An Empirical Study on the Effects of Streamer Theoretical and Professional Expertise Depth, Consumer Empathy, and the Density of Commercial Persuasive Talk in Livestream Commerce on Consumers' Purchase Conversion in the Skincare and Beauty Sector, with Consumer Emotional Attachment as a Mediating Mechanism

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Abstract

This study addresses a highly salient yet persistent challenge in China's skincare and beauty livestream commerce, namely why purchase conversion remains markedly volatile despite consistently strong viewing traffic. Drawing on the Stimulus Organism Response framework and attachment theory, the study conceptualises streamer theoretical and professional expertise depth, consumer empathy, and the density of commercial persuasive talk during livestreams as key external stimuli within the livestream room. Consumer emotional attachment is positioned as the core psychological mechanism linking streamer behaviours to conversion outcomes. A questionnaire survey was administered to Chinese consumers with viewing and purchasing experience in skincare and beauty livestreams, and the hypothesised relationships were examined using partial least squares structural equation modelling. The results indicate that expertise depth and empathic capability enhance purchase conversion, whereas a higher density of commercial persuasive talk suppresses conversion. In addition, consumer emotional attachment mediates the effects of all three streamer behavioural factors on conversion, suggesting that conversion is not driven solely by promotional stimulation. Rather, professional explanation and emotional responsiveness jointly cultivate a psychological bond with the streamer, which subsequently translates into purchase decisions. The study further clarifies the conversion logic of skincare and beauty products, which are characterised by a strong reliance on explanation, demonstrating that content credibility and relational credibility are more likely than short term stimulation to generate stable conversion. These findings provide a clearer mechanistic account of the commonly observed phenomenon of high traffic but low conversion in livestream commerce and offer actionable implications for practice. Streamers should prioritise professionalised explanations and high-quality empathic interaction as core capability development. Brands and platforms should also reduce their reliance on high intensity scripted persuasive talk in evaluation and governance and instead strengthen long term incentives for content quality and relationship quality.

Keywords

Livestream commerce, Skincare and beauty, Purchase conversion, Stimulus Organism Response framework, Emotional attachment, Streamer professionalism, Empathic interaction

Introduction

Driven by the deep integration of the digital economy and the platform economy, livestream commerce has become one of the most representative emerging business forms in China's consumer market [1]. It has gradually shifted from being a supplementary content channel to an important transaction scenario that operates in parallel with conventional e-commerce. Enabled by the high level of integration among short video platforms, social media, and e-commerce systems, livestream selling compresses product information delivery,

consumption experience construction, and purchase decision making into the same temporal window through real-time product demonstration, instant interaction, and contextualised explanation, thereby substantially improving transaction efficiency and conversion capability [2]. In terms of market scale, China's livestream commerce has expanded rapidly within only a few years. Its transaction value has reached the trillion RMB level, and its share within the overall online retail system has continued to rise, making it a key engine for the growth of online consumption. During this process, livestream commerce has become less dependent on price advantages or channel dividends and has increasingly evolved a competitive structure centred on content quality, streamer influence, and user relationships. Accordingly, the industry has exhibited a clear shift from traffic driven logic to content and relationship driven logic [3].

Within the category structure of livestream commerce, skincare and beauty have long occupied a central position and represents one of the most mature, highly competitive, and heavily commercialised tracks in livestream selling [4]. Skincare and beauty products are characterised by high repurchase frequency, high consumer attention, and strong experience dependence. Consumers typically place strong emphasis on ingredient mechanisms, efficacy rationales, skin type suitability, and safety in the purchasing process, which creates higher requirements for the depth of information explanation and the manner of expression [5]. In livestream settings, skincare and beauty products are no longer merely items that are displayed. Instead, they are continuously reinterpreted and redefined through the streamer's explanation, and their value is more strongly communicated through linguistic construction, interactive feedback, and emotional resonance [6]. In practice, it can be observed that when product prices and channel conditions are similar, conversion performance varies substantially across livestream rooms. Skincare and beauty livestreaming has increasingly demonstrated category specific characteristics that are dominated by the streamer's professional expressive capability, interaction style, and overall content pacing. Evidence from leading livestream cases indicates that beauty streamers with stable audiences and strong content-based trust can still achieve high conversion even when promotional intensity is not the strongest. This phenomenon has become widely observable in industry and suggests that skincare and beauty livestream selling is evolving from a purely sales-oriented activity into a business model that is highly dependent on content quality and consumers' psychological engagement.

To date, the development of skincare and beauty livestream commerce has reached a stage where the central industry tension is no longer primarily concerned with channel expansion or user reach. Instead, it has increasingly shifted towards the instability of purchase conversion and an overall decline in conversion efficiency [7]. On the one hand, e-commerce livestreaming has become deeply embedded in everyday consumption. The user base continues to expand, viewing behaviour has become highly routinised, and livestream rooms are no longer short of traffic or interaction. On the other hand, from an operational perspective, many brands and streamers have found that even when viewership is considerable and comment activity is high, the proportion of consumers who ultimately place orders remain unsatisfactory, and conversion rates show substantial divergence across livestream rooms [8]. For brands, such uncertainty in conversion directly affects the return on livestream marketing investment, inventory management, and long-term operational expectations. For platforms, fluctuations in conversion efficiency weaken livestream commerce as a stable contributor to overall transaction volume. From the consumer perspective, frequent entry into livestream rooms without translating engagement into purchase decisions is often not driven by the absence of demand. Rather, it reflects hesitation regarding product fitness, the credibility of recommendations, and perceived purchasing risk [9]. This issue is particularly salient in skincare and beauty, a category that is highly dependent on trust and explanation. In this context, low conversion not only indicates that transactions fail to materialise but may also gradually erode the trust base underpinning livestream shopping, thereby accumulating structural risks beneath an apparent prosperity [10].

This phenomenon cannot be adequately attributed to intensified market competition or a general return to consumer rationality. More fundamentally, it is rooted in changes in livestream content structure and streamer communication styles. With the influx of large numbers of streamers and brands into the skincare and beauty track, livestream content has become increasingly

homogeneous in product selection logic, explanatory approaches, and delivery pacing. As a result, consumers find it progressively more difficult to obtain professional judgements from livestreams that meaningfully reduce decision uncertainty at the informational level. The core concerns in skincare and beauty consumption extend beyond visual presentation. They centre on whether ingredient mechanisms are clearly explained, whether efficacy claims are logically coherent, and whether usage risks are disclosed in an accurate manner. When a streamer's professional expression is limited to simplified descriptions or slogan like promises, consumers often interpret such cues as insufficient or even unreliable [11]. At the same time, the density of commercial persuasive talk in livestreams has continued to increase. Although intense promotional reminders and time pressure may stimulate impulsive responses in the short term, in skincare and beauty categories where sensitivity is high and the cost of trial and error is substantial, overly dense persuasive talk can trigger consumer defensiveness and encourage psychological distancing from livestream recommendations [12]. More importantly, during this process, some livestream rooms have gradually weakened their responsiveness to consumers' authentic emotions and individual differences. Interaction increasingly takes the form of procedural replies, making it difficult for consumers to feel understood and taken seriously. When livestream communication fails to establish an emotional connection, consumers may postpone or abandon purchasing even if they acknowledge the product's value. This dynamic contributes to the recurrent industry phenomenon of high traffic yet low conversion [13].

Based on the above practical context and problem orientation, the focus of the study can be further narrowed to those observable cues within livestream rooms that are most likely to determine conversion outcomes. In other words, this study does not treat fluctuations in purchase conversion as a phenomenon driven solely by traffic or pricing. Rather, it conceptualises conversion volatility as an outcome triggered by streamer behavioural characteristics and gradually consolidated at the level of consumer psychology. Accordingly, the study takes the industry issue of unstable purchase conversion in skincare and beauty livestream commerce as its point of departure and seeks to systematically analyse the underlying formation

mechanism from the perspective of streamer behaviours. The analysis centres on three key factors, namely the streamer's theoretical and professional expertise depth, empathic capability towards consumers, and the density of commercial persuasive talk during livestreams, and examines whether, and through what pathways, these factors shape consumers' purchase decision making. Given that skincare and beauty consumption is highly reliant on affective experience and relational trust, the study further introduces consumer emotional attachment as a mediating mechanism. This is intended to explain why streamer behaviours do not necessarily influence conversion outcomes directly but instead affect purchase behaviour by shaping consumers' emotional bonding with the streamer and the livestream room. On this basis, to translate the research problem into empirically testable and operational objectives, the study specifies the following research objectives.

Research Objective 1: To examine whether, in the context of skincare and beauty livestream commerce, streamer theoretical and professional expertise depth, consumer empathy, and the density of commercial persuasive talk exert significant effects on consumers' purchase conversion.

Research Objective 2: To examine whether consumer emotional attachment mediates the relationship between streamer theoretical and professional expertise depth, empathic capability, and the density of commercial persuasive talk, and consumers' purchase conversion, thereby revealing the underlying psychological mechanism through which streamer behaviours influence conversion outcomes.

Research Objective 3: To develop, based on empirical findings, a systematic explanatory framework for the formation of purchase conversion in skincare and beauty livestream commerce, providing evidence-based support for both livestream commerce theory development and industry practice.

From a theoretical perspective, this study investigates skincare and beauty livestream commerce as a highly contextualised and affected laden consumption setting and focuses on the relationships between streamer behavioural characteristics and consumers' purchase conversion. In doing so, it contributes to a deeper understanding of consumer decision mechanisms in livestream commerce. Existing studies on livestream selling have largely concentrated on salient factors such

as technological affordances, interaction frequency, or price related stimulation. By contrast, discussions of how streamers' professional articulation, empathic interaction, and the manner of employing persuasive talk shape consumer decision making at the psychological level remain relatively fragmented. There is a lack of systematic explanation regarding the mechanism through which conversion outcomes are formed. By incorporating consumer emotional attachment into the analytical framework, this study not only clarifies the underlying psychological pathways through which streamer behaviours influence conversion, but also addresses the insufficient attention paid to affective mechanisms in extant research. In this sense, the study enriches the explanatory dimensions of consumer behaviour research in livestream commerce contexts and provides a more integrative analytical perspective for future empirical work in related domains.

From a practical perspective, this study offers direct implications for operational optimisation in skincare and beauty livestream commerce. As purchase conversion has become a key performance indicator constraining high quality industry development, it is increasingly difficult to sustain conversion improvements by relying solely on traffic acquisition or promotional intensity [14]. By identifying the key streamer behavioural factors shaping conversion and explicating the specific mechanism through which these factors affect consumer decision making via emotional attachment, the findings can provide more precise decision support for platforms, brands, and streamers. The results can inform the optimisation of content design, professional explanation, and interaction practices for streamers, while also guiding the industry away from an excessive reliance on persuasive talk driven stimulation and short-term conversion tactics. Instead, the industry can shift towards a longer-term operational logic that prioritises professional credibility and emotional connection, thereby promoting a more stable and sustainable development trajectory for skincare and beauty livestream selling.

Theoretical framework

Theoretical foundations

This study first adopts the Stimulus Organism Response framework as one of its core theoretical foundations. Originally developed to explain how external environmental stimuli induce corresponding behavioural responses through changes in individuals' internal psychological states, the framework has been widely applied in recent years to research on digital consumption and online contexts [15]. In livestream commerce, consumers do not passively receive information. Rather, they are continuously exposed to multiple external stimuli, such as the streamer's mode of professional explanation, level of emotional expression, and intensity of commercial persuasive talk. Together, these factors constitute key stimulus elements in the livestream environment. According to the framework, external stimuli does not translate directly into purchasing behaviour. Instead, they first shape consumers' internal psychological states, triggering changes in affective responses, trust judgements, and relational cognition, which subsequently manifest as behavioural outcomes in terms of whether a transaction is completed [16]. Applying this framework to skincare and beauty livestream commerce enables a nuanced explanation of why streamer theoretical and professional expertise depth, empathic capability, and the density of commercial persuasive talk are unlikely to affect conversion in a simple linear manner. Their effects are more plausibly realised through consumers' psychological processing. Recent empirical evidence also suggests that in livestream commerce settings, streamer information quality, interaction styles, and communication strategies significantly influence consumers' emotional arousal, perceived trust, and psychological engagement. These organism level changes represent critical antecedents of purchasing behaviour [17]. Accordingly, the Stimulus Organism Response framework provides a robust explanatory structure for building an overarching logic from streamer behaviours to consumer purchase conversion, ensuring that the hypothesised pathways among variables are theoretically grounded [18].

Building on this foundation, the study further incorporates attachment theory as a complementary theoretical lens to explain the deeper psychological mechanism through which consumers form stable purchasing behaviour in livestream commerce contexts. Attachment theory posits that through sustained interaction and affective investment, individuals develop

emotional bonds with objects, and once such bonds are established, they exert substantial influence on attitudes and behavioural choices [19]. In skincare and beauty consumption, product outcomes are often difficult to fully verify through short term experience. Consequently, consumers are more inclined to project trust onto the information source. This tendency becomes particularly pronounced in livestream settings that strongly rely on streamer explanation and recommendation, where the streamer increasingly functions as a salient object of consumer emotional attachment [20]. Recent studies indicate that affective interaction, empathic responsiveness, and sustained communication in livestream environments strengthen consumers' emotional attachment to streamers. Such attachment can significantly reduce perceived risk and enhance purchase certainty [21]. Conceptualising emotional attachment as a mediating mechanism not only explains why streamers with stronger expertise depth and empathic capability are more likely to achieve higher conversion but also suggests that commercial persuasive talk may produce substantially different effects depending on the underlying emotional relationship. Therefore, attachment theory provides essential psychological support for elucidating how streamer behaviours influence conversion decisions through affective pathways. In combination with the Stimulus-Organism-Response framework, it enables a systematic explanation of the formation logic of consumer purchase conversion in skincare and beauty livestream commerce from two complementary levels, namely external stimuli and internal affective mechanisms.

Research hypotheses

In skincare and beauty livestream commerce, consumers' conversion decisions are highly contingent on their assessments of information credibility and recommendation reliability. The streamer's theoretical and professional expertise depth constitutes one of the key cues shaping such assessments [22]. Compared with general fast moving consumer goods, skincare and beauty products involve ingredient mechanisms, boundaries of efficacy, and usage risks. Consumers often find it difficult to verify actual effects through short term experience and therefore tend to rely on the streamer's professional explanation to reduce decision uncertainty

[23]. Prior studies indicate that within livestream commerce environments, streamers' domain knowledge and explanatory capability significantly enhance consumers' perceptions of information quality and recommendation credibility, thereby strengthening purchase intention and actual purchasing behaviour [24]. When consumers perceive that the streamer possesses a solid theoretical foundation and can clearly explain product principles, they are more likely to regard the streamer as a trustworthy information source and, on this basis, complete the purchase decision [25]. Accordingly, it can be inferred that streamer theoretical and professional expertise depth exerts a positive influence on consumer conversion in skincare and beauty livestream commerce. Based on this reasoning, the following hypothesis is proposed.

H_1: Streamer theoretical and professional expertise depth has a significant positive effect on consumer purchase conversion in skincare and beauty livestream commerce.

Beyond professional capability, the streamer's understanding of and responsiveness to consumers' emotions and individual differences during interaction is also an important determinant of conversion outcomes. Skincare and beauty consumption is often accompanied by skin related anxiety, appearance pressure, and self-care needs. Consequently, consumers seek not only product information but also emotional understanding and reassurance in livestream rooms [26]. Related research suggests that empathic capability in livestream interaction strengthens consumers' psychological involvement by making them feel that their needs are taken seriously, thereby increasing trust in the streamer and the recommended content [27]. When consumers perceive that the streamer can understand their confusion and concerns from their standpoint, they are more likely to develop positive affective responses and, on this basis, make purchase decisions [28]. Accordingly, in skincare and beauty livestream commerce, streamer empathic capability facilitates consumers' transition from viewing and interaction to actual purchase conversion [29].

H_2: Streamer empathic capability towards consumers has a significant positive effect on consumer purchase conversion in skincare and beauty livestream commerce.

Compared with expertise depth and affective interaction, the use of commercial persuasive talk during livestreams may exert a more complex influence on conversion. On the one hand, moderate promotional reminders, limited time discounts, and calls to action can induce a sense of urgency and encourage consumers to make purchase decisions more quickly [30]. On the other hand, in skincare and beauty categories characterised by high perceived risk and substantial trial and error costs, overly dense or highly stimulating commercial persuasive talk can trigger psychological defensiveness and lead consumers to question the underlying motives of recommendations [31]. Prior research has found that when consumers perceive an excessive sales orientation on the part of the streamer, their trust and purchase intention may decline, thereby inhibiting conversion behaviour [32]. Therefore, within skincare and beauty livestream contexts, a higher density of commercial persuasive talk does not necessarily produce positive effects. Instead, it may negatively affect conversion. Based on this reasoning, the following hypothesis is proposed.

H_3: The density of commercial persuasive talk during livestreams has a significant negative effect on consumer purchase conversion in skincare and beauty livestream commerce.

More broadly, streamer behaviours influence conversion outcomes not solely by directly stimulating consumers to purchase, but by shaping consumers' affective states and relational cognition [33]. Attachment theory posits that through sustained interaction and affective investment, individuals gradually develop emotional bonds with a focal object, and such bonds can significantly reduce uncertainty and strengthen behavioural certainty [34]. In livestream selling contexts, streamer expertise depth and empathic interaction contribute to consumers' emotional attachment to the streamer. Once such attachment is established, consumers are more likely to complete purchase decisions based on relational trust. By contrast, an excessively high density of commercial persuasive talk may undermine the formation of emotional attachment, leading consumers to interpret interaction as

one way selling and thereby weakening psychological bonding [35]. Existing empirical evidence indicates that consumer emotional attachment to the streamer significantly mediates the relationship between streamer characteristics and purchase behaviour in livestream environments. Accordingly, this study further posits the mediating role of consumer emotional attachment between streamer behaviours and purchase conversion. Based on this reasoning, the following hypotheses are proposed.

H_4: Consumer emotional attachment mediates the relationship between streamer theoretical and professional expertise depth and consumer purchase conversion.

H_5: Consumer emotional attachment mediates the relationship between streamer empathic capability towards consumers and consumer purchase conversion.

H_6: Consumer emotional attachment mediates the relationship between the density of commercial persuasive talk during livestreams and consumer purchase conversion.

Based on these hypotheses, this study develops an integrated framework linking streamer behaviours to consumer purchase conversion in skincare and beauty livestream commerce. Within this framework, streamer theoretical and professional expertise depth, empathic capability towards consumers, and the density of commercial persuasive talk are conceptualised as key independent variables. Consumer purchase conversion serves as the outcome variable capturing the actual conversion effectiveness of livestream selling. Consumer emotional attachment functions as the mediating variable that connects streamer behaviours with conversion outcomes by explaining how streamer behaviours indirectly shape conversion decisions through influencing consumers' affective bonding with the streamer and the livestream room. Overall, this study argues that streamer behaviours first influence consumers' cognitive and affective responses to the streamer, thereby altering the level of emotional attachment. The strengthening or weakening of emotional attachment subsequently determines whether

consumers complete purchase conversion. This relational framework provides a clear logical basis for

subsequent empirical testing and model development (as shown in Figure 1).
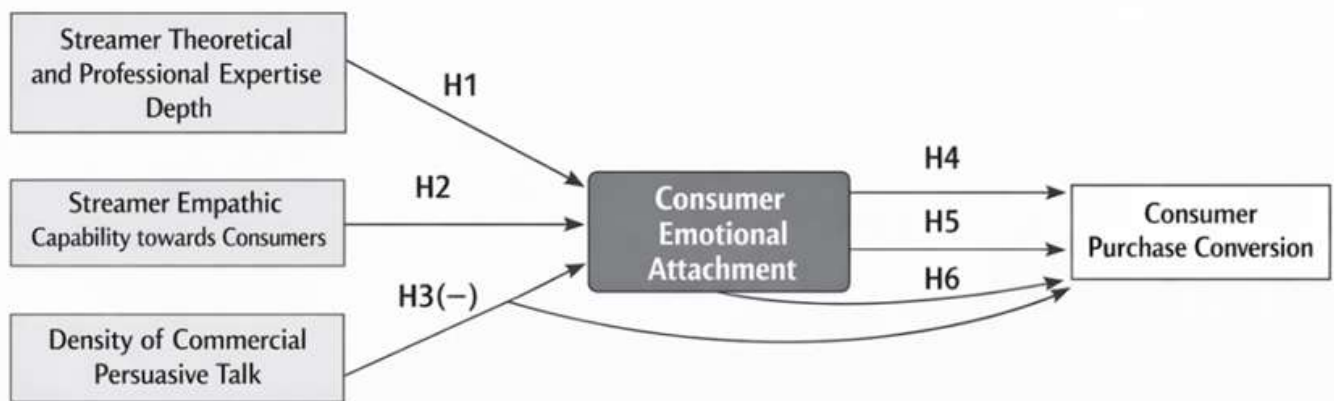

Figure 1. Conceptual framework.

Research method

Research design and measurement instruments

This study adopts a quantitative research approach. The research design is descriptive in nature, and cross-sectional data serves as the primary data source. A descriptive design is adopted because the study focuses on the structural relationships among streamer behavioural characteristics, consumer psychological states, and conversion outcomes in skincare and beauty livestream commerce contexts, rather than on causal intervention or experimental manipulation. Cross sectional data can provide a relatively comprehensive depiction, at a specific time point, of consumers' cognition, affective responses, and behavioural outcomes associated with livestream commerce experiences. Such data have been widely used in livestream commerce and consumer behaviour research and are regarded as appropriate for testing multivariate relationships and mediation models. Data collection was conducted between September 2025 and November 2025. During this period, China's livestream commerce market conditions were relatively stable and were not subject to concentrated disturbances arising from major platform policy adjustments or extreme promotional events. This helped to capture consumer cognition and behavioural data that are more representative. The target population comprised Chinese consumers with viewing and purchasing experience in skincare and beauty livestreams. Specifically, respondents were required to have watched at least one skincare and beauty livestream within the past three months and to have either engaged

in actual purchasing behaviour during livestream sessions or demonstrated a clear purchase intention. To ensure sample validity and contextual relevance, multiple screening questions were placed before the main questionnaire items, such as whether respondents had watched skincare and beauty livestreams and whether they had completed purchases in livestream rooms. Only participants who met the study criteria were allowed to proceed with the questionnaire.

With respect to measurement, all latent constructions were operationalised using established scales from both domestic and international literature, with appropriate adaptations to the livestream commerce context. Streamer theoretical and professional expertise depth was measured primarily by drawing on prior approaches that assess streamer professionalism and knowledge authority in livestream commerce research. The items focused on the streamer's capability to explain product ingredients, clarify efficacy mechanisms, and appropriately use professional terminology. Streamer empathic capability towards consumers was adapted from scales related to perceived empathy and interactive care, emphasising the extent to which the streamer understands consumer needs, responds to emotions, and provides personalised feedback during interaction [36]. The density of commercial persuasive talk during livestreams was measured based on recent research on promotional scripts and the intensity of commercial orientation in livestream contexts, focusing on the frequency and intensity of promotional directives, limited time reminders, and price stimulating language

[37]. Consumer emotional attachment, as the mediating variable, was measured by drawing on extensions of brand attachment and interpersonal attachment research in livestream contexts, emphasising consumers' emotional bonding with and psychological reliance on the streamer [38]. Consumer purchase conversion, as the outcome variable, was measured using self-reported items capturing consumers' actual purchase frequency and conversion tendency in livestream settings. All items were measured using a five-point Likert scale.

Sample source and sampling method

In terms of population definition, the target population of this study comprises active consumers in China who participate in skincare and beauty livestream commerce. According to an industry report released by iResearch, the number of livestream commerce users in China has exceeded 500 million, and skincare and beauty has consistently ranked among the leading categories in livestream consumption. This indicates the presence of a stable and substantial potential research population. On this basis, this study employed convenience sampling to obtain respondents. Convenience sampling was chosen because livestream commerce consumers were highly dispersed and it was difficult to construct a complete sampling frame. In contrast, targeted distribution through social media platforms, online survey platforms, and livestream user communities enables the efficient collection of context relevant samples under feasible cost and time constraints. This approach has been widely adopted in empirical livestream commerce research [39]. With respect to sample size determination, the study calculated the required sample size in accordance with the analytical requirements of structural equation modelling. Following the minimum sample size guideline for PLS-SEM (Partial Least Squares Structural Equation Modeling) proposed by Hair and colleagues, the sample size should be no less than ten times the largest number of structural paths directed at any latent construct, while also considering model stability and the statistical power required for mediation testing. In the proposed model, the maximum number of structural paths is three. Accordingly, the theoretical minimum sample size is at least 120 observations. Importantly, the present study not only estimates multiple structural

relationships, but also conducts robust mediation tests using bootstrapping and includes necessary control variables to reduce potential confounding bias. These analytical procedures substantially increase the demand for a larger sample size.

On this basis, the expected final valid sample size was set at 310. This decision was supported by three considerations. First, 310 is well above the minimum threshold, which helps improve the stability of path coefficient estimation and reduces model uncertainty arising from small sample fluctuations. Second, mediation testing is more sensitive to sample size. A sufficiently large sample improves the convergence of bootstrap confidence intervals and enhances the robustness of conclusions, thereby strengthening the statistical power of hypothesis testing. Third, questionnaire-based studies inevitably encounter invalid responses in practice, including careless responding, failure to pass screening items, and extreme straight line answering patterns. Setting the expected sample size at 310 therefore provides adequate buffer for data cleaning while retaining enough valid cases. In summary, using 310 valid responses as the target sample size better satisfies the overall requirements of PLS-SEM about estimation precision and robustness, providing a reliable data foundation for subsequent structural model estimation and mediation mechanism testing.

Empirical results

Demographic profile of the sample

Questionnaire distribution and collection were conducted between September 2025 and November 2025. The survey was disseminated in a targeted manner through social media platforms, online questionnaire platforms, and user communities of skincare and beauty livestream commerce. A total of 356 questionnaires were returned. Based on the screening items and data cleaning procedures, responses that did not meet the eligibility criteria regarding skincare and beauty livestream viewing and purchasing experience, as well as questionnaires exhibiting evident straight line answering patterns and extreme invalid responses, were removed. The final dataset comprised 310 valid cases. This sample size exceeds the basic requirements of PLS SEM for stable model estimation and bootstrapped mediation testing and

is therefore adequate to support subsequent estimation of both the measurement model and the structural model.

The demographic distribution of the sample is reported as follows. In terms of gender, 72 respondents were male, representing 23.2 percent, and 238 respondents were female, representing 76.8 percent. With respect to age, 6 respondents were aged 18 or below, representing 1.9 percent; 102 respondents were aged 19 to 24, representing 32.9 percent; 116 respondents were aged 25 to 30, representing 37.4 percent; 54 respondents were aged 31 to 35, representing 17.4 percent; 22 respondents were aged 36 to 40, representing 7.1 percent; and 10 respondents were aged 41 or above, representing 3.2 percent. Regarding education level, 18 respondents reported senior high school or below, representing 5.8 percent; 66 reported a junior college diploma, representing 21.3 percent; 176 reported a bachelor's degree, representing 56.8 percent; and 50 reported a master's degree or above, representing 16.1 percent. In terms of monthly disposable income, 38 respondents reported RMB 3,000 or below, representing 12.3 percent; 102 reported RMB 3,001 to 6,000, representing 32.9 percent; 86 reported RMB 6,001 to 9,000, representing 27.7 percent; 50 reported RMB 9,001 to 12,000, representing 16.1 percent; and 34 reported RMB 12,001 or above, representing 11.0 percent. Regarding occupation, 78 respondents were students, representing 25.2 percent; 154 were corporate employees, representing 49.7 percent; 42 were freelancers, representing 13.5 percent; 20 were self-employed business owners, representing 6.5 percent; and 16 reported other occupations, representing 5.2 percent.

With respect to livestream usage intensity over the past three months, 118 respondents reported watching skincare and beauty livestreams one to two times per week, representing 38.1 percent; 104 reported three to four times per week, representing 33.5 percent; and 88 reported five or more times per week, representing 28.4 percent. In terms of purchase conversion frequency over the past three months in skincare and beauty livestreams, 126 respondents reported one to two purchases, representing 40.6 percent; 104 reported three to five purchases, representing 33.5 percent; and 80 reported six purchases or more, representing 25.8 percent (Table 1).

Table 1. Demographic characteristics of the sample (N = 310).

Variable	Category	Frequency(N)	Percentage (%)
Gender	Male	72	23.2
	Female	238	76.8
Age	18 years old and below	6	1.9
	19-24 years old	102	32.9
	25-30 years old	116	37.4
	31-35 years old	54	17.4
	36-40 years old	22	7.1
	41 years old and above	10	3.2
Education level	High school or below	18	5.8
	Junior college (associate degree)	66	21.3
	Bachelor's degree	176	56.8
	Master's degree or above	50	16.1
Monthly disposable income (RMB)	≤ 3,000	38	12.3
	3,001-6,000	102	32.9
	6,001-9,000	86	27.7
	9,001-12,000	50	16.1

Variable	Category	Frequency(N)	Percentage (%)
	≥ 12,001	34	11.0
Occupation	Student	78	25.2
	Corporate employee	154	49.7
	Freelancer	42	13.5
	Self-employed	20	6.5
	Other	16	5.2
Frequency of watching skincare & Beauty live streams (Past 3 months)	1-2 times per week	118	38.1
	3-4 times per week	104	33.5
	5 times or more per week	88	28.4
Purchase frequency in skincare & Beauty live streams (Past 3 months)	1-2 times	126	40.6
	3-5 times	104	33.5
	6 times or more	80	25.8

Reliability and validity of the measurement model

The measurement model was specified to use reflective indicators. Each latent construct was measured with five Likert scale items. The internal consistency assessment indicates that all latent constructs achieved Cronbach's alpha values above 0.80, and composite reliability values exceeded 0.85, demonstrating satisfactory internal consistency reliability. Regarding convergent validity, the standardised factor loadings of all measurement items met or were close to the recommended threshold of 0.70, and the average variance extracted values for all latent constructs were above 0.50. These results suggest that the measurement items adequately capture their corresponding latent constructions (Table 2).

Table 2. HTMT discriminant validity test results.

Latent variable	PD	EM	SD	EA	CRate
PD	—	0.62	0.28	0.7	0.58
EM	/	—	0.31	0.75	0.61
SD	/	/	—	0.44	0.47
EA	/	/	/	—	0.73
CRate	/	/	/	/	—

PD = Blogger's theoretical professional depth EM = Empathy ability SD = Sales discourse density EA = Consumer emotional attachment CRate = Consumer conversion rate

Given that this study relies on cross sectional self-reported questionnaire data, multiple procedural remedies were implemented at the research design stage to mitigate the potential influence of common method bias. Specifically, the questionnaire was administered anonymously and did not collect any information that could be used to identify respondents. Items measuring the key variables were presented in a random order to reduce consistency artefacts arising from same source measurement. In addition, the wording of items was designed to avoid salient social desirability cues, and screening items as well as reverse interpretation prompts were incorporated to reduce the likelihood of mechanical responding.

At the statistical testing level, this study adopted a full collinearity assessment approach by examining variance inflation factors for all latent constructions. The results indicate that the full collinearity VIF values for all constructions were below the recommended threshold of 3.3, suggesting no evidence of systematic collinearity

risk attributable to common method bias. Specifically, the VIF values were 1.82 for PD, 2.05 for EM, 1.36 for SD, 2.24 for EA, and 2.10 for CRate. As a supplementary test, Harman's single factor test was also conducted. The results show that the first factor accounted for 34.7 percent of the total variance, which is below the commonly used cautionary threshold of 50.0 percent. Taken together, the procedural remedies and the available statistical evidence suggest that common method bias is unlikely to pose a substantive threat to the empirical conclusions of this study. The relevant statistics are reported in Table 3.

Table 3. Statistical test results for common method bias.

Test method	Test target	Indicator	Result	Criterion
Full collinearity test	PD	VIF	1.82	VIF < 3.3
	EM		2.05	
	SD		1.36	
	EA		2.24	
	CRate		2.10	
Harman's single-factor test	/	Variance explained by the first factor	34.70%	< 50.0%

Structural model assessment and hypothesis testing results

The structural model was estimated to use SmartPLS, and significance testing was conducted via bootstrapping with 5,000 resamples. In terms of model explanatory power, consumer emotional attachment (EA) achieved an R^2 value of 0.53, while consumer purchase conversion (CRate) achieved an R^2 value of 0.47. These values indicate that the model provides substantial explanatory power for both the mediating variable and the core outcome variable. With respect to predictive relevance, the Q^2 values were 0.36 for EA and 0.31 for CRate, both exceeding zero, thereby demonstrating acceptable predictive relevance of the model. Regarding overall model fit, the standardised root means square residual value was 0.061, which is below the commonly accepted threshold of 0.080, suggesting that the model exhibits a satisfactory level of fitness. A summary of these model quality indicators is provided in Table 4.

The structural path analysis reveals that streamer theoretical and professional expertise depth has a significant positive effect on consumer purchase conversion ($\beta = 0.21$, t = 3.62, p < 0.001), supporting H_1. Streamer empathic capability towards consumers also exerts a significant positive effect on purchase conversion ($\beta = 0.26$, t = 4.11, p < 0.001), supporting H2. In contrast, the density of commercial persuasive talk during livestreams has a significant negative effect on consumer purchase conversion ($\beta = -0.18$, t = 3.05, p = 0.002), supporting H_3.

The mediation analysis further indicates that streamer theoretical and professional expertise depth and empathic capability both significantly enhance consumer emotional attachment, which in turn exerts a significant positive indirect effect on purchase conversion. These results provide support for H_4 and H_5, respectively. Conversely, the density of commercial persuasive talk significantly suppresses consumer emotional attachment and generates a significant negative indirect effect on purchase conversion through emotional attachment, supporting H_6. In terms of effect patterns, all three mediation paths exhibit partial mediation, meaning that while the indirect effects are significant, the corresponding direct effects remain significant. The standardised path coefficients, t values, and significance levels for all hypothesised relationships are reported in Table 5. The bias corrected bootstrap confidence interval results for the mediation effects are presented in Table 6.

Table 4. Overall quality indicators of the structural model.

Category	Indicator	Value	Criterion	Result
Explanatory power	R^2 (EA)	0.53	≥ 0.25	Good
	R^2 (CRate)	0.47	≥ 0.25	Good

Category	Indicator	Value	Criterion	Result
Predictive relevance	Q^2 (EA)	0.36	> 0	Supported
	Q^2 (CRate)	0.31	> 0	Supported
Overall model fit	SRMR	0.061	< 0.08	Supported

Table 5. Summary of hypothesis testing results (Standardized path coefficients, Bootstrapping = 5,000, N = 310).

Hypothesis	Path	β	t	p	Conclusion
H_1	PD → CRate	0.21	3.62	< 0.001	Supported
H_2	EM → CRate	0.26	4.11	< 0.001	Supported
H_3	SD → CRate	-0.18	3.05	0.002	Supported
H_4	PD → EA → CRate	0.12	4.02	< 0.001	Supported
H_5	EM → EA → CRate	0.14	4.58	< 0.001	Supported
H_6	SD → EA → CRate	-0.07	2.78	0.006	Supported

Table 6. Confidence interval results for mediation effects (Bias-corrected, 95% CI).

Mediation path	Indirect effect	95% Confidence interval	Includes 0	Conclusion
PD → EA → CRate	0.12	[0.06, 0.19]	No	Mediation supported
EM → EA → CRate	0.14	[0.08, 0.22]	No	Mediation supported
SD → EA → CRate	-0.07	[-0.13, -0.02]	No	Mediation supported

Conclusion

The empirical results provide a clear response to Research Objective 1, indicating that streamer behavioural characteristics significantly influence consumer purchase conversion in skincare and beauty livestream commerce. Specifically, streamer theoretical and professional expertise depth has a significant positive effect on consumer purchase conversion, and streamer empathic capability likewise exerts a significant positive effect, whereas the density of commercial persuasive talk shows a significant negative effect on purchase conversion. Accordingly, H_1, H_2, and H_3 are supported. These findings suggest that in skincare and beauty, a category characterised by strong reliance on ingredient explanation and efficacy comprehension, conversion formation is not primarily driven by external promotional stimulation. Rather, it is more dependent on the streamer's capacity to provide professional explanations and the quality of interactive care. By contrast, when livestream communication overly highlights sales orientation, consumers are more likely to adopt a defensive interpretation, thereby suppressing conversion.

Furthermore, in relation to Research Objective 2, this study tested the mechanistic role of consumer emotional attachment and found that emotional attachment significantly mediates the relationships between all three types of streamer behaviour and purchase conversion. Specifically, streamer theoretical and professional expertise depth and empathic capability significantly enhance consumer emotional attachment and indirectly increase purchase conversion through emotional attachment, thus supporting H_4 and H_5. In contrast, the density of commercial persuasive talk significantly weakens consumer emotional attachment and indirectly inhibits purchase conversion through emotional attachment, thereby supporting H_6. All three mediation paths exhibit partial mediation, indicating that although

emotional attachment repreconversion; psychological channel through which streamer behaviours influence conversion, streamer behaviours also retain direct effects that do not depend on emotional attachment. Overall, the results also support the framework development aim articulated in Research Objective 3. The formation of purchase conversion in skincare and beauty livestream commerce can be understood as a process in which stream professionalism and empathic engagement provide the relational basis, emotional attachment consolidates psychological commitment, and conversion is subsequently facilitated, while an intensified use of commercial persuasive talk generates a dual inhibitory effect by undermining emotional bonding and directly suppressing conversion outcomes.

From an academic and theoretical perspective, this study provides a context specific extension and refinement to research on livestream commerce and consumer behaviour. Existing studies on livestream selling have largely focused on technological features, interaction frequency, price stimulation, or streamers' observable attributes. By contrast, discussions of the psychological mechanism through which streamers influence conversion outcomes via content and relationships remain relatively fragmented, and systematic analysis is particularly scarce for categories that are highly dependent on explanation. By positioning skincare and beauty livestream commerce as the research context, the study clearly distinguishes three behavioural cues with different psychological orientations, namely stream theoretical and professional expertise depth, empathic capability, and the density of commercial persuasive talk. By incorporating consumer emotional attachment, it demonstrates that streamer behaviours do not exert a simple direct influence on conversion. Instead, they shape consumer decision making progressively through relational psychological bonding.

Within the Stimulus Organism Response framework, this study extends emotional attachment beyond prior research that has primarily centred on brands or platforms and situates it in livestream contexts where the streamer functions as a salient carrier of consumers' affective bonds. In doing so, the study addresses a longstanding question in the literature, namely why conversion outcomes remain highly differentiated in livestream environments where high frequency interaction and strong stimulation coexist. The findings indicate that merely intensifying promotional stimulation does not stabilise conversion, and that neglecting professional credibility and affective bonding may instead reduce consumers' psychological engagement. This perspective offers a more explanatory theoretical lens for understanding the structural phenomenon of high traffic yet low conversion in livestream commerce.

From an industry and practical perspective, this study offers actionable implications for operational optimisation in skincare and beauty livestream commerce. The results show that improving conversion does not depend on the intensive deployment of commercial persuasive talk, but rather on whether streamers can establish stable affective connections through professional explanation and empathic interaction. This conclusion helps correct the prevalent industry tendency to substitute content quality with persuasive talk intensity and provides clear guidance for platforms, brands, and streamers in content design and talent development. For streamers, the findings imply that core competitiveness lies not in the speed of promotional pacing, but in the ability to translate professional knowledge into understandable and credible communication and to respond to consumers' authentic concerns during interaction. For brands and platforms, the results suggest that streamer selection and support should place greater emphasis on professional background and affective communication capability, rather than relying solely on short term conversion performance or script execution. More broadly, the identified pathway linking professionalism and empathy to emotional attachment and subsequently to purchase conversion provides practical justification for shifting from immediate conversion maximisation towards long term relationship building. This supports an industry transition from a short-term model characterised by high stimulation and low trust to a more stable and sustainable relationship-based business model in skincare and beauty livestream commerce.

At the streamer level, this study provides context specific implications. In skincare and beauty livestream commerce, purchase conversion is not primarily driven

by promotional intensity. Rather, it depends on whether streamers can consistently deliver professional explanations and affective responses that consumers find trustworthy and worth emotionally attaching to. Skincare and beauty products are associated with relatively high perceived usage risk and experiential uncertainty. Consumers enter livestream rooms largely to confirm whether a product fits their individual conditions, rather than merely to pursue price advantages. In this context, streamer theoretical and professional expertise essentially represents explanatory capability, namely whether the streamer can communicate ingredient mechanisms, efficacy logic, and applicability boundaries in a clear, comprehensible, and internally coherent manner. Meanwhile, empathic capability is not simply emotional echoing. It is reflected in the process of recognising, responding to, and alleviating consumers' anxieties and doubts. When streamers first understand consumers' genuine concerns and then reduce uncertainty through professional information, consumers are more likely to develop stable psychological bonds and, on this basis, complete conversion decisions. Accordingly, the core competitiveness of skincare and beauty livestream rooms lies not in the urgency of persuasive pacing, but in the trust, foundation jointly constructed by professional explanation and affective interaction.

From the perspective of brands, Multi-Channel Network (MCN) agencies, and operational teams, the findings indicate clear limitations in the prevalent industry practice of substituting content quality with high density commercial persuasive talk. The results suggest that excessive emphasis on sales orientation not only fails to sustain conversion improvements but may also weaken consumers' psychological engagement and relational identification. Therefore, in livestream operations, the use of commercial persuasive talk should be incorporated into a more cautious content governance framework, ensuring that promotional information serves decision support rather than exerting emotional pressure on consumers. More importantly, brands and agencies should gradually shift from evaluating livestream performance solely through immediate conversion metrics to assessing relational indicators, such as whether consumers are willing to stay longer, revisit livestream rooms repeatedly, and participate actively in interaction. Such behaviours reflect the accumulation of emotional

attachment and constitute a critical precondition for conversion to occur in a stable manner over time. Based on this logic, streamer training and content design should move beyond a narrow focus on script execution and instead systematically strengthen professional explanatory capability and empathic interaction capability, enabling livestream content to respond to consumer needs at both informational and affective levels.

At the platform governance level, the study further demonstrates that the widely observed phenomenon of high traffic but low conversion in skincare and beauty livestream commerce is not merely a consequence of intensified market competition. It is closely associated with content homogenisation, persuasive talk overload, and insufficient relationship building. This implies that platforms should recalibrate incentive structures in algorithmic recommendation and rule setting, placing greater emphasis on content quality and relationship quality. For skincare and beauty, a category that strongly depends on trust and explanation, platforms should establish clear standards to curb exaggerated promises and the proliferation of highly stimulating persuasive talk. Meanwhile concerns and allocation and resource support, platforms should prioritise livestream rooms that provide clear explanations, respond authentically to consumer concerns, and maintain long term interactive relationships. When platforms no longer rely solely on short term conversion or frequent promotions as core evaluation signals but instead guide the industry towards an operational logic that balances professional credibility with affective bonding, skincare and beauty livestream commerce is more likely to develop along a more stable and sustainable trajectory.

Despite its contributions, this study has limitations in research design and methodological choices that warrant further refinement in future research. First, the study relies on cross sectional self-reported questionnaire data to measure consumers' cognition, affective states, and conversion behaviour at a specific time point. Although common method bias was systematically addressed through both procedural remedies and statistical tests, the influence of subjective recall bias and imperfect contextual reconstruction cannot be eliminated. Consumers' evaluations of streamer expertise depth, empathic capability, and emotional attachment may evolve dynamically with viewing frequency, relationship

duration with the livestream room, or exposure to external information, yet cross sectional data cannot capture such developmental processes. Second, although the sample covers respondents with different genders, ages, education levels, and income groups, it was obtained primarily through convenience sampling. Moreover, the research context was confined to skincare and beauty livestream commerce in China, which may limit the generalisability of findings to other product categories or cultural markets. In addition, the study focuses on streamer behavioural characteristics and consumer affective mechanisms, without incorporating product objective attributes, pre-existing brand reputation, or platform institutional differences into the analytical framework. This may lead to a relatively simplified account of the mechanism underlying conversion formation.

Building on these limitations, future research can extend and deepen the findings in several directions. First, methodologically, subsequent studies may integrate longitudinal tracking data or experimental designs to examine how consumer emotional attachment forms through sustained interaction and how it influences repeat purchase and relationship stability. This would enable a more nuanced understanding of the dynamic mechanism through which streamer behaviours affect conversion. Second, future research may expand the scope to other categories characterised by high perceived risk or high involvement, such as health supplements, maternal and infant products, or high value durables, to test the boundary conditions of the proposed pathways. Comparative research across cultures or across platforms is also needed to explore the relative importance of professional expression and empathic interaction under different institutional environments and consumption cultures. Finally, future research could introduce additional variables into the existing framework, such as streamer authenticity, platform governance intensity, or algorithmic recommendation logic, to develop a more comprehensive explanatory model. Such efforts would offer more forward-looking support for both theoretical advancement and managerial decision-making regarding conversion behaviour in livestream commerce.

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Conflicts of Interest

The authors declare no conflict of interest.

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