



OPEN A study on the causes of viewers' non-continuous following intention in tourism live streaming

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With the advancement of digital technologies, tourism live streaming (TLS) has rapidly gained global popularity due to its real-time and interactive features, showcasing significant marketing potential. However, viewer retention remains a major challenge and a bottleneck for TLS development. This study first defined the concept and dimensions of alternative attractiveness in TLS through qualitative interviews. It then constructs an analytical framework based on the Push–Pull–Mooring (PPM) theory. It empirically tests how psychological contract breach, viewer-live streamer social distance, and alternative attractiveness influence viewers' non-continuous following intention (NCFI) in TLS. The findings reveal that these factors significantly impact NCFI. Customer complaining behavior mediates the relationship between psychological contract breach and NCFI, and perceived controllability positively moderates this relationship. This study provides a new theoretical perspective on understanding viewer attrition mechanisms and offers practical suggestions for TLS platforms and streamers to enhance viewer retention.

Keywords Tourism live streaming, Psychological contract breach, Social distance, Alternative attractiveness, Non-continuous following intention

With the rapid advancement of the internet and digital technologies, tourism live streaming (TLS) has emerged as a dynamic mode of information dissemination that surpasses traditional text and images. Unlike static information transmission, TLS leverages real-time interaction, enabling viewers to acquire instant tourism information while engaging with streamers¹. This interaction enhances viewers' awareness and emotional connection with tourism destinations, facilitating two-way communication and increasing immersion and participation². According to data from China Tourism Academy, 2020 was hailed as the “Year of Live Tourism,” with 26.3% of Chinese consumers watching live streaming of cloud tourism. The rapid rise of tourism streamers on short-video platforms like TikTok has demonstrated the immense potential of live streaming in tourism marketing³. For instance, Dong Yuhui's Lijiang tourism live streaming attracted 5 million viewers and generated over 50 million RMB in sales.

TLS has also shown rapid growth globally, not only in China. According to Streams Charts, in the third quarter of 2024, global viewers collectively watched 19.8 billion hours of live-streaming content, with YouTube leading as the dominant platform, demonstrating the broad reach of live streaming. In the Asia–Pacific region, Ctrip has established a new TLS center in Thailand, leveraging the country's mature live-streaming ecosystem and abundant resources for tourism content creation to attract international viewers successfully. In 2023, Ctrip launched its “Super Global Travel” live-streaming series in Thailand, selling over 20,000 hotel rooms and significantly boosting inbound tourism demand. Following this, similar live-streaming events in Tokyo, Singapore, Seoul, and Hong Kong further increased tourism demand in these regions. These examples highlight that TLS demonstrates significant marketing potential within the global tourism industry and has become a key tool for engaging viewers and driving tourism-related consumer behavior. It plays a crucial role in attracting target markets and enhancing industry competitiveness⁴.

TLS effectively shortens the psychological distance between viewers and destinations by integrating exploration, social interaction, and entertainment elements⁵. It stimulates sensory experiences and tourism desires, providing an innovative approach to scene-based marketing^{6,7}. However, despite its excellent performance in attracting viewers and driving sales, the success of TLS relies not only on content creativity and appeal but also on maintaining a strong and active viewer base. Any minor dissatisfaction or negative experience

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may lead to viewer attrition, which poses a significant challenge for TLS. Therefore, enhancing long-term viewer engagement and retention has become an urgent issue for live-streaming platforms and content creators to address.

TLS is an emerging research area that has gradually become a focus of academic attention. Existing studies mainly concentrate on aspects such as live streaming experiences^{8,9}, viewer attention behavior¹⁰, purchasing behavior^{11,12}, and tourism intentions¹³, exploring how live streaming enhances viewer interactivity and engagement to boost tourism intentions and purchasing behavior¹¹. These studies offer insights into the positive factors that drive sustained viewer attention. However, research addressing viewer retention remains insufficient despite its critical role in ensuring the sustainability and stability of live-streaming marketing effectiveness^{14,15}. Existing studies mainly focus on analyzing the drivers of continuous viewer attention, such as the interaction between live streamers and viewers⁸ and the impact of digital availability on impulsive consumption and viewer intentions¹⁵. However, there has been limited research on the reverse factors that lead to viewer disengagement. This gap in research has resulted in a lack of a comprehensive understanding of the mechanisms behind viewers' non-continuous following intention (NCFI), especially in terms of the negative factors contributing to viewer attrition. The factors influencing NCFI are complex and diverse, requiring more in-depth and systematic research to reveal the underlying mechanisms, thereby providing effective retention strategies for live-streaming platforms and content creators.

This study applies the Push–Pull–Mooring (PPM) theory to address this research gap. This study explores the impact mechanisms of the push, pull, and mooring dimensions on viewers' NCFI by developing a research framework through a literature review and in-depth interviews. The research not only helps fill the gap in the academic literature regarding viewer attrition and retention rates but also provides practical guidance for live-streaming platforms, content creators, and tourism practitioners. It will help them better understand and address the issue of viewer retention, thereby enhancing the market competitiveness of live-streaming content and increasing viewer loyalty and engagement.

Literature review

Conceptual connotations of TLS

As an interactive media form relying on digital platforms, TLS offers a unique tourism experience through live audiovisual content. It emphasizes immersive destination experiences, including local food and culture, stimulating viewers' interest in visiting the destination in person^{15,16}. Overcoming spatial limitations and enhancing authenticity and interactivity increase viewers' sense of participation and social interaction and effectively promote the destination⁸. The academic definition of TLS is still evolving. Hilvert-Bruce et al.¹⁷ describe it as an internet-based multimedia entertainment form emphasizing real-time interaction between streamers and viewers. Meanwhile, Su et al.⁹ focus on the role of tourism streamers in highlighting destination features and stimulating viewer participation.

TLS relies on digital platforms, such as YouTube, Instagram, and TikTok, which provide technical support and interactive spaces for tourism-related live streaming and have become the core medium for showcasing tourism content⁵. Platforms refer to internet-based digital spaces that provide the technological foundation for real-time interaction, information exchange, and social functions between content creators and viewers^{18,19}. This study views TLS as a way to showcase tourism scenes vividly using digital platforms. By offering immersive virtual tourism experiences, TLS can enrich viewers' engagement and enhance their loyalty and retention. Additionally, it effectively increases the visibility and promotional impact of destination services.

The literature review of viewer behavior in TLS

Research into TLS viewer behavior primarily examines the drivers behind viewing, touring, and purchasing decisions. Liu et al.²⁰ identified key motivational factors, including social belonging, media engagement, and relaxation, that shape viewers' viewing motives through interviews and empirical research. Studies suggest that live streaming offers a dynamic, interactive visual experience that differs from static visual media^{5,13}, allowing viewers to virtually follow the trajectory of tourists in real-time and stimulating "online unconscious motives."

Tools like the Stimulus-Organism-Response model and motivation theory have been employed to study tourists' engagement with tourism and purchasing motives. Li et al.²⁰ found that customer participation enhances purchasing intentions, while Zhang et al.¹³ noted that destination image and interaction can build trust and influence tourism intentions. Additionally, the unique features of tourism e-commerce live streaming—interactivity, authenticity, and entertainment—along with traffic experience and trust positively influence purchasing intentions²⁰. Yu and Xie⁶ discovered that entertainment atmosphere and celebrity appeal in tourism e-commerce could boost viewer purchasing intentions via place attachment.

Despite these findings linking live streaming features to viewer motives, current research fails to explain the reverse perspective of why viewers disengage from live streaming. A holistic theoretical model to account for non-continuation behavior is missing, and there is a dearth of empirical studies on this aspect, hindering a thorough comprehension of viewer behavior complexity in TLS.

Research on NCFI

Definition of NCFI

In TLS, viewers' attention behavior is a one-way participation process that does not require approval from the streamer¹⁶. Habits often drive this shift in participation mode and can lead to discontinuous use or self-regulation behaviors, similar to NCFI²¹. However, NCFI in TLS has specific characteristics distinguishing it from disengagement behaviors on other social media platforms. Specifically, NCFI in TLS differs significantly from disengagement behaviors on traditional social media regarding non-continuous following motivation, tolerance for non-instant interaction, and expectations for personalized feedback. Detailed content is presented in Table 1.

Based on the above characteristics, NCFI in TLS mainly manifests as viewers reducing their watching time, unfollowing, or switching to other live-streaming channels when they perceive that the content does not meet their expectations or that the interactive experience is poor. These behaviors reflect viewers’ psychological and behavioral changes under high interaction costs and personalized needs.

The literature review of NCFI

Research on social media NCFI investigates viewer detachment, usage cessation, or platform-switching behaviors. Findings suggest that reciprocity²³, information overload²⁴, and viewer exhaustion²¹ influence social media engagement. Viewer transfer studies differentiate between migrations between various media and shifts between products or services within the same platform. For instance, Hsieh et al.²⁵ examined the transition from blogs to microblogs. Kwak et al.²⁶ identified information, relationship longevity, reciprocity, and network overlap as key factors in microblog viewer migration. Zhang et al.²⁷, from a social exchange perspective, argued that perceived costs and benefits drive NCFI on WeChat subscriptions.

However, research on NCFI in TLS remains under-researched. Unlike other live content formats, TLS focuses on environmental interaction, destination showcasing, and viewer engagement with tourist experiences, cultivating a community around shared interests rather than purely transactional interactions^{2,15}. This distinct context calls for in-depth exploration into the determinants of NCFI specific to TLS.

PPM theory

The PPM theory provides a comprehensive explanatory framework for forming individual behavioral intentions by identifying push, pull, and mooring factors that influence behavior change²⁸. This theory has been widely applied in marketing management and has been further extended in the field of information technology. For example, Fu et al.²⁹ studied Facebook user churn by considering fatigue and dissatisfaction as push factors while viewing personal norms and habits as mooring factors. Tang et al.³⁰ developed a non-continuous motivation model for the brand Weibo, with information quality and service as push factors, alternative attractiveness as pull factors, and perceived non-compliance costs as mooring factors. Zhang et al.³¹ used the PPM theory to analyze bloggers’ switching intentions, identifying viewer satisfaction as the main push factor, alternative services as pull factors, and switching costs as mooring factors. These studies indicate that the PPM theory is adaptable to various contexts and helps analyze complex user behavior shifts.

This study uses the PPM theory as a theoretical framework to analyze NCFI in TLS, demonstrating its applicability in several aspects. First, the PPM theory helps integrate the influence of various stakeholders, especially the original live-streaming accounts, alternative live-streaming accounts, and individual viewers. These factors shape viewers’ behavior and affect their retention through push, pull, and mooring mechanisms^{2,32}. Second, the PPM theory can explain the effects of these various influencing factors on forming NCFI, such as positive promotion or negative hindrance. This analytical framework helps uncover the distinct roles of each stakeholder and their combined effects on viewer behavior, making it particularly suitable for the complex behavioral patterns of viewers in the TLS industry. Finally, the PPM theory considers external situational factors. It incorporates the viewers’ internal psychological factors³³, scientifically explaining how factors like content preferences, interactive experiences, and personalized live-streaming matching collectively influence NCFI. This multi-stakeholder and multi-effect-based analysis approach aligns well with the complexity of viewer behavior in TLS, offering more comprehensive strategic guidance for practical operations.

In conclusion, the PPM theory provides a solid theoretical foundation for this study. It can integrate multidimensional factors while capturing the high dynamism and individual psychological drivers unique to TLS. Its application helps to better understand behavioral shifts in the TLS context and provides theoretical support and practical insights for related research and practice.

Influence factors of NCFI in TLS

By reviewing the literature and observing reality, this study identifies the potential influencing factors: psychological contract breach³², viewer-live streamer social distance³⁴, alternative attractiveness³⁵, customer complaining behavior³⁶, and perceived controllability³⁷. Based on the PPM theory, the above factors are classified to analyze the causes of NCFI in TLS as systematically as possible.

Comparison dimensions	NCFI in TLS	Disengagement on traditional social media
Non-continuous following motivation	Influenced by factors such as preferences for types of tourism destinations (e.g., natural landscapes, cultural sites) and tourism styles (e.g., road trips, cycling)	This is mainly due to broad interest differences, such as changes in areas like beauty, fashion, and other fields
Tolerance for non-instant interaction	Lower tolerance for non-instant interactions, such as when live-streamed real-time communication is not promptly responded to, which may lead to viewer’s NCFI	Higher tolerance for non-instant interactions, as delayed responses to comments typically do not lead to disengagement
Expectations for personalized feedback	Higher expectations for personalized feedback, such as when one-on-one responses during a live streaming are not provided, potentially triggering viewer’s NCFI	There are lower expectations for personalized feedback, as users are usually willing to accept viewing other comments to resolve their doubts, which does not lead to disengagement

Table 1. Comparison of NCFI in TLS and disengagement on traditional social media. Compiled based on Qaisar et al.²², Liang et al.¹⁶, Le and Chen²¹. Tolerance for non-instant interaction is primarily compared from the time dimension, referring to the viewers’ tolerance for non-instant interactions during the TLS. In contrast, expectations for personalized feedback focus on the content dimension, referring to the viewers’ level of expectation for personalized and customized feedback.

Push factors

Psychological contract breach

Psychological contract breach is a key push factor influencing viewers' NCFI in TLS. This violation occurs when viewers form negative perceptions of their live-streaming experience³². Rousseau first proposed the concept of psychological contract³⁸, suggesting that when consumers feel that a service provider has failed to fulfill an implicit agreement, a violation occurs, leading to a decline in loyalty. Due to the complexity of psychological contracts, unmet expectations increase the likelihood of contract violation³⁹.

Psychological contract breach consists of transactional and relational psychological contract breach⁴⁰. A transactional psychological contract breach refers to situations where there is a violation or failure to meet expectations in the economic exchange between viewers and streamers. Specifically, in TLS, a streamer may recommend a product from a tourist destination during a live session, claiming it is high quality and unique. However, if viewers purchase the product and find its quality is subpar and does not match the streamer's description, they may feel deceived, leading to a crisis of trust. Furthermore, suppose viewers purchase tourism products or tickets through the live-streaming platform and later discover that the prices are higher than those on other platforms. In that case, they may believe that the streamer has failed to fulfill their promise of offering "discounts and convenience," which further diminishes trust in the streamer.

On the other hand, a relational psychological contract breach refers to the breakdown of trust and reciprocal relationships between viewers and streamers on a social and emotional level⁴⁰. For example, an emerging streamer may initially establish sincere and intimate interactions with viewers, presenting a humble and relatable image that fosters a sense of connection. However, as the streamer's popularity grows, they may exhibit an arrogant attitude, reducing or neglecting interactions with viewers. This shift can create a sense of increased social distance, leading to disappointment and a crisis of trust.

In TLS, a psychological contract breach significantly undermines viewers' trust in the streamer, and trust is crucial for maintaining continuous viewer engagement. Viewers may reduce their viewing frequency and switch to alternative content when a violation occurs, further destabilizing the live streaming ecosystem^{36,40}.

Customer complaining behavior

Scholars generally consider customer complaining as a part of service failure, referring to the actions or non-actions displayed by customers due to dissatisfaction⁴¹. In the context of TLS, customer complaining behavior can be defined as a series of behavioral or non-behavioral reactions triggered by perceived dissatisfaction during the viewing process of TLS viewers³⁶.

Perceived controllability

Perceived controllability is crucial for consumers to assess service failure causes, indicating their belief in the manageability of service issues⁴². In TLS, operators facilitate vibrant tourism product presentations and foster trust between live streamers and viewers. Perceived controllability pertains to viewers' views on live streamers' power to prevent a psychological contract breach. High perceived controllability suggests that viewers attribute live streaming failures to the streamers' lack of ability, believing that the streamer possesses the necessary conditions and capabilities to avoid failure. Conversely, when the perceived controllability is low, viewers are more likely to attribute live streaming failures to external factors beyond the streamer's control, considering these factors to be outside the streamer's capacity to manage and thus assigning only secondary responsibility to the streamer³⁷.

Mooring factor: viewer-live streamer social distance

Per the PPM theory, mooring factors are personal or social elements that can sway viewer behavior³², impacting NCFI despite evident push and pull factors. In TLS, the viewer-live streamer social distance characterized by similarity, familiarity, and closeness can shape viewers' connections to the content⁴³. Originally denoting social class disparities, social distance now informs research on norms, emotions, and interactions. Helfgott and Gunnison⁴³ interpret social distance emotionally, while Liviatan et al.⁴⁴ suggest that familiarity fosters identification. Thus, as a measure of similarity, social distance influences interpersonal closeness. This study examines the viewer-live streamer social distance to understand its role in interaction and as a mooring factor in NCFI.

Pull factor: alternative attractiveness

In TLS, the pull effect is the allure that draws viewers to engage with different live streamers. Alternative attractiveness significantly influences viewers' propensity to switch, with limited options leading to continued viewing of the current live streamer⁴⁵. Ping⁴⁶ regarded alternative attractiveness as consumers' evaluation of choices, while Jones et al.⁴⁷ considered it to reflect viewers' positive attitudes toward competitive substitutes in the market. Dai and Deng⁴⁸ pointed out that alternative attractiveness is the degree to which viewers are attracted to other platforms that provide similar functions while using the current service. Therefore, this study defines the alternative attractiveness of TLS as the satisfaction viewers gain by following other TLS⁴⁹.

Study I: the attribute dimensions of alternative attractiveness in TLS

This study performed with relevant guidelines. The concept of alternative attractiveness in TLS remains underexplored, with a deficiency in measurement tools. At the same time, it has been characterized by various dimensions in other research areas, such as cost, variety, and service quality in online retail⁵⁰. Its application in live streaming requires further investigation due to its distinct features like shared interests^{5,15}, immersive experiences, and interactive depth.

Study I aims to identify the attributes of alternative attractiveness unique to TLS. Employing qualitative methods and utilizing Nvivo.11 for data coding, this study seeks to establish a basis for accurately measuring and applying alternative attractiveness in future research, enhancing our understanding of how viewers perceive the allure of alternative TLS.

Data sources

This study’s data collection combined face-to-face and online interviews. Participants were viewers who had long followed specific TLS streamers and had strong language skills. The platforms involved in the interviews included WeChat, Xiaohongshu, and Douyin. Participants were recruited by joining fan groups, interacting with related social media posts, and utilizing snowball sampling. This recruitment method effectively targets viewers with extensive experience in watching TLS, ensuring they have a deeper understanding of TLS and providing more reliable and high-quality data support for the study.

The sample selection followed the principles of qualitative research, emphasizing the depth of the sample and data saturation⁵¹. We selected individuals with a deep understanding and personal experience of TLS, particularly those who had initially followed a specific streamer and later transitioned to following other streamers (for example, from following “Fang Qi Kiki” to following “Planet Research Institute”). Participants’ ages ranged from 20 to 47 years, and their professional backgrounds included students, teachers, and employees of private enterprises. Approximately 87.5% of the respondents held a university degree or higher. Regarding gender, 41.6% were male and 58.4% were female. Thus, the sample represents gender, age, and professional background (see Table 2).

However, snowball sampling may lead to insufficient representativeness of the sample in specific characteristics, as it may be biased toward participants with more closely connected social networks, thus affecting the diversity of the sample⁵². To address this issue, the researchers focused on sample heterogeneity during the initial design phase by engaging with multiple fan groups of different streamers and conducting extensive online social interactions to encompass a more diverse range of viewers. Additionally, theoretical saturation was strictly followed during data collection, meaning data collection ceased when no new insights were provided^{51,52}, to maximize sample diversity and the credibility of the research conclusions.

The interview guide was developed based on extensive live-streaming observation and literature review and was refined after initial interviews with three experienced participants. The study was conducted from March 2 to April 28, 2023, and involved 24 participants. The interviews primarily focused on recalling viewing experiences, evaluating the attractiveness of live-streaming and streamers, and assessing live-streaming quality standards. The interviews followed a semi-structured format, with questions covering participants’ tourism

No	Gender	Age	Education background	Occupation	Frequently watched TLS accounts
T1	Female	26	Bachelor’s degree	Secondary school teacher	Fang Qi Kiki Xi’an Travel Zhang Zheng
T2	Female	27	Bachelor’s degree	Primary school teacher	Da Long Is Here
T3	Female	27	Master’s degree	Secondary school teacher	Chongqing Travel A Xin
T4	Female	26	Master’s degree	Student (currently enrolled)	Fang Qi Kiki
T5	Female	25	Bachelor’s degree	Private company employee	Fang Qi Kiki Planet Research Institute
T6	Male	37	Doctoral degree	University teacher	Lei’er Josh Watches the World
T7	Male	25	Bachelor’s degree	State-owned enterprise employee	Adventure Lei Detective
T8	Male	26	Bachelor’s degree	State-owned enterprise employee	Xu Yun Wanders China
T9	Male	27	Master’s degree	Student (currently enrolled)	Dreamer Japaul
T10	Female	32	Bachelor’s degree	Foreign company employee	Putuo Mountain Little Handsome
T11	Male	24	Master’s degree	Student (currently enrolled)	East Buy
T12	Female	24	Master’s degree	Student (currently enrolled)	Dong Jun Xiao Yu
T13	Female	25	Bachelor’s degree	Bank employee	Captain Han’s Drift Journey
T14	Female	28	Master’s degree	University teacher	Xiamen Abo
T15	Female	26	Bachelor’s degree	Foreign company employee	Lvxing
T16	Male	24	Master’s degree	Student (currently enrolled)	Hu Yuanxing
T17	Male	26	Bachelor’s degree	Freelancer	Baikal A Nan
T18	Male	25	Bachelor’s degree	Entrepreneur	Fang Qi Kiki
T19	Female	20	Associate degree	Student (currently enrolled)	Wan Laifu
T20	Female	25	Bachelor’s degree	Civil servant	Fang Qi Kiki
T21	Male	25	Associate degree	Foreign company employee	Muqi
T22	Male	44	Doctoral degree	University teacher	Xi’an Travel Zhang Zheng
T23	Female	47	High school	Foreign company employee	50-Year-Old Aunt’s Self-Driving Tour
T24	Female	35	Doctoral degree	Student (currently enrolled)	Guo Youcai

Table 2. Basic information of participants (N = 24).

experiences, live-streaming viewing habits, preferred streamers, viewing durations, reasons for ceasing to watch, and motivations for switching to other streamers.

After the interviews, all recordings were transcribed, and a portion of the data was randomly allocated for coding (2/3) and saturation checks (1/3) to ensure comprehensive and in-depth data analysis. The average duration of each interview was 40 min, and approximately 180,000 words of interview text were generated.

Text analysis

Open coding

This study employed open coding to initially analyze interview data, meticulously examining responses from 2/3 of participants. Through line-by-line analysis and labeling, conceptual categories were identified, and similar elements merged into broader themes. After filtering out rare and contradictory concepts, the study culminated in 35 distinct concepts and 21 coherent categories (Table 3).

Axial coding

Axial coding involves cluster analysis, exploring the relationships between each category and establishing connections among different categories. As the relationships become clear, subcategories and main categories are formed, as shown in Table 4.

Through logical analysis, this study identified nine subcategories: professionalism, credibility, charisma, visual pleasure, auditory pleasure, emotional resonance, timeliness, freshness, and diversity, and three overarching categories: competence of tourism live streamers, enjoyment of tourism viewing, and attractiveness of tourism topics.

Selective coding

Selective coding was applied to distill a central category that encapsulates the primary themes, culminating in the refinement of “alternative attractiveness” as the core concept, supported by three key dimensions: competence of tourism live streamers, enjoyment of tourism viewing, and attractiveness of tourism topics.

The competence of tourism live streamers is defined by live streamers’ professional qualities, such as knowledge, integrity, and humor, which captivate viewers and build trust. In an increasingly standardized industry, these attributes secure more excellent viewer favor. Live streamers like Dong Yuhui, lauded for “knowledge-based sales” and recognized as a “cultural live streamer,” have attracted a significant following by providing informative and culturally rich content, as opposed to those who rely on empty sensationalism.

Enjoyment of tourism viewing refers to the satisfaction and pleasure viewers experience from live streaming, which provides more than information and shopping. It offers a comforting “cloud tourism” experience. The interactive elements of these streams, engaging viewers visually, audibly, and emotionally, can immerse viewers and enhance their willingness to continue following. However, poor-quality streamers can prompt viewers to seek more enjoyable alternatives, as seen in cases where viewers have switched due to unsatisfactory video quality.

The attractiveness of tourism topics reflects the relevance of streaming content to viewers’ interests. Content that consistently engages viewers encourages long-term following, while repetitive or monotonous content can lead to disinterest and a quest for diverse and trending streams. Viewers may tire of streams featuring similar attractions and seek a variety of destinations to sustain their interest.

Theoretical saturation check

This study, through the coding analysis of the remaining 1/3 of the interview materials, confirmed that the three attribute dimensions of alternative attractiveness in TLS (competence of tourism live streamers, enjoyment of tourism viewing, and attractiveness of tourism topics) have reached theoretical saturation, without revealing new categories or concepts.

Study II: quantitative analysis of the causes of NCFI in TLS

Research hypotheses

Viewers’ NCFI in TLS mainly manifests as viewers reducing their watching time, unfollowing, or switching to other live-streaming channels. The PPM theory consolidates factors into push, pull, and mooring effects, influencing the viewers’ decision to follow. This study, grounded in PPM theory and informed by in-depth interviews, has delineated the dimensions of alternative attractiveness and developed a model encompassing push (psychological contract breaches), pull (alternative attractiveness), and mooring (viewer-live streamer social distance) factors, as depicted in Fig. 1.

Hypotheses related to push factors

- (1) The impact of psychological contract breach on NCFI

The success of TLS hinges on sustained viewer engagement, which is governed by an unwritten psychological contract encompassing transactional and relational aspects. According to social exchange theory, unmet expectations can lead to the termination of relationships and provoke negative responses, altering cognition, emotions, attitudes, and behavior and potentially leading to disloyalty and adverse actions^{40,53}. Thus, when viewers perceive a psychological contract breach in TLS, it may erode trust and incite negative sentiments, increasing the likelihood of discontinuing their followership. Therefore, the following hypotheses are proposed:

Initial category	Initial concept	Interview raw sentences
A1 Knowledge reserve	a1 Rich industry jargon	He can describe the beautiful scenery with rich language and different levels of emotional change, unlike other live streamers who say, "Beautiful! Very beautiful!"
	a2 Profound cultural accumulation	The live streamer has a profound cultural accumulation of geography and history, understands rare characters of inscriptions and stone carvings, and has a unique entry point for introducing tourist destinations, from which I can learn much obscure knowledge
A2 Itinerary planning ability	a3 Convenience of itinerary planning	Previously, I wanted to take my baby Guoguo out to play and follow him. He helps fans with strategies, including tourism routes, transportation methods, and accommodation recommendations, which is convenient for me
	a4 Reasonableness of itinerary planning	The products in his live-streaming window are very suitable for me. The itinerary is not rushed, and he truly considers the tourists instead of just trying to sell more products
A3 Attraction recommendation ability	a5 Accuracy of attraction recommendation	His live-streaming viewers are mainly single women over 28 years old, which can more delicately meet my needs
	a6 Timeliness of attraction recommendation	She live streams at a fixed time every day at the scenic spot, patiently informing fans about recent outfit recommendations, the weather conditions, and the transportation options around the area
A4 Price credibility	a7 Stable prices	The product prices in his live streaming are stable, unlike some live streaming, which are 4999 today and 3999 a month later, which are too unstable
	a8 Low prices	The product prices in his live streaming have always been very low, which left a deep impression on me
A5 Content credibility	a9 High originality of content	Many live streamers plagiarize copywriting and themes, but she has always insisted on originality and creation, and the spirit is commendable
	a10 Few live advertisements	I hate those live streamers who start live streaming with products without telling a few stories and scenes
A6 Product credibility	a11 Credible products	Some live streamers talk about many of the tour's benefits in their live streaming, but their detail pages do not list them, making them hard to believe. However, these live streamers' detail pages are always particular and detailed
A7 Enthusiasm	a12 Tourist interaction	She is very sociable and always seeks out tourists to engage in conversation
	a13 Interaction with residents	She can speak various dialects and is good at communicating with residents, which is very strong
	a14 Viewer interaction	He is hot at heart, always able to talk eloquently, and his expressions consider the viewer's emotions
A8 Sincerity	a15 Sincerity	Last time, during live streaming, a fan brushed a big navigation, and he was very embarrassed, feeling that they did not know each other and that it was too precious
A9 Humor	a16 Humor	I usually relax by watching TLS, and I like interesting live streaming. He is good at telling jokes and is very funny
A10 Picture quality	a17 Equipment quality	Today, the TLS's quality is generally not very high, but his live streaming differs. The shooting equipment and various camera movements are at the master level
	a18 Composition effect	I hate some live streaming with many tourists entering the frame or other things entering, which lack aesthetics. His live-streaming composition is very particular and not too casual
A11 Attraction quality	a19 Natural scenery	The scenery in the live-streaming is stunning. Once, I saw the sunset at the Golden Mountain, which shocked me!
	a20 Buildings	I have seen many uniquely shaped buildings in his live streaming
A12 Live streamer image	a21 Image and temperament	I like him because he is very simple, straightforward and handsome! No way to resist
A13 Live streamer's voice	a22 Outstanding voice timbre	The live streamer's voice is captivating and enjoyable to hear
	a23 Smooth speech rate	He is gentle, speaking slowly and methodically. I like listening to him talk
A14 Background music	a24 Moderate volume	His live streaming gives people a very comfortable feeling and healing, unlike some live streaming, which is noisy and rowdy, a group of people making a fuss, feeling very noisy and harsh to the ear
	a25 Slow rhythm	His live streaming usually matches some very relaxing music, like the previously popular background music for "Going to a Place with Wind," which matches the beautiful scenery well
A15 Value consistency	a26 Cultural value consistency	This live streamer has a pair of eyes that can discover beauty. Through live streaming, he brought the cultural relics of the Forbidden City to life, and his camera also let me see many scenes that I had been to but had not seen
	a27 Consistency in life philosophy	Some live streamers conduct TLS purely for money, so they will keep bringing products. However, he is different. Making money is not his only purpose. He enjoys sharing beautiful scenery with everyone and enjoys the interaction and dialogue with our fans
A16 Emotional projection	a28 Positive emotions	I can feel her love for the tourism career and enjoy it. It is super infectious and can stimulate my passion and interest in life
	a29 Stable emotions	He is very patient, answering the barrage of questions tirelessly, and his stable emotions make me very comfortable. I like him
A17 Emotional similarity	a30 Similar emotional direction	She bravely lives out herself, daring to choose such a life. I like it very much and yearn for it
	a31 Similar emotional intensity	He is one of the few bloggers who rides bicycles to Tibet. Even through the live streaming, I can feel his hardship, but he still insists, which powerfully moves me and strengthens my confidence in riding a bicycle to Tibet
A18 Timeliness	a32 Timeliness	I like to follow trends. He can always keep up with them. Although I have to work every day, I can pretend to check in at any time by following him
A19 Popularity	a33 Popularity	The recent Zibo barbecue is very popular. Watching him eat made me crazy
A20 Freshness	a34 Freshness	I like him to go to some niche places
A21 Diversity	a35 Diversity	His live streaming is about scenery and stories. Whenever I hear fascinating stories, such as sweet or tragic love stories, they suit my taste

Table 3. Examples of initial concepts and categories formed by open coding.

Main category	Subcategory	Initial category
C1 Competence of tourism live streamers	B1 Professionalism	A1 Knowledge reserve; A2 Itinerary planning ability A3 Attraction recommendation ability
	B2 Credibility	A4 Price credibility; A5 Content credibility; A6 Product credibility
	B3 Charisma	A7 Enthusiasm; A8 Sincerity; A9 Humor
C2 Enjoyment of tourism viewing	B4 Visual pleasure	A10 Picture quality; A11 Attraction quality; A12 Live streamer image
	B5 Auditory pleasure	A13 Live streamer's voice; A14 Background music
	B6 Emotional resonance	A15 Value consistency; A16 Emotional projection A17 Emotional similarity
C3 Attractiveness of tourism topics	B7 Timeliness	A18 Timeliness; A19 Popularity
	B8 Freshness	A20 Freshness
	B9 Diversity	A21 Diversity

Table 4. Subcategories and corresponding main categories are formed by axial coding.

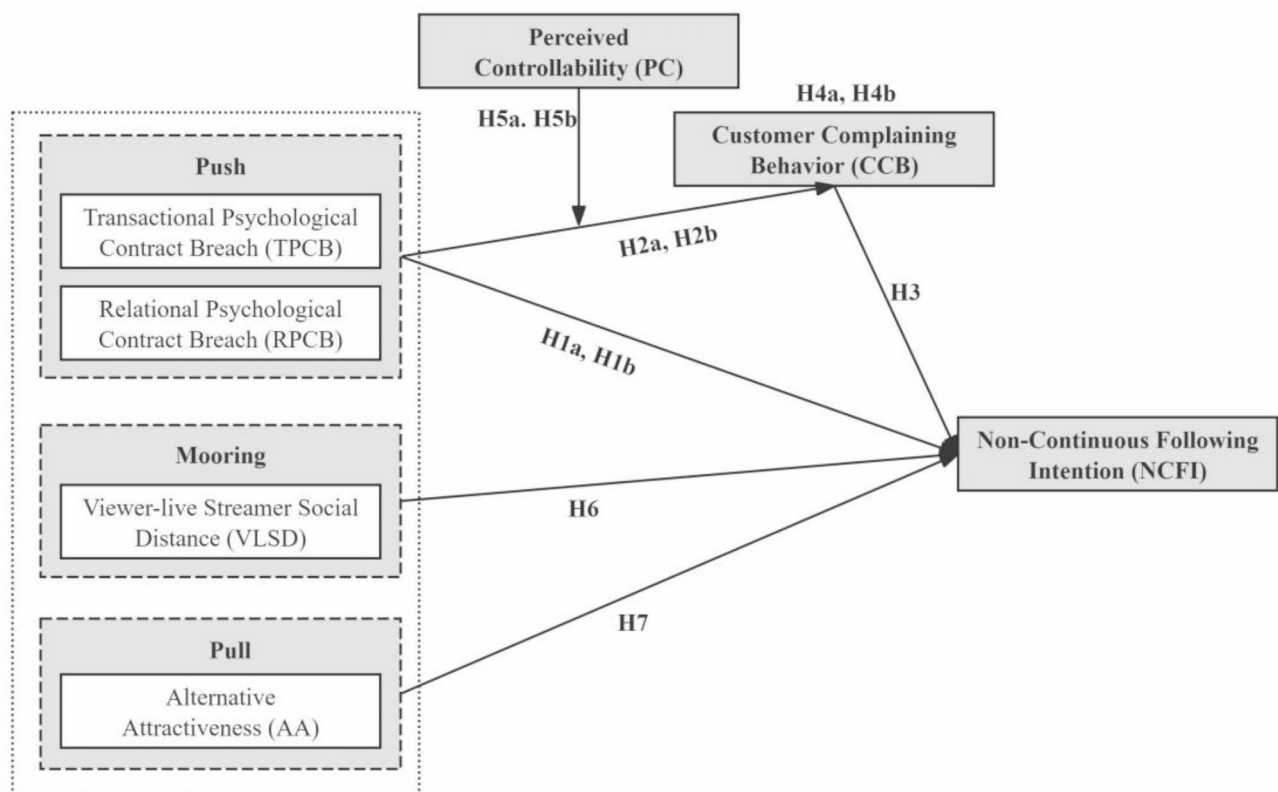


Fig. 1. Research model of causes of NCFI in TLS based on PPM theory.

H1a Transactional psychological contract breach is positively related to viewers' NCFI in TLS.

H1b Relational psychological contract breach is positively related to viewers' NCFI in TLS.

(2) The impact of psychological contract breach on customer complaining behavior

Research on customer-enterprise relationships has increasingly focused on the behavioral consequences of psychological contract breaches. Bavik et al.⁵⁴ propose that a psychological contract breach of perceived service quality can significantly impact tourists' satisfaction and word-of-mouth. Bavik et al.⁵⁵ note a positive correlation between such breaches and various customer complaints, with increased severity of the breach escalating the propensity for complaining behavior. These findings imply that unmet expectations in live streaming can provoke viewer complaints. Consequently, the study proposes the following research hypotheses:

H2a Transactional psychological contract breach is positively related to customer complaining behavior.

H2b Relational psychological contract breach is positively related to customer complaining behavior.

(3) The impact of customer complaining behavior on NCFI.

Enterprises risk incurring customer dissatisfaction through their products or services, potentially sparking a range of complaints as customers seek redress or express their grievances. Research indicates that such complaining behavior is linked to a customer's likelihood to switch providers and often precedes their disengagement^{2,56}. Huang and Ma³⁶ discovered that direct customer complaints can enhance repurchase intentions, whereas private complaints tend to diminish them. Disgruntled viewers in the online TLS market can swiftly identify alternatives and divert their focus¹⁴, suggesting that complaining behavior could foster an intention to discontinue following. Consequently, the study proposes the research hypothesis:

H3 Customer complaining behavior is positively related to viewers' NCFI in TLS.

(4) The mediating effect of customer complaining behavior on the relationship between psychological contract breach and viewers' NCFI in TLS

In TLS, viewers exhibit psychological contract breaches primarily in transactional and relational facets. Service failures can prompt viewers to feel betrayed, leading to dissatisfaction and disappointment, and they often articulate this through complaints, potentially impacting their future engagement⁵⁷. Research reveals that customers frequently opt for complaint behavior rather than silence post-breach, influencing their withdrawal intentions⁴⁰. With these insights, the study proposes the following research hypotheses:

H4a Customer complaining behavior mediates the relationship between transactional psychological contract breach and viewers' NCFI in TLS.

H4b Customer complaining behavior mediates the relationship between relational psychological contract breach and viewers' NCFI in TLS.

(5) The moderating effect of perceived controllability on the relationship between psychological contract breach and customer complaining behavior.

In TLS, the relationship between viewers and live streamers transcends the traditional buyer–seller dynamic, focusing on shared experiences and community enhancement²⁰. When live streaming services encounter problems, viewers may perceive a psychological contract breach. However, due to their emotional and time investment, viewers often seek reasons to continue their engagement. A key element in this process is perceived controllability during a crisis, an essential component of attribution theory⁵⁸.

Weiner's attribution theory suggests that viewers, as rational information processors, are influenced by causal inferences⁵⁹. If viewers believe an issue is within the operator's control, it may trigger negative emotions and defensive actions, such as reduced trust or purchase intent⁶⁰. In TLS, viewers assess the live streamer's responsibility and accountability in the event of a breach. If they view the live streamer as responsible and capable but inactive, this can provoke negative emotions and lead to complaints^{37,61}. Thus, increased controllability may exacerbate viewer complaints. Based on these insights, the study proposes the following research hypotheses:

H5a The relationship between transactional psychological contract breach and customer complaining behavior is positively moderated by perceived controllability.

H5b The relationship between relational psychological contract breach and customer complaining behavior is positively moderated by perceived controllability.

Hypotheses related to a mooring factor

Customer relationship management research indicates that strong brand or enterprise relationships can mitigate the negative effects of product failures⁶². Social distance, measuring interaction, communication, and closeness, influences individual interpretations and perceptions of others⁶³. Liberman et al.³⁴ propose that social distance levels affect the depth of information processing and psychological responses, including attitudes and moral judgments. A smaller social distance encourages consideration of context, relaxed moral criteria, and increased tolerance for unethical actions⁶⁴, while a more significant social distance emphasizes broader moral principles and higher moral expectations⁶⁵. Therefore, closer social bonds in TLS may enhance viewer tolerance and loyalty. Based on this, the study proposes the following research hypothesis:

H6 Viewer-live streamer social distance is positively related to viewers' NCFI in TLS.

Hypotheses related to a pull factor

The research utilized Nvivo.11 to dissect interview data, pinpointing three critical dimensions influencing viewers' intentions to stop following TLS: competence of tourism live streamers, enjoyment of tourism viewing, and attractiveness of tourism topics. Studies suggest that viewers are inclined to stay with current relationships when satisfied and confronted with unappealing alternatives⁶⁶. However, the emergence of formidable rivals

can undermine viewer loyalty⁶⁷. In social networking platforms³⁵ and social media¹⁸, the allure of alternatives significantly impacts viewers' inclination to switch, diminishing their intent to persist with existing platforms. Xie et al.⁶⁸ observed a similar trend with tourism booking sites, where alternative attractiveness decreased viewers' continued engagement. Consequently, the study proposes the following research hypothesis:

H7 Alternative attractiveness is positively related to viewers' NCFI in TLS.

Research sample

This study recruited TLS enthusiasts through private messages or comments on platforms such as Douyin, Ctrip, and Mafengwo and identified relevant bloggers using keywords on Xiaohongshu and Weibo. A snowball sampling method was applied through social network platforms to select the sample. The survey was conducted from May 15 to August 13, 2023, with 437 questionnaires distributed and 391 valid responses received, resulting in an effective response rate of 89.47%. According to the sample's descriptive statistics, the majority of respondents were aged between 20 and 29 years, accounting for 59.60%, and 54.73% of the respondents were female.

Regarding occupation, students and employed individuals comprised 38.36% and 58.83%, respectively. The educational background of the respondents was relatively high, with 69.05% holding a bachelor's degree or higher. Regarding the number of tourism bloggers, most respondents followed three or more bloggers, accounting for 61.64%, indicating a potential for NCFI. As for the choice of tourism viewing platform, Douyin was the most popular, with about 46.29% of respondents preferring this platform. The sample population was relatively young, highly educated, and more inclined to watch TLS content on Douyin. Table 5 presents the basic characteristics of the sample.

Variable measurement

The study adapted empirical research from related fields to create measurement items specific to TLS to ensure the questionnaire's reliability and validity. The questionnaire is divided into seven sections: psychological contract breach, viewer-live streamer social distance, alternative attractiveness, customer complaining behavior, perceived controllability, NCFI, and demographics. It includes eight items for psychological contract breach, divided into transactional and relational sub-dimensions⁶⁹; four items for viewer-live streamer social distance^{57,70}; nine items for alternative attractiveness^{66,71}; three items for customer complaining behavior^{36,56}; three items for NCFI⁷²; and three items for perceived controllability⁷³. All latent variables are measured using a 5-point Likert scale.

A pre-survey distributed on TikTok and Ctrip from May 3–10, 2023, gathered 137 responses to assess the questionnaire's design, accuracy, and the reliability and validity of its constructs. The Cronbach's coefficient for the variables was above 0.7, and item factor loadings exceeded 0.7, indicating strong reliability and validity. The final questionnaire, refined based on pre-survey results, was distributed through the same platforms.

Common method bias test

This study applied Harman's single-factor test using exploratory factor analysis in Spss 26.0 for all items to mitigate common method bias. The results identified eight factors with eigenvalues over 1, accounting for 69.772% of the total variance. The primary unrotated factor accounted for 34.866% of the variance, falling below the 50% threshold, suggesting that common method bias was not a significant concern in this analysis.

Reliability and validity test

The study utilized Spss 26.0 and Amos 23.0 for the scale's reliability and validity assessment. All Cronbach's coefficients exceeded 0.7, demonstrating strong internal consistency and reliability. Confirmatory factor analysis results indicated an χ^2/df ratio of 1.334, RMSEA of 0.029, NFI of 0.923, NFI of 0.918, IFI of 0.978, and CFI of 0.978, all of which are within accepted fit criteria, confirming a strong model-data alignment. Variable composite reliability (CR) values were above 0.7, and factor loadings were above 0.70, verifying the scale's reliability. The average variance extracted (AVE) for all scales was over 0.5, signifying excellent convergent validity (see Table 6). Additionally, the square root of AVE surpassed the inter-variable Pearson correlation coefficients, demonstrating the scale's strong discriminant validity (refer to Table 7).

Characteristic	Range	n	%	Characteristic	Range	n	%
Age	≤ 19	21	5.37	Gender	Male	177	45.27
	20–29	233	59.60		Female	214	54.73
	30–39	107	27.37	The number of tourism bloggers followed	One	44	11.25
	≥ 40	30	7.66		Two	106	27.11
Occupation	Student	150	38.36		Three	158	40.41
	Employed	230	58.83		> 3	83	21.23
	Other	11	2.81	Tourism viewing platform	Douyin	181	46.29
Education level	≤ High school	47	12.02		Ctrip	95	24.30
	Associate degree	74	18.93		Mafengwo	78	19.95
	Bachelor's degree	199	50.89		Others	37	9.46
	≥ Master's degree	71	18.16				

Table 5. Sample descriptive statistics.

Variable	Dimension	Standardized factor loading	AVE	CR
Transactional psychological contract breach (TPCB)	TPCB1	0.732	0.571	0.842
	TPCB2	0.761		
	TPCB3	0.757		
	TPCB4	0.774		
Relational psychological contract breach (RPCB)	RPCB1	0.767	0.584	0.849
	RPCB2	0.761		
	RPCB3	0.786		
	RPCB4	0.743		
Customer complaining behavior (CCB)	CCB1	0.739	0.589	0.811
	CCB2	0.751		
	CCB3	0.811		
Perceived controllability (PC)	PC1	0.787	0.612	0.825
	PC2	0.709		
	PC3	0.845		
Viewer-live streamer social distance (VLSD)	VLSD1	0.806	0.657	0.885
	VLSD2	0.811		
	VLSD3	0.827		
	VLSD4	0.799		
Alternative attractiveness (AA)	AA1	0.769	0.616	0.828
	AA2	0.771		
	AA3	0.810		
Non-continuous following intention (NCFI)	NCFI1	0.763	0.569	0.798
	NCFI2	0.767		
	NCFI3	0.729		

Table 6. Results of convergent validity test for all variables.

Variable	TPCB	RPCB	CCB	PC	VLSD	AA	NCFI
TPCB	0.756						
RPCB	0.661***	0.764					
CCB	0.537***	0.543***	0.767				
PC	0.370***	0.477***	0.524***	0.782			
VLSD	0.412***	0.522***	0.509***	0.440***	0.811		
AA	0.501***	0.559***	0.573***	0.531***	0.570***	0.785	
NCFI	0.641***	0.648***	0.725***	0.493***	0.674***	0.747***	0.754

Table 7. Correlation analysis and discriminant validity for all variables. The diagonal values in the table represent the square root of the AVE for each construct, while the off-diagonal values represent the correlations between constructs. According to the Fornell-Larcker criterion, discriminant validity is established when the square root of the AVE is greater than the correlations. ***indicates $p < 0.01$.

Path analysis and hypothesis testing

This study assessed the structural equation model using Amos 26.0 and maximum likelihood estimation. It showed an excellent fit ($\chi^2/df = 1.587$, RMSEA = 0.039, GFI = 0.938, CFI = 0.974, RFI = 0.921, NFI = 0.934, IFI = 0.974, TLI = 0.969), suitable for path analysis.

In the main effects outlined in Table 8, TPCB is positively related to viewers' NCFI in TLS ($\beta = 0.158$, $p < 0.05$), supporting H1a. RPCB exhibits a stronger positive relationship with viewers' NCFI in TLS ($\beta = 0.245$, $p < 0.01$), supporting H1b. Furthermore, TPCB significantly increases CCB ($\beta = 0.284$, $p < 0.01$), supporting H2a. The effect of RPCB on CCB is even more significant ($\beta = 0.333$, $p < 0.01$), supporting H2b. CCB is also positively related to viewers' NCFI in TLS ($\beta = 0.141$, $p < 0.05$), supporting H3. Additionally, VLSD positively relates to viewers' NCFI in TLS ($\beta = 0.213$, $p < 0.01$), supporting H6. AA significantly positively affects viewers' NCFI in TLS ($\beta = 0.414$, $p < 0.01$), supporting H7.

The mediating effect was tested using Hayes's⁷⁴ bootstrapping method, with the number of bootstrap resamples set to 2,000 and the confidence level set to 95%. The results are presented in Table 9 and indicate the following: (1) The mediating effect of CCB on the relationship between TPCB and viewers' NCFI in TLS is significant ($\beta = 0.040$, [0.003, 0.110]). (2) The mediating effect of CCB on the relationship between RPCB and viewers' NCFI in TLS is also significant ($\beta = 0.047$, [0.005, 0.119]). H4a and H4b are supported.

Path relationship	Estimate	S.E	C.R	<i>p</i> value	Standardized estimate	Hypothesis test
TPCB→NCFI	0.158	0.067	2.354	**	0.157	Support H1a
RPCB→NCFI	0.245	0.073	3.353	***	0.254	Support H1b
TPCB→CCB	0.284	0.074	3.819	***	0.305	Support H2a
RPCB→CCB	0.333	0.072	4.065	***	0.372	Support H2b
CCB→NCFI	0.141	0.063	2.247	**	0.116	Support H3
VLS→NCFI	0.213	0.053	4.004	***	0.231	Support H6
AA→NCFI	0.414	0.090	4.608	***	0.323	Support H7

Table 8. Parameter estimates of structural equation modeling execution results. ***Indicates $p < 0.01$, **indicates $p < 0.05$.

Effect	Effect value	Bias corrected CI (95%)	Proportion of effect	Hypothesis test
TPCB→CCB→NCFI				
Total effect	0.198	[0.042, 0.363]		
Direct effect	0.158	[0.001, 0.322]	80%	
Mediating effect of CCB	0.040	[0.003, 0.110]	20%	Support H4a
RPCB→CCB→NCFI				
Total effect	0.292	[0.121, 0.468]		
Direct effect	0.245	[0.065, 0.427]	84%	
Mediating effect of CCB	0.047	[0.005, 0.119]	16%	Support H4b

Table 9. The mediating role of CCB in the relationship between PCB and viewers' NCFI in TLS. BootCI lower bound and BootCI upper bound represent the lower and upper bounds of the 95% confidence interval, respectively. All values are rounded to three decimal places.

Path	Moderated variable: PC	Estimate	S.E	t	<i>p</i>	Bias corrected CI (95%)	Hypothesis test
TPCB→CCB	Low group	0.281	0.063	4.447	***	[0.157, 0.405]	Support H5a
	Medium group	0.367	0.047	7.792	***	[0.274, 0.460]	
	High group	0.453	0.063	7.218	***	[0.330, 0.576]	
RPCB→CCB	Low group	0.213	0.070	3.019	**	[0.074, 0.351]	Support H5b
	Medium group	0.340	0.050	6.773	***	[0.241, 0.438]	
	High group	0.467	0.060	7.733	***	[0.348, 0.586]	

Table 10. The moderating role of PC in the relationship between PCB and CCB. ***Indicates $p < 0.01$; **indicates $p < 0.05$.

PC positively moderates the relationships between TPCB and CCB, as well as between RPCB and CCB. The study found that the impact of TPCB on CCB was weaker under conditions of low PC (simple slope = 0.281, $p < 0.01$), and the effect intensified under conditions of high PC (simple slope = 0.453, $p < 0.01$), supporting H5a. Similarly, the positive influence of RPCB was also weaker at low levels of PC (simple slope = 0.213, $p < 0.05$) and significantly more substantial at high levels of PC (simple slope = 0.467, $p < 0.01$), supporting H5b. For more details, see Table 10. We further mapped the moderating effects. Figures 2 and 3 show that when PC is high, as the number of TPCB or RPCB increases, CCB will be further strengthened.

Discussion

Research conclusions

In the digital age, TLS has become a key medium connecting tourist destinations with viewers, significantly influencing the business model innovation and marketing strategies of tourism enterprises and destinations. TLS's success relies on the viewer's continuous engagement; achieving growth in traffic and promotional goals becomes challenging without sufficient engagement¹⁵.

Based on the PPM theory, this study employs a mixed research approach to explore the reasons behind NCFI in TLS comprehensively. In Study I, a measurement scale for alternative attractiveness was developed, clarifying the scope and components of this variable and providing a theoretical foundation for subsequent research. Study II further investigates how psychological contract breach (which contains two sub-dimensions of transactional and relational), as push factors, significantly influences viewers' NCFI in TLS, with RPCB having a powerful impact. The path analysis results indicate that psychological contract breach trigger negative emotions and a loss of trust in the viewer, thereby increasing their NCFI in TLS. Specifically, a relational psychological

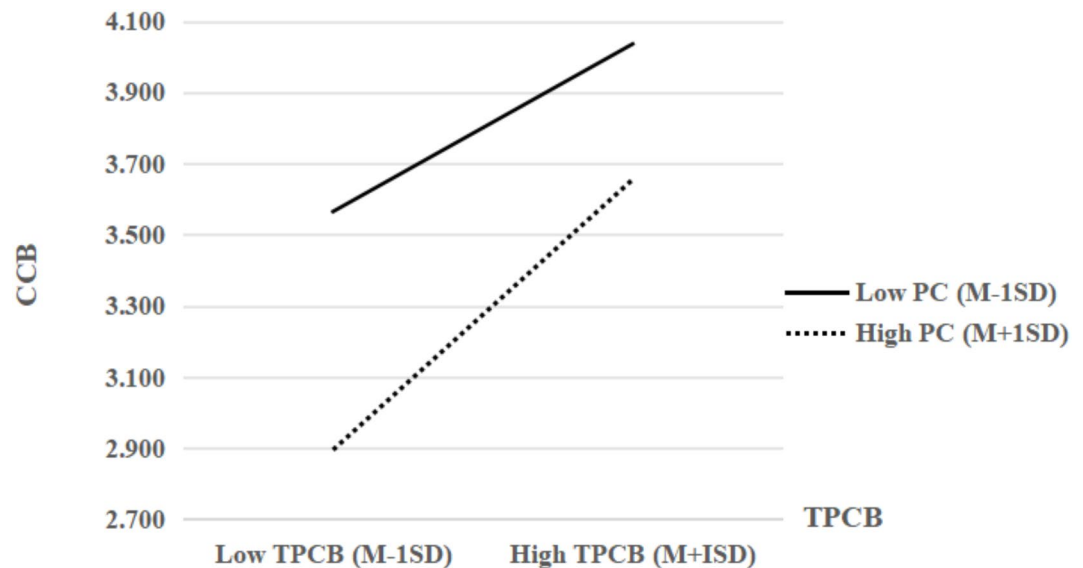


Fig. 2. Moderating effect of PC on the relationship between TPCB and CCB.

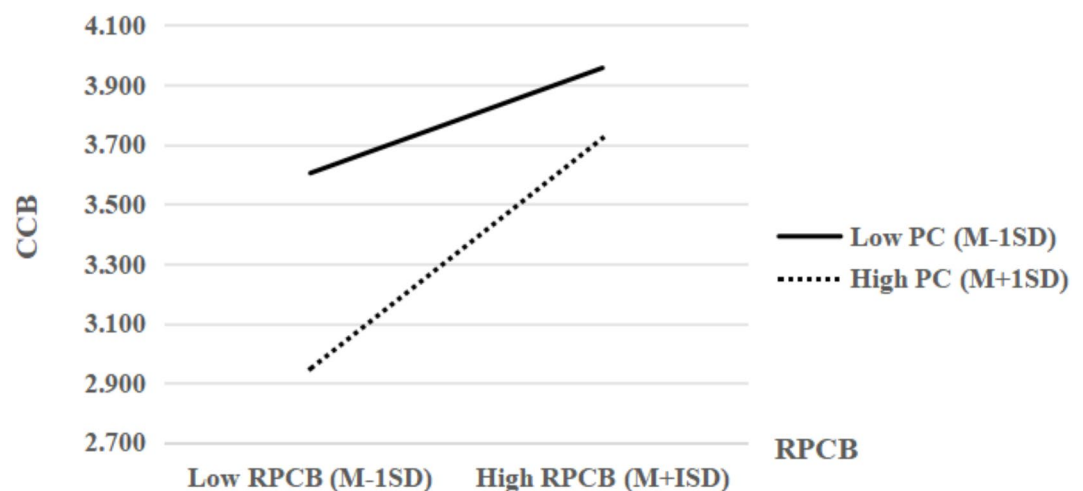


Fig. 3. Moderating effect of PC on the relationship between RPCB and CCB.

contract breach is more likely to provoke emotional responses and trust divergence from the viewers, making their impact more significant than a transactional psychological contract breach.

Moreover, customer complaining behavior is important to mediate between psychological contract breach and viewers' NCFI in TLS. The path analysis shows that psychological contract breach directly triggers customer complaining behavior, further exacerbating the viewers' NCFI in TLS. This mechanism reveals how negative interactions within TLS can amplify viewer disengagement through complaining emotions. Further analysis indicates that perceived controllability significantly moderates the relationship between psychological contract breach and customer complaining behavior. When the viewer perceives the live streaming content or services as more controllable^{8,75}, they are more likely to adopt positive coping strategies and reduce complaining behavior; conversely, lower perceived controllability increases customer complaining behavior.

In addition to a psychological contract breach, alternative attractiveness, and viewer-live streamer social distance, as pull and mooring factors, also influence viewers' NCFI in TLS. As an external distractor, alternative attractiveness diverts the viewer's attention and reduces their focus on the live-streaming content. At the same time, when viewer-live streamer social distance is significant, the viewer's emotional investment in the live-streaming content is lower, thus increasing the likelihood of viewers' NCFI in TLS^{2,64}.

Theoretical contributions

The main contributions of this study are reflected in the following three aspects:

First, the study constructs and extends the PPM theoretical framework for viewers' NCFI in TLS, clarifying its underlying mechanisms and boundary conditions. Based on the PPM theory, this study proposes and builds a novel framework to explain the formation mechanisms of viewers' NCFI in TLS. Most existing studies focus on viewer engagement or following behavior in TLS^{2,13}, overlooking the reverse factors that lead to viewer disengagement. By integrating psychological contract breach and the dynamic relationship between viewers and live streamers, this study fills this research gap and advances the application of the PPM theory in NCFI research³³. Specifically, this study investigates how push factors (transactional and relational psychological contract breach), a pull factor (alternative attractiveness), and a mooring factor (viewer-live streamer social distance) work together to influence viewers' NCFI in TLS. In particular, the mediating role of a customer complaining behavior reveals how a psychological contract breach triggers negative emotions and trust erosion³⁶, further amplifying viewers' NCFI in TLS. Moreover, the study finds that perceived controllability significantly moderates the relationship between psychological contract breach and customer complaining behavior. When viewers perceive they have control over the live streaming content or service, they are more likely to adopt positive coping strategies and reduce customer complaining behavior. Conversely, lower perceived controllability exacerbates customer complaining behavior and viewers' NCFI in TLS. This study expands the application of the PPM theory and provides a systematic theoretical framework for understanding NCFI in TLS, deepening our understanding of viewer behavior.

Second, this study refines and deepens the dimensions of alternative attractiveness, advancing the development of related theories. Although alternative attractiveness is identified as a key factor influencing viewers' continuous attention, previous research has only briefly explored this concept, with unclear definitions and a lack of a multidimensional perspective⁶⁸. Through in-depth interviews, this study identifies and refines three key dimensions of alternative attractiveness in TLS, addressing gaps in the existing literature on this concept. This refinement provides a clear theoretical framework for subsequent quantitative research and offers a new perspective on how alternative attractiveness influences viewers' attention and engagement^{5,13}. Unlike traditional studies that mainly focus on advertising content or creative appeal, this study analyzes alternative attractiveness from a multidimensional perspective, advancing the understanding of viewer behavior in information technology and digital marketing⁷⁶ and providing theoretical support for optimizing live streaming content and improving viewer retention.

Third, this study innovatively shifts to the NCFI perspective, enriching the reverse thinking in TLS research. Most existing literature studies viewer "following" behavior, especially how live streaming content attracts viewers to maintain continuous attention^{15,16}. By employing a reverse thinking approach, this study breaks from the traditional "following" perspective and shifts attention to the exploration of NCFI, i.e., why viewers interrupt their attention to TLS. This innovative perspective provides new research directions for the TLS and digital marketing fields⁵, filling the research gap in the literature on "churn" or "non-continuous following" behavior. The study focuses on the formation mechanisms of NCFI, revealing how psychological contract breach, viewer-live streamer social distance, and alternative attractiveness drive viewer attrition, offering significant theoretical and practical value. In particular, existing literature has paid limited attention to viewers' emotional and trust dynamics during live streaming^{2,16}. At the same time, this study deepens the theoretical exploration of this area by focusing on the negative effects of a psychological contract breach.

Management implications

Practical implications for TLS enterprises

TLS enterprises should prioritize institutional and resource allocation strategies to enhance viewer retention and loyalty. Firstly, trust management and contract fulfillment mechanisms should be improved. TLS enterprises should establish institutionalized management processes to ensure viewer trust in the platform. This includes developing standardized trust management systems, such as transparent communication mechanisms and multi-tiered feedback channels, to promptly address viewer complaints and concerns, thereby minimizing the negative emotions caused by psychological contract breaches³⁶. Furthermore, integrating contract fulfillment into the performance evaluation system for streamers and clear behavioral guidelines and standards can encourage streamers to honor their commitments during TLS, avoiding trust erosion and viewer disloyalty due to unfulfilled promises.

Secondly, enhances the perceived controllability of content. TLS enterprises should leverage technology and resources to improve viewer engagement and their sense of control over live-streaming content. For instance, they can develop highly interactive and customizable live-streaming templates and provide streamers with intelligent tools and resources to enrich the viewer's sense of control. Specific measures include introducing AI-powered interactive technologies, real-time data analytics tools, and personalized content recommendation modules to help streamers dynamically adjust live-streaming content based on viewer preferences, thereby significantly boosting viewer satisfaction and engagement.

Lastly, strengthens the emotional connection between streamers and viewers. Research shows that when the viewer-live streamer social distance is considerable, viewers' emotional involvement tends to be lower⁶⁴, increasing the likelihood of viewers' NCFI in TLS. Therefore, TLS enterprises should implement systematic incentive measures and operational models to help streamers establish stronger emotional bonds with their viewers. On the one hand, TLS enterprises can set up incentive mechanisms to encourage streamers to increase the frequency and depth of interactions during TLS, such as responding to viewer questions in real-time or engaging in comment exchanges, thereby narrowing the psychological distance between streamers and viewers. On the other hand, TLS enterprises can regularly organize online and offline interactive activities, such as fan meetups or themed community events, to foster deeper emotional connections between streamers and their viewers, enhancing viewer loyalty and a sense of belonging.

Practical implications for TLS streamers

As content creators who directly engage with viewers, TLS streamers should optimize their performance at the operational and behavioral levels to enhance viewer engagement and emotional investment.

Firstly, emotional interaction should be strengthened to reduce viewer-live streamer social distance. Streamers should actively engage with viewers by interacting with them in real time and promptly responding to comments and questions to foster participation. Sharing personal stories or expressing emotional resonance can further build trust and a sense of closeness with the viewer. This approach effectively reduces social distance and deepens emotional connections.

Secondly, maintain transparency and credibility of content. Streamers should avoid false advertising or misleading viewers, ensuring the authenticity and consistency of their content. For example, they can disclose detailed information about live-streamed products or destinations in advance, avoiding exaggerated claims to build viewer trust. Regularly updating live-streaming content to ensure accuracy and freshness enhances viewer satisfaction and loyalty.

Lastly, innovative content formats increase appeal. Streamers must continuously adapt live-streaming formats and enrich content based on viewer preferences to sustain their interest⁸. For instance, integrating virtual reality technology can create immersive tourism experiences while incorporating cultural stories or historical backgrounds that add depth to the content. Additionally, interactive features such as live polls or other viewer-driven activities can increase engagement and focus, reducing the likelihood of attention diversion due to competing attractions. By implementing these strategies, TLS streamers can effectively foster deeper connections with their viewer and sustain their attention.

This study offers TLS enterprises and streamers practical insights on addressing viewers' NCFI in TLS. TLS enterprises should establish robust trust management and contract fulfillment mechanisms, enhance viewer perceived controllability, and deepen the emotional connection between streamers and viewers. Streamers should emphasize strengthening emotional interaction, ensuring the transparency and credibility of live-streaming content, and continuously innovating content formats to boost viewer engagement and emotional investment. Implementing these strategies allows the TLS industry to foster long-term viewer attention, enhance user retention, and promote sustainable development. These insights provide valuable management experience for existing enterprises and offer guidance for the growth of emerging platforms and creators.

Limitations and future research

This study explores the impact of psychological contract breach, viewer-live streamer social distance, and alternative attractiveness on viewers' NCFI in TLS. While it provides important insights into the TLS field, several limitations remain.

First, this study relies on online data collection, which may not fully capture the subtle differences in viewer behavior and emotional responses. Due to the risks of memory bias and self-reporting bias in online surveys, participants' responses may not entirely reflect their genuine emotions and behavioral reactions. To improve the reliability and validity of future research, a combination of experimental designs and longitudinal tracking data could be employed⁵³. Multiple data collection methods, such as real-time behavioral tracking and sentiment analysis, could further refine our understanding of dynamic viewer responses, yielding more accurate and in-depth findings.

Additionally, this study did not fully consider the impact of cultural differences on viewer behavior. As the research sample primarily focuses on specific groups or regions, future studies should consider how cultural backgrounds influence perceptions and reactions to psychological contract breach, viewer-live streamer social distance, and alternative attractiveness. Viewers' expectations, emotional involvement, and NCFI toward TLS content may differ in cultural contexts⁷⁷. For example, in individualistic cultures, viewers may emphasize the streamer's personal charm, personality, and interactive style, tending to establish a connection with the streamer and valuing the streamer's style and engagement. In contrast, in collectivist cultures, viewers may focus more on the social value and consistency of the content, prioritizing its authenticity and reliability over the streamer's appeal. Therefore, future research could further explore how cultural differences affect the interaction between these key factors and provide more accurate theoretical support and practical guidance for TLS platforms in a globalized context.

Finally, this study does not distinguish between different types of TLS. However, various types (natural landscape live streaming and cultural history live streaming) may influence viewers' emotional investment and NCFI through their unique content styles and presentation formats. For example, natural landscape live streaming might attract viewers through stunning visual experiences and immersive commentary. In contrast, cultural history live streaming may enhance viewers' interest through in-depth cultural explanations or engaging storytelling. These live streaming types may vary viewer-live streamer social distances and alternative attractiveness, leading to varied impacts on viewer behavior. Future research should further explore the differences between types of TLS, analyzing their effects on viewer interaction, emotional investment, and behavioral responses. This will enrich existing theoretical frameworks and provide more targeted guidance and recommendations for the TLS industry.

Conclusion

Based on the PPM theory, this study explores the formation mechanism of viewers' NCFI in TLS. The findings reveal that factors such as psychological contract breach, viewer-live streamer social distance, and alternative attractiveness significantly affect viewers' NCFI in TLS, with relational psychological contract breach having the most prominent impact. Customer complaining behavior mediates the relationship between psychological contract breach and viewers' NCFI in TLS, while perceived controllability positively moderates the relationship between psychological contract breach and customer complaining behavior. The contributions of this study

are threefold: First, it constructs and expands the NCFI model in TLS, enriching the application of PPM theory; second, it refines the dimensions of alternative attractiveness, providing a clear framework for future research; and third, it innovatively examines viewer behavior from the perspective of NCFI, filling the research gap on viewer attrition. At the same time, this study provides practical recommendations for TLS enterprises and streamers, including strengthening trust management, enhancing content controllability, and deepening emotional connections between streamers and viewers, thereby effectively improving viewer engagement and loyalty and promoting the sustainable development of the TLS industry. However, this study has certain limitations regarding sample size and data collection. Future research could combine various data methods to explore the impact of cultural differences and different types of TLS on NCFI, further improving the theoretical framework and providing more comprehensive guidance for the TLS industry.

Data availability

All data generated or analysed during this study are included in this published article [and its supplementary information files].

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Author contributions

L. D. was primarily responsible for the conception and design of the research, as well as for data collection, statistical analysis, and drafting the manuscript. G. X. contributed to data analysis and was responsible for securing funding. M. P. managed reviewer comments, undertook manuscript revisions, and finalized it for submission. F. B. participated in both data collection and analysis. All authors collaboratively revised the manuscript to ensure its intellectual rigor and approved the final version for submission.

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Declarations

Competing interests

The authors declare no competing interests.

Ethics approval

We have applied for and filed the necessary documentation with our institution. Since our study does not involve animal experiments or issues related to human health, ethics approval is not required. However, we have obtained informed consent from all participants involved in the study.

Informed consent

Thank you very much for participating in our survey, which is a questionnaire and interview about Travel Live Streaming and is only used for academic research. In the process of answering the question, you need to observe the content and experience emotions, make judgments and associations, and maintain your brain's thinking. During the scoring process, there were no situations of being empty, dazed, or feeling sleepy. This participation is purely voluntary and you may terminate your participation in this study at any time. The decision will not result in any adverse consequences. When collecting questionnaire data, personal information such as name, etc. is not involved, and only a number is used to store your information. The collected information is only for academic research purposes and personal information is strictly confidential. If you have any inquiries about this study in the future, you can send an email to dingliu1998@163.com. If you already understand the above content and are willing to participate in this study, please check “Yes” below and sign.

Additional information

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1038/s41598-025-93200-4>.

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