The Influence of Anti-Counterfeiting Strategies on Purchase Intention for Luxury Cosmetics Products: Evidence from a Counterfeit-Prone Market Through the Lens of Signaling Theory

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ABSTRACT

Counterfeit cosmetics threaten consumer safety and weaken trust in legitimate brands, and consumers often cannot verify authenticity before purchase. This study examines whether consumers' perceptions of brand-led anti-counterfeiting strategies are associated with purchase intention for luxury cosmetics products, specifically luxury cosmetics, in Bangladesh, a counterfeit-prone market, using signaling theory as the interpretive lens. A structured questionnaire was administered in person to 417 shoppers (all aged 15 years or older; none was below 15) inside official brand outlets in Dhaka (six brands, 60 outlets; stratified by brand, with systematic selection of every 8th buyer). Five constructs were measured with three items each on a five-point Likert scale; the items were newly developed, so the measurement results are treated as preliminary, and data were analyzed with PLS-SEM in SmartPLS 4. Marketing Communication was the strongest correlate of purchase intention ($\beta = 0.449$, $f^2 = 0.115$), followed by Quality ($\beta = 0.166$, $f^2 = 0.025$) and Technology ($\beta = 0.125$, $f^2 = 0.015$, below the conventional threshold for a small effect). Safety Compliance had no significant direct association ($\beta = 0.047$, $p = 0.466$). The model explained 50.8% of the variance in purchase intention. Respondents were already shopping in official outlets, so the results describe perceived signals among consumers who have chosen the genuine channel and do not show that these strategies change willingness to buy among consumers exposed to counterfeits. Brands may therefore prioritize clear authenticity communication and consistent quality, while regulators may consider making compliance cues more recognizable. Signal credibility, perceived authenticity, trust, and perceived risk were not measured, and no mediation or moderation was tested. The study contributes a comparative test of four perceived authenticity signals in a single model in physical official retail in Dhaka. Because the data are cross-sectional, the coefficients are associations and not causal effects, and they are judged by effect size as well as by p-values.

Keywords: Counterfeit cosmetics, luxury cosmetics, anti-counterfeiting strategies, purchase intention, signaling theory

INTRODUCTION

Facial luxury cosmetics has become vital across all demographics, motivated by health, beauty standards, and personal hygiene standards, and international trends such as the Korean cosmetics, a symbol of smooth, youthful, and pristine skin (Anggraini, 2024). The luxury cosmetics and halal beauty markets are expanding rapidly across emerging regions in Asia, Africa, and the Middle East, reflecting growing consumer demand for personal care and culturally aligned beauty products (Koswara & Herlina, 2025; Osman et al., 2022). As these markets continue to grow, the circulation of counterfeit luxury cosmetics products has also increased, creating serious concerns for consumer safety and weakening trust in legitimate brands (Le, 2024; Shepherd et al., 2023; Tanvir et al., 2023).

Evidence shows that approximately 22% of consumers admit to purchasing counterfeit products, which suggests that the problem is widespread and may shape consumer perceptions and purchasing decisions (Shepherd et al., 2023). Within this broader pattern of market growth and authenticity challenges, Bangladesh

represents an important emerging luxury cosmetics market where the demand for cosmetic and personal care products is steadily increasing (Samir et al., 2022; Tanvir et al., 2023). Market estimates indicate that the Bangladesh luxury cosmetics industry was valued at around USD 1.77 billion in 2025 and is expected to reach nearly USD 2.91 billion by 2035, growing at a compound annual growth rate (CAGR) of 5.10% during the forecast period (Arora et al., 2025). Rapid growth in luxury cosmetics sales has been accompanied by the spread of counterfeits, which increases the need for anti-counterfeiting approaches to protect shoppers, ensure authenticity, and maintain marketplace credibility (Pua & Chew, 2023).

To reduce counterfeit risks, luxury cosmetics brands are increasingly adopting authenticity verification systems such as QR codes, NFC tags, and blockchain-based authentication to improve traceability, transparency, and consumer confidence (Pua & Chew, 2023; Liu & Dawod, 2025a). These technologies allow consumers to verify product authenticity before purchase, thereby reducing uncertainty and supporting safer buying decisions (Anggraini, 2024). However, overly complex or unreliable verification processes may limit trust and reduce adoption (Budhewar et al., 2024; Pua & Chew, 2023). Mainstream counterfeit-consumption research has focused mainly on why consumers buy counterfeits, emphasizing attitudes, brand image, product knowledge, and perceived risk (Diouani et al., 2023; Shepherd et al., 2023), and has paid less attention to how brand-led authenticity signals relate to intentions to buy genuine products. This study addresses that gap descriptively, by estimating the relative association of perceived strategies with purchase intention among shoppers in official outlets. The novelty lies in three features: the four signal categories are compared within one model instead of one or two at a time, the outcome is intention to buy genuine products and not counterfeit consumption, and the setting is physical official retail in an emerging market, where most available evidence comes from e-commerce or student samples (Liu & Dawod, 2025b; Tanvir et al., 2023).

In counterfeit-prone markets, where consumers cannot directly verify authenticity before purchase, authenticity seals, QR or NFC verification, quality consistency, certifications, and anti-counterfeit communication can be conceptualized as signals sent by brands (Pua & Chew, 2023; Angelica et al., 2026). Accordingly, this study addresses the following research question: How are consumers' perceptions of brand-led anti-counterfeiting strategies associated with their purchase intention for luxury cosmetics in a counterfeit-prone market?

LITERATURE REVIEW

Underpinning theory

There is a high degree of information asymmetry in the market for cosmetics and personal care products, because the authenticity, quality, and safety of a product often cannot be verified by the consumer before purchase (Pua & Chew, 2023; Liu & Dawod, 2025b). Signaling theory proposes that a better-informed party can reduce this asymmetry by sending observable signals that the less-informed party interprets (Connelly et al., 2025). In marketing, signals of unobservable quality are credible when they are costly to fake or when sending a false signal would be penalized (Connelly et al., 2025). Traceability, verification, quality certifications, packaging features, and compliance mechanisms can therefore be viewed as candidate authenticity signals in the luxury cosmetics market (Liu & Dawod, 2025b). For instance, halal labels and packaging features can serve as visible cues that influence purchase intention for luxury cosmetics products (Permadi, 2026); similarly, sustainability-related product information can convey positive attributes that influence purchasing decisions (Angelica et al., 2026). QR codes, NFC tags, and blockchain authentication are technological mechanisms that can function as signals by allowing consumers to check product information and identify fakes (Subramaniam et al., 2025; Liu & Dawod, 2025b).

Signals, however, need to be observable, credible, and consistent to reduce uncertainty; otherwise their signaling value is weakened (Connelly et al., 2025). In this context, Marketing Communication, Quality, Technology, and Safety Compliance strategies can be treated as four categories of signals that brands send about authenticity, reliability, and protection (Huong et al., 2024; Pua & Chew, 2023). Signal effectiveness also depends on the receiver's ability to observe and interpret the signal, which this study does not measure. Signaling theory has four elements: a signaler, a signal, a receiver, and signal cost (Connelly et al., 2025).

Here the brand is the signaler, the four strategies are the signals, and the consumer is the receiver; signal cost and credibility are not measured and are therefore treated as boundary conditions of the interpretation (see Theoretical implications). Existing studies mostly examine individual authenticity signals one or two at a time (Liu & Dawod, 2025b; Permadi, 2026), and few compare several signal types in the same model for genuine-product purchase intention. Using signaling theory, this study therefore estimates the relative association of four perceived anti-counterfeiting strategies with purchase intention for luxury cosmetics products among shoppers in official outlets.

Hypotheses development and research framework

This section serves as a link between theory and empirical testing by examining the effect of luxury cosmetics brands' prevention strategies on consumers' purchase intentions. Each sub-section progresses in a logical manner by first defining a construct, then linking it with pertinent theories, summarizing empirical studies, associating it with consumer behavior, and finally setting out the hypothesis.

Marketing communication strategy and purchase intention

Marketing Communication Strategy (MCS) refers to coordinated brand messages, such as authenticity seals and counterfeit-awareness guidance, that help consumers identify luxury cosmetics products and avoid counterfeits (Pua & Chew, 2023). From a signaling perspective, communication that makes authenticity cues visible and understandable can lower skepticism and convey that the product is genuine (Connelly et al., 2025), and the credibility of the communicator affects how beauty-related messages are received (Manchanda et al., 2022). Integrated marketing communication has been linked to favorable choice and performance outcomes in other settings (Sharma et al., 2024; Roy & Misra, 2024). Hence, the following hypothesis is proposed:

H1. Marketing Communication Strategy has a positive impact on Purchase Intention.

Quality strategy and purchase intention

The Quality Strategy refers to consistent ingredients, product performance, and clear information to help consumers identify luxury cosmetics products (Liu & Dawod, 2025b). Through Signaling Theory, uniform quality and transparency act as authenticity cues distinguishing originals from counterfeits (Macchione Saes et al., 2025). Enhancing ingredients, standardizing quality, and providing detailed product information are expected to increase consumer confidence and favor the purchase of genuine products over fakes (Huong et al., 2024; Kifaya, 2024). Therefore, the proposed hypothesis is as follows:

H2. The Quality Strategy has a positive impact on Purchase Intention.

Technology strategy and purchase intention

The Technology Strategy refers to digital tools such as QR codes, NFC, and blockchain used to verify luxury cosmetics authenticity (Borate & Patil, 2025). Signaling theory suggests that verification technology can be a credible authenticity cue when packaging alone is insufficient, because it is harder for counterfeiters to imitate than a printed seal (Connelly et al., 2025). Informational signals shape cosmetics consumers' behavior (Chen et al., 2025), and technology-based cues have been examined in cosmetics e-commerce (Liu & Dawod, 2025a, 2025b). Thus, the following hypothesis is proposed:

H3. Technology Strategy has a positive impact on Purchase Intention.

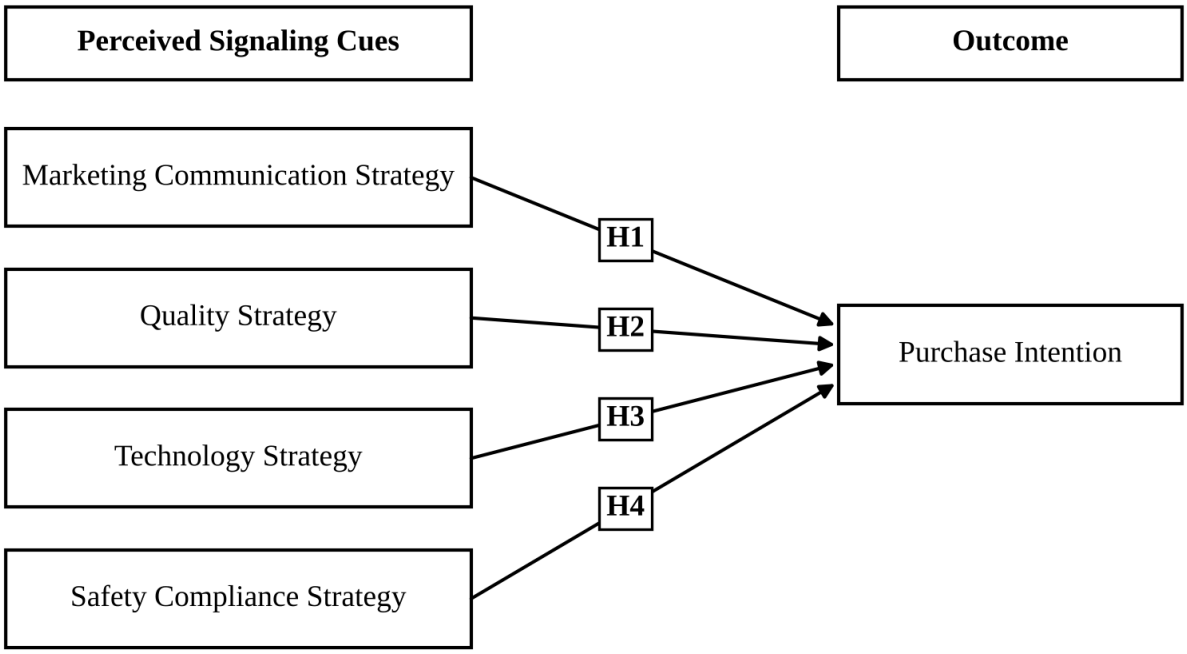
Safety compliance strategy and purchase intention

The Safety Compliance Strategy refers to adherence to safety protocols through labeling, ingredient management, certification, and inspection (Othman et al., 2024). Signaling theory implies that recognized certifications such as ISO 22716 and Dermatest® can signal product safety and, indirectly, genuineness, provided that consumers recognize and trust them (Macchione Saes et al., 2025). Such compliance signals are expected to reduce safety concerns and encourage choosing authentic luxury cosmetics over counterfeits (Huong et al., 2024). Therefore, the following hypothesis is proposed:

H4. Safety Compliance Strategy has a positive impact on Purchase Intention.

Based on the above discussion, this study proposes the research framework in Figure 1, which specifies four direct paths from perceived prevention strategies to purchase intention. The framework contains no mediators or moderators.

Figure 1. Framework of the study



Source(s): Developed by the Researchers

METHODOLOGY

This study used a cross-sectional survey to examine the relationship between consumers' perceptions of anti-counterfeiting prevention strategies and their purchase intention for luxury cosmetics products in official brand outlets in Dhaka.

Sampling

The target population comprised consumers purchasing luxury cosmetics products from official brand outlets in Dhaka. Because the sampling frame was the flow of buyers inside official outlets, the sample consists of consumers who had already chosen a genuine retail channel; this design choice is discussed as a limitation in the Limitations and future research section. Purposive sampling was used to select six luxury cosmetics brands based on brand popularity and retail presence, prioritizing brands operating a higher number of outlets. A total of 60 outlets of these brands were included, and stratified sampling was applied, treating each brand as a separate stratum with allocation proportional to the number of outlets. Stratum sizes were set using the number of outlets per brand and the average buyer flow across the day (low in the morning, moderate in the afternoon, and peak in the evening). Within each outlet, systematic sampling was applied using an interval of every 8th buyer, and respondents with incomplete or irrelevant responses were excluded, leaving 417 valid responses. Responses are nested within six brands and 60 outlets; this clustering was not modeled in the reported estimates (see the Limitations and future research section). Sample adequacy was assessed for PLS-SEM with the inverse square root method (Hair et al., 2022): at a 5% significance level and 80% power, the minimum sample size is approximately $(2.486 / 0.125)^2 \approx 396$ when the smallest significant path coefficient in the model (0.125) is used, which the sample of 417 exceeds. A sensitivity calculation with the noncentral F distribution indicates that a single predictor with $f^2 = 0.02$ can be detected with about 82% power at $\alpha = 0.05$ with $n = 417$.

Both checks use observed coefficients and are therefore post hoc. Because respondents were drawn only from official outlets, generalization is limited to consumers who buy luxury cosmetics in official outlets in Dhaka; the inference concerns relationships among perceived signals in this channel and not population-level estimates for all consumers.

Data collection procedures

Data were collected through structured, self-administered questionnaires during in-person visits to the selected 60 official outlets of six brands in the first week of September 2026, a period chosen to avoid major festivals so that consumer flow would be regular. A pilot test with 30 respondents was conducted to refine the questionnaire, and only participants who had purchased luxury cosmetics products and could provide informed responses were included. Responses were carefully screened for completeness and consistency to minimize biased or careless answers, and location-based visits across various times of the day aimed to reach consumers from different demographic and purchasing backgrounds; the sample is not claimed to be representative of all luxury cosmetics buyers in Dhaka. Table 1 shows that no respondent was below 15 years of age, so no data from respondents under 15 were collected or analyzed.

Measures

The survey instrument measured five constructs with three items each, using a five-point Likert scale from "strongly disagree" (1) to "strongly agree" (5). The items were developed by the authors for this study; they were not adopted from existing validated consumer scales. Published work informed the content domain of each construct (see Table 1 and Appendix Table A), but none of the cited sources provides a validated scale for these constructs, so the instrument should be regarded as newly developed. Because no established scale was adopted, construct validity is assessed empirically through indicator reliability, convergent validity (AVE), and discriminant validity (HTMT) and is regarded as preliminary, and the model is presented as exploratory. Marketing Communication Strategy (MCS) covers noticed authenticity seals, understanding of counterfeit-awareness guidelines, and use of email to give feedback or ask questions; Quality Strategy (QS) covers perceived ingredient quality, quality consistency, and clarity of product information; Technology Strategy (TS) covers QR-code checking, belief in brand monitoring of product flow, and phone-based (NFC) checking; Safety Compliance Strategy (SCS) covers perceived ingredient safety control, certification compliance, and routine inspection; and Purchase Intention (PI) was measured with three items on intention to buy verified products, preference for brand-approved sellers, and repurchase intention. A pilot test with 30 respondents was used to refine the questionnaire (see Data collection procedures). Several items have measurement limitations that are discussed in the Limitations and future research section: MCS3, TS1, and TS3 describe the respondent's own feedback or verification behavior rather than the brand's strategy; MCS1 combines an observed cue with a resulting confidence judgment; and the authenticity-seal cue in MCS1 is conceptually close to the certification cues in SCS. The three behavior-oriented items (MCS3, TS1, TS3) are read as indicators of how actively consumers use the communication and verification channels that the brand provides, which is the receiver side of the signaling process (Connelly et al., 2025); the construct labels are therefore read as perceived and used strategies and not as audited brand actions.

Data analysis procedures

Data were analyzed with SmartPLS 4.0 using partial least squares structural equation modeling (PLS-SEM). PLS-SEM was chosen because the study is prediction-oriented, aims to explain variance in a single endogenous construct (purchase intention), and does not assume normally distributed data (Hair et al., 2022). All five constructs are modeled reflectively. With n = 417 the sample is not small, so sample size was not a reason for choosing PLS-SEM. The analysis followed a two-step approach: first, the measurement model was evaluated for indicator loadings, internal consistency reliability (Cronbach's alpha, rho_a, and composite reliability rho_c), convergent validity (AVE), and discriminant validity (HTMT; Cheung et al., 2024); second, the structural model was assessed through path coefficients and their significance (bootstrapping), the coefficient of determination (R^2), effect sizes (f^2, interpreted with the benchmarks of 0.02, 0.15, and 0.35 reported by Hair et al. (2022)), and out-of-sample predictive power using PLSpredict (Sarstedt et al., 2025).

Path significance was assessed by bootstrapping. Because brand and outlet clustering and control variables (age, gender, income) were not estimated, the structural results are interpreted at the pooled-sample level and are not adjusted for brand, outlet, or demographic differences.

ANALYSIS AND RESULTS

Table 1. Demographic profile of the respondents

Aspects	Classification	Frequency	Percentage	Total Number	Total Percentage
Age	Below 15	0	0.00%	417	100%
	15-20	108	25.90%		
	21-30	189	45.32%		
	31-45	95	22.78%		
	46-60	25	6.00%		
Gender	Male	65	15.59%	417	100%
	Female	352	84.41%		
Education	Graduate	116	27.82%	417	100%
	Undergraduate degree	125	29.98%		
	HSC/A-level	88	21.10%		
	SSC/O-level	71	17.03%		
	Others	17	4.08%		
Occupation	Student	243	58.27%	417	100%
	Business	65	15.59%		
	Public Service	39	9.35%		
	Private Service	47	11.27%		
	Homemaker	16	3.84%		
	Others	7	1.68%		
Average Monthly Family Income (BDT)	Less than 15000	0	0.00%	417	100%
	15001-50000	52	12.47%		
	50001-70000	97	23.26%		

Aspects	Classification	Frequency	Percentage	Total Number	Total Percentage
	70001-100000	159	38.13%		
	Above 100000	109	26.14%		
Frequency of buying luxury cosmetics	More than once a week	4	0.96%	417	100%
	Once a week	21	5.04%		
	Twice a month	91	21.82%		
	Once a month	237	56.83%		
	Once every 3 months or less	64	15.35%		
Purchasing Decision regarding luxury cosmetics	Alone	116	27.82%	417	100%
	Family Members	33	7.91%		
	Friends	207	49.64%		
	Significant others	13	3.12%		
	Colleagues	46	11.03%		
	Others	2	0.48%		

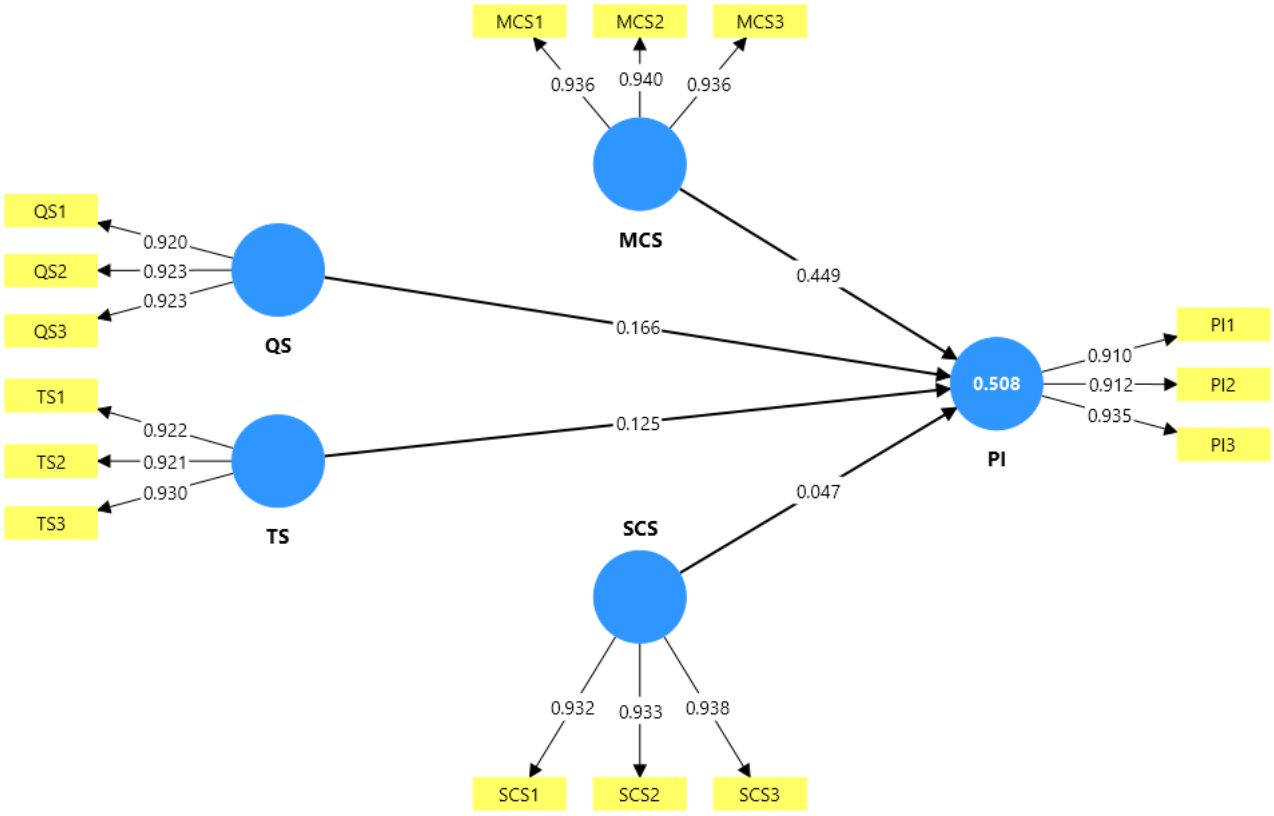
Source(s): Developed by the Researchers

Respondents' demographic characteristics

A structured survey instrument was used to investigate consumers' perceptions of anti-counterfeiting strategies and their purchase intention for luxury cosmetics products, and it produced 417 valid responses. Of the respondents, 15.59% were male and 84.41% were female (see Table 1). Most of the participants were from the 21–30 years age group (45.32%), followed by 15–20 years (25.90%) and 31–45 years (22.78%), while those aged 46–60 years made up a small proportion (6.00%). No respondent was below 15 years (0, 0.00%), so no data from respondents under 15 were collected or analyzed.

In the case of educational qualifications, most of the participants were undergraduate degree holders (29.98%) or graduates (27.82%), while a minority of them had HSC/A-level (21.10%) or SSC/O-level (17.03%) qualifications. The sample mainly consisted of students (58.27%), along with participants from the business, private, and public sectors. Family income was reported in four bands above BDT 15,000 (see Table 1). Luxury Cosmetics product purchases were mainly done once a month (56.83%), and friends (49.64%) were the main source of influence, while purchasing decisions were made individually by 27.82% of respondents. The sample is therefore young, mostly female, and student-heavy, which limits generalization (see Limitations and future research).

Figure 2. Structural model



Source(s): Developed by the Researchers

Table 2. Validity and reliability of the constructs

Constructs	Item(s)	Loadings	Cronbach's Alpha	rho_a	Average Variance extracted	Indicator VIF
Marketing Communication Strategy	MCS1	0.936	0.931	0.931	0.879	3.72
	MCS2	0.940				3.882
	MCS3	0.936				3.785
Quality Strategy	QS1	0.920	0.911	0.911	0.850	2.979
	QS2	0.923				3.151
	QS3	0.923				3.142
Technology Strategy	TS1	0.922	0.914	0.914	0.854	3.182
	TS2	0.921				3.153
	TS3	0.930				3.185

Constructs	Item(s)	Loadings	Cronbach's Alpha	rho_a	Average Variance extracted	Indicator VIF
Safety Compliance Strategy	SCS1	0.932	0.928	0.928	0.873	3.52
	SCS2	0.933				3.572
	SCS3	0.938				3.874
Purchase Intention	PI1	0.910	0.908	0.908	0.845	2.806
	PI2	0.912				2.905
	PI3	0.935				3.602

Sources (s): Developed by the Researchers

Measurement model

Validity and reliability of the constructs

Measurement model results are interpreted following Hair et al. (2022). Outer loadings should exceed 0.70 for adequate indicator reliability. In this study, all loadings ranged from 0.910 to 0.940, above the threshold. Loadings that are uniformly this high, together with very high AVE values, can also indicate redundancy among items rather than excellent measurement (Hair et al., 2022). Internal consistency was evaluated with Cronbach's alpha, rho_a, and composite reliability (rho_c); values between 0.70 and 0.95 are generally considered satisfactory, whereas values above 0.95 may indicate item redundancy (Hair et al., 2022).

As shown in Table 2, Cronbach's alpha ranged from 0.908 to 0.931, and rho_a was identical to alpha to three decimals for all five constructs. Composite reliability (rho_c), computed from the standardized loadings in Table 2, was 0.956 (MCS), 0.944 (QS), 0.946 (TS), 0.954 (SCS), and 0.942 (PI); the values for MCS and SCS are slightly above 0.95, the level at which item redundancy becomes a concern. AVE values ranged from 0.845 to 0.879, above the 0.50 criterion for convergent validity, although values this high are consistent with highly similar items.

Indicator VIF values ranged from 2.806 to 3.882, and seven indicators (MCS1–MCS3, SCS1–SCS3, and PI3) exceed 3.3, the level commonly used as a signal of possible common method bias when applied to full-collinearity VIFs (see Castillo López et al., 2025, for a review of how common method bias is handled in PLS-SEM). Indicator VIFs are not the relevant collinearity check for the structural model, and the inner (predictor) VIFs and the full-collinearity VIFs are not reported here. Because the data are single-source, collected at one point in time, and self-reported on the same scale, common method bias cannot be ruled out. The coefficients are therefore read as possibly inflated by shared method variance.

Discriminant validity (HTMT ratio)

Table 3. Discriminant validity (HTMT ratio)

	MCS	QS	SCS	TS	PI
MCS					

	MCS	QS	SCS	TS	PI
QS	0.790				
SCS	0.821	0.709			
TS	0.765	0.622	0.703		
PI	0.755	0.653	0.631	0.621	

Note(s): MCS, Marketing Communication Strategy, QS, Quality Strategy, TS, Technology Strategy**,** SCS**,** Safety Compliance Strategy**,** PI, Purchase Intention

Sources (s): Developed by the Researchers

Discriminant validity was assessed with the heterotrait–monotrait (HTMT) ratio (Hair et al., 2022). Values below 0.90 are acceptable for conceptually similar constructs, and values below 0.85 are recommended for conceptually distinct constructs (Hair et al., 2022). As presented in Table 3, HTMT values ranged from 0.621 to 0.821, all below 0.85. The highest value, between MCS and SCS (0.821), is close to the stricter threshold and is consistent with conceptual overlap between the two constructs: authenticity seals (an MCS item) are also a certification-type cue of the kind captured by SCS. HTMT confidence intervals (Cheung et al., 2024), the Fornell–Larcker criterion, and cross-loadings are not reported. HTMT therefore provides initial rather than complete evidence of discriminant validity.

Model fit

Table 4. Model-fit summary

	Saturated Model	Estimated Model
SRMR	0.033	0.033
d_ULS	0.128	0.128
d_G	0.224	0.224
Chi-square (χ^2)	570.612	570.612
NFI	0.905	0.905

Sources (s): Developed by the Researchers

Model fit indices are reported in Table 4 for completeness. Because all four predictors point directly to purchase intention, the structural model is saturated, and the saturated and estimated models therefore produce identical values. The SRMR of 0.033 (below the 0.08 guideline) consequently reflects only the discrepancy between observed and model-implied correlations in the measurement model and does not test the structural model. The d_ULS (0.128), d_G (0.224), and chi-square (570.612, a chi-square statistic and not a chi-square/df ratio) values likewise cannot discriminate between models in the absence of a competing specification, and the NFI of 0.905 is only marginally above the 0.90 convention. These indices are therefore not used as evidence for the structural model; the evaluation relies on R^2, f^2, path significance, and PLSpredict.

Structural model analysis

Table 5. Path coefficients

Hypothesis	Path(s)	Beta	Standard Deviation	T-Statistics	p-values	Supported
H1	MCS→PI	0.449	0.071	6.296	< 0.001	YES
H2	QS → PI	0.166	0.055	2.996	0.003	YES
H3	TS →PI	0.125	0.056	2.234	0.026	YES
H4	SCS→ PI	0.047	0.064	0.729	0.466	NO

Note(s): MCS, Marketing Communication Strategy, QS, Quality Strategy, TS, Technology Strategy**,** SCS**,** Safety Compliance Strategy**,** PI, Purchase Intention

Sources (s): Developed by the Researchers

The structural model results (Table 5) show that Marketing Communication Strategy (MCS) has the strongest positive association with Purchase Intention ($\beta = 0.449$, $t = 6.296$, $p < 0.001$), supporting H1. Quality Strategy (QS) is also positively and significantly related to Purchase Intention ($\beta = 0.166$, $t = 2.996$, $p = 0.003$), supporting H2. Technology Strategy (TS) has a smaller but statistically significant positive coefficient ($\beta = 0.125$, $t = 2.234$, $p = 0.026$), supporting H3; as Table 6 shows, its effect size is negligible.

Safety Compliance Strategy (SCS) is not significantly related to Purchase Intention ($\beta = 0.047$, $t = 0.729$, $p = 0.466$), so H4 is not supported. Because the data are cross-sectional and self-reported, these coefficients describe associations and not causal effects, and because MCS and SCS are closely related (HTMT = 0.821), the non-significant SCS coefficient may partly reflect variance that SCS shares with MCS.

Table 6. F-square and R-square values

Hypothesis	Path(s)	F-square	R-square	R-square adjusted
H1	MCS →PI	0.115	0.508	0.503
H2	QS → PI	0.025		
H3	TS →PI	0.015		
H4	SCS→ PI	0.002		

Note(s): MCS, Marketing Communication Strategy, QS, Quality Strategy, TS, Technology Strategy**,** SCS**,** Safety Compliance Strategy**,** PI, Purchase Intention

Sources (s): Developed by the Researchers

The model explains 50.8% of the variance in Purchase Intention ($R^2 = 0.508$; adjusted $R^2 = 0.503$), a moderate level of explanatory power. Using the benchmarks reported by Hair et al. (2022) (0.02 small, 0.15 medium, 0.35 large), the effect size of MCS ($f^2 = 0.115$) lies between small and medium, that of QS ($f^2 = 0.025$) is

small, that of TS ($f^2 = 0.015$) is below the threshold for a small effect, and that of SCS ($f^2 = 0.002$) is negligible. In practical terms, MCS carries most of the model's explanatory power, QS contributes modestly, and the statistically significant TS coefficient has little practical importance. Statistical significance shows only whether a coefficient differs from zero given n = 417, whereas practical significance concerns its magnitude: TS ($p = 0.026$, $f^2 = 0.015$) is statistically significant but practically negligible, and MCS is the only predictor that is both significant and close to a medium effect.

Predictive performance (PLSpredict)

Table 7. PL Spredict results

Variable	Items	Q^2predict	PLS-SEM RMSE	LM RMSE
Purchase Intention	PI1	0.418	0.857	0.869
	PI2	0.415	0.858	0.870
	PI3	0.426	0.85	0.863

Note(s): PI, Purchase Intention

Sources (s): Developed by the Researchers

PLSpredict (Sarstedt et al., 2025) was used to assess out-of-sample prediction. The Q^2predict values for all three Purchase Intention indicators are positive (0.415–0.426), indicating that the model predicts better than the naive indicator-mean benchmark. The PLS-SEM RMSE is lower than the linear-model (LM) benchmark for all three indicators, which, by the PLSpredict guideline summarized in Sarstedt et al. (2025), points to predictive power. However, the differences are small (about 0.012–0.013), so the practical advantage over a simple regression is marginal, as expected for a model in which all predictors point directly to the outcome. The Q^2 values indicate moderate out-of-sample accuracy for purchase intention for luxury cosmetics products among the surveyed shoppers; they should not be described as high predictive relevance.

DISCUSSION AND IMPLICATIONS

Discussion of findings

Marketing Communication was by far the strongest correlate of purchase intention ($\beta = 0.449$; $f^2 = 0.115$). In signaling terms, communication is the most observable of the four signals: consumers encounter seals, guidelines, and campaigns directly, whereas quality consistency, brand monitoring, and certification must be inferred or are rarely seen (Connelly et al., 2025). Two caveats apply. First, the MCS items include an authenticity-seal cue worded in terms of confidence that the product is real, which overlaps conceptually with purchase intention and with SCS, and MCS and SCS have the highest HTMT value (0.821); the size of the MCS coefficient may therefore be inflated by item overlap and common method variance. Second, because respondents were already inside official outlets, the finding says that, among genuine-channel shoppers, those who perceive stronger communication report higher intention to buy; it does not show that communication moves consumers away from counterfeits.

Quality Strategy showed a small but significant association ($\beta = 0.166$; $f^2 = 0.025$). Consistent perceived quality is an experience-based cue (Connelly et al., 2025), and in markets where consumers cannot tell genuine goods from counterfeits before purchase, consistent quality is one of the few attributes that can distinguish genuine products (Pua & Chew, 2023). However, the QS items reflect perceptions of products the respondents already buy, so the reverse direction, in which satisfied buyers intend to buy again and therefore rate quality highly, is also plausible. Technology Strategy had a statistically significant but practically negligible

association ($\beta = 0.125$; $f^2 = 0.015$, below the 0.02 threshold). Verification technology is, in principle, a signal that is costly to imitate, but its value depends on consumers actually using it, and two of the three TS items measure the respondent's own scanning behavior and not the brand's provision of technology. The small effect may therefore reflect low or uneven use of QR and NFC verification; usage data are needed to test this.

Safety Compliance had no significant association with purchase intention ($\beta = 0.047$; $f^2 = 0.002$). Several explanations are plausible, but none was tested in this study. First, consumers may be unable to verify certifications or may not recognize the standards and bodies behind them, which makes compliance a weak signal for receivers (Connelly et al., 2025). Second, trust in regulators and in the certification system may be low in this market, which reduces the credibility of compliance claims. Third, the sample was drawn inside official outlets, where consumers may take compliance for granted, leaving little variation for SCS to explain. Fourth, SCS shares variance with MCS (HTMT = 0.821), so its unique contribution in a model that includes MCS may be small even if safety cues matter on their own.

Compared with prior work, this study differs in sample and outcome. Research on counterfeit consumption has mostly asked why consumers buy counterfeits, focusing on attitudes, brand image, knowledge, and perceived risk (Diouani et al., 2023; Shepherd et al., 2023), including among Bangladeshi undergraduates (Tanvir et al., 2023), whereas this study examines intention to buy genuine products among shoppers in official outlets. Studies of cues in cosmetics typically examine one or two cues at a time (Liu & Dawod, 2025b; Permadi, 2026); the present results suggest that, when several signals are considered together, communication cues dominate. Because designs, samples, and measures differ, these comparisons are indicative only.

Theoretical implications

This study applies signaling theory (Connelly et al., 2025) to the question of which brand-led authenticity signals are associated with purchase intention for luxury cosmetics products in a counterfeit-prone market. It treats Marketing Communication, Quality, Technology, and Safety Compliance as four categories of signals and shows that their associations with purchase intention differ in strength: Marketing Communication is strongest, Quality is small, Technology is negligible, and Safety Compliance is not significant. The contribution to signaling theory is threefold: it shows that, in a counterfeit-prone market, signals sent by the same brands differ in how strongly they relate to genuine-product intention; it separates signal provision from signal use by distinguishing brand-provided cues from consumer verification behavior (MCS3, TS1, TS3); and it points to signal cost, credibility, and recognizability, which Connelly et al. (2025) place at the core of the theory, as the mechanisms to be measured next. These are propositions for future testing and not tested mechanisms. The pattern fits the expectation that signals that are observable and easy to interpret matter more than signals that consumers cannot readily verify (Connelly et al., 2025). The contribution is nonetheless limited: signal credibility, cost, perceived authenticity, perceived risk, and trust were not measured, no mediation or moderation was tested, and the model consists of four direct paths to a single outcome. The study therefore provides descriptive, theory-informed evidence and not a test of the signaling mechanism, and it does not support claims of an integrated framework.

Practical implications

The results offer tentative guidance for brands and regulators operating in official retail. First, communication that makes authenticity cues visible and understandable showed the strongest association with purchase intention, so brands may prioritize clear and consistent authenticity messaging at the point of sale. Second, consistent quality and clear product information were modestly associated with purchase intention and are worth maintaining. Third, the small association for Technology suggests that QR or NFC verification is likely to matter more if it is easy to use and consumers know how to use it; brands should track actual usage. Fourth, the null Safety Compliance result does not imply that compliance is unimportant; it suggests that consumers in this sample do not link compliance to purchase intention, so regulators and brands may need to make certifications recognizable and verifiable if they are to work as signals. These implications come from a cross-sectional sample of shoppers in official outlets and should be tested with consumers across channels before they are generalized.

CONCLUSION

This study examined how consumers' perceptions of four brand-led anti-counterfeiting strategies are associated with purchase intention for luxury cosmetics products among shoppers in official outlets in Dhaka. Marketing Communication showed the strongest association with purchase intention, Quality a small association, and Technology a statistically significant but negligible one, while Safety Compliance showed no significant association. The findings are consistent with signaling theory's emphasis on observable and interpretable signals, but the study did not measure signal credibility, trust, or perceived risk, and its sample consisted of consumers who had already chosen the genuine channel. The results should therefore not be read as evidence that these strategies increase willingness to buy among consumers exposed to counterfeits. Brands may prioritize clear authenticity communication and consistent quality, and regulators may consider making compliance cues more recognizable. Future studies should test these ideas with channel-neutral samples, validated scales, and mediating variables.

LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. First, and most important, respondents were surveyed inside official brand outlets. They had already chosen the genuine channel, so purchase intention is likely high and counterfeit exposure low; the design cannot show that anti-counterfeiting strategies change willingness to buy genuine products among consumers who face counterfeits, and the findings should be treated as relationships among perceived signals within this channel. Future studies should sample across channels (including online and informal sellers) and measure prior counterfeit purchase. Second, responses are nested within six brands and 60 outlets, and this clustering and brand effects were not modeled; control variables (age, gender, income, brand) were not included. Because of this, standard errors may be understated and coefficients may partly reflect brand or demographic differences. Future work should add them or use multigroup analysis or brand dummies. Third, the model contains four direct paths to a single outcome. Mediators (such as perceived authenticity or trust), moderators (such as prior counterfeit experience or digital literacy), signal characteristics (credibility, cost, visibility), and perceived risk were not measured, so the signaling mechanism was not tested. Fourth, the scales were developed by the authors and were not validated in earlier studies. Some items measure respondents' own behavior (MCS3, TS1, TS3) or combine a cue with a resulting judgment (MCS1); the very high loadings and AVEs and the identical alpha and rho_a values suggest redundant items; and HTMT confidence intervals, the Fornell–Larcker criterion, and cross-loadings were not reported. Fifth, the data are single-source, cross-sectional self-reports on one scale. Indicator VIFs above 3.3 for seven items and the absence of a common method bias test mean that common method bias cannot be ruled out, and causal direction cannot be established. Sixth, the youngest age band is 15–20 years and no respondent was below 15 years (Table 1), so the findings do not extend to younger consumers. Seventh, the sample is limited to Dhaka and is not claimed to be representative, and it is young, mostly female (84.41%), and student-heavy (58.27%), and stores were not selected on sales or market share. Finally, the model is saturated, so fit indices are uninformative about the structural model.

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