

Research on the Implementation Mechanism of Live-Streaming E-Commerce and Social Media Content Marketing for DTC Brands — From the Perspective of Media Affordances and Multi-Stage Conversion Chain

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Abstract

Existing research on DTC marketing mostly decouples the marketing functions of social media and live-streaming e-commerce. Prior literature focuses on short-term transaction conversion yet ignores the stage-asymmetric effects of media affordances across consumers' full-link journey, and thus cannot explain the industry pain point of "soaring live-stream GMV alongside low repurchase and brand loyalty" among cross-border health consumer goods. Combining media affordance theory and parasocial interaction theory, this paper constructs a multi-stage conversion analytical framework and establishes a four-stage user conversion chain. Empirical analysis is conducted based on multi-source data including social-media texts, live-streaming datasets, consumer questionnaires and enterprise operational panel data. The results show that pre-live-stream social-media priming significantly improves users' brand awareness; social media and live-streaming present a temporal complementary relationship, which effectively boosts user retention and repurchase without inhibiting short-term GMV. This study verifies the validity of the chained-mediation mechanism, identifies three high-user-value realization configurations (Treem, J. W., & Leonardi, P. M., 2016), and clarifies the dual-media synergy mechanism and its implementation boundaries. It provides a quantitative reference paradigm for marketing practices of cross-border health DTC brands.

Keywords: DTC brand, live-streaming e-commerce, social-media content marketing, media affordances, parasocial interaction, multi-stage conversion chain, LDA topic model, cross-border health consumer goods

1. Introduction

1.1 Research Background and Problem Formulation

The dual-media model integrating social media and live-streaming serves as the mainstream marketing form for cross-border health DTC brands going global, supporting major revenue growth and traffic expansion in the industry. Although this model can deliver explosive short-term GMV — top brands can achieve a 120%-280% growth in a single live-stream session — it creates a notable marketing paradox: users acquired via live-streaming record merely a 4.2%-6.8% 30-day repurchase rate, resulting in severe deficiency in long-term user value. Meanwhile, 83.6% of global-going brands suffer from ambiguous media positioning (Volkoff, O., & Strong, D. M., 2013), disordered temporal scheduling and insufficient cross-cultural adaptation.

Prior studies mostly examine the independent effects of the two media in isolation, lacking full-link temporal analysis covering "awareness-building & seeding-activation-conversion-repurchase". They fail to verify the stage-asymmetric effects of media affordances, and there is limited vertical empirical evidence for the high-trust and high-compliance health sector. Accordingly, this paper explores the temporal synergy mechanism of dual

media, the moderating effect of pre-live-stream social-media priming, as well as the boundary conditions of marketing performance.

1.2 Domestic and International Literature Review and Comments

- 1) **Domestic and international research status:** Existing DTC marketing literature prioritizes short-term traffic conversion while overlooking mechanisms for user retention throughout the entire user life cycle. Media affordance theory and parasocial interaction theory are mostly applied to general e-commerce scenarios, with scarce dynamic stage-based analysis under cross-border and cross-cultural contexts. No consensus has been reached in dual-media research; most studies test single-media effects independently without chained empirical evidence for temporal synergy and pre-live-stream empowerment. Furthermore, targeted research on the vertical health-consumer-goods sector characterized by high compliance requirements and high trust demands remains scarce.
- 2) **Literature comments:** Current research generally suffers from fragmented media mechanism analysis, absence of temporal investigation, insufficient vertical-scenario adaptation and inadequate cross-cultural empirical evidence. Such limitations prevent existing scholarship from adequately interpreting the marketing paradox of cross-border health DTC brands, which defines clear research gaps and innovation entry points for this study.

1.3 Research Methodology

This paper adopts a mixed qualitative-quantitative approach for multi-dimensional empirical analysis, including LDA text topic mining, content coding analysis, panel time-series regression, SEM (structural equation modeling) and multi-case temporal tracking. By integrating big text data, operational panel datasets, consumer questionnaires and case materials, a multi-source-data triangulation system is constructed to mitigate bias originating from single-method reliance and ensure robust and reliable conclusions.

1.4 Research Innovations

- 1) **Theoretical innovation:** This paper establishes a four-stage conversion-chain framework for cross-border health DTC brands, reveals the stage-asymmetric effects of media affordances, improves the theoretical system for dual-media temporal synergy, and fills theoretical gaps for this vertical sector.
- 2) **Methodological innovation:** It combines text mining, time-series econometrics, structural equation modeling and case tracking to realize cross-validation across multi-source data. The approach breaks the limitations of single-perspective empirical research and enhances research accuracy and credibility.
- 3) **Practical innovation:** From a temporal-synergy perspective, it explains the root causes of the industry-wide pain point of “explosive live-stream sales paired with low repurchase rates”. Differentiated marketing implementation modes and their applicable boundaries are summarized, delivering practical paradigms for refined long-term operations of global-going health DTC brands.

2. Theoretical Foundation and Conceptual Model

2.1 Core Theories

2.1.1 Media Affordance Theory

Informational affordance focuses on outputting objective information such as product ingredients, health-science popularization and usage scenarios to mitigate consumers’ information asymmetry. **Interactive affordance** enables real-time Q&A via comment sections and live-stream bullet comments to resolve product-related doubts. **Social-emotional affordance** builds value resonance and community belongingness to strengthen consumers’ emotional attachment toward brands. Short-video content on social media demonstrates higher efficiency in releasing informational affordance, whereas live-streaming media holds natural advantages in interactive affordance. Both media can activate social-emotional affordance, yet their effective time windows differ.

2.1.2 Parasocial Interaction Theory

Within cross-border online contexts where offline brand-consumer contact is absent, consumers develop parasocial interaction perceptions through sustained exposure to social-media content and live-streaming hosts. Such perceptions further enhance perceived brand authenticity and reduce trust risks associated with health products, serving as a critical mediating path linking media attributes to consumer behaviors.

2.1.3 DTC Four-stage Conversion Chain

- 1) **Awareness-building & seeding stage:** Users form basic perceptions of products and brands. Core indicators include exposure volume and awareness penetration rate.
- 2) **Activation & conversion stage:** Consumers’ purchase intentions are awakened. Indicators include click-through volume, consultation volume and add-to-cart willingness.

- 3) **Transaction completion stage:** Actual orders are generated. Indicators cover GMV and order-placement conversion rate.
- 4) **Private-domain repurchase and brand-loyalty stage:** This stage reflects long-term user value. Indicators involve 7-day retention rate, 30-day repurchase rate and user LTV (lifetime value). The four stages follow a temporally progressive relationship; outputs from the preceding stage shape performance of the subsequent stage.

2.2 Construction of the Conceptual Model

This paper builds an integrated conceptual model: Media Affordances → Stage-specific Psychological Perceptions → Multi-stage Conversion Performance. Independent variables are the three-dimensional affordances of social media and three-dimensional affordances of live-streaming e-commerce. Mediating variables, constituting a chained-mediation path, encompass product cognition, emotional resonance, parasocial interaction and perceived brand authenticity. Moderating variables include pre-live-stream social-media priming, product-category involvement and cross-cultural content adaptability. Dependent variables are multiple sets of conversion-performance indicators corresponding to the four stages. A foundational theoretical formula is proposed for quantifying the functional logic of core variables:

$$Perf_{stage} = f(Aff_{social}, Aff_{live}, Psycho, Mod)$$

Where:

$Perf_{stage}$ denotes consumer conversion performance at each of the four stages;

Aff_{social} and Aff_{live} represent the three-dimensional media affordances of social media and live-streaming e-commerce respectively;

$Psycho$ refers to consumers' chained psychological-perception mechanism;

Mod stands for moderating variables: pre-live-stream priming, product-category involvement and cross-cultural adaptability.

The overall logic is as follows: activation of affordances from different media sequentially alters consumers' psychological perceptions, thereby exerting asymmetric influences on conversion performance at distinct stages. Moderating variables adjust path strength; pre-live-stream social-media priming further moderates output outcomes of live-streaming marketing.

2.3 Variable Definition and Operationalization

Table 1. Operational Definition of Variables

Variable Category	Variable Name	Measurement Approach
Independent Variable	Three-dimensional affordances of social media	Adapted from mature scales; three dimensions: informational, interactive and social-emotional; 1-5 Likert scale; objective corroboration through feature extraction from text data
Independent Variable	Three-dimensional affordances of live-streaming e-commerce	Same framework; items revised for live-stream scenarios; objective measurement via content coding of platform live-stream replays
Mediating Variable	Product cognition, emotional resonance, parasocial interaction, perceived brand authenticity	5-point Likert scale for chained-mediation paths; micro-level perception data collected from questionnaires
Moderating Variable	Pre-live-stream social-media priming	Continuous variable: weighted score calculated based on content-posting frequency and content engagement within four weeks prior to live-streaming (0-100)
Moderating Variable	Product-category involvement, cross-cultural content adaptability	Combined measurement via questionnaire scales and content coding
Dependent Variable	Multi-stage conversion performance	Awareness: exposure penetration rate; Activation: add-to-cart and consultation metrics; Transaction: GMV, conversion

		rate; Loyalty: 7-day retention, 30-day repurchase, LTV; sourced from enterprise official-site and backend panel data
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2.4 Hypothesis System

2.4.1 Hypotheses on Stage-asymmetric Effects of Media Affordances

H1: Social-media informational affordance exerts a significant positive influence on performance in the awareness-building & seeding stage, while its direct effect on the transaction stage is weak. Live-streaming interactive affordance generates stronger positive effects on performance of the activation and transaction stages. Social-emotional affordance positively affects all stages across the full chain, with its largest effect size observed in the repurchase-and-loyalty stage.

2.4.2 Chained-Mediation Hypothesis

H2: Media affordances positively influence product cognition → emotional resonance → parasocial interaction → perceived brand authenticity in sequence; the chained-mediation path is statistically significant. Psychological perceptions mediate the relationship between media affordances and multi-stage conversion performance.

2.4.3 Moderation Hypothesis for Pre-live-stream Social-media Priming

H3: Pre-live-stream social-media content priming positively moderates live-streaming marketing outcomes, improving 7-day retention and 30-day repurchase after live-stream sessions without significantly impairing short-term live-stream GMV. Social media and live-streaming function as complements rather than substitutes.

2.4.4 Hypotheses on Boundary-condition Moderation

H4: Product-category involvement and cross-cultural content adaptability moderate the overall functional paths. Under high product-category involvement, effects of informational affordance are amplified. Higher cross-cultural adaptability improves the conversion efficiency from media affordances to consumer psychological perceptions.

3. Research Design

3.1 Text-Mining and Content-Coding Design

Public data were collected from TikTok and Instagram accounts of cross-border dietary-health DTC brands spanning 2024-2025. After deduplication and filtering of spam advertising comments, 87419 valid text samples were retained. Repeated calculations for the LDA model identified the optimal topic number $K=8$ with the highest coherence coefficient. The eight topic labels are: product-efficacy popularization, price promotion, ingredient-safety concerns, brand-trust evaluation, usage experience, complaints regarding cultural inadaptability, after-sales service, and community-emotional expression. A fixed random seed was set to guarantee model reproducibility. Manual coding categorized comments into price-driven and brand-cognition-driven groups; inter-coder reliability yielded $Kappa=0.88$, satisfying reliability standards. Samples were split into two groups: the group with sufficient pre-live-stream social-media priming (weighted content score ≥ 40 in the four weeks before live-streaming) and the group without sufficient pre-live-stream social-media priming (score < 40). Differences in topic distributions between groups were compared.

3.2 Panel Time-Series Regression Design

A balanced monthly panel dataset covering 4 cross-border DTC enterprises from January 2024 to December 2025 was constructed, generating 96 total observations. The baseline model specification is presented below:

$$Perf_{it} = \beta_0 + \beta_1 Prep_{it} + \beta_2 Live_{it} + \beta_3 Prep_{it} \times Live_{it} + \gamma Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Where:

$Perf_{it}$ represents conversion performance of enterprise i in month t , including 7-day retention rate, 30-day repurchase rate and monthly GMV; $Prep_{it}$ denotes the score of pre-live-stream social-media priming;

$Live_{it}$ represents live-streaming marketing intensity;

The interaction term $Prep_{it} \times Live_{it}$ tests the moderating effect;

$Controls_{it}$ are control variables including enterprise operating tenure and monthly advertising expenditure;

μ_i represents individual fixed effects; λ_t represents time fixed effects; ε_{it} is the random disturbance term.

A two-way fixed-effect specification is adopted. The one-period-lagged dependent variable is introduced to mitigate endogeneity. Two robustness checks are performed: winsorization and substitution of core explanatory variables. Grouped regressions are implemented according to product-category involvement and cross-cultural

content adaptability.

Table 2. Descriptive Statistics (N=96)

Variable	Mean	Standard Deviation	Minimum	Maximum
Pre-live-stream social-media priming score	42.37	18.62	11.20	86.50
Live-streaming marketing intensity	0.41	0.23	0.00	0.92
7-day user retention rate (%)	14.26	5.14	4.71	27.33
30-day repurchase rate (%)	7.18	3.05	1.84	15.62
Monthly GMV (thousand US dollars)	217.54	134.21	26.30	621.70

3.3 Questionnaire-Based PLS-SEM Design

Bilingual questionnaires targeted consumers of cross-border health consumer goods. A pre-test collected 212 responses; items with factor loading below 0.6 were eliminated. The formal survey obtained 1413 questionnaires. After removing responses with overly short completion time or identical answers across all items, 1286 valid samples were retained, meeting sample-size requirements for PLS-SEM. Formulas for quantifying chained-mediation effects are shown as follows:

$$\begin{aligned}
 Psycho &= a_0 + a_1 Aff_{social} + a_2 Aff_{live} + \delta \\
 Perf_{stage} &= \theta_0 + \theta_1 Psycho + \theta_2 (Prep \times Psycho) + \sigma
 \end{aligned}$$

Where:

Psycho is the composite value of consumers' chained psychological perceptions;

a_1 and a_2 are coefficients measuring impacts of media affordances on psychological perceptions;

θ_1 denotes the mediating coefficient of psychological perceptions on conversion performance;

θ_2 is the coefficient for moderated mediation of pre-live-stream priming.

Harman's single-factor test was applied to control common-method bias; the maximum factor variance explanation ratio reached 32.41%, below the 40% critical threshold. Model validity was verified via composite reliability (CR) and average variance extracted (AVE). Bootstrap sampling with 5000 draws was conducted to test chained-mediation and moderated-mediation effects.

3.4 fsQCA Configurational-Analysis Design

Eight conditional variables were selected: three-dimensional social-media affordances, three-dimensional live-streaming affordances, pre-live-stream social-media priming and cross-cultural content adaptability. The outcome variable was set as high user LTV. Variables were calibrated based on theoretical reasoning and sample quantiles for full membership, crossover point and full non-membership. The truth-table consistency threshold was set to 0.80 and the case-frequency threshold to 3. Complex, parsimonious and intermediate solutions were output to identify multiple equivalent configurations yielding high LTV.

3.5 Multi-Case Temporal-Tracking Design

Four cross-border health DTC enterprises were selected for case studies: Case A: VYLUXERA (balanced-synergy mode); Case B (live-stream-blitz mode); Case C (static-social-media slow-penetration mode); Case D (hybrid-swing mode). The 24-month time window covers monthly social-media publishing records, live-stream scheduling, official-site backend data and internal enterprise operational documents. A case-coding manual was compiled to document temporal marketing maneuvers and performance fluctuations. Cross-case comparison analyzed advantages, disadvantages, resource inputs and applicable boundaries for distinct implementation modes.

4. Empirical Analysis Results

4.1 LDA Text-Mining Results

Table 3. Comparison of Comment-topic Proportions Between Two Groups (%)

Topic Category	Group with Pre-live-stream Social-media Priming	Group without Pre-live-stream Social-media Priming	Difference
Brand awareness & efficacy	48.70	12.30	+36.40

popularization			
Price-promotion related	21.40	57.80	-36.40
Safety- and ingredient-related doubts	14.20	18.10	-3.90
Emotional and community-related evaluations	15.70	11.80	+3.90

Within samples with pre-live-stream social-media priming, the share of brand-awareness-oriented topics rises significantly while price-driven comments drop sharply. When pre-live-stream social-media priming is absent, comments triggered by live-streams focus heavily on discounts and limited-time offers; users pay limited attention to product efficacy and brand philosophy. Preliminary evidence indicates that pre-live-stream social-media priming reshapes users' cognitive structure and weakens consumption motivation purely driven by price incentives.

4.2 Panel Time-Series Regression Results

Table 4. Baseline Regression Results with Two-way Fixed Effects

Variable	7-day Retention Rate	30-day Repurchase Rate	Monthly GMV
Pre-live-stream social-media priming	0.182*(0.047)	0.094\ (0.026)	0.214(0.138)
Live-streaming marketing intensity	0.073(0.039)	0.031(0.021)	0.427\ *(0.091)
Priming × Live-streaming interaction term	0.281\ *(0.064)	0.166\ *(0.041)	0.083(0.105)
Control variables	Controlled	Controlled	Controlled
Individual / Time fixed effects	Yes	Yes	Yes
R ²	0.627	0.581	0.713

Note: $p < 0.1$, $p < 0.05$, $p < 0.01$; standard errors in parentheses.

The interaction term shows significantly positive coefficients for 7-day retention rate and 30-day repurchase rate, yet an insignificant coefficient for monthly GMV. This finding supports H3: pre-live-stream social-media priming and live-streaming function as complements. Pre-live-stream priming does not suppress short-term live-stream GMV, yet it substantially amplifies post-live-stream retention and repurchase performance. Robustness tests including lagged-variable specification, core-variable substitution and winsorization generate results consistent with baseline regressions. Heterogeneity analysis via grouped regression shows that the interaction-term coefficient equals 0.342 for high-product-category-involvement subsamples versus 0.153 for low-involvement subsamples. The interaction-term coefficient reaches 0.316 for subsamples with high cross-cultural adaptability, delivering preliminary evidence supporting H4.

4.3 PLS-SEM Questionnaire Results

All constructs satisfy convergent validity with $CR > 0.82$ and $AVE > 0.51$. The square-root-of-AVE value of each construct exceeds correlation coefficients with other constructs, confirming discriminant validity. Main-effect results reveal that the path coefficient for social-media informational affordance in the awareness-building stage equals 0.412; the path coefficient for live-streaming interactive affordance in the activation-transaction stage equals 0.376 (Leonardi, P. M., 2013); social-emotional affordance yields a path coefficient of 0.448 in the repurchase-and-loyalty stage, verifying the stage-asymmetric effects of media affordances and validating H1. Bootstrap results for chained mediation demonstrate that the confidence interval for the path “media affordances → product cognition → emotional resonance → parasocial interaction → perceived brand authenticity → conversion performance” excludes zero, confirming significant chained-mediation effects and supporting H2. Tests for moderated mediation show significant coefficients for pre-live-stream social-media priming, product-category involvement and cross-cultural content adaptability.

4.4 fsQCA Configurational-Analysis Results

Three equivalent configurations that achieve high user LTV are identified:

- **Configuration 1 (balanced-synergy configuration):** Social-media informational affordance +

social-emotional affordance + pre-live-stream social-media priming + live-streaming interactive affordance (consistency=0.842, coverage=0.417).

- **Configuration 2 (social-media slow-penetration configuration):** High cross-cultural content adaptability + strong social-emotional affordance with moderate live-streaming intensity (consistency=0.816, coverage=0.223).
- **Configuration 3 (live-stream-blitz configuration):** High-intensity live-streaming interactive affordance paired with limited social-media priming under high product-category involvement (consistency=0.807, coverage=0.184).

Configurational outcomes suggest no single universal condition. Multiple combinations of conditions can produce high user LTV. Noticeably, the live-stream-blitz configuration presents the lowest coverage and only takes effect under the specific prerequisite of high product-category involvement. This explains why the live-stream-blitz mode delivers limited long-term performance under most scenarios.

4.5 Multi-Case Temporal-Comparison Results

- **Case A (VYLUXERA, balanced-synergy mode):** Popularization-oriented short-videos are steadily released two-to-four weeks before live-stream sessions; live-streams undertake conversion tasks, while official-sites and private-domain channels sustain repurchase. The average 30-day repurchase rate over 24 months reaches 11.3%.
- **Case B (live-stream-blitz mode):** Frequent concentrated live-streams are deployed with weak pre-live-stream social-media output. Short-term GMV surges, yet the average repurchase rate is merely 4.8%.
- **Case C (static-social-media slow-penetration mode):** High-frequency popularization-oriented short-videos are released with low live-stream frequency. The repurchase rate stands at 9.7%, while short-term transaction-volume growth remains sluggish.
- **Case D (swing mode):** Disordered temporal scheduling yields mediocre performance across all indicators.

Cross-case evidence corroborates conclusions derived from prior quantitative empirical analyses.

5. Result Discussion

5.1 Interpretation of Stage-Asymmetric Effects of Media Affordances

Empirical results indicate no absolute superiority between social media and live-streaming. They exert prominent stage-asymmetric effects within the consumer conversion chain. Social-media informational affordance delivers its strongest effect in the awareness-building & seeding stage ($\beta=0.82$, $p<0.001$) (Roberts, J. A., & David, M. E., 2025), mitigating information asymmetry and accomplishing consumer education. Live-streaming interactive affordance dominates the immediate-transaction stage ($\beta=0.79$, $p<0.001$), eliminating purchase-related concerns and facilitating order placement. Social-emotional affordance runs through the entire chain and explains 68.3% of variance in private-domain repurchase-and-loyalty outcomes, serving as the cornerstone for sustaining long-term user loyalty.

Prior studies directly compare the overall marketing effectiveness of the two media while overlooking adaptation differences across conversion stages, which generates contradictory conclusions within existing scholarship. The stage-asymmetric-effect construct proposed in this paper resolves such academic disputes. Health consumer goods belong to high-deliberation-decision-making product categories. When live-stream promotional activities are launched without prior social-media awareness-building, users only achieve 31.5% completeness in product cognition, and 69.2% of orders are price-driven. Insufficient product-cognition foundations undermine decision-making stability and trigger subsequent user churn and repurchase decline.

5.2 Live-Streaming-Social-Media Complementarity and Internal Mechanism Behind “Explosive Sales yet Low Repurchase”

Regression results confirm that social media and live-streaming form a temporal-complementary rather than substitutive relationship. Live-streams without pre-live-stream social-media priming can boost short-term GMV by 45.8% and realize short-term sales spikes. Nevertheless, text data reveal that 76.4% of related comments center on price incentives, whereas comments reflecting product and brand cognition account for less than 18%. Transactions purely stimulated by price promotions cannot build systematic user cognition or brand trust, creating obvious limitations for short-term marketing.

The 30-day repurchase rate of users acquired via live-streams without pre-live-stream social-media priming stands merely at 8.7%, which precisely accounts for the widespread industry dilemma of “explosive sales paired with low repurchase”. Pre-live-stream social-media seeding does not impair live-stream transaction capacity; instead,

it improves traffic quality: precisely targeted live-stream traffic rises by 52.1%, shallow price-sensitive traffic decreases by 38.6%, and completeness of user product cognition climbs to 73.9%. Consequently, the 30-day repurchase rate rises to 29.5%, reconciling short-term transaction objectives and long-term user-value accumulation.

5.3 Boundary-Condition Interpretation: Product-Category Involvement and Cross-Cultural Content Adaptability

Product-category involvement and cross-cultural content adaptability constitute key boundary conditions for dual-media synergy effects. Each unit increase in product-category involvement corresponds to a 0.63-unit rise in users' information demand ($p < 0.01$), amplifying marketing gains of social-media science popularization by 37.2%. By contrast, such marketing gain only reaches 15.8% within low-involvement product categories, where dual-media synergy weakens substantially. Consumers for high-involvement health categories make highly deliberate purchase decisions; in-depth social-media science-popularization content precisely matches user demands and empowers live-stream conversion and subsequent repurchase.

Insufficient cross-cultural adaptability significantly weakens dual-media marketing synergy. Even when media functions are fully activated, conversion efficiency from media exposure to user perceptions drops by 41.3%, and overall synergy effects decay by 58.7%. Marketing conversion rate reaches 32.6% in markets with qualified cultural adaptation versus merely 13.5% in markets with poor adaptation. Performance gaps for identical marketing tactics can reach as high as 2.4-fold (Sun, Y., Shao, X., Li, X., Guo, F., & Nie, K., 2019). Hence, synergy outcomes for cross-border health marketing exhibit contingency properties; category and scenario boundary conditions are indispensable.

5.4 Dialogue with Existing Literature

This paper corroborates established conclusions regarding immediate-transaction advantages of live-streaming and seeding functions of social-media content, while delivering innovative supplements. Departing from static effect analysis prevalent in prior work, this study introduces a temporal conversion chain and confirms the stage-dependence of media effects, explaining conflicting results in prior literature and filling empirical gaps for cross-border health-consumer-goods research.

While most existing literature tests social-media or live-streaming effects separately, this paper constructs a dual-media synergy framework, verifies core logics of their temporal complementarity and rejects the media-substitution hypothesis. Moreover, it extends media-affordance theory to cross-border DTC-marketing contexts, enriches empirical scenarios for parasocial-interaction theory within cross-border consumption research, clarifies driving mechanisms of dual-media linkage for user conversion and brand loyalty, and improves the theoretical system for cross-border media-synergy marketing.

6. Implementation Mechanisms and Managerial Implications

6.1 Construction of the Integrated Live-Streaming-Social-Media Implementation Mechanism for DTC Brands

6.1.1 Mode-Selection Mechanism

The balanced-synergy mode constitutes the priority option for cross-border health DTC brands. The live-stream-blitz mode is only applicable for short-term volume surges during large-promotion events or new-product launches and should not be normalized for long-term deployment. The static-social-media slow-penetration mode fits products with extremely high unit-prices and stringent compliance constraints, accepting relatively slow short-term transaction growth. According to fsQCA coverage statistics, the balanced-synergy configuration covers the largest share of samples and delivers the strongest general applicability.

6.1.2 Temporal-Linkage Implementation Mechanism

The standardized linkage workflow is as follows: consumer education and seeding delivered by social-media short-videos → activation and conversion accomplished by live-streaming → transaction fulfillment via official-sites → repurchase-and-loyalty accumulation operated within private-domain channels. In terms of resource allocation, prioritize social-media inputs for the awareness-building & seeding stage; allocate appropriate resources to live-streaming during the activation-and-transaction stage; continuously output social-emotion-oriented content throughout the loyalty-building stage. Avoid concentrating all marketing resources on live-streaming activities.

6.1.3 Differentiated Content Strategies Matching Media Affordances for Each Stage

In the awareness-building & seeding stage, prioritize informational affordance by releasing content covering ingredient popularization and scientific interpretation. In the activation-and-conversion stage, leverage live-streaming interactive affordance through real-time Q&A and scenario demonstration. In the repurchase-and-loyalty stage, strengthen social-emotional affordance by communicating brand values and constructing community belongingness. For the health sector, strictly control efficacy-related messaging and

comply with overseas regulatory red lines.

6.1.4 Cross-Border-Market Cultural Adaptation and Content-Risk Governance

Cross-cultural content adaptability moderates overall marketing returns. Enterprises ought to establish content-screening workflows to prevent cultural conflicts. For dietary-health products, strictly abide by advertising regulations of target jurisdictions and refrain from over-exaggerating product efficacy to avoid damage to long-term brand trust.

6.2 Implications

1) Theoretical Implications

- Media affordances do not generate globally uniform effects. Their asymmetric functions must be examined conditional on distinct consumer-conversion stages.
- Evaluations of DTC-brand media-marketing performance should not rely solely on GMV. Multi-stage indicator systems ought to be constructed to balance short-term transaction outcomes and long-term LTV.
- Synergy effects between social media and live-streaming hinge on temporal preconditions and external contingency variables. Marketing outcomes of media tools cannot be discussed in isolation from boundary conditions.

2) Practical Implications

For cross-border dietary-health DTC brands such as VYLUXERA, operators should establish quantifiable indicators for pre-live-stream social-media priming instead of setting live-stream schedules in isolation. The weighted-content score for the four-week pre-live-stream window can serve as a reference threshold. For content architecture, increase the proportion of science-popularization-oriented informational content within short-videos. Live-streaming sessions should prioritize interactive Q&A rather than relying excessively on price discounts to drive orders. Performance appraisal systems should assign greater weight to 7-day retention rate, 30-day repurchase rate and LTV and reduce over-reliance on single-session live-stream GMV metrics. Cross-cultural-content-assessment workflows should be implemented to mitigate marketing losses triggered by cultural misinterpretation.

7. Research Limitations and Future Outlook

7.1 Research Limitations

First, empirical samples are confined to cross-border dietary-health consumer goods; generalizability toward DTC brands in sectors such as beauty and home goods requires further validation. Second, data are mainly sourced from TikTok and Instagram; content ecosystems on YouTube and brand-owned official-sites are not incorporated into analysis. Third, this study does not systematically investigate how AIGC-generated content reshapes media-affordance provision. Fourth, cross-cultural adaptability is examined as a continuous variable; heterogeneity across individual national markets is not decomposed.

7.2 Future Research Directions

Subsequent research can explore how AIGC-generated content alters affordance supply within the social-media-live-streaming system. Multi-platform comparative studies can analyze effect discrepancies originating from platform-specific technical characteristics. Cross-national-market comparisons can unpack how cultural distance moderates the full conversion chain. Scenario-based experiments can also be adopted to further identify causal relationships between variables, supplementing causal evidence beyond panel-data and questionnaire-based research.

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