustainable fashion industry. To effectively drive consumption, managers are advised to implement a multi-layered strategy encompassing macro-level positioning, meso-level operations, and micro-level interactions.

At the macro-strategic level, brand managers should redefine their value proposition by embedding sustainability within intrinsic product quality. The results confirm that Product Attribute Perception remains a dominant driver of consumer behavior. This implies that a "sustainability-only" differentiation strategy is insufficient for broader market adoption. Instead, brands should adopt a holistic positioning strategy where eco-friendly materials are marketed as enhancers of product performance.

At the micro-interaction level, practitioners should engineer a seamless integration between physical touchpoints and digital dialogue. Given that Eco-friendly Packaging Attitude and Social Media Engagement function as parallel mediators, brands should design specific touchpoints to bridge these two mechanisms. This tactical integration ensures that the physical unboxing experience immediately translates into digital word-of-mouth, amplifying the brand's reach through user-generated content.

(4) Limitations and future research

Despite the theoretical and practical contributions outlined above, this study is subject to several limitations that suggest avenues for future inquiry.

First, the empirical setting is restricted to Australian consumers, a population characterized by relatively high environmental awareness and purchasing power. Consequently, the generalizability of the findings to other cultural or economic contexts remains to be verified. Future research could replicate this framework in developing economies or collectivist cultures to investigate whether the dual-pathway mechanism holds across diverse market environments.

Second, the cross-sectional nature of the survey data precludes the establishment of strict causal relationships between the variables. Although the parallel mediation model provides a robust theoretical explanation of the associations, the directionality of effects relies on theoretical inference. To address this, future scholars might employ longitudinal designs or experimental manipulations to vigorously test the causal impact of channel convenience and product attributes on consumer engagement and subsequent behavior.

5. Conclusion

In conclusion, this study contributes to the sustainable fashion literature by breaking away from traditional product-centric perspectives to propose a more holistic theoretical framework. While confirming that intrinsic attributes—such as design quality and durability—remain fundamental, our empirical findings indicate that sustainable consumption is not driven by product characteristics in isolation. Crucially, the analysis establishes that channel convenience plays an equally pivotal independent role in shaping consumer behavior.

Furthermore, the validation of the parallel mediation model reveals that these effects are transmitted through a distinct dual-pathway mechanism: eco-friendly packaging attitude and social media engagement. These findings expand existing theory by demonstrating that sustainable consumption originates from the dynamic interaction between a product's functional quality and the external consumption infrastructure. Practically, the results suggest that accelerating the fashion industry's transition toward sustainability requires a coordinated strategy. Ultimately, this research provides a robust theoretical foundation and an actionable strategic roadmap for advancing the adoption of sustainable fashion at scale.

References

[1] Ajzen, I. (1991). The theory of planned behavior. Organizational behavior and human decision processes, 50(2), 179-211.
[2] Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers' product evaluations. Journal of marketing research, 28(3), 307-319.
[3] Gam, H.J. (2011). Are fashion-conscious consumers more likely to adopt eco-friendly clothing?. Journal of fashion marketing and management: An international journal, 15(2), 178-193.
[4] Garcia, M. (2024, May 24). Fashion Industry Statistics. 10xhire.
[5] Grand View Research. (2024). Apparel Market Size, Share & Growth Analysis Report, 2030.
[6] Hollebeek, L. D., Glynn, M. S., & Brodie, R. J. (2014). Consumer Brand Engagement in Social Media: Conceptualization, Scale Development and Validation. Journal of Interactive Marketing, 28(2), 149–165.
[7] Lundblad, L., & Davies, I. A. (2016). The values and motivations behind sustainable fashion consumption. Journal of consumer behaviour, 15(2), 149-162.
[8] Marshall, D. (2022, September 15). What Is Sustainable Fashion and Why Is It so Important. IMMAGO.
[9] Seiders, K., Voss, G. B., Grewal, D., & Godfrey, A. L. (2012). Do satisfied customers buy more? Examining moderating influences in a retailing context. International Retail and Marketing Review, 8(1), 38-60.
[10]Steenis, N. D., Van Herpen, E., Van Der Lans, I. A., Ligthart, T. N., & Van Trijp, H. C. (2017). Consumer response to packaging design: The role of packaging materials and graphics in sustainability perceptions and product evaluations. Journal of cleaner production, 162, 286-298.
[11]White, K., Hardisty, D., & Habib, R. (2019). The Elusive Green Consumer. Harvard Business Review.