Exploring the Mechanisms of Live-streaming Technology and Impulse Buying Tendency: Do Zero Moment of Truth Value, Trust, and Emotional Engagement Matter?

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Authorship

Xin-Jean Lim
Business School, Sun Yat-Sen University, Shenzhen, 518107, Guangdong, China
School of Business and Economics, Universiti Putra Malaysia, 43400, Selangor, Malaysia
Email: lim.xinjean@yahoo.com

Jun-Hwa Cheah ***(Corresponding Author)***
Associate Professor
Norwich Business School, University of East Anglia, Norwich, United Kingdom.
Adjunct Associate Professor
Faculty of Business, Sohar University, Sohar, Oman
Email: jackycheahjh@gmail.com / J.cheah.@uea.ac.uk
ORCID: 0000-0001-8440-9564

Nisreen Ameen
Senior Lecturer
School of Management, Royal Holloway, University of London, London, United Kingdom.
Department of Marketing, The University of Jordan, Amman, Jordan
Email: nisreen.ameen@rhul.ac.uk

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Abstract

Live-streaming e-commerce (LSE) platforms are information systems (IS) that blend real-time entertainment with instant purchasing to offer novel experiences to users. Drawing on cognitive appraisal theory, this study explains how LSE experiences stimulate users' emotions and impulse buying behavior through a sequential process consisting of primary appraisal, secondary appraisal, and behavioral outcomes. Using a sample drawn from millennial users (between 18-35 years old), two studies were conducted. In the initial pilot investigation (n = 425), we examined users' perceptions and behaviors when using LSE platforms; in the main study (n = 200), we explored the potential mediating and moderating factors affecting impulse buying tendency. Overall, the findings show that LSE affordances predict the zero moment of truth (ZMOT) value on LSE platforms. The results also indicate that both trust in the streamer and emotional engagement play a mediating role in the relationship between ZMOT value and impulse buying tendency. Finally, we find that trust beliefs in the LSE platform play an important moderation role in strengthening the prediction of impulse buying tendency. This study concludes with recommendations for future LSE research and practice.

Keywords: Cognitive appraisal theory; live-streaming platforms; impulse buying tendency; zero moment of truth; LSE affordances

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1 Introduction

Live-streaming e-commerce (LSE) platforms have transformed online retail by incorporating sophisticated audiovisual techniques, such as multiple camera angles, professional lighting, and high-fidelity sound into buying experiences. These platforms feature rich interactive elements that provide users with an immersive and realistic experience, simulating physical presence in a virtual shopping environment (Gu et al., 2024). Streamers, acting as virtual sellers, use LSE to reach wider audiences and facilitate engaging interactions with users to sell goods (Luo et al., 2024a). By leveraging the immediacy and interactivity of live video, streamers can showcase product and service features while promptly responding to user comments and inquiries during streaming sessions. This real-time engagement allows streamers to build relationships with their audience, creating a unique opportunity to go beyond conventional online shopping or e-commerce experiences.

Building upon these immersive features, the real-time and interactive capabilities of LSE platforms not only foster relationship building but also provide streamers with opportunities to create a sense of urgency and excitement among users, often leading to impulse decision-making. Across various fields of study, impulse buying is recognized as a powerful strategy for businesses. Streamers frequently leverage this phenomenon by employing promotions and limited-time offers, which are among the most effective promotional strategies to induce impulse buying tendencies (Han, 2023). In fact, by creating a sense of urgency, streamers can effectively leverage the LSE platform to expedite inventory levels for product availability and sales.

To date, numerous studies have examined ways to stimulate impulse buying in various digital commerce (i.e., electronic, social, and mobile commerce) (Lim et al., 2020; Lim et al., 2021; Lo et al., 2022; Luo et al., 2024a). However, no consensus exists on the psychological processes triggering this behavior on interactive platforms such as LSE. These

features change the shopping experience in ways that traditional e-commerce is unable to compete. Traditional platforms only allow customers to browse static product pages. In contrast, LSE platforms offer real-time, two-way communication between streamers and users (Wymer et al., 2021), which creates a fluid and unpredictable shopping environment where purchase decisions can be influenced immediately. The LSE platform also integrates multiple modalities—live video, synchronous chat, demonstrations, and social interactions—into one cohesive experience (Yang et al., 2023a). This multi-modal approach may trigger different psychological processes than traditional browsing. Understanding this underlying process is crucial for streamers aiming to convert "viewers" into "buyers" and sustain the LSE business model (Luo et al., 2024a; Miranda et al., 2024). Such insights can also help streamers differentiate themselves in the competitive market.

To explore this phenomenon, this study draws on cognitive appraisal theory to elucidate the underlying mechanisms through which streamers can amplify users' impulse buying tendencies. Cognitive appraisal theory posits that individuals' emotional responses and subsequent behaviors are determined by their evaluation of events in relation to their goals and well-being (Lazarus, 1991; Roseman & Smith, 2001). In the context of LSE, this theoretical lens enables the examination of how platform-specific stimuli trigger cognitive appraisals that potentially lead to impulsive purchasing decisions.

Unlike interactions in traditional e-commerce, where users rely on peer reviews or recommendations to assess offering quality, selling within LSE primarily depends on platform affordances that capture users' attention by enhancing Zero Moment of Truth (ZMOT) value. As conceptualized in traditional e-commerce, ZMOT represents a critical moment when individuals form initial impressions toward an offering based on search information (Chu & Kim, 2011; Lecinski, 2011). This concept has evolved from a pre-purchase information-gathering phase to a more dynamic construct in digital commerce environments (Moran et al., 2014; Wolny & Charoensuksai, 2014).

In the LSE environment, ZMOT is embedded within real-time interactions between streamers and users. Unlike traditional e-commerce, where ZMOT occurs as a sequential process (Lecinski, 2011; Löfgren, 2005), LSE integrates product features, user reviews, live feedback, and demonstrations simultaneously. This transformation makes ZMOT a dynamic and interactive experience. Building on this, Das et al. (2022) define ZMOT as an indicator of how users evaluate the information search process in LSE. In this context, ZMOT value reflects a streamer's ability to capture and maintain user attention using LSE platform features.

The importance of ZMOT in LSE is amplified by increasing market competition. With the number of streamers growing rapidly, capturing user attention has become more challenging. Streamers often have only a few seconds to engage viewers before they leave a live session (Chen et al., 2024; Hua et al., 2023). The rise of content creators across platforms has further intensified competition, making effective ZMOT strategies crucial. Successfully engaging users during ZMOT extends the reach of live broadcast and reduces dropout rates, particularly during the exploration stage when uncertainty is high—such as with unfamiliar streamers or infrequently purchased items. Research shows that first impressions formed during these moments strongly influence purchasing decisions and platform engagement (Zhang & Zhang, 2024; Liu et al., 2023). Despite its significance, little research has examined how LSE affordances influence ZMOT value. Specifically, the factors that trigger this effect in dynamic selling environments remain unclear. To address this gap, the first part of this study explores the following research question:

RQ1: Do LSE affordances have a positive impact on the ZMOT value within an LSE session?

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To provide deeper insights, this study examines the mediating effects of trust beliefs and emotional engagement with streamers. Trust beliefs are key to alleviating perceived risk and fostering confidence in users' decision-making (Lacity et al., 2024). On LSE platforms, trust in streamers plays a crucial role in bridging the gap between consumer intent and impulse purchases, especially when users engage with unfamiliar streamers. When viewers perceive a streamer as credible, this trust serves as a psychological bridge that transforms initial interest into spontaneous purchasing actions (Zhang et al., 2023). Specifically, a streamer's perceived expertise, authenticity, and reliability directly enhance users' confidence in product recommendations, effectively bypassing the traditional deliberation process (Chen et al., 2024). Consequently, when users perceive a streamer as trustworthy, they rely on this trust in place of conducting extensive research (i.e., product information gathering, price comparisons across platforms, etc.), resulting in spontaneous purchasing decisions that transform initial ZMOT considerations into impulse buying behaviors during live shopping events.

Beyond trust beliefs in streamer, emotional engagement represents another key factor shaping impulse buying behavior on LSE platforms. Unlike traditional e-commerce, LSE fosters real-time interactions and social presence that establish a higher degree of emotional responses. This emotional intensity, though underexplored in the extant literature, appears to bypass rational decision-making and facilitate impulsive purchases (Ahn & Kwon, 2022). When users develop deeper emotional connections with streamers, they experience a sense of intimacy and social bonding, increasing receptivity to product presentations and time-sensitive offers (Luo et al., 2024a). These affective states, whether driven by excitement or social connection, override deliberative thinking, accelerating the transition from product discovery to spontaneous purchase. Based on these considerations, the second part of this study addresses the following research question:

RQ2: How do trust beliefs in streamer and emotional engagement affect the connection between the ZMOT value and impulse buying tendency on LSE platforms?

Concurrently, trust beliefs in the LSE platforms constitute a multidimensional construct that exerts significant influence throughout users' decision-making continuum. (Schuetz et al., 2024). Within virtual selling ecosystems predicated on monetary transactions, platforms must establish robust mechanisms for personal and financial data protection, ensure transaction transparency, and facilitate effective dispute resolution processes. Recent empirical evidence from Lankton et al. (2015) demonstrates that platform trust fundamentally shapes users' cognitive and behavioral responses from initial product discovery through to purchase completion. During the preliminary phase of live-session evaluation, platform trust functions as a critical boundary condition in the consumer decision process. Platforms perceived as unreliable may substantially inhibit users' capacity to derive ZMOT value from LSE affordances, whereas those deemed trustworthy enhance information credibility and consumer confidence. In subsequent decision stages, users' propensity toward impulse purchasing remains contingent upon their trust in the platform's security infrastructure, order fulfilment reliability, and transactional integrity—even in instances where streamer trust and emotional engagement are well-established. These considerations suggest that platform trust beliefs function as both an enabler and constraint within the LSE purchasing process, influencing how affective and cognitive responses translate into behavioral outcomes. This conceptualization informs our final research inquiry:

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RQ3: How do trust beliefs in the LSE platform moderate users' experience during both the initial stage of interest (LSE affordances and ZMOT value) and the subsequent process of impulse buying (trust in streamers and emotional engagement on impulse buying tendencies)?

To address our research questions, we conducted two studies to examine how impulse buying behavior develops among younger users on LSE platforms. Study 1, using a survey method with 425 users aged 18–35 who had experience with LSE platforms, found that LSE affordances serve as a primary appraisal in influencing ZMOT value. At the secondary stage, this ZMOT value acts as a key antecedent, positively shaping trust beliefs and engagement relationships with streamers before leading to impulse buying decisions. Study 2, with 200 participants from the same demographic, further confirmed that trust beliefs in streamer and emotional engagement serve as critical mechanisms that strengthen users' motivation for impulse purchases. Additionally, findings highlight that trust beliefs in the LSE platform play a persuasive role in shaping users' initial interest and the subsequent process of impulse buying tendencies during the decision-making process.

This study offers several contributions to both theory and practice. By applying cognitive appraisal theory, we provide empirical evidence that users' impulse buying behavior forms through a sequential process, particularly influenced by trust beliefs in streamer and emotional engagement. Specifically in the LSE literature, our work emphasizes that platform affordances should be optimized to capture users' attention at the exploration stage, before they join a specific live selling session (i.e., ZMOT stage). We also identify the critical contingent factor of platform trustworthiness in digital commerce. For practicing managers, this study offers concrete implications. It highlights the necessity for streamers to develop effective strategies that maintain trustworthy and engaging relationships with users while fully utilizing LSE affordances to drive impulse buying. Additionally, our findings on platform trust beliefs provide managers with specific recommendations for determining when it is more (or less) beneficial to use a trustworthy virtual selling platform.

2. Literature review

2.1 Live-streaming e-Commerce (LSE) platforms

LSE platforms exploit live streaming to offer "over-the-top" buying experiences to users by delivering live streams directly to viewers over the internet. These platforms leverage their unique affordances to create engaging e-commerce experiences that connect businesses with their target audience, showcase products, host events, and foster relationships between sellers and buyers (Zhang et al., 2023). Specifically, the affordances of LSE platforms make it easier for streamers to exhibit real-time interaction with users through several features like live demonstrations, interactive comments, and personalized recommendations – all of which enhance users' attention and encourage continued participation in sessions.

In the context of LSE, ZMOT represents individuals' initial impressions of a live session (Lecinski, 2011). LSE platforms afford opportunities to select among many streaming sessions. Hence, it is typical for users to move on to another session when a streamer or product fails to capture their interest during ZMOT. To retain users effectively, streamers must offer unique and interactive experiences. Optimizing ZMOT requires leveraging platform affordances to engage users' attention from the first moments (Han & Kim, 2020). Successfully capturing users' attention during ZMOT increases retention rates and potentially stimulates impulse purchases. In this case, it is reasonable to consider that ZMOT acts as a

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cognitive filter that fosters trust, emotional engagement, and ultimately impulse purchase tendencies in LSE environments.

"Impulsive buying tendency", which refers to a distinct classification of individual decision behavior that is unplanned, triggered by exposure to a stimulus, and happens "on the spot" (Rook & Fisher, 1995). On LSE platforms, impulse buying is mainly triggered by the platform's capabilities. First, the real-time nature of an LSE platform creates a sense of immediacy and urgency. Streamers employ persuasive tactics to build excitement and encourage impulse buying among users (Vazquez et al., 2020). Second, many streamers utilize various promotion selling techniques on LSE platforms, such as offering limited-time promotions, flash sales, and exclusive deals (Chou, 2019), to create urgency that compels users to make immediate purchases. Third, social validation plays a significant role on LSE platforms (Zhou et al., 2019), with users often engaging in live discussions and comments during broadcasts. Observing others make purchases and express approval can lead to a sense of social validation regarding impulse purchases. Finally, the convenience and ease of making purchases on LSE platforms are the key that increases the tendency to make impulsive buying (Xie et al., 2022).

2.2 Cognitive Appraisal Theory

Lazarus (1991, p. 3) defines appraisal as a "cognitive process that explains how an individual evaluates the environment". This concept forms the core idea of cognitive appraisal theory, which posits that appraisals of stimuli determine why people manifest different emotions and behaviors in response to their environment (Arnold, 1960). Building upon this theory, it provides a robust foundation to explain how and why individuals evaluate and respond to stimuli through a logical sequence of information processing.

The existing literature on cognitive appraisal theory has evolved around two schools of thought. Some scholars argue that emotions are the dominant factor affecting consumption-related behavior such as satisfaction and loyalty (Zheng et al., 2020). Others point out that reactions are not automatic responses, but rather the result of subconscious mental assessments that correspond to individuals' characteristics (needs, wants, goals, and past knowledge) (Cai et al., 2018). Consequently, the evaluation process can be classified into two phases. It begins with a primary appraisal, in which the individual evaluates each stimulus based on its congruence and relevance to their goals. If the stimulus is considered congruent with personal objectives, a secondary appraisal is initiated (Ma et al., 2013). During the secondary appraisal stage, individuals form various emotional states through psychological processes. When individuals evoke a positive inner reaction, it leads to a favorable response.

In terms of application, cognitive appraisal theory is widely used to justify how users appraise the affordances of a contemporary IS tool or make decisions to continue or discontinue its use. For example, this theory offers scholars insights into the opportunities, threats, and salient emotions associated with metaverse usage and user interactions within this platform (Suh, 2024). Similarly, researchers have utilized this theory to explore the factors embraced by users cognitively and emotionally in the acceptance of generative AI tools (Downen et al., 2024). Given the maturity of this theory, this study posits that further exploration is needed to detect specific cognitive and emotional appraisal dimensions that are relatively salient when exploring the tendency to evoke users' impulse buying behavior on LSE platforms.

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In accordance with cognitive appraisal theory, this study positions the LSE platform's affordances as the primary appraisal, which users utilize to assess the value of joining a particular live session. Users are exposed to multiple simultaneous stimuli, including peer interactions and streamers' persuasive strategies (i.e., visibility, meta-voicing, and guidance shopping). Subsequently, these dynamic environments have the potential to influence users to make impulsive purchases, particularly when their affective states are amplified through interactions with streamers. These include ZMOT value, trust beliefs in streamer, and emotional engagement, which represent significant emotional reactions resulting at the secondary stage. The proposed idea is consistent with the adaptive cognitive processing argument proposed by Yu et al. (2023). It posits that appraisals can evolve dynamically based on contextual factors, thereby aligning with the fluid nature of decision-making in LSE. For instance, research has demonstrated that environmental cues in LSE, such as social interactions from LSE affordances, significantly influence consumers' emotions and cognitive responses, thereby affecting their impulse buying behaviors. Therefore, these ideas are framed in the research model depicted in Figure 1, and seven hypotheses are formulated, as explained in the following section.

[Insert Fig.1 here]

3. Hypotheses Development

3.1 Primary Appraisal: LSE Affordances

Technology affordances are defined as "the possibilities for goal-oriented actions afforded to specified user groups by the technical functionalities of technical objects" (Markus & Silver, 2008, p. 622). Within the LSE environment, affordances are realized through shopping-oriented actions facilitated by the platform's embedded technical features (Hua et al., 2024). This study postulates that visibility, meta-voicing, and guided shopping (Sun et al., 2019; Dong & Wang, 2018) are key affordances that work synergistically to shape user experiences and influence the formation of ZMOT value in LSE platforms.

First, visibility features enhance LSE affordances by enabling real-time product demonstrations, providing users with an immersive and interactive product evaluation experience (Ki et al., 2024). Unlike traditional e-commerce, which relies on pre-recorded videos or static images, high-visibility affordances allow streamers to showcase product attributes, benefits, and unique selling points dynamically, strengthening user trust and value perception (Gu, Cheng, & Shen, 2023).

Second, meta-voicing fosters real-time and transparent interactions between streamers and users, reinforcing social presence and engagement (Jia et al., 2024). Meta-voicing allows users to engage in live discussions, enhancing the authenticity and credibility of product information (Hua et al., 2024). This synchronous exchange enables community-driven decision-making, where users are influenced by the collective opinions of both the streamer and other viewers.

Third, guided shopping enhances LSE affordances by offering personalized shopping experiences in a co-viewing environment. As noted by Yan et al. (2023), guided shopping affordances allow streamers to offer live recommendations, mimicking in-store shopping assistance and interactions. This interactive guidance enables users to ask questions, seek tailored advice, and make well-informed decisions.

The integration of these three affordances creates a comprehensive platform that addresses users' cognitive needs during the critical ZMOT phase, specifically enabling them to have a more realistic experience in a real-time, interactive e-commerce environment (Hua et al., 2024). Empirical evidence suggests that these affordances significantly influence how

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users perceive and evaluate information during their initial encounter with products in digital environments (Hua et al., 2024; Liu, 2023). At this crucial juncture when users are forming first impressions, LSE affordances provide multi-sensory cues that traditional e-commerce platforms cannot replicate. The real-time nature of these affordances reduces information asymmetry between sellers and buyers, thereby enhancing the perceived value of the information search process—a core component of ZMOT value (Das et al., 2022).

Moreover, recent studies demonstrate that LSE affordances directly address the limitations of conventional online shopping environments by providing dynamic information presentation, social validation mechanisms, and personalized guidance (Jia et al., 2024; Yim et al., 2017). When streamers effectively leverage these affordances, they create a more engaging and trustworthy information environment that positively shapes users' early evaluations. Extending this perspective through the lens of cognitive appraisal theory (Lazarus, 1991), this study proposes that LSE affordances serve as primary cues that users cognitively appraise when searching for live-streaming sessions that best fit with their shopping goals and information needs. Thus, it is hypothesized that:

H1: *LSE affordances positively affect ZMOT value.*

3.2 Secondary Appraisal: ZMOT value

Unlike the traditional funnel model, where consumers systematically narrow their choices, modern users often expand their options based on new information acquired during the pre-purchase stage (Yen & Chiang, 2021). This shift highlights the critical role of the ZMOT value on LSE platforms, where streamers must immediately capture user interest to convert them into actual buyers. The value users derive from ZMOT plays a pivotal role in shaping perceptions of the streamer and the product. When streamers provide real-time product information, answer questions, and demonstrate product use, they enhance ZMOT value, making the shopping experience more informative and engaging. Simultaneously, when users perceive streamers as approachable and knowledgeable, they are more likely to trust their opinions and recommendations, reinforcing their confidence in the purchasing process.

Prior research supports this connection. Kim and Lennon (2013) found that users actively engage in the ZMOT stage to seek information about a streamer's reputation and reliability, which serves as a foundation for trust formation. When users encounter credible signals—such as expertise, transparency, and authentic engagement—during ZMOT interactions, their trust naturally increases. This aligns with Petty and Cacioppo's (1986) postulation, which suggests that users engaging in systematic information processing are more likely to form trust-based beliefs. In the LSE context, trust formation at ZMOT is driven by users' evaluation of streamer credibility, interactive responsiveness, and real-time demonstrations. Therefore, we propose the following hypothesis:

H2a: *ZMOT value has a positive impact on trust beliefs in streamer.*

Cognitive responses often serve as the basis for affective responses (Zhang et al., 2024), with information from LSE platforms needing to be deemed valuable before emotional engagement can be formed. It can be inferred that valuable experience at the ZMOT stage creates a desire for users to foster increased emotional involvement and investment towards the streamer on the LSE platform. This assumption is attributed to the fact that positive and fulfilling experiences garnered during this stage evoke positive emotions (Muzellec & O'Raghallaigh, 2018). Similarly, the usefulness of information must be cognitively assessed before affective behaviors, such as emotional engagement that can be developed, ultimately influencing behavioral outcomes in the context of LSE (Hsu, 2023; Lo et al., 2022). As a

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result, when users derive high value from the ZMOT stage, this positive experience makes them perceive that the streamer truly understands their unique needs and desires. Therefore, we propose the following hypothesis:

H2b: *ZMOT value has a positive impact on emotional engagement.*

3.3 Secondary Appraisal: Trust beliefs in streamer

Trust beliefs in streamer enhances users' confidence in their professionalism while reducing suspicion of opportunistic behavior (Zhang et al., 2023). As opinion leaders in live-selling rooms, streamers who are perceived as experts or trusted for their personal taste become important triggers for impulse buying, as decisions require less deliberation when such trust exists (Chen et al., 2024). This aligns with cognitive dissonance theory, which suggests that individuals seek information from trusted sources to justify their actions. Users often seek reassurance from trusted streamers about their purchases' benefits, and once strong trust is established, they become more susceptible to impulsive buying decisions as they perceive the streamer's information as reliable. Therefore, we propose the following hypothesis:

H3: *Trust beliefs in streamer has a positive impact on impulse buying tendency.*

3.4 Secondary Appraisal: Emotional Engagement

Emotional engagement serves as a heuristic signal that reduces cognitive effort in purchase behavior (Lim et al., 2020). The essence of emotional engagement is the art of capturing individuals' attention in two forms—emotional connection and emotional expression—which motivates them to naturally engage in virtual interactions with the streamer. Evidence suggests that when information is shared by a preferred streamer, an individual is more likely to make a buying decision with that particular streamer (Ahn & Kwon, 2022). Several studies also indicate that emotional engagement can engender a sense of excitement and connection, fostering a positive relationship wherein users feel personally connected to the streamer (Luo et al., 2024b). These evoked positive emotions may lead users to perceive the streamer as their close friend and their offerings as more appealing and valuable, in turn increasing the likelihood of an impulsive purchase. Accordingly, it is reasonable to postulate the hypothesis as follows:

H4: *Emotional engagement has a positive impact on impulse buying tendency.*

3.5 Mediating Effects: Trust beliefs in Streamer and Emotional Engagement

Cognitive appraisal theory defines emotions as processes rather than states, suggesting that cognitive evaluations of situations interact to elicit specific emotional responses (Lazarus, 1991). Extending the postulations in LSE context, this study examines how trust beliefs in streamer and emotional engagement mediate the relationship between ZMOT value and impulse buying tendency on LSE platforms.

In the primary stage, streamers strategically leverage LSE platform affordances to capture users' attention during the ZMOT stage. During this exploration phase, users actively seek value-added live stream sessions that enhance their product knowledge through real-time demonstrations, interactions, and streamer-led discussions. Informative and interesting sessions are more likely to maintain users' attention and foster deeper interest. The secondary stage focuses on how users form perceptions of streamers after attending a live session, where streamers work to build relational bonds and persuade users to commit both time and financial resources to purchase decisions.

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In the relationship-building process, trust beliefs in streamer emerges as a critical psychological mechanism that shapes users' perceptions of products and purchase decisions (Gvili & Levy, 2023). When users develop confidence in a streamer's recommendations and product endorsements, this trust increases the likelihood of impulse buying. Trust beliefs in streamer closely relates to perceptions of information credibility (Chaker et al., 2024), which is crucial on LSE platforms where users cannot physically examine products as they would in traditional stores. As such, it is reasonable for this study to posit that trust beliefs serve as a mediating mechanism, explaining how ZMOT value translates into impulsive buying behavior through effective relationship building. When users perceive ZMOT information as persuasive and valuable, it creates psychological assurance through trust in the streamer, ultimately enhancing impulsive buying tendencies. Therefore, the following hypothesis is proposed:

H5a: *Trust beliefs in streamer mediates the path between ZMOT value and impulse buying tendency.*

The ZMOT stage is followed by another critical moment of exciting users to increase repeat viewership. Emotional engagement, encompassing feelings of excitement, joy, and connectedness, represents the fundamental emotional response linked to consumption experiences (Ahn & Kwon, 2022). Within LSE platforms, this engagement is shaped by dynamic relationships between streamers and users, representing the emotional investment allocated toward a particular streamer. When users experience heightened emotional engagement from ZMOT value, it serves as a crucial psychological driver, translating initial cognitive appraisal into impulsive purchase behavior (Khoi & Le, 2023). This engagement cultivates profound connections with streamers during the secondary stage of viewing and selling, fostering authenticity and trust. Users who experience a "mental sensation of engagement" (Shin, 2019) that intensifies emotional connections with content and social interactions, are more likely to exhibit purchasing immediacy. These reasonings support emotional engagement as a mediating mechanism explaining how ZMOT value influences impulse buying tendency by transforming cognitive evaluations into affect-driven consumption responses. Therefore, we propose the following hypothesis:

H5b: *Emotional engagement mediates the path between ZMOT value and impulse buying tendency.*

3.6 Moderating Effect: Trust beliefs in the LSE platform

Trust beliefs in LSE platform is increasingly challenged by concerns about data privacy, payment security, and technical reliability (Zhang et al., 2022). Users' trust can be undermined by technical issues such as video stuttering, data overload, or sudden audio-visual failures (Wongkitrungrueng & Assarut, 2020). Given these concerns, this study positions trust beliefs in the LSE platform in encompassing three key dimensions (McKnight et al., 2011): reliability (belief in consistent proper operation), helpfulness (belief in adequate and responsive assistance), and functionality (belief in the platform's capability to meet user needs).

According to cognitive appraisal theory, the primary appraisal stage involves an individual's initial assessment of whether a situation is relevant, beneficial, or detrimental to their goals (Lazarus, 1991). In the LSE context, users engage platform affordances – including visibility, meta-voicing, and guidance shopping features – when entering a live-streaming session. However, these LSE affordances can only generate meaningful ZMOT

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value when users trust the platform as a reliable and helpful environment for product information acquisition. For instance, even if a platform offers various LSE affordances, users who distrust the platform's credibility or fear deceptive content may not perceive these features as beneficial for ZMOT value. Similarly, suspicions about content manipulation or misleading endorsements can diminish the effectiveness of LSE affordances in fostering ZMOT value. This aligns with the notion that trust-related appraisals shape how individuals process and respond to external stimuli. Hence, trust beliefs in the LSE platform serve as a crucial boundary condition in the primary appraisal stage, determining how effectively users can utilize LSE affordances to form ZMOT value. Therefore, it is reasonable to propose that:

H6a: *The positive impact of LSE affordances on ZMOT value is stronger when trust beliefs in the LSE platform are high.*

In the secondary appraisal stage, individuals assess their perceived control over the situation and their ability to act upon their initial evaluations (Lazarus, 1991; Moors et al., 2013). During this stage, trust beliefs in the LSE platform extends beyond information evaluation to influence users' impulse purchase tendencies. Users' trust expectations significantly influence their subsequent usage and outcomes - they are more likely to engage in transactions when they believe the platform processes them efficiently and reliably (Chen et al., 2024). The impact of streamer trust on impulse buying increases when users perceive that the LSE platform provides clear, accurate information about pricing, sales terms, and order tracking (Zhang et al., 2023). However, when platform trust is compromised, particularly regarding security measures against data breaches and fraud, users may perceive higher transaction risks and uncertainty, potentially switching to alternative platforms, especially for unfamiliar and high-involvement purchases (Wongkitrungrueng & Assarut, 2020). Therefore, we propose the following hypothesis:

H6b: *The positive impact of trust beliefs in streamer on impulse buying tendency is stronger when trust beliefs in the LSE platform are high.*

Trust beliefs in the LSE platform acts as a psychological enabler that encourages users to establish interpersonal relationships through interactions. When users perceive the platform as trustworthy, particularly in terms of secure data handling and responsible use, they interact more confidently with streamers. This heightened platform trust amplifies the effect of emotional engagement on impulse purchases by reducing perceived risks and increasing transactional security (Lankton et al., 2015; Lu & Yi, 2023). In contrast, when trust beliefs in the LSE platform is lacking, users may show reluctance even when emotionally engaged with streamers – concerns about transaction security, data integrity or platform reliability can weaken this relationship and cause hesitation in making impulse purchases. Hence, a strong trust beliefs in the LSE platform serves as a crucial element in strengthening the impact of emotional engagement on impulse purchasing during the decision-making stage. Therefore, we propose the following hypothesis:

H6c: *The positive impact of emotional engagement on impulse buying tendency is stronger when trust beliefs in the LSE platform are high.*

3.7 Moderated mediation

IS studies have consistently demonstrated that elevated levels of trust not only serve as a catalyst for social interactions, facilitating seamless transactions and exchanges amid social uncertainties (Liu, 2023), but they also foster collaborative transactions and diminish risks

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inherent in interpersonal engagements (Tsai & Hung, 2019). Despite these significant findings, we lack insights into the specific stage at which trust begins to play an influential role. Based on related findings stating that the level of trust perceived among users is expected to foster a sense of safety and security throughout the process of utilizing a platform (Lankton et al., 2015), this study argues that the establishment of trust beliefs in LSE platforms synergistically amplifies the mediating paths connecting the ZMOT value and impulse buying tendency.

This argument is triggered by the fact that, at the ZMOT, users are in the decision-making phase and are evaluating whether to engage with the platform. Trust at this stage can significantly influence their willingness to explore and try out the platform. If users trust the platform from the outset, they are more likely to take the first step and join a live-streaming session. Consistently, studies have found that trust is the most powerful tool to help reduce the perceived risks associated with using a new platform (Choung et al., 2023). Concerns about privacy, security, and the credibility of content can deter users from joining a live-stream. By establishing trust early, the platform can alleviate these concerns, making users feel more secure and comfortable. Therefore, we propose:

H7a*: The mediating effect of trust beliefs in streamer on the relationship between ZMOT value and impulse buying tendency is strengthened, when trust beliefs in the LSE platform is high.*
H7b. *The mediating effect of emotional engagement on the relationship between ZMOT value and impulse buying tendency is strengthened, when trust beliefs in the LSE platform is high.*

4. Overview of the Study

This study specifically examines the millennial cohort to provide a comprehensive understanding of impulse buying behavior in LSE. Millennials, born between 1981 and 1996, comprise a significant portion of LSE users and demonstrate high engagement with digital platforms, particularly in social commerce (Smith, 2021). This demographic is not only tech-savvy but also exhibits distinct consumption patterns that prioritize convenience, social interaction, and personalized experiences - key elements that LSE platforms are designed to facilitate (Choi & Lee, 2020). Their high participation in platforms that integrate entertainment and shopping, such as live-streaming commerce, makes them ideal subjects for understanding impulse buying dynamics (Wang et al., 2023).

This research comprises two complementary studies. Study 1 serves as an initial pilot investigation. It examined the sequential process from primary appraisals (LSE affordances) to secondary appraisals (ZMOT value, trust beliefs in streamer, emotional engagement), leading to impulse buying tendency (H1-H4), including mediating effects (H5a and H5b). Study 2 serves as the main study that re-validates the findings from Study 1 using a different sample of millennial participants and explores the moderating (H6a to H6c) and moderated-mediation paths (H7a to H7b). This two-study approach strengthens our findings' robustness while highlighting the incremental process of how live-streaming interactivity influences users' buying behavior.

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5. Study 1: Initial Pilot Investigation

5.1 Design and Procedures

Study 1 used data collected from participants in Malaysia who were millennials (i.e., between the ages of 18 and 35), had an active subscription to at least one LSE platform[1], and had not purchased limited edition products or retrieved discount codes to make purchases from LSC.[2] Malaysia was a useful context for our study, because approximately 20 million residents there use Facebook or Instagram for LSE shopping (Statista, 2021). There are also four million users of TikTok, one of the most popular LSE platforms in Malaysia, with a notable concentration of users below the age of 30 (The Sun Daily, 2020).

To conduct the data collection, we designed a written descriptive scenario (vignette) to gauge participants' perceptions and decisions towards the LSE session (see Appendix A). The use of hypothetical scenarios provides a good approximation of the user's decision-making process and allows for better control and measurement than real-world behavior, hence mitigating external factors that might influence participants' responses.

Before collecting our data, we tested the validity of the instruments through a pretest (n=10) and a pilot test (n=50) with a panel of experts consisting of IS professors and representatives of the target group. These tests helped to determine the relevance of the questionnaire and whether the instructions and statements were appropriate and understood. Based on the pretest results, we modified some of the measurement items to correct grammatical errors, misspellings, and sentence structure. The pilot test results showed that all the variables met the composite reliability requirement with values above 0.7.

We collected the data using an online survey between March 1 and May 31, 2022. Of the 450 responses, we excluded 25 with suspicious response patterns (straight lines or inconsistent responses), leaving 425 responses for analysis (see Table 1). The demographic profile of respondents in Study 1 indicates that the majority identified as female (56.5%) and were single (62.4%). The majority of participants were under the age of 25 (38.8%), held a bachelor's degree (38.6%), and reported a monthly income ranging from RM2,001 to RM4,000 (approximately USD480–USD960) (48.2%). In terms of purchasing behavior on LSE platforms, the most frequently bought product categories were fashion and apparel (35.5%), cosmetics (27.8%), food (24.7%), and daily necessities (12.0%), a pattern that is consistent with the statistics reported by Ma (2024). Additionally, 60.0% of the participants indicated a preference for watching LSE sessions hosted by female streamers.

[Insert Table 1 here]

5.2 Measures

LSE affordances, encompassing three dimensions—visibility, meta-voicing, and guidance shopping—were adopted from Dong and Wang (2018)[3]. The scale for trust beliefs in

[1] A user with an active subscription to a LSE usually means that they are a paying member of that particular streaming service and can access premium features, content, or other benefits.

[2] During a live-stream, special discounts and recommendations of limited edition products are frequently given at random to lure individuals to stay longer. This common practice encourages individuals to develop the idea that live-streaming entails exclusive product recommendations that are limited edition and special discounts that are only valid for a short period of time (e.g., a code that expires in one hour). Therefore, individuals will feel pressured to make quick, impulse purchases to avoid missing out on a deal (Liu, 2023).

[3] The conceptualization of LSE affordances in this study inherently reflects platform-agnostic features, capturing the fundamental functionalities of the LSE that emerge from user-technology interactions rather than being constrained to a specific LSE platform. This aligns with affordance theory, which views affordances as relational features that emerge from users' interactions with technology, independent of platform-specific variations (Leonardi, 2011; Hua et al., 2024). Consequently, examining LSE affordances in a generalized

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streamer was derived from Kim and Park (2013)[4] and Gefen et al. (2003). The scale of emotional engagement was adapted from Lim et al. (2015), while the scale for impulse buying tendency was drawn from Rook and Fisher (1995) and Weun et al. (1998). Additionally, the scale for ZMOT value was adapted from Das et al. (2022) and Han and Kim (2020). All items were rated on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree) (see Appendix B).

5.3 Control Variables

The proposed model includes four control variables: marital status, age, income level, and preferred type of streamer. Empirical findings suggested that users under the age of 25 demonstrate higher familiarity with online selling technologies and greater impulse buying tendencies due to relatively lower self-control (Badgaiyan & Verma, 2014). Moreover, an extensive literature review highlights a clear preference among users for purchasing from female streamers, attributed to their perceived trustworthiness and meticulousness in product recommendations (Yang et al., 2023b). Additionally, it is suggested that single individuals with higher income levels demonstrate a greater propensity for impulse buying behavior (Chen et al., 2019).

5.4 Results

5.4.1 Common Method Bias

We adopted two types of assessments to test for common method bias (CMB) issues. First, the full collinearity test shows that the variance inflation factor (VIF) values are below 3.33 (Table 2) (Kock & Lynn, 2012). Second, the unmeasured latent method construct (ULMC) test (see Appendix C, see Study 1) (Chin et al., 2012; Liang et al., 2007) shows that all the substantive loadings are significant. The majority of the method loadings demonstrate insignificant results (with either negative or relatively small values), except for VI4, M4, M5, GS3, TS2, EE3, EE4, IBT2, IBT3, IBT4, and ZOT2. In addition, the ratio of substantive variance to method variance is substantially large at 72:1. Thus, both tests confirm that CMB should not pose a problem in interpreting the results of this study.

5.4.2 Measurement Model

To evaluate the measurement model, we used covariance-based structural equation modeling (CB-SEM) to perform the confirmatory factor analysis (CFA). As shown in Table 2, all the constructs meet the minimum threshold for composite reliability (CR > 0.7) and convergent validity (outer loadings above 0.708 and average variance extracted (AVE) above 0.50) (Hair et al., 2019). We then used Fornell and Larcker's (1981) test to analyze the discriminant validity of the measures. The results support discriminant validity, given that the square root of the AVE coefficients for all constructs is greater than the value of the correlations for all pairs of constructs (Table 3). On top of that, the goodness-of-fit indices for the measurement model are satisfactory (Hair et al., 2019). The fit indices for this model are as follows:

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manner allows for a holistic understanding of the core characteristics of the LSE environment from the user's perspective.

[4] The conceptualization of trust beliefs in streamers, which is frequently addressed through the overarching term "streamers," is determined by users' experiences with the streamers they engage with in the LSE. These streamers are evaluated based on their persuasion and trustworthiness in general with users in the LSE environment. This evaluation can significantly affect users' perceptions or decisions, rather than being exclusive to a single individual (Kim & Park, 2013). Consequently, trust beliefs in streamers emerges as a pivotal factor in the LSE environment, which can shape user perceptions and influence purchasing decisions.

χ^2/df = 3.81, RMSEA = 0.05, SRMR = 0.07, AGFI = 0.98, GFI = 0.98, TLI = 0.98, and CFI = 0.97.[5]

[Insert Tables 2 and 3 here]

5.4.3 Structural Model

The overall goodness-of-fit indices of the structural model are within the acceptable range: χ^2/df = 3.52, RMSEA = 0.05, SRMR = 0.07, AGFI = 0.95, GFI = 0.96, TLI = 0.95, and CFI = 0.95. As hypothesized (see Table 4), LSE affordances (β = 0.57; p = 0.00) has a positive impact on the ZMOT value, thereby supporting H1. In addition, the ZMOT value has a positive effect on both trust beliefs in streamer (β = 0.72; p = 0.01) and emotional engagement (β = 0.65; p = 0.01), providing support for H2a and H2b. In turn, both trust beliefs in streamer (β = 0.31; p = 0.01) and emotional engagement (β = 0.34; p = 0.01) have a positive impact on impulse buying tendency, especially after controlling for the insignificant effects of type of preferred streamer, marital status, age, and monthly income. These results support H3 and H4. Finally, trust beliefs in streamer (β = 0.23; p = 0.01) and emotional engagement (β = 0.22; p = 0.01) have a significant mediating effect on the relationship between ZMOT value and impulse buying tendency, supporting both H5a and H5b. Overall, the model proposed in study 1 demonstrates satisfactory predictive power, with R^2 values ranging from 15% to 52%, and there are no collinearity issues, given that the VIF of all constructs is below 3.33 (Hair et al., 2019).

[Insert Table 4]

6. Study 2: Main Study

6.1 Design and Procedures

In study 2, we applied the same criteria outlined in study 1 (section 5.1). We first conducted a pretest (n=15) and a pilot test (n=45) with a panel of experts comprising IS professors and representatives from the target demographic[6]. This rigorous process ensured the attainment of content validity, particularly when trust beliefs in the LSE platform were introduced in the research model. Notably, the pretest outcomes remained consistent, and the pilot test responses demonstrated that all variables met the threshold for composite reliability (> 0.7). The data collection took place through an online survey between May 1 and July 31, 2023. We invited 300 millennials to take part in the survey. Of these, 210 respondents completed the survey. Having scrutinized the responses, we excluded 10 that displayed suspicious response patterns, such as straight-lining or inconsistency. This left 200 responses available for subsequent analysis.

As shown in Table 1 (see Study 2), the majority of respondents identified as female (64.0%) and single (61.0%). Most were also between the age of 26 and 29 (67.5%), held a master's degree (62.5%), and had a monthly income between RM4,001 and RM6,000

[5] To have an acceptable goodness of model fit in CB-SEM, χ^2/df = < 3 or < 5, RMSEA < 0.08, SRMR < 0.08, AGFI > 0.90, GFI > 0.90, TLI > 0.90, and CFI > 0.90 (Hair et al., 2019). We applied these criteria to the assessments of the measurements and the structural model.

[6] Specifically, the pretest in Study 2 was conducted with the aim of validating the applicability of the research instrument under the specific conditions of the main study. This was a necessary step due to demographic differences between the samples of Study 1 and the inclusion of new variables, such as trust beliefs in the LSE platform and control variables (i.e., years of experience using live streaming technology, frequency of using live-streaming technology, etc.). This procedure ensured that any potential ambiguities were addressed and that the measurement items effectively captured the intended constructs within the LSE context. Finally, a pilot test was conducted in Study 2 to assess the reliability and validity of the newly incorporated measurement scales before proceeding with actual data collection.

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(approximately USD480–USD960) (73.5%). Fashion and apparel remained the dominant product category (39.5%), which is consistent with Study 1. Additionally, 75.0% of respondents preferred watching LSE sessions hosted by female streamers. Furthermore, a substantial proportion of respondents (82.5%) reported an average of four years of experience using LSE platforms, signifying a high level of familiarity and proficiency with LSE. Also, 60.5% of participants characterized their usage frequency as slightly high, indicating a prevalent use of LSE. In regard to information-seeking behavior, the predominant proportion of respondents (42.5%) reported "sometimes" seeking information from sources other than live-streaming commerce platforms when researching a product or service prior to purchase.

6.2 Measures

We adapted the measurement items for trust beliefs in the LSE platform from McKnight et al. (2011) (see Appendix B for details)[7]. For the rest of the variables, we used the same items as set out in Study 1 (see section 4.2). Consistent with study 1, all items were rated on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree).

6.3 Control Variables

In Study 2, we controlled for marital status, age, income level, and preferred streamer type. Additionally, we included three more control variables: years of experience using LSE, frequency of LSE platform usage, and frequency of using alternative sources (e.g., e-commerce websites and mobile apps) for product-related information. Evidently, research shows that impulse buying tendency is influenced by platform exposure (Lu & Chen, 2021; Sun et al., 2019), while users who gather information from multiple channels typically take longer to make purchase decisions compared to single-channel users (Chen et al., 2024). These additional controls helped account for potential confounding effects from participants' information-seeking behaviors across non-LSE sources.

6.4 Results

6.4.1 Common method bias

The full collinearity test (VIF values < 3.33) (Table 5) and the ULMC test (Appendix C; see Study 2) suggest that common method bias is not a concern.

6.4.2 Measurement Model

The results of the CFA show satisfactory levels of internal consistency, convergent validity, and discriminant validity (Tables 5 and 6). In addition, the goodness-of-fit indices for the measurement model are satisfactory (Hair et al., 2019), where $\chi^2/df = 4.78$, RMSEA = 0.05, SRMR = 0.077, AGFI = 0.95, GFI = 0.94, TLI = 0.97, and CFI = 0.97.

[Insert Table 5 and Table 6 here]

6.4.3 Structural Model

As shown in Table 7, all the direct paths exhibit significant results (p = 0.00), which corroborates the findings reported in study 1. Importantly, our analysis reveals that years of

[7] The conceptualization of trust in the LSE platform is measured based on users' experiences across the LSE platforms they engage with, ensuring that their evaluations reflect generalized trust perceptions rather than being restricted to a single platform. This approach is consistent with prior research on trust beliefs in the LSE platform (McKnight et al., 2011), which underscores the importance of anchoring trust assessments to users' interactions within the LSE environment.

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experience level and frequency of using LSE platforms are the only control variables that exhibit effects on impulse buying tendency ($p = 0.01$): an outcome that reflects our rigorous efforts to control the confounding effects. Overall, the proposed model demonstrates satisfactory predictive power in study 2, with R^2 values ranging from 32% to 56%. Given that the VIF is below 3.33 for all constructs (Hair et al., 2019), there are no collinearity issues. In addition, the structural model achieves satisfactory results in terms of model fit: $\chi^2/df = 4.74$, RMSEA = 0.05, SRMR = 0.076, AGFI = 0.94, GFI = 0.93, TLI = 0.96, and CFI = 0.96.

To test for moderation (H6a, H6b, and H6c), we used the double-mean centering approach (Hair et al., 2019). Results show that the relationship between LSE affordances and ZMOT value is moderated by trust beliefs in the LSE platform ($\beta = 0.13$, $p = 0.00$) during the primary appraisal stage. Similarly, at the secondary appraisal stage, results show that the relationship between trust beliefs in streamer and impulse buying tendency is moderated by trust beliefs in the LSE platform ($\beta = 0.18$, $p = 0.00$). Trust beliefs in the LSE platform also moderates the relationship between emotional engagement and impulse buying tendency ($\beta = 0.21$, $p = 0.00$). Importantly, the inclusion of this moderating effect raises the R^2 value from 39% to 53% for the ZMOT value as well as 41% to 51% for the impulsive buying tendency. Meanwhile, the goodness-of-fit statistics indicating that the model has an acceptable fit ($\chi^2/df = 4.87$; SRMR = 0.098; RMSEA = 0.050, SRMR = 0.079, AGFI: 0.01, GFI = 0.91, TLI = 0.093, and CFI = 0.092).

To corroborate the evidence supporting H6a, H6b, and H6c, we then assessed the interaction plot for the moderators. The interaction plots shown in Figure 2 (Panel A, Panel B, and Panel C) show that the line for high trust beliefs in the LSE platform is steeper than the line for low trust beliefs in the LSE platform. This indicates that when users have strong trust beliefs in the LSE platform, the connections between LSE affordances on ZMOT value, as well as trust beliefs in streamer and emotional engagement on impulse buying tendency, are found to be stronger. Thus, the proposed hypotheses of H6a, H6b, and H6c are supported.

[Insert Table 7 here]
[Insert Figure 2 here]

Finally, we assessed the moderated mediation paths, particularly in the secondary appraisal stage. The results shown in Table 8 indicated support for the index of moderated mediation ($p < 0.05$), as the confidence interval did not include zero. We then analyzed the mediation effects of trust beliefs in the LSE platform at various levels of moderation (i.e., high, low, and medium). As the findings shown in Table 5, the conditional mediation impact of both trust beliefs in streamer and emotional engagement became stronger from low levels to higher levels of trust beliefs in the LSE platform. Therefore, H7a and H7b were supported.

7. Discussion and Implications

7.1 General Discussion

Drawing on cognitive appraisal theory, our research examines the underlying appraisals behind impulse buying tendencies on LSE platforms. In the primary appraisal stage, this research highlights that LSE affordances critically shape users' perceptions of ZMOT value. Building upon the significant findings of H1, we confirm that individuals' perceptions of technology's affordances influence a spectrum of intended and unintended behaviors (Das et al., 2022; Hua et al., 2024; Treem & Leonardi, 2013).

In the secondary appraisal stage, our study elucidates the pivotal role of ZMOT value in fostering user trust and cultivating emotional connections with streamers within the LSE ecosystem (as corroborated by H2a and H2b). Our findings show that users who receive great

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value from streamer during the ZMOT stage, exhibit a higher level of trust beliefs in streamer and engage with them emotionally. These findings echo earlier works which conclude that when users perceive a live-selling session as valuable for their decision-making, they are inclined to develop positive affective responses, such as admiration, trust, or affinity towards the streamer (Luo et al., 2024a).

This study further confirms the causal and indirect effects of trust in streamers and emotional engagement as significant secondary appraisals influencing impulse buying through ZMOT value (supported by H3 to H5). These results align with previous research showing that trust in e-commerce settings increases the likelihood of engaging in both planned and unplanned purchases (Cao & Galinsky, 2020). LSE users with higher levels of trust and emotional engagement with streamers demonstrate greater impulse buying tendencies. This finding is parallel with existing literature that suggests trust in streamers creates psychological closeness and interpersonal intimacy, enhancing impulse buying behavior (Liu et al., 2023). Additionally, emotional engagement strengthens this effect, particularly when LSE sessions create interactive experiences that evoke positive emotional responses, leading to an increased sense of urgency to purchase showcased products (Gvili & Levy, 2023).

Last and most importantly, our extension study revealed that the previously discussed direct and indirect effects are contingent upon users' trust beliefs in LSE platforms (supported by H6a, H6b, H6c, H7a, and H7b). In the LSE context, trust beliefs in the platform serves as a fundamental factor that facilitates relationship-building and transaction behavior by reducing perceived uncertainty and risk. While existing studies show inconsistent conclusions about trust antecedents and their impact on user intentions (e.g., Gu et al., 2024; Lankton et al., 2015), our research validates platform trust as a boundary condition from a broader perspective. The findings reveal that when users perceive the LSE platform as reliable, functional, and helpful, their overall usage experience improves significantly. This enhanced experience strengthens users' beliefs about the LSE session's ability to enhance ZMOT value during the exploration stage and increases their likelihood of making impulse purchases, particularly when interacting with trusted and engaging streamers.

7.2 Theoretical Implications

The theoretical implications of this study are threefold. First, this research challenges the dominant paradigm that primarily focuses on technology affordances' post-adoption effects. Our investigation reveals that LSE affordances serve as critical primary appraisal mechanisms through which users evaluate the engagement value of each live session. Within dynamic selling platforms like LSE, affordances cannot be delivered through isolated features. Our study emphasizes that the three core features - visibility, metavoicing, and guidance shopping - must be integrated concurrently to capture users' attention and interest at the ZMOT stage. This insight reveals a critical temporal aspect of user engagement: ineffective integration of affordances during initial interaction can lead to user migration, reducing transaction opportunities. From the significant findings, our study provides a more nuanced understanding of technology affordances beyond post-adoption to the early-stage evaluative stage.

Second, this study advances cognitive appraisal theory by revealing how trust beliefs in streamers and emotional engagement function as secondary appraisal mechanisms transforming initial evaluations into impulse buying behaviors. Our empirical evidence addresses calls for understanding how affective states accelerate evaluation processes in real-time digital shopping environments (Feng et al., 2024; Gu et al., 2024). Trust beliefs create cognitive shortcuts that reduce perceived risk, while emotional engagement generates arousal

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states that compress decision timeframes. These mechanisms work synergistically in unfamiliar virtual environments to lower resistance to impulse buying. This application of cognitive appraisal theory demonstrates how sequential appraisal processes operate in high-velocity digital environments where deliberative evaluation cycles condense into near-instantaneous reactions, establishing a foundation for future research at the intersection of LSE affordances, user appraisals, and purchasing behaviors.

Last, our study stands out by examining the conditional effects of trust beliefs in technology in heightening LSE usage. Despite previous studies acknowledging the imperative role of trust beliefs in IS platforms in affecting users' usage experience (Khoi & Le, 2023; Miranda et al., 2024), more evidence is needed to gauge its influential role in different stages of IS interaction. Our findings imply that trust beliefs in LSE platforms play two significant conditioning roles, both in users' exploration (i.e., technology affordances – ZMOT value) and interaction stages (moderated-mediation paths). These proven findings draw attention to the need for future IS studies to develop a broader understanding of how trust functions in technological contexts and how it adds value for streamers using the platform to influence desirable responses from users, making the IS platform more sustainable.

7.3 Managerial Implications

This study elucidates implications for several key practitioners of the LSE platform, including streamers and platform management teams.

Streamers should strategically leverage LSE platform affordances to enhance ZMOT value through multiple complementary features. Visibility affordances create transparent product presentations that address users' initial information needs, reducing uncertainty during the critical ZMOT stage when potential customers are still forming impressions. Meta-voicing affordances facilitate real-time interaction that validates product claims through community feedback, strengthening perceived credibility during users' preliminary evaluation and creating a social proof that influences decision-making. While guidance shopping affordances provide personalized recommendations that help users navigate product options efficiently, streamlining their decision-making process by highlighting relevant products based on expressed preferences or browsing history. By integrating these three affordances, streamers create a comprehensive pre-purchase environment that satisfies users' informational and social validation needs. In fact, effective implementation of these affordances also helps streamers differentiate their offerings in a crowded marketplace while simultaneously addressing the cognitive uncertainty that often prevents users from committing to particular live shopping experiences. This integration is especially important during the exploration stage, when users have uncertain notions regarding which live sessions to participate in and which will optimize their value-seeking, given their limited knowledge.

Beyond optimizing platform affordances, our findings emphasize that streamers should cultivate positive affective states to transform initial interest into impulse purchases. Trust beliefs and emotional engagement serve as critical psychological bridges between ZMOT value and purchase behavior. To build trust, streamers should project professionalism through appropriate attire and well-designed backdrops during livestream sessions. This professional presentation significantly enhances viewers' first impressions and perceived credibility. Additionally, streamers must demonstrate comprehensive product knowledge, providing detailed specifications, usage guidelines, and comparative advantages to help users fully understand product benefits. This expertise-driven approach establishes the streamer as

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a credible information source, fostering trust that reduces perceived risk in the virtual shopping environment.

To strengthen emotional engagement, streamers should implement concrete strategies that create authentic connections with viewers. Rather than exclusively focusing on product promotion, streamers should integrate personal elements by sharing glimpses of their daily lives, behind-the-scenes content, and authentic reactions to products. This personalization transforms the commercial interaction into a relational experience. Additionally, incorporating emotional storytelling that frames products within relatable narratives—such as how a skincare product solved the streamer's specific skin issues or how a kitchen gadget transformed their cooking routine—creates memorable emotional anchors. These engagement techniques collectively generate parasocial bonds that bypass rational decision-making processes, making viewers more receptive to impulse purchases driven by emotional connection rather than purely utilitarian evaluation.

To enhance users' confidence in LSE platforms, system designers and engineers should implement strategic trust-building measures across the platform architecture. First, they should establish transparent policies regarding terms of service, privacy, and community guidelines with easily accessible information about data handling practices. Implementing robust security measures—including strong encryption protocols, two-factor authentication, and secure payment processing—protects users' financial and personal information. Second, platform teams should deploy effective content moderation through a combination of AI-powered filtering and human oversight, ensuring live-streams maintain community standards while preserving authentic interaction. The platform should feature intuitive navigation and search functionality that helps users quickly discover relevant content based on their preferences and browsing history. Additionally, implementing real-time technical performance monitoring can prevent disruptions that might undermine user trust, ensuring consistent streaming quality regardless of traffic volume. These comprehensive approaches create a robust trust infrastructure that encourages confident platform engagement, ultimately fostering a vibrant and sustainable LSE ecosystem.

7.4 Limitations and Future Research

This study is subject to several limitations. First, the data were collected in Malaysia, a developing country, may limit the generalizability to regions with different cultural practices. Future research should conduct comparative studies between developed and developing countries, as cultural differences significantly impact technology usage behavior.

Second, despite conducting two complementary studies, both used cross-sectional designs, limiting causal inference and the ability to capture evolving user behaviors and attitudes. Future research should employ real-time data collection methods to assess ZMOT value perceptions. Time-lagged studies comparing pre-livestream (when users anticipate events and engage with promotional content) and post-livestream phases (when users interact directly with streamers and other viewers) would provide valuable insights. Additionally, scholars should develop reliable scales to measure both the first and second moments of truth within the ZMOT value and examine their impacts on LSE usage behavior.

Third, future research should conduct experimental studies examining streamer characteristics. Characteristics such as authenticity, charisma, and trustworthiness are crucial for attracting and retaining viewers during live sessions (Zhao et al., 2023). When these characteristics align with user preferences, they directly influence ZMOT value, affective responses, and behavioral outcomes. The incorporation of advanced experimental methods, such as eye-tracking and facial expression analysis, would also contribute to a more profound comprehension of the streamer characteristics during the live-streamed interactions (Hong et

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al., 2021; Mullins et al., 2022; Pfeiffer et al., 2020). These approaches would provide deeper insights into the immediacy and automaticity of evaluations and impulse buying decisions, complementing self-reported data and advancing our understanding of users' cognitive, affective and conative responses in LSE platforms.

Fourth, future studies should explore additional LSE features to develop a more comprehensive understanding of LSE affordances. Leonardi (2011) suggests that affordances can manifest through different features depending on technology usage and context, influencing user behavior in various ways. As LSE evolves as a form of social commerce, it not only facilitates product information dissemination but also enables socially interactive and entertaining shopping experiences (Wang et al., 2023). Future research should investigate other potential LSE affordances, including entertainment affordances and social connection affordances (Hua et al., 2024), to better understand the multifaceted nature of user engagement with these platforms.

Finally, future research should incorporate more dynamic theoretical perspectives by integrating cognitive appraisal with dual-process theories of decision-making (Bala & Venkatesh, 2016; Zhang & Ruan, 2024). These frameworks account for both automatic impulse-driven stimuli and reflective deliberate appraisals, along with real-time engagement models that consider feedback loops between users, streamers, and peer interactions (Novak & Hoffman, 2009). For example, initial purchase hesitation in LSE environments may transform into impulse buying through positive viewer comments and limited-time offers. Researching this phenomenon would benefit from real-time behavioral tracking methods such as gaze patterns and clickstream data (Pfeiffer et al., 2020), as well as sentiment analysis of live comments (Storey & Park, 2022). These methodological advances are crucial for capturing LSE's dynamic decision-making processes, revealing how impulse buying stems from both immediate heuristic judgments and deliberate systematic evaluations.

8. Conclusion

This study illuminated the drivers of impulse buying tendencies in LSE platforms. Leveraging cognitive appraisal theory, we identified users' perceptions of interactive affordances as pivotal primary appraisals shaping ZMOT value. We underscored the significance of affective factors—particularly trust beliefs in streamers and emotional engagement—as secondary appraisals essential in driving impulsive buying tendencies. By uncovering the contingency role of trust beliefs in LSE platforms, our findings enrich this burgeoning field, catalyzing a deeper understanding of user experience and behavior formation in these dynamic shopping environments.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT to copyedit and improve the language and readability of author-generated text. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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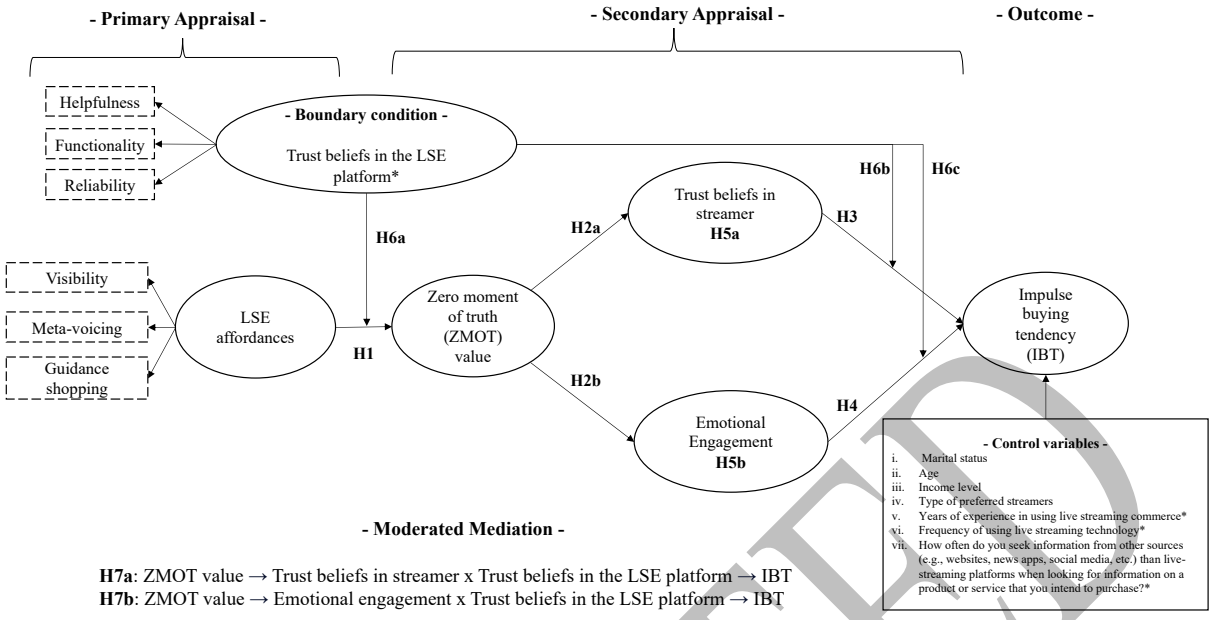
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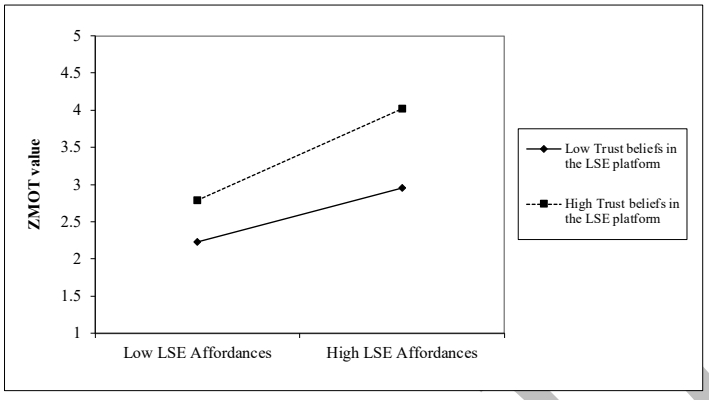
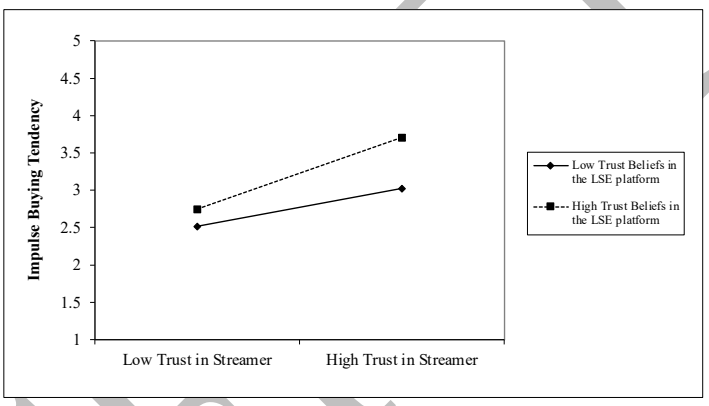
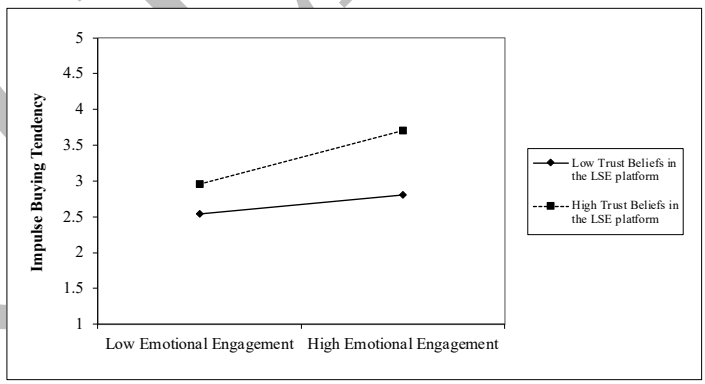
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Note: Dashbox means lower-order constructs; * means that the construct was included in the main study.

Figure 1: Research Model

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Panel	Interaction Plot
A	
B	
C	

Remarks:
(i) Panel A is the interaction plot of LSE affordances x trust beliefs in the LSE platform on ZMOT value,
(ii) Panel B is the interaction plot of trust beliefs in streamer x trust beliefs in the LSE platform on impulse buying tendency, and
(iii) Panel C is the interaction plot of emotional engagement x trust beliefs in the LSE platform on impulse buying tendency.

Figure 2: Interaction plots of trust beliefs in the LSE platform

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Table 1: Demographic sample

Variable	Category	Study 1 (n = 425)	Study 1 (%)	Study 2 (n = 200)	Study 2 (%)
Gender	Male	185	43.5	72	36.0
	Female	240	56.5	128	64.0
Marital status	Single	265	62.4	122	61.0
	Married	160	37.7	78	39.0
Age	25 years old and below	165	38.8	26	13.0
	26 to 29 years old	142	33.4	135	67.5
	30 to 35 years old	118	27.8	39	19.5
Education	Diploma	153	36.0	0	0.0
	Bachelor's degree	164	38.6	55	27.5
	Master's degree	85	20.0	125	62.5
	Doctorate degree	23	5.4	20	10.0
Monthly income	RM 2,000 or below	170	40.0	13	6.5
	RM 2,001-RM 4,000	205	48.2	50	25.0
	RM 4,001-RM 6,000	50	11.8	147	73.5
Product category	Fashion and apparel	151	35.5	79	39.5
	Cosmetics	118	27.8	61	30.5
	Food	105	24.7	43	21.5
	Daily suppliers	51	12.0	17	8.5
Preference streamer	Male streamer	170	40.0	50	25.0
	Female streamer	255	60.0	150	75.0
Years of experience in using live streaming commerce	1 year	-	-	0	0.0
	2 years	-	-	12	6.0
	3 years	-	-	23	11.5
	4 years	-	-	165	82.5

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Frequency of use of live streaming technology	Very low	-	-	0	0.0
	Slightly low	-	-	0	0.0
	Medium	-	-	20	10.0
	Slightly high	-	-	121	60.5
	Very high	-	-	59	29.5
How often do you seek information from other sources (e.g., websites, news apps, social media, etc.) than live-streaming commerce platforms when looking for information on a product or service that you intend to purchase?	Rarely	-	-	15	7.5
	Occasionally	-	-	58	29.0
	Sometimes	-	-	85	42.5
	Frequently	-	-	31	15.5
	Always	-	-	11	5.5

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Table 2: Assessment of the measurement model - Study 1

Construct	Item	Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)	Full Collinearity (FC)
Visibility	V1	0.90	0.92	0.75	2.69
	V2	0.91			
	V3	0.84			
	V4	0.82			
Meta-voicing	M1	0.78	0.89	0.63	2.42
	M2	0.78			
	M3	0.88			
	M4	0.75			
	M5	0.77			
Guidance shopping	GS1	0.84	0.90	0.70	2.91
	GS2	0.88			
	GS3	0.81			
	GS4	0.82			
Trust beliefs in streamer	TS1	0.86	0.89	0.68	3.32
	TS2	0.93			
	TS3	0.88			
	TS4	0.57			
Emotional engagement	EE1	0.65	0.85	0.58	1.81
	EE2	0.79			
	EE3	0.77			
	EE4	0.83			
Impulse buying tendency	IBT1	0.53	0.84	0.51	1.19
	IBT2	0.82			
	IBT3	0.67			
	IBT4	0.80			
	IBT5	0.71			
ZMOT value	ZMOT1	0.74	0.88	0.64	2.86
	ZMOT2	0.78			
	ZMOT3	0.78			
	ZMOT4	0.89			
LSE affordances*	Visibility	0.81	0.86	0.68	1.43
	Metavoicing	0.84			
	Guidance shopping	0.82			

Note: * means that the construct was measured as a higher-order construct.

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Table 3: Discriminant validity assessment - Study 1

Construct	1	4	5	6	7
1. LSE affordances*	**0.82**				
2. Trust beliefs in streamer	0.57	**0.82**			
3. Impulse buying tendency	0.16	0.26	**0.71**		
4. ZMOT value	0.62	0.72	0.15	**0.80**	
5. Emotional engagement	0.42	0.60	0.30	0.63	**0.76**

Note: * means that the construct was measured as a higher-order construct.

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Table 4: Result of structural model assessment - Study 1

	Relationship	Std Beta	Std Error	t-value	p-value	BCa CI LB	BCa CI UB	VIF	R^2
Direct	H1: LSE affordances → ZMOT value	0.57	0.04	13.96	0.00	0.50	0.64	1.00	0.32
	H2a: ZMOT value→ Trust beliefs in streamer	0.72	0.06	12.69	0.01	0.64	0.91	1.00	0.52
	H2b: ZMOT value → Emotional engagement	0.65	0.05	9.20	0.01	0.37	0.57	1.00	0.42
	H3: Trust beliefs in streamer → IBT	0.31	0.07	3.21	0.01	0.11	0.38	1.72	0.15
	H4: Emotional engagement → IBT	0.34	0.11	3.54	0.01	0.17	0.64	1.62	
Mediation	H5a: ZMOT value →Trust beliefs in streamer →IBT	0.23	0.08	3.01	0.01	0.12	0.33		
	H5b: ZMOT value → Emotional engagement → IBT	0.22	0.08	2.88	0.01	0.13	0.32		
Control Variable	(i) Preferred streamer → IBT	0.05	0.04	1.21	0.30	-0.03	0.10		
	(ii) Marital status → IBT	0.06	0.04	1.53	0.21	-0.01	0.09		
	(iii) Age → IBT	0.04	0.04	1.16	0.32	-0.07	0.13		
	(iv) Monthly income → IBT	0.05	0.05	1.02	0.27	-0.01	0.14		

Note: NA: Not applicable; ZMOT value: Zero moment of truth value; IBT: Impulse buying tendency

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Table 5: Assessment of the measurement model - Study 2

Construct	Construct	Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)	Full Collinearity (FC)
Emotional engagement	EE1	0.76	0.89	0.68	1.25
	EE2	0.86			
	EE3	0.81			
	EE4	0.87			
Guidance shopping	GS1	0.89	0.95	0.82	2.08
	GS2	0.92			
	GS3	0.91			
	GS4	0.91			
Impulse buying tendency	IBT1	0.77	0.88	0.59	3.09
	IBT2	0.80			
	IBT3	0.83			
	IBT4	0.76			
	IBT5	0.68			
Metavoicing	M1	0.88	0.94	0.76	2.57
	M2	0.89			
	M3	0.91			
	M4	0.82			
	M5	0.87			
Reliability	Reliability1	0.81	0.91	0.72	2.44
	Reliability2	0.78			
	Reliability3	0.91			
	Reliability4	0.88			
Functionality	FUNC1	0.95	0.96	0.90	3.21
	FUNC2	0.96			
	FUNC3	0.93			
Helpfulness	Help1	0.88	0.92	0.74	1.83
	Help2	0.90			
	Help3	0.88			
	Help4	0.78			
Trust beliefs in streamer	TS1	0.90	0.93	0.78	2.90
	TS2	0.94			
	TS3	0.93			
	TS4	0.75			
Visibility	VI1	0.91	0.95	0.82	2.95
	VI2	0.94			
	VI3	0.89			
	VI4	0.88			
ZMOT value	ZMOT1	0.83	0.93	0.76	3.01
	ZMOT2	0.87			

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	ZMOT3	0.86			
	ZMOT4	0.93			
Trust beliefs in the LSE platform*	Reliability	0.88	0.85	0.66	2.12
	Functionality	0.70			
	Helpfulness	0.85			
LSE affordances*	Visibility	0.89	0.92	0.79	1.24
	Metavoicing	0.89			
	Guidance shopping	0.88			

Note: * means that the construct was measured as a higher-order construct.

Table 6: Discriminant validity assessment - Study 2 (Actual study)

Construct	1	2	3	4	5	6
1. Impulse buying tendency	**0.77**					
2. LSE affordances	0.16	**0.89**				
3. Emotional engagement	0.37	0.33	**0.83**			
4. Trust beliefs in the LSE platform	0.18	0.73	0.66	**0.81**		
5. Trust beliefs in streamer	0.41	0.56	0.56	0.79	**0.88**	
6. ZMOT value	0.19	0.62	0.56	0.73	0.75	**0.87**

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Table 7: Result of structural model assessment - Study 2

	Relationship	Std Beta	Std Error	t-value	p-value	BCa CI LB	BCa CI UB	VIF	R^2
Direct	H1: LSE affordances → ZMOT value	0.62	0.05	13.63	0.00	0.54	0.69	1.00	0.39
	H2a: ZMOT value → Trust beliefs in streamer	0.75	0.02	32.05	0.00	0.71	0.78	1.00	0.56
	H2b: ZMOT value → Emotional engagement	0.58	0.04	14.50	0.00	0.49	0.61	1.00	0.32
	H3: Trust beliefs in streamer → Impulse buying tendency	0.54	0.14	3.77	0.00	0.31	0.78	2.96	0.41
	H4: Emotional engagement → Impulse buying tendency	0.41	0.15	2.73	0.00	0.06	0.39	1.32	
Mediation	H5a: ZMOT value → Trust beliefs in streamer→ Impulse buying tendency	0.41	0.12	3.42	0.00	0.23	0.51		
	H5b: ZMOT value → Emotional engagement → Impulse buying tendency	0.24	0.10	2.40	0.00	0.14	0.31		
Moderation	H6a: LSE affordances x Trust beliefs in the LSE platform → ZMOT value	0.13	0.03	3.81	0.00	0.07	0.18		0.53
	H6b: Trust beliefs in streamer x Trust beliefs in the LSE platform → Impulse buying tendency	0.18	0.06	3.01	0.00	0.06	0.27		0.51
	H6c: Emotional engagement x Trust beliefs in the LSE platform → Impulse buying tendency	0.21	0.07	3.00	0.00	0.11	0.30		
Control Variable	Type of preferred streamer → Impulse buying tendency	-0.07	0.04	1.55	0.30	-0.16	0.10		
	Marital status → Impulse buying tendency	-0.06	0.04	1.27	0.21	-0.12	0.06		
	Age → Impulse buying tendency	-0.05	0.04	1.09	0.32	-0.13	0.03		
	Monthly income → Impulse buying tendency	-0.06	0.05	1.22	0.27	-0.15	0.04		
	Years of experience in using live-streaming commerce → Impulse buying tendency	0.15	0.08	2.03	0.01	0.03	0.33		
	Frequency use of live streaming technology → Impulse buying tendency	0.16	0.08	2.11	0.01	0.04	0.34		
	How often do you seek information from other sources (e.g., websites, social media, salesperson, traditional advertisement, etc.) than live-streaming platforms when looking for information on a product or service that you intend to purchase? → Impulse Buying Tendency	0.06	0.04	1.50	0.08	-0.04	0.15		

Note: NA: Not applicable; ZMOT value: Zero moment of truth value.

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Table 8: Assessment of Moderated Mediation - Study 2

Hypothesis	Relationship	Std Beta	Std Error	t-value	p-value	BCa CI LB	BCa CI UB
H7a: ZMOT value → Trust beliefs in streamer* Trust beliefs in the LSE platform → Impulse buying tendency	Index of Moderated Mediation	0.10	0.04	2.31	0.00	0.04	0.18
	Moderator:						
	Low level of Trust beliefs in the LSE platform (-1 SD)	0.15	0.07	2.32	0.01	0.04	0.25
	Medium level of Trust beliefs in the LSE platform (Mean)	0.17	0.05	3.48	0.00	0.09	0.25
	High level of Trust beliefs in the LSE platform (+1 SD)	0.18	0.07	2.45	0.01	0.06	0.31
H7b: ZMOT value → Emotional engagement*Trust beliefs in the LSE platform → Impulse buying tendency	Index of Moderated Mediation	0.09	0.04	2.00	0.03	0.02	0.16
	Moderator:						
	Low level of Trust beliefs in the LSE platform (-1 SD)	0.09	0.06	1.61	0.05	0.00	0.19
	Medium level of Trust beliefs in the LSE platform (Mean)	0.14	0.04	3.51	0.00	0.08	0.22
	High level of Trust beliefs in the LSE platform (+1 SD)	0.20	0.06	3.48	0.00	0.11	0.30

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Appendix

Appendix A: Vignette Research Design



Imagine you are browsing live-streaming commerce platforms such as Facebook, YouTube, or TikTok. You come across a streamer you follow who is about to start a live stream. The streamer announces that they will be showing some new products during the live stream. These products are something you have been searching for information about. When the livestream starts, the streamer begins presenting the products enthusiastically, explaining their features and benefits. In addition, the streamer interacts with viewers in the chat, answering questions about the product line and sharing their own experiences with the products. You also notice comments from other viewers expressing their enthusiasm for the product range.

After reading this scenario, you will be asked to answer a series of close-ended questions related to the situation. These survey questions will probe your thoughts, feelings, and decision-making process throughout the imagined experience.

Appendix B: Measurement items

Visibility (Dong and Wang, 2018)	
VI1	Live-streaming e-commerce provides me with detailed pictures and videos of the products.
VI2	Live-streaming e-commerce makes the product attributes visible to me.
VI3	Live-streaming e-commerce offers information on product usage in a clear and accessible manner to me.
VI4	Live-streaming e-commerce helps me to visualize products as if they were in the physical store.
Meta-voicing (Dong and Wang, 2018)	
M1	Live-streaming e-commerce allows me to comment on products in real-time.
M2	Live-streaming e-commerce allows me to react to streamers' feedback on products.
M3	Live-streaming e-commerce allows me to share my opinions on products with other users.
M4	Live-streaming e-commerce allows me to participate in communal discussions on products with streamers.
M5	Live-streaming e-commerce allows me to share my shopping experiences with streamers and other users.
Guidance shopping (Dong and Wang, 2018)	
GS1	Streamers on live-streaming e-commerce provide detailed information about products I intend to buy
GS2	Streamers on live-streaming e-commerce help me establish my product needs without constraints.
GS3	Streamers on live-streaming e-commerce assist me in identifying product attributes that best match my preferences.
GS4	Streamers on live-streaming e-commerce offer personalized product recommendations based on my requirements.
Trust beliefs in the LSE platform - Reliability (Mcknight et al., 2011)	
TBST-R1	The live-streaming e-commerce platform is highly reliable.
TBST-R2	The live-streaming e-commerce platform does not fail me.
TBST-R3	The live-streaming e-commerce platform is consistently dependable.
TBST-R4	The live-streaming e-commerce platform operates without malfunctions..
Trust beliefs in the LSE platform – Functionality (Mcknight et al., 2011)	
TBST-F1	The live-streaming e-commerce platform provides the necessary functionalities I need.
TBST-F2	The live-streaming e-commerce platform has the features required for my tasks.
TBST-F3	The live-streaming e-commerce platform is capable of performing the functions I need.
Trust beliefs in the LSE platform – Helpfulness (Mcknight et al., 2011)	
TBST-H1	The live-streaming e-commerce platform effectively meets my need for assistance.
TBST-H2	The live-streaming e-commerce platform provides competent and relevant guidance.
TBST-H3	The live-streaming e-commerce platform offers the help I need when required.

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TBST-H4	The live-streaming e-commerce platform provides clear and practical advice.
Trust beliefs in streamer (Kim and Park, 2013; Gefen et al., 2003)	
TS1	I believe in the information that the streamer provides through live-streaming e-commerce.
TS2	I can trust streamers who use live-streaming e-commerce.
TS3	I believe that streamers who use live-streaming e-commerce are trustworthy.
TS4	I do not believe that streamers in live-streaming e-commerce would take advantage of me.
Emotional engagement (Lim et al., 2015)	
EE1	I quoted the streamer when he/she said something good or witty.
EE2	I expressed my feelings about the streamer in live streaming chats.
EE3	I sometimes use an emote to the streamer when he/she said something good or witty.
EE4	When I participate in a live streaming chat, I feel emotionally connected with streamer I am chatting with.
Zero moment of truth value (Das et al., 2022; Han and Kim, 2020)	
ZOT1	Product information provided during the live-streaming session help to save my time and costs when searching for information
ZOT2	The evaluation of the electronic word-of-mouth and feedback for this product in live-streaming session is accurate and empathic.
ZOT3	The live streaming session provides accurate and clear information about the product.
ZOT4	The live-streaming session provides necessary information and communication about the product.
Impulse buying tendency (Rook and Fisher, 1995; Weun et al., 1998)	
IBT1	When using live-streaming e-commerce, it is fun to buy spontaneously.
IBT2	When using live-streaming e-commerce, I often buy things without thinking.
IBT3	When using live-streaming e-commerce, sometimes I feel like buying things on the spur-of-the-moment.
IBT4	When using live-streaming e-commerce, ‘buy now, think about it later’, describes me.
IBT5	When using live-streaming e-commerce, I have bought things I had not intended to purchase.

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Appendix C: Assessment of common method bias using the unmeasured latent method construct (ULMC)

Study	Construct	Path	Substantive Loading	Substantive Variance	t-value	Path	Method Loading	Method Variance	t-value
1	Visibility	Visibility ⟶ VI1	0.933	0.870	64.232**	Method ⟶ VI1	-0.056	0.003	1.830
		Visibility ⟶ VI2	0.916	0.839	58.832**	Method ⟶ VI2	0.042	0.002	0.718
		Visibility ⟶ VI3	0.905	0.819	47.79**	Method ⟶ VI3	-0.037	0.001	1.137
		Visibility ⟶ VI4	0.863	0.745	37.583**	Method ⟶ VI4	0.074	0.005	2.148*
	Meta-voicing	Meta-voicing ⟶ M1	0.836	0.699	30.653**	Method ⟶ M1	-0.043	0.002	0.779
		Meta-voicing ⟶ M2	0.833	0.694	28.438**	Method ⟶ M2	0.046	0.002	0.544
		Meta-voicing ⟶ M3	0.899	0.808	70.548**	Method ⟶ M3	-0.053	0.003	1.953
		Meta-voicing ⟶ M4	0.820	0.672	32.925**	Method ⟶ M4	-0.069	0.005	2.364*
		Meta-voicing ⟶ M5	0.794	0.630	23.413**	Method ⟶ M5	0.129	0.017	2.983**
	Guidance shopping	Guidance shopping ⟶ GS1	0.889	0.790	45.784**	Method ⟶ GS1	-0.055	0.003	1.194
		Guidance shopping ⟶ GS2	0.898	0.806	52.988**	Method ⟶ GS2	-0.065	0.004	0.146
		Guidance shopping ⟶ GS3	0.839	0.704	24.620**	Method ⟶ GS3	0.114	0.013	2.558**
		Guidance shopping ⟶ GS4	0.902	0.814	47.711**	Method ⟶ GS4	-0.061	0.004	1.800
	Trust beliefs in streamer	Trust beliefs in streamer ⟶ TS1	0.920	0.846	15.171**	Method ⟶ TS1	-0.072	0.005	0.715
		Trust beliefs in streamer ⟶ TS2	0.998	0.996	29.505**	Method ⟶ TS2	-0.078	0.006	2.023*
		Trust beliefs in streamer ⟶ TS3	0.945	0.893	22.918**	Method ⟶ TS3	-0.027	0.001	0.555
		Trust beliefs in streamer ⟶ TS4	0.523	0.274	4.611**	Method ⟶ TS4	0.204	0.042	1.949
	Emotional engagement	Emotional engagement ⟶ EE1	0.804	0.646	27.177**	Method ⟶ EE1	-0.071	0.005	1.777
		Emotional engagement ⟶ EE2	0.865	0.748	34.545**	Method ⟶ EE2	-0.021	0.000	0.944
		Emotional engagement ⟶ EE3	0.865	0.748	35.727**	Method ⟶ EE3	-0.053	0.003	2.029*
		Emotional engagement ⟶ EE4	0.793	0.629	34.983**	Method ⟶ EE4	0.133	0.018	4.099**
	Impulse buying tendency	Impulse buying tendency ⟶ IBT1	0.655	0.429	13.983**	Method ⟶ IBT1	0.045	0.002	0.945
		Impulse buying tendency ⟶ IBT2	0.845	0.714	43.649**	Method ⟶ IBT2	-0.184	0.034	3.017**
		Impulse buying tendency ⟶ IBT3	0.749	0.561	24.991**	Method ⟶ IBT3	0.166	0.028	4.724**
		Impulse buying tendency ⟶ IBT4	0.839	0.704	40.719**	Method ⟶ IBT4	-0.081	0.007	2.519**

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		Impulse buying tendency ⟶ IBT5	0.772	0.596	27.636**	Method ⟶ IBT5	-0.059	0.003	0.787
	ZMOT value	Zero moment of truth value ⟶ ZOT1	0.776	0.602	15.944**	Method ⟶ ZOT1	0.072	0.005	1.134
		Zero moment of truth value ⟶ ZOT2	0.932	0.869	31.144**	Method ⟶ ZOT2	-0.126	0.016	2.871**
		Zero moment of truth value ⟶ ZOT3	0.797	0.635	21.546**	Method ⟶ ZOT3	0.064	0.004	1.299
		Zero moment of truth value ⟶ ZOT4	0.902	0.814	38.282**	Method ⟶ ZOT4	0.031	0.001	0.296
	Average			**0.720**				**0.008**	
2	Visibility	Visibility ⟶ VI1	0.935	0.874	52.258**	Method ⟶ VI1	-0.073	0.005	1.125
		Visibility ⟶ VI2	0.919	0.845	48.982**	Method ⟶ VI2	0.078	0.006	1.037
		Visibility ⟶ VI3	0.917	0.841	41.676**	Method ⟶ VI3	-0.072	0.005	1.156
		Visibility ⟶ VI4	0.868	0.753	35.878**	Method ⟶ VI4	0.069	0.005	1.823
	Meta-voicing	Meta-voicing ⟶ M1	0.864	0.746	26.334**	Method ⟶ M1	-0.018	0.000	0.514
		Meta-voicing ⟶ M2	0.841	0.707	24.055**	Method ⟶ M2	0.054	0.003	0.401
		Meta-voicing ⟶ M3	0.904	0.817	63.140**	Method ⟶ M3	-0.051	0.003	1.702
		Meta-voicing ⟶ M4	0.851	0.724	26.579**	Method ⟶ M4	-0.067	0.004	1.818
		Meta-voicing ⟶ M5	0.857	0.734	21.485**	Method ⟶ M5	0.120	0.014	2.444*
	Guidance shopping	Guidance shopping ⟶ GS1	0.903	0.815	38.441**	Method ⟶ GS1	-0.063	0.004	1.352
		Guidance shopping ⟶ GS2	0.902	0.814	44.787**	Method ⟶ GS2	-0.042	0.002	0.053
		Guidance shopping ⟶ GS3	0.837	0.701	20.615**	Method ⟶ GS3	0.107	0.011	2.038*
		Guidance shopping ⟶ GS4	0.897	0.805	36.128**	Method ⟶ GS4	-0.040	0.002	1.013
	Reliability	Reliability ⟶ TBST-R1	0.855	0.731	28.718**	Method ⟶ SP1	-0.067	0.004	1.299
		Reliability ⟶ TBST-R2	0.822	0.676	23.354**	Method ⟶ SP2	0.092	0.008	1.484
		Reliability ⟶ TBST-R3	0.886	0.785	36.841**	Method ⟶ SP3	0.085	0.007	1.348
		Reliability ⟶ TBST-R4	0.875	0.766	36.757**	Method ⟶ SP4	-0.085	0.007	1.034
	Helpfulness	Helpfulness ⟶ TBST-H1	0.894	0.799	60.229**	Method ⟶ TP1	-0.091	0.008	1.134
		Helpfulness ⟶ TBST-H2	0.904	0.817	84.675**	Method ⟶ TP2	0.095	0.009	1.566
		Helpfulness ⟶ TBST-H3	0.887	0.787	41.674**	Method ⟶ TP3	-0.091	0.008	1.381
		Helpfulness ⟶ TBST-H4	0.838	0.702	27.523**	Method -⟶ TP4	-0.098	0.010	1.475
	Functionality	Functionality ⟶ TBST-F1	0.952	0.906	20.666**	Method ⟶ T1	-0.017	0.000	0.327

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	Functionality ⟶ TBST-F2	0.927	0.859	24.593**	Method ⟶ T2	-0.091	0.008	1.819
	Functionality ⟶ TBST-F3	0.868	0.753	12.266**	Method ⟶ T3	0.111	0.012	1.661
Trust beliefs in streamer	Trust beliefs in streamer ⟶ TS1	0.882	0.778	12.419**	Method ⟶ TS1	0.095	0.009	1.454
	Trust beliefs in streamer ⟶ TS2	0.904	0.817	26.364**	Method ⟶ TS2	-0.086	0.007	2.009*
	Trust beliefs in streamer ⟶ TS3	0.955	0.912	19.694**	Method ⟶ TS3	-0.042	0.002	0.740
	Trust beliefs in streamer ⟶ TS4	0.952	0.906	4.455**	Method ⟶ TS4	0.168	0.028	1.444
Emotional engagement	Emotional engagement ⟶ EE1	0.862	0.743	25.138**	Method ⟶ EE1	-0.072	0.005	1.756
	Emotional engagement ⟶ EE2	0.869	0.755	31.868**	Method ⟶ EE2	-0.097	0.009	0.967
	Emotional engagement ⟶ EE3	0.885	0.783	33.006**	Method ⟶ EE3	-0.068	0.005	2.158*
	Emotional engagement ⟶ EE4	0.877	0.769	28.226**	Method ⟶ EE4	0.148	0.022	3.927**
Impulse buying tendency	Impulse buying tendency ⟶ IBT1	0.682	0.465	14.198**	Method ⟶ IBT1	0.090	0.008	1.497
	Impulse buying tendency ⟶ IBT2	0.847	0.717	35.718**	Method ⟶ IBT2	-0.094	0.009	2.400*
	Impulse buying tendency ⟶ IBT3	0.758	0.575	24.749**	Method ⟶ IBT3	0.153	0.023	3.603**
	Impulse buying tendency ⟶ IBT4	0.852	0.726	31.880**	Method ⟶ IBT4	-0.078	0.006	2.111*
	Impulse buying tendency ⟶ IBT5	0.889	0.790	26.315**	Method ⟶ IBT5	-0.087	0.008	0.858
ZMOT value	Zero moment of truth value ⟶ ZOT1	0.894	0.799	15.102**	Method ⟶ ZOT1	0.074	0.005	0.725
	Zero moment of truth value ⟶ ZOT2	0.923	0.852	25.266**	Method ⟶ ZOT2	-0.101	0.010	2.000*
	Zero moment of truth value ⟶ ZOT3	0.785	0.616	17.251**	Method ⟶ ZOT3	0.093	0.009	1.446
	Zero moment of truth value ⟶ ZOT4	0.909	0.826	29.576**	Method ⟶ ZOT4	0.098	0.010	1.468
Average			**0.770**				**0.008**	

Note: **p < 0.01, *p < 0.05

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