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Published in:
Internet Research

Published: 01/01/2024

Document Version:
Post-print, also known as Accepted Author Manuscript, Peer-reviewed or Author Final version

Publication record in CityU Scholars:
[Go to record](#)

Published version (DOI):
[10.1108/INTR-06-2022-0415](https://doi.org/10.1108/INTR-06-2022-0415)

Publication details:
Men, J., Zheng, X., & Davison, R. M. (2024). The role of vicarious learning strategies in shaping consumers' uncertainty: the case of live-streaming shopping. *Internet Research*, 34(3), 891-916.
<https://doi.org/10.1108/INTR-06-2022-0415>

Citing this paper

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The role of vicarious learning strategies in shaping consumers' uncertainty: The case of live-streaming shopping

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Abstract

Purpose – This article seeks to understand how live-streaming technology (i.e., interactivity and effective use of live-streaming shopping's information presentation tool) impacts consumers' credibility perception regarding live streamers.

Design/methodology/approach – We empirically examined our hypotheses with data (n=405) collected from a survey of consumers who engage in live-streaming shopping.

Findings – Our results demonstrate that vicarious learning strategies (both coactive and independent) can shape consumers' benefit perceptions (i.e., virtual presence and psychological proximity), and further have a positive effect on consumers' personal value (i.e., perceived live streamer credibility). Furthermore, the consumers' perception of the live streamers' credibility positively affects their purchase intentions and ultimately influences their purchase behavior.

Originality/value – Building on the vicarious learning theory and means-end chain model, this study investigates the mechanism of the IT features of live-streaming shopping in reducing consumers' uncertainty about live streamers. This study reveals the value of vicarious learning experiences in reducing consumers' uncertainty and further enhancing their purchase behavior.

Keywords Live-streaming shopping, Credibility, Vicarious learning, Means-end chain model

Paper type Research paper

1. Introduction

Live-streaming shopping is a new economic format that involves specific activities with videos and is widely adopted by retailers for its unique product presentation and high-level interaction (Zhang *et al.*, 2022). Specifically, as the integration of social commerce attributes with live streaming technology, live-streaming shopping provides consumers with various communication technologies, enabling them to instantaneously interact with live streamers (Sun *et al.*, 2019). For example, it enables consumers to have real time interaction with live streamers. Thus, consumers can obtain personalized and detailed information about products (Sun *et al.*, 2019). It also provides an opportunity for consumers to have a quasi “face-to-face” interaction with live streamers, allowing consumers to observe the expressions and actions of the live streamers. Such an interaction approach effectively reduces consumers' perceived risks of products and improves the authenticity of live streamers (Zhang *et al.*, 2022). In addition, due to the existence of instant comments from others on the screen, consumers can further evaluate the live streamers and the

products they sell. All these communication technologies will help consumers learn more about live streamers and induce their perception of live streamers' credibility.

Various electronic commerce or social commerce websites, such as Taobao, Amazon, and Facebook, have created a "live-streaming shopping" function within their platforms to promote commercial activities. iiMedia Research reports that in 2021, live-streaming shopping sales in China accounted for \$174 billion, and by 2025, this figure will reach \$310 billion (iiMedia Research, 2022). The live-streaming shopping market in the United States will be worth \$55 billion by the end of 2026 (Chevalier, 2022).

In contrast to traditional recommendation techniques, such as static text and images, live-streaming shopping allows live streamers to present their products via both video and audio to their potential consumers, which provides richer product information than static text and images (Chen *et al.*, 2019). Furthermore, live-streaming shopping allows consumers to engage in quasi "face-to-face" interaction, increasing their sense of the live streamers' authenticity (Sun *et al.*, 2019) and reducing their perception of uncertainty. Uncertainty pertains to the extent to which the future conditions of the environment cannot be predicted or foreseen with precision, as a result of incomplete or imperfect information (Pavlou *et al.*, 2007). However, research into the uncertainty reduction process of live streamers in live-streaming shopping is still at a nascent stage (Cai and Wohn, 2019). Prior studies on live-streaming mainly focused on consumers' website adoption behaviors (e.g., Wongkitrungrueng and Assarut, 2020; Chen and Lin, 2018). Recently, a few scholars have begun to examine consumers' purchase behavior in live-streaming shopping (e.g., Sun *et al.*, 2019; Park and Lin, 2020). Nevertheless, how the characteristics of live-streaming shopping influence consumer purchase behavior is unknown. A consumer's positive perception of live streamers' credibility (CPLSC) was demonstrated to be a critical component in improving seller's sales performance (Pavlou *et al.*, 2007). Accordingly, we specifically explore the impacts of the features of live-streaming on CPLSC and consumers' purchase behaviors.

Consumers in online commerce cannot have a direct experience of the products presented online. They can only learn from others online before delivery of the products. For example, in live-streaming shopping, consumers can interact directly and instantaneously with live streamers (Lu *et al.*, 2018). The direct interaction can prompt consumers to pay attention to the focal products and live streamers, which lowers their uncertainty perceptions of live streamers (Clement Addo *et al.*, 2021). Furthermore, live-streaming shopping also allows consumers to observe the live streamers' behaviors (e.g., their interaction with other consumers), as well as other consumers' comments on their past transaction experiences with live streamers. In this way, consumers can evaluate live streamers by learning their current and past performance. It is the specific attributes of live-streaming shopping that allow consumers to simultaneously learn from live streamers both directly and indirectly. According to the learning paradigm in vicarious learning theory (Bandura, 1977; Myers, 2018), the former learning mechanism is referred to as coactive vicarious learning (CVL) (i.e., vicarious learning occurs through active interaction with others); the latter learning mechanism is referred to as independent vicarious learning (IVL) (vicarious learning occurs through passive observation of others) (Myers, 2018). Both learning processes are considered to be key mechanisms influencing individual attitudes and behaviors, and enriching the knowledge

of individuals and promotes their performance (Myers, 2018). Specifically, CVL-related and IVL-related attributes of live-streaming help consumers understand the live streamers better and enhance their credibility, ultimately influencing the consumers' purchase behavior. Therefore, it is vital to understand how CVL and IVL influence CPLSC and consumers' behaviors in live-streaming shopping. Unfortunately, prior studies of live-streaming shopping mainly focused on CVL-related attributes (e.g., real time interaction, social interaction, and interactivity), while neglecting IVL-related attributes (see Table I). In addition, these studies inferred or acknowledged the role of the attribute of live-streaming shopping on consumers' perception and behavior, but they rarely explained these factors theoretically. Specifically, the theories they adopted (e.g., stimulus-organism-response (SOR) model, E-commerce system success model, IT affordance) only provide a scheme to categorize the numerous stimuli of live-streaming shopping on consumers' behaviors and perceptions. This study explains the impact of the specific features of live-streaming on CPLSC from the vicarious learning perspective, and recognizes that both IVL-related and CVL-related attributes are critical components needed for consumers to understand the live streamer.

Table I. Overview of Studies on Live-streaming shopping

Authors	Theory	Antecedents	Dependent variables	Research methods
Lin <i>et al.</i> (2022)	SOR framework	Demand, convenience, interactivity, playfulness, perceived enjoyment	Impulsive buying intention	Online questionnaire survey
Guo <i>et al.</i> (2021)	Trust transfer theory	Trust in community members, trust in broadcasters, trust in products, swift guanxi	Customer engagement	Online questionnaire survey
Yu and Zheng (2022)	Perceived value theory	Financial value, functional value, individual value, social value, customer engagement	Purchase intention	Online questionnaire survey
Bao and Zhu (2022)	E-commerce system success model	Vividness, real-time interaction, diagnosticity, serendipity,	Stickiness intention	Online questionnaire survey

		customer satisfaction, perceived value, flow		
Li <i>et al.</i> (2022)	Social presence and the social facilitation theory, SOR framework, motivation theory	Live streamer attractive appearance, live streamer real-time interaction, hedonic attitude, utilitarian attitude, celebrity endorsement	Impulse buying	Online questionnaire survey
Chen <i>et al.</i> (2022a)	SOR framework	Perceived expertise, perceived similarity, perceived familiarity, perceived likeability, swift guanxi	Purchase intention	Online questionnaire survey
Sun <i>et al.</i> (2019)	IT affordance	Visibility, metavoicing, guidance shopping, immersion, presence (social presence, telepresence),	Purchase intention	Online questionnaire survey
Li <i>et al.</i> (2021)	Attachment theory and socio-technical approach	Interaction, identification, synchronicity, vicarious expression, emotional attachment to streamers, platform attachment	Visit duration, user retention	Online questionnaire survey
Park and Lin (2020)	Match-up	Wanghong-	Intention to	Online

	hypothesis	product fit, live content-product fit, Wanghong trustworthiness, Wanghong attractiveness, utilitarian attitude, hedonic attitude, self-product fit	buy	questionnaire survey
Wongkitrungrueng and Assarut (2019)	Perceived value theory	Utilitarian value, hedonic value, symbolic value, trust in products, trust in sellers	Customer engagement	Online questionnaire survey
Zhang <i>et al.</i> (2022)	Socio-technical system theory	Active control, synchronicity, two-way communication, personalization, visibility, trust in streamers, trust in products	Continuance intention	Online questionnaire survey
Lu and Chen (2021)	Signaling theory	Physical characteristic similarity, value similarity, product fit uncertainty, trust, product quality uncertainty	Purchase intention	Online questionnaire survey
Ma <i>et al.</i> (2022)	Social telepresence	Consumer-anchor interaction, consumer-consumer interaction, social presence, physical presence, trust	Purchase hesitation	Online questionnaire survey
Gao <i>et al.</i> (2021)	Elaboration likelihood model	Information completeness, information accuracy,	Purchase intention, response intention	Online questionnaire survey

		information currency, streamer trustworthiness, streamer attractiveness, bullet-screen consistency, co- viewer involvement, perceived persuasiveness, mindfulness		
Guan <i>et al.</i> (2021)	Flow theory	Responsiveness, two-way communication, social presence, self-presentation, social orientation, harmony, flow, sense of belonging to the viewer crowd, perceived proximity to the streamer	Purchase intention of virtual gifts	Online questionnaire survey
Chen <i>et al.</i> (2022b)	Dual-process theory	Real-time communication, product interactivity, perceived authenticity, perceived enjoyment, convenience of product search, product quality uncertainty, product fit uncertainty, habit	Purchase intention	Online questionnaire survey
Lo <i>et al.</i> (2022)	SOR framework	Price perception, scarcity	Impulsive buying	Online questionnaire

		persuasion, vicarious experience, parasocial interaction, social contagion, cognitive reactions, affective reactions, susceptibility to social influence, impulsive buying tendency, impulsive buying urge	behaviour	survey
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This study set out to address the following research question: *How do coactive vicarious learning and independent vicarious learning influence the CPLSC and consumers' behaviors?* To address this question, we adopt the means-end chain model (Gutman, 1982) as our theoretical framework. This model posits that consumers choose a service or purchase a product for the positive benefits provided by the consumption, which in turn helps them achieve their desired end states (i.e., value) (Chen *et al.*, 2019). In this study, we consider how vicarious learning-related attributes of live-streaming (interactivity and effective use of live-streaming shopping's information presentation tool (EULSIT)) enable consumers to obtain the positive benefits and their desired value (virtual presence, psychological proximity and CPLSC).

2. Theoretical background and research hypotheses

Live-streaming shopping provides consumers with the opportunity for both direct and indirect interaction with live streamers. However, prior studies of live-streaming shopping only considered platform-based tools that afford direct interactions between consumers and streamers. Platform-based tools that support indirect interactions between consumers and streamers, are neglected. For example, Li *et al.* (2022) investigated the impact of live streamers appearance and real-time interaction on consumers' impulse buying behavior. Sun *et al.* (2019) took visibility affordance, metavoicing affordance, and guidance shopping affordance as the external factors, and investigated their roles on consumers' purchase intention in live-streaming shopping. The unique technical features of live-streaming shopping not only enable consumers to interact directly with live streamers, but also enable their indirect interaction with live streamers by observing live streamers and other consumers' comments about live streamers. These will help consumers learn more about live streamers and induce their perception of live streamers' credibility. Thus, this study incorporates these two interaction strategies (i.e., direct interaction and indirect interaction) to comprehensively explore the vicarious learning process in live-streaming shopping. In particular,

this study adopts vicarious learning theory to explore the impact of these interaction strategies on consumers' perceived values and behaviors. In the next section, we will introduce vicarious learning theory, and explain consumers' vicarious learning process in live-streaming shopping.

2.1. Vicarious learning theory

Vicarious learning refers to a process in which “by observing a model of the desired behavior, an individual forms an idea of how response components must be combined and sequenced to produce the new behavior” (Bandura, 1977, p. 35). It represents learning through observing and replicating the behavior of the role models (referring to anyone who potentially influences the decisions or behaviors of those they contact) (Bandura, 1977). Nowadays, the phenomenon of individual learning has evolved from individuals focusing on isolated tasks to learning from coordinated group activities (Myers, 2018). Increasingly, coordinated work has changed the way individuals learn (Noe *et al.*, 2014). For example, individuals learn not only from observing others, but also from having interpersonal interactions with others (Myers, 2018). Thus, the vicarious learning process can be experienced through both active interaction and passive observation, which are regarded as coactive vicarious learning (CVL) and independent vicarious learning (IVL), respectively.

2.1.1. CVL-related attribute

CVL has been defined as “a discursive process by which individuals learn through the interactive sharing and joint processing of another's work experience(s)” (Myers, 2018, pp. 33-34). It can be induced by the introduction of live-streaming technology (Li *et al.*, 2020). For example, live-streaming shopping allows consumers to interact with live streamers in real time. This process helps consumers learn from live streamers by interacting with them directly and can induce CVL since CVL occurs when consumers experience these interactions (Li *et al.*, 2020). That is to say, the CVL process in live-streaming shopping is achieved through interactivity. Thus, in this study, we regarded interactivity as a CVL-related attribute of live-streaming shopping.

Interactivity has been defined as the degree to which a consumer perceives the control and synchronicity of communication with a seller (live streamer) (Ou *et al.*, 2014). It is a critical construct in measuring individual perceptions of interaction (Lowry *et al.*, 2009). Interactivity is a second-order formative construct, which includes three first-order reflective constructs, namely, two-way communication, control, and synchronicity. Two-way communication emphasizes that one can receive feedback from the other after sending a message (Lowry *et al.*, 2009). Active control refers to the extent to which individuals can freely choose the information they want to discuss with others and guide the conversation during the interaction (Lowry *et al.*, 2009). Synchronicity is “the degree to which users' input into a communication and the response they receive from the communication are simultaneous” (Liu and Shrum, 2002, p. 55).

Based on communication and efficacy principles (Lowry *et al.*, 2009), this study views two-way communication, control, and synchronicity as the theoretical sub-constructs of perceived interactivity. Various studies in the information systems (IS) literature also support this statement (e.g., Ou *et al.*, 2014; Lowry *et al.*, 2009). These studies regarded interactivity as a second-order formative construct, consisting of three first-order reflective constructs. The interactivity of live-streaming shopping enables consumers to learn from live streamers by interacting with them

directly in real time. Through direct interaction with live streamers, consumers can obtain information from and about live streamers, which helps them understand these live streamers better.

2.1.2. IVL-related attribute

In addition to CVL, the technical attributes of live-streaming shopping also support IVL. IVL refers to a one-way observation process in which learners observe the role model (Myers, 2018). It posits that the role model simply provides learners with an observable experience, and learners have to assimilate the remaining part of the learning process by themselves (Myers, 2018). In addition to observing the behavior of the role model, IVL includes symbolic learning (Bandura, 1977; Myers, 2018). In the symbolic learning process, the performance of the role model is captured by documents or records, and there is no direct interaction between the role model and the learner (Myers, 2018). In this study, we assume that live-streaming shopping's information presentation tool is effectively used to achieve IVL in live-streaming shopping. Adapted from Ou *et al.*'s (2014) study, we define the EULSIT as the extent to which a consumer believes that using this tool in live-streaming shopping helps him or her evaluate live streamers. Specifically, this attribute helps consumers obtain information about live streamers by observing a live streamer's behavior and other consumers' comments on their past transaction experiences with that live streamer. Thus, we propose that the IVL process in live-streaming shopping is achieved through effective use of that tool. Accordingly, we regard the EULSIT as the IVL-related attribute of live-streaming shopping.

In the next section, drawing on the means-end chain (MEC) framework (Gutman, 1982), we will investigate the relationship between these learning processes and consumers' perceptions and behaviors in the live-streaming shopping context.

2.2. Means-end chain framework

The means-end chain (MEC) framework is a model that explains "how consumers select a product or service to facilitate the achievement of desired values" (Huang and Chang, 2020, p. 3). It suggests that product or service in relation to consumers can be divided into three levels, namely, attributes (the attributes of a product or service), consequences (subjective experiences derived from product use), and values (consumer's core purposes and goals in life) (Woodruff, 1997). The major assumption of this framework is that individuals purchase something or use a service because they expect a specific value from their usage behavior (Jung, 2014). Sun *et al.* (2019) proposed that the specific attributes of live-streaming shopping could realize consumers' values. Thus, this study adopts the MEC framework to investigate the role of the attributes of live-streaming shopping on realizing consumers' consequences and values.

In this study, we viewed the interactivity and EULSIT as the core attributes of live-streaming shopping. In particular, drawing from the vicarious learning perspective, we refer to interactivity as a CVL-related attribute, and EULSIT as an IVL-related attribute. The consequences refer to consumer's perception of the services experience or the product consumption (Lin and Fu, 2018). This perception can be positive (i.e., benefits) or negative (e.g., risk) (Lin and Fu, 2018). This study only focuses on the impact of positive perception of consumers on their goals in live-streaming shopping. Firstly, the major assumption of this theory is that consumers are likely to select products/services that can fulfill their personal values (Xiao *et al.*, 2017). However, negative

consequences do not reinforce the personal value. Since this study focuses on the mechanism of the effect of the attributes of live-streaming shopping on fulfilling consumers' personal values. We only considered positive consequences in this study. Secondly, numerous researchers have stated that positive perceptions (i.e., benefits) are more important for consumers after the services experience or the product consumption than negative perceptions (e.g., Cheng *et al.*, 2018; Fu and Wu, 2013), and thus "benefits" should be adopted as a substitute of the "consequences" in the original MEC framework (Fu and Wu, 2013; Lin and Fu, 2018). Thus, following their studies, this study uses "benefits" to represent "consequences" in the MEC framework. Various scholars proposed that learning can facilitate presence perception and foster socialization (e.g., Edirisingha *et al.*, 2009; Kehrwald, 2008). In live-streaming shopping, this relationship can be further strengthened. Specifically, the liveness and interactivity of live-streaming shopping shape the presence perception of consumers (Lin *et al.*, 2022). The communication technologies of live-streaming shopping can instantaneously send images, sounds, and comments to consumers, allowing them to sense the real time immersion of live-streaming shopping, and further enhance their perception of presence and social intimacy (Wongkitrungrueng and Assarut, 2020). Thus, we adopt virtual presence and psychological proximity as the benefits. The value, in this study, refers to CPLSC, which is a critical factor for consumers to make the final purchase decision.

2.2.1. Interactivity, virtual presence, and psychological proximity

The interactivity function of live-streaming shopping makes it an immersive medium. Firstly, in live-streaming shopping, consumers can ask live streamers questions while watching the presentation of the product, which enhances the consumers' presence perception (Wongkitrungrueng and Assarut, 2020). Furthermore, live-streaming shopping allows consumers to engage in seemingly "face-to-face" interaction, which increases their perception of the live streamers' authenticity (Sun *et al.*, 2019) and thus reduces their (psychological) distance. The psychological feeling of psychological proximity and presence makes immersive media (e.g., live-streaming shopping) captivating and enjoyable; this is why immersive devices are becoming increasingly popular (Breves and Schramm, 2021).

Virtual presence refers to the consumers' subjective perception of the authenticity of their shopping experience in the online shopping context (Mollen and Wilson, 2010). It has two dimensions, namely, telepresence and social presence. Telepresence refers to an individual's perception of a virtual environment that is spatially or physically real (Steuer, 1992). Social presence refers to an individual's perception of intimacy with others (Ou *et al.*, 2014).

Interactivity can induce individuals' virtual presence perception (Lee and Park, 2014). This is because instant contact and sound can stimulate consumers' senses and create the impression that they are in a real environment (Papagiannidis *et al.*, 2017). In addition, an interactive website allows users to control the processes they want, and users who have control over their actions on the website tend to develop a strong sense of presence (Shen and Khalifa, 2012). Thus, we can infer that in live-streaming shopping, the instant interaction between the consumer and live streamer makes the shopping scenario more real for consumers. During the interaction process, consumers can sense the presence of the live streamer. Accordingly, we propose the following hypothesis:

H1a. Interactivity is positively related to virtual presence in live-streaming shopping.

Psychological distance “is a subjective experience that something is close or far away from the self, here, and now” (Trope and Liberman, 2010, p. 440). When something is close to the self, here, and now, then we denoting that the thing is psychologically proximate to the individual; on the contrary, when something is far away from the self, here, and now, we denoting that the thing is psychologically remote from the individual (Trope and Liberman, 2010; Liberman and Trope, 2008). Live-streaming is an immersive media technology that decreases the psychological distance; meanwhile, consumers pursue psychological proximity in live-streaming shopping (Cai and Wohn, 2019). Thus, we particularly focus on psychological proximity. We focus on three aspects of psychological distance: spatial distance, temporal distance, and social distance (Lim *et al.*, 2012). Similarly, psychological proximity can also be divided into three parts: spatial proximity, temporal proximity, and social proximity. Following Lim *et al.* (2012) and Lee *et al.* (2018), spatial proximity, temporal proximity, and social proximity refer to the proximity of an object perceived by individuals in terms of space, time, and social relations, respectively.

Ou *et al.* (2014) proposed that interactivity could help two objects to build a relationship with each other. Thus, we infer that interactivity between consumers and live streamers will strengthen the consumers’ perception of social proximity. In addition, the instant feedback of interactivity will make consumers feel that they are in the same space, which will strengthen their perception of spatial proximity and temporal proximity. Accordingly, we hypothesize that interactivity can enhance consumers’ perception of psychological proximity.

H1b. Interactivity is positively related to psychological proximity in live-streaming shopping.

2.2.2. EULSIT, virtual presence, and psychological proximity

EULSIT allows consumers to observe the behaviors of live streamers and browse other consumers’ comments about live streamers. This feature facilitates the conveyance process where information from many sources is disseminated. Specifically, the behavior of live streamers and the comments from other consumers can be viewed as critical messages that help consumers understand and form a perception of intimacy with live streamers. Ou *et al.* (2014) stated that such messages enable consumers to develop a sense of being with others, and thus facilitate their perception of presence. This is because the contact, sounds, and feedback information could stimulate the consumers’ sense that they are in the real environment and interacting with other people (Ou *et al.*, 2014; Papagiannidis *et al.*, 2017). In addition, the EULSIT of live-streaming shopping can present consistent and accurate stimulations, making the interactions between them less artificial and more social (Lombard and Ditton, 1997; Stein and Meredith, 1993), and thus enhance consumers’ perception of presence. Therefore, we propose the following hypothesis:

H2a. EULSIT is positively related to virtual presence in live-streaming shopping.

The EULSIT enables consumers to interact with the streamers indirectly, which provides consumers with more details about streamers. The more details consumers know about live streamers, the more they feel familiar with the live streamer, which is expected to contribute to social proximity (Liberman *et al.*, 2007). In live-streaming shopping, all the interactions are instantaneous (e.g., the interaction between live streamer and other consumers), which brings consumers the experience of co-viewing (Ang *et al.*, 2018). Such experience enables consumers

to feel that they are in the same space, which strengthens their perception of spatial and temporal proximity. Therefore, we propose the following hypothesis:

H2b. EULSIT is positively related to psychological proximity in live-streaming shopping.

2.2.3. The interaction of interactivity and EULSIT

As mentioned in the sections above, a live-streaming shopping website has some specific features that induce high-quality communication among live streamers and consumers, for example, interactivity and EULSIT. Interactivity allows consumers to post questions, opinions, and demands to live streamers and obtain feedback from the live streamer. Meanwhile, consumers can also measure the quality of the live streamer through observing live streamer's behavior and browsing other consumers' comments. These two features interact to facilitate multiplicity of information cues and language variety (texts, sound, and action), which further leads to the reinforcement effect on "benefits" (i.e., virtual presence and psychological proximity). Specifically, multiplicity of information cues decreases the misunderstandings among individuals and stimulates more frequent socio-emotional interactions (refer to "the purposeful interchanges (often communication) among group members that shape perceptions of emotions and socio-emotional climate" (Bakhtiar *et al.*, 2018, p. 62)) among them (e.g., consumers and live streamer) (Shen *et al.*, 2021), which further enhances consumers' perceptions of psychosocial benefits (i.e., virtual presence and psychological proximity) (Bakhtiar *et al.*, 2018). Lee and Park (2014) proposed that a multiplicity of information cues enable consumers to envision detailed information, thereby inducing consumers' perception of psychological proximity and virtual presence. Therefore, we propose the following hypotheses:

H3a. Interactivity and EULSIT have a positive interaction effect on virtual presence in live-streaming shopping.

H3b. Interactivity and EULSIT have a positive interaction effect on psychological proximity in live-streaming shopping.

2.2.4. Virtual presence and psychological proximity

A sense of virtual presence can induce individuals' perception of interpersonal relationships (Short *et al.*, 1976). Specifically, individuals tend to construct relationships with others in a social environment more often than in a remote environment (Steuer, 1992). Thus, we can infer that virtual presence can induce a sense of social proximity. Virtual presence can also reduce individuals' perception of spatial limitations on the virtual community (Lee and Park, 2014). For example, Ou *et al.* (2014) proposed that when individuals interact with each other, this interaction is similar to traditional face-to-face communication. In particular, in live-streaming shopping, the social environment where consumers and live streamers interact makes them feel like they are having instant interactions in the same place and at the same time. Thus, spatial proximity and temporal proximity are both induced. Accordingly, we infer that virtual presence induces consumers' perceptions of psychological proximity and propose the following hypothesis:

H4. Virtual presence is positively related to psychological proximity in live-streaming shopping.

2.2.5. Virtual presence, psychological proximity, and CPLSC

Product realism generated from immersion in a website reduces the ambiguity of product information as well as perceived risk (Lee and Park, 2014), thereby increasing credibility of the

information source (e.g., live streamer). Specifically, when consumers are immersed in a vivid and interactive situation (the major characteristics of telepresence), the cognitive elaboration process of consumers will be enhanced. This is because such a situation is more lively and interesting, which encourages individuals to engage in a more elaborate encoding process (Nisbett and Ross, 1980). Such a process can stimulate consumer's perception of concreteness and details (Taylor and Thompson, 1982), which can reduce consumers' uncertainty perception (Pavlou *et al.*, 2007) and thus enhance their credibility perception.

Rice and Love (1987) indicated that media that provide social presence can contribute to a friendly context, which leads to ongoing interaction (Kehrwald, 2008). Trust is built on the extensive interaction that enables consumers to create reliable expectations of what other people may do (Gefen and Straub, 2004). Specifically, when consumers experience a high degree of social presence, indicating that they are involved in direct or indirect human contact (e.g., human contact with live streamer), this contributes to the establishment of credibility (Gefen and Straub, 2004). Accordingly, we proposed the following hypothesis:

H5. The consumers' perception of virtual presence in live-streaming shopping is positively associated with CPLSC.

We adopt construal level theory (Liberman and Trope, 1998) to explain the relationship between psychological proximity and CPLSC. According to construal level theory, individuals tend to use detailed information (a low-level or concrete construal) to construe objects when the psychological distance between the objects and individuals is short (i.e., psychological proximity). Specifically, with the decrease of psychological distance between live streamers and consumers, consumers can use detailed information to construe live streamers; that is to say, consumers pay attention to and master detailed information about live streamers when the psychological distance between them is short. Detailed transaction-related information can enhance the CPLSC (Pavlou *et al.*, 2007). Thus, we infer that psychological proximity can increase the CPLSC. Edwards *et al.* (2009) similarly argued that psychological proximity can increase consumers' sense of credibility. Accordingly, we propose the following hypothesis:

H6. The consumers' perception of psychological proximity in live-streaming shopping is positively associated with CPLSC.

2.2.6. CPLSC, purchase intention, and purchase behavior

Credibility refers to the degree to which an individual perceives the trustworthiness of the information provider (Rogers and Shoemaker, 1971). Consumers are more likely to be persuaded by a credible information provider (Pavlou and Dimoka, 2006), leading to an increase in their intention to purchase (Pavlou *et al.*, 2007). Prior literature supported this statement. For example, Prendergast *et al.* (2014) confirmed the relationship between salesperson credibility (trustworthiness and attractiveness) and consumer purchase intention. Therefore, we propose the following hypothesis:

H7. CPLSC is positively related to consumer purchase intention.

Drawing on the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980), we posit that individuals' purchase intention is the most important antecedent of their actual purchase behavior. Specifically, when consumers have the intention to purchase the product, they will try to buy it.

Thus, we propose the following hypothesis:

H8. Consumers' purchase intentions are positively related to their purchase behavior.

2.2.7. Control variables

To test the research model, we also included demographic variables as control variables for purchase behavior, such as gender, age, income, and employment status. Figure 1 shows our research framework.

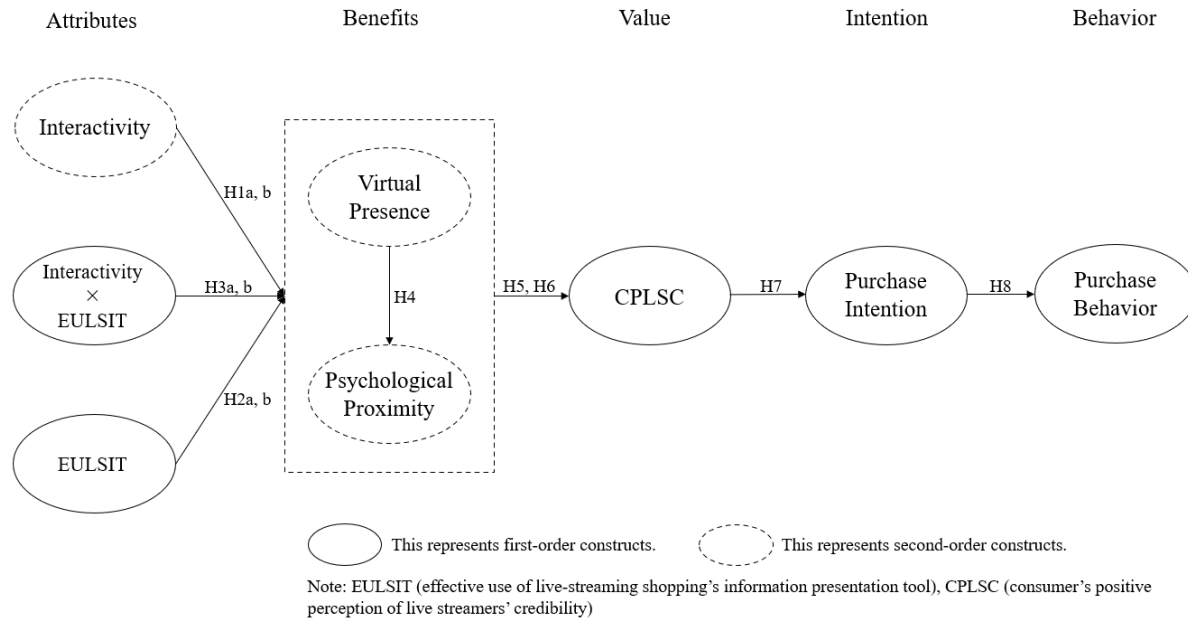


Figure 1. Research model.

3. Methodology

3.1. Measurement development

This study adapted the measurement items from prior validated scales. Modifications were made to ensure that each item fits the current research context. We then distributed the questionnaire to academic experts in the field of IS and asked them to examine it. Following their feedback, we made a few changes accordingly. The items of these constructs and their sources are shown in Appendix A. We determined whether the consumers had engaged in purchase behavior by asking interviewees the question, “Have you ever made a purchase during the live-streaming shopping? (Yes/No)”.

We collected the responses to the questionnaire in China. In order to ensure the accuracy of the Chinese questionnaire and its consistency with the original English questionnaire, we conducted a translation-back-translation method (Brislin *et al.*, 1973) to design the survey. A pilot test was conducted among 7 graduate students in related fields to further identify ambiguous items.

3.2. Research design

We created an online questionnaire on Wenjuanxing, an online survey platform in China (www.wjx.cn). We then distributed the link to the questionnaire on social media platforms (e.g., Wechat) to invite participants. Participants were asked to answer survey questions based on their

overall experience in live-streaming shopping. To ensure that each participant only submitted one response, we carefully monitored the internet protocol (IP) addresses. Also, since our target sample was users who have experience in live-streaming shopping, we used the questions “Have you ever visited a live-streaming shopping website?” and “How often do you visit live-streaming shopping websites?”, to exclude those respondents who answered “No” or “Seldom”. In total, we obtained 405 valid responses for the final analysis. The demographic profile information of the respondents is shown in Table II.

Table II. Demographics of respondents.

Demographics	Frequency	Percentage (%)
Gender		
Male	128	31.60%
Female	277	68.40%
Age range		
Below 20	41	10.12%
21–29	256	63.21%
30–39	72	17.78%
40–49	27	6.67%
Above 50	9	2.22%
Employment status		
Students	194	47.90%
Full-time Job	175	43.21%
Part-time Job	20	4.94%
No Job	16	3.95%
Personal income in RMB (monthly)		
Below 2,000	144	35.56%
2,001–3,000	69	17.04%
3,001–5,000	100	24.69%
5,001–8,000	66	16.30%
Above 8,000	26	6.42%

Since the survey data was collected from one source, there is a risk of common method bias (CMB). We first performed Harman’s single-factor test (Podsakoff *et al.*, 2003). In an unrotated principal components factor analysis, the factor with the largest eigenvalue explained less than 50% of the total variance, which indicates that the CMB is not an issue in this study (Harman, 1976). Second, following Hu *et al.* (2019), we compared the fit between the measurement model and one-factor model to verify that CMB is not serious in this study. The fit of the one-factor model, chi-square (594) = 5313.61, root mean square error of approximation (RMSEA) = 0.140, is inferior to the fit of the proposed model, chi-square (549) = 1631.39, RMSEA = 0.070. Taken together, these results indicate that CMB is not a problem in this study. We further conducted collinearity

diagnostics for all constructs to examine for multicollinearity. The results show that the variance inflation factors (VIFs) values of all items are less than 10, implying no major multicollinearity problems in this study (Petter *et al.*, 2007).

To check for non-response bias, we compare early to late respondents. Specifically, we compared the differences between first and last 25% of responses received (Armstrong and Overton, 1977) using chi-squares of the critical measurement items from the responses (Zhou *et al.*, 2018). The results show that there is no significant difference between the early and late responses, which implies that non-response bias is not a serious issue in this study.

4. Data analysis and results

4.1. Measurement model

The validity and reliability of the constructs were verified through confirmatory factor analysis. As shown in Table III, the item loadings of all the constructs are above the benchmark value of 0.7, indicating that the constructs have good agreement (Hair *et al.*, 2011). Furthermore, the composite reliability (CR) ranges from 0.910 to 0.955 (above the benchmark value of 0.7) (Hair *et al.*, 2011), indicating that the inner consistency of the scales is good. The Average Variance Extracted (AVE) scores range from 0.760 to 0.905 (above the benchmark value of 0.5) (Fornell and Larcker, 1981), demonstrating that the constructs exhibit relatively good convergent validity. Cronbach's Alpha scores range from 0.823 to 0.930, exceeding the benchmark value of 0.6 (Hair *et al.*, 1998). Then we examined the discriminant validity of the constructs. Table IV shows that the square roots of the AVE of the constructs are higher than the correlations between different constructs (Fornell and Larcker, 1981).

Table III. Results of the confirmatory factor analysis.

Constructs	Items	Loading	CR	AVE	Cronbach's Alpha
EULSIT	EULSIT1	0.872	0.932	0.774	0.903
	EULSIT2	0.865			
	EULSIT3	0.904			
	EULSIT4	0.878			
AC	AC1	0.972	0.917	0.848	0.823
	AC2	0.848			
TWC	TWC1	0.952	0.950	0.905	0.896
	TWC2	0.951			
SYN	SYN1	0.945	0.944	0.893	0.881
	SYN2	0.945			
CPLSC	CPLSC1	0.856	0.940	0.760	0.921
	CPLSC2	0.807			
	CPLSC3	0.902			
	CPLSC4	0.901			
	CPLSC5	0.889			
SPX	SPX1	0.893	0.950	0.826	0.930
	SPX2	0.917			

	SPX3	0.914			
	SPX4	0.911			
TPX	TPX1	0.911	0.910	0.771	0.851
	TPX2	0.880			
	TPX3	0.841			
SOP	SOP1	0.930	0.938	0.834	0.900
	SOP2	0.915			
	SOP3	0.895			
SP	SP1	0.884	0.940	0.798	0.915
	SP2	0.893			
	SP3	0.921			
	SP4	0.874			
TP	TP1	0.868	0.923	0.749	0.888
	TP2	0.884			
	TP3	0.873			
	TP4	0.836			
PI	PI1	0.929	0.955	0.877	0.930
	PI2	0.935			
	PI3	0.945			

Note1: All factor loadings are significant at the $p < 0.001$ level.

Note2: EULSIT (effective use of live-streaming shopping's information presentation tool), AC (active control), TWC (two-way communication), SYN (synchronicity), CPLSC (consumer's positive perception of live streamers' credibility), SPX (spatial proximity), TPX (temporal proximity), SOP (social proximity), SP (social presence), TP (telepresence), PI (purchase intention).

Table IV. Correlations between constructs.

	EULSIT	CPLSC	PI
EULSIT	0.880		
CPLSC	0.640	0.872	
PI	0.579	0.619	0.936

Interactivity, virtual presence, and psychological proximity are the second-order formative constructs. Unlike the reflective constructs, the statistics for reliability assessment, including Cronbach's alpha, AVE, and CR, are not meaningful for formative constructs, as they are not necessarily correlated (Tan *et al.*, 2013; Blut, 2016). Following Petter *et al.* (2007), we evaluated the measurement model of second-order formative constructs using indicator weights, collinearity, and loadings. As shown in Table V, all indicator weights and loadings of the three second-order formative constructs (i.e., interactivity, virtual presence, and psychological proximity) are

statistically significant. Although the weight of active control is lower than the recommended level of 0.1 (Andreev *et al.*, 2009), and its loading is lower than 0.5 (Hair *et al.*, 2016), we still retained active control in the research model. This is because the sub dimension is an integral part of its second-order formative construct, and all sub dimensions have significant bivariate correlations with their respective constructs (Cenfetelli and Bassellier, 2009). Moreover, we compared the model with and without active control and found that the two models yielded similar results. The VIFs are lower than the cut-off value of 10, thereby indicating that the collinearity is not a concern in this study (Petter *et al.*, 2007).

Table V. Weights, VIFs, and loadings (n = 405).

Construct	Dimensions	Weights	VIFs	Loadings
Interactivity	Active Control	0.093*	1.033	0.265**
	Two-way communication	0.297***	2.740	0.889***
	Synchronicity	0.726***	2.774	0.980***
Virtual Presence	Social Presence	0.742***	2.687	0.983***
	Telepresence	0.303***	2.687	0.892***
Psychological Proximity	Spatial Proximity	0.457***	5.142	0.968***
	Temporal Proximity	0.340***	4.489	0.946***
	Social Proximity	0.255**	4.117	0.925***

Note: *p < 0.05, **p < 0.01, ***p < 0.001.

Then, we evaluated the convergent and discriminant validity of the formative constructs by conducting the modified multitrait multimethod (MTMM) analysis (Loch *et al.*, 2003; Vance *et al.*, 2008). The modified MTMM analysis indicates that all the correlations of item-to-construct are at a level of $p < 0.01$, that is to say, the formative constructs have appropriate convergent validity (Vance *et al.*, 2008). In addition, most of the correlations of “inter-item” and “item-to-construct” are higher than other measures or construct, thus, discriminant validity of the formative constructs can be verified (Loch *et al.*, 2003). In all, both convergent and discriminant validity is demonstrated in our analysis.

4.2. Hypotheses testing

We adopted multiple regression analysis with SPSS 26 to test the proposed research hypotheses. Given that the interactivity, virtual presence, and psychological proximity in the hypotheses were measured formatively, we followed Ringle *et al.*'s (2012) two-stage approach to handle our reflective-formative type of hierarchical component model. In the first stage, we estimated the main effects model to generate the latent variable scores of all constructs. In the second stage, we used the latent variable scores obtained in stage 1 to represent their intended constructs. Table VI shows the standardized path coefficients and t values for each hypothesis of our research model. The results show that all the hypotheses are supported. The R^2 values of purchase behavior, purchase intention, CPLSC, psychological proximity and virtual presence are 31.4%, 38.3%, 37.6%, 76.9%, and 57.1%, respectively.

Table VI. Results of hypotheses testing.

Hypothesis	Constructs and relationship	Standardized path coefficient	t	Supp
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H1	Interactivity - Virtual Presence	0.725***	21.110	Yes
H2	Interactivity - Psychological Proximity	0.697***	19.489	Yes
H3	EULSIT - Virtual Presence	0.534***	12.690	Yes
H4	EULSIT - Psychological Proximity	0.517***	12.127	Yes
H5	Virtual Presence - Psychological Proximity	0.868***	35.075	Yes
H6	Virtual Presence - CPLSC	0.596***	14.903	Yes
H5	Psychological Proximity - CPLSC	0.589***	14.650	Yes
H6	CPLSC - Purchase Intention	0.619***	15.816	Yes
H7	Purchase Intention - Purchase Behavior	0.523***	12.309	Yes

Note: 0.01 < * p < 0.05; ** p < 0.01; *** p < 0.001.

Among the control variables, gender (coefficient of 0.133, $p < 0.01$), income (coefficient of 0.104, $p < 0.05$), and age (coefficient of -0.129, $p < 0.05$) have significant effects on consumers' purchase behavior, while employment status has an insignificant influence on consumers' purchase behavior. That is to say, women are more likely to make purchases than men in the live-streaming shopping context, and consumers with higher incomes are more likely to make purchases in the live-streaming shopping context. In addition, the results also reveal that younger consumers are more likely to make purchases in the live-streaming shopping.

Following Ali *et al.* (2019), we adopted PROCESS syntax to examine the interaction effect between interactivity and EULSIT on consumers' virtual presence and psychological proximity, respectively (i.e., H3a and H3b). As shown in Table VII, when the EULSIT is low (- 1 S.D.), the impact of interactivity on virtual presence is positive and significant but weak ($\beta = 0.52$, Boot S.E. = 0.05). However, when the EULSIT is high (+ 1 S.D.), the impact of interactivity on virtual presence is positive and significant but stronger ($\beta = 0.73$, Boot S.E. = 0.05). Similarly, when the EULSIT is low (- 1 S.D.), the impact of interactivity on psychological proximity is positive and significant but weak ($\beta = 0.47$, Boot S.E. = 0.05). However, when the EULSIT is high (+ 1 S.D.), the impact of interactivity on psychological proximity is positive and significant but stronger ($\beta = 0.73$, Boot S.E. = 0.05). Figure 2 and Figure 3 plot the significant interaction effects between interactivity and EULSIT on virtual presence and psychological proximity, respectively.

Table VII. Interaction effect analysis.

Interaction effect of interactivity and EULSIT on virtual presence.				
	Path coefficient	Boot S.E.	t-Value (bootstrap)	95% CI
Low; Mean - 1 S.D.	0.5206	0.0459	11.3497	(0.4304, 0.6108)
Moderate; Mean	0.6243	0.0389	16.0488	(0.5478, 0.7008)
High; Mean + 1 S.D.	0.7280	0.0485	15.0124	(0.6327, 0.8234)
Interaction effect of interactivity and EULSIT on psychological proximity.				
Low; Mean - 1 S.D.	0.4668	0.0474	9.8374	(0.3735, 0.5601)
Moderate; Mean	0.6005	0.0402	14.9215	(0.5214, 0.6796)
High; Mean + 1 S.D.	0.7342	0.0502	14.6343	(0.6355, 0.8328)

Note: Values for EULSIT are the mean and plus/minus one standard deviation (S.D.) from mean; S.E. = Standard error.

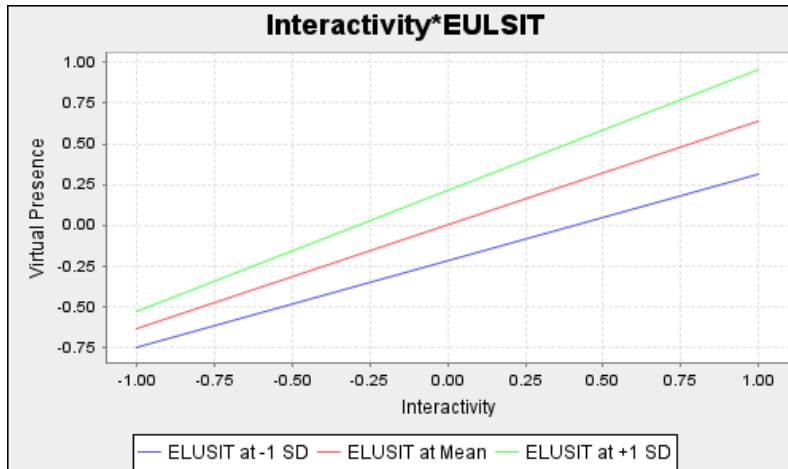


Figure 2. Interaction effect between interactivity and EULSIT on virtual presence.

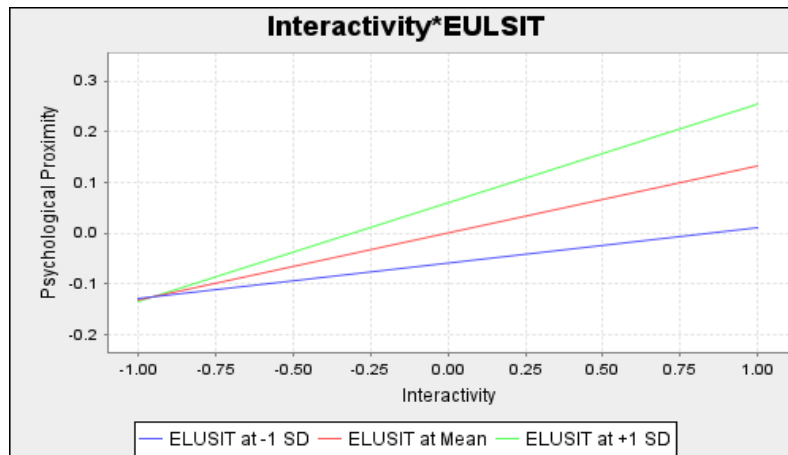


Figure 3. Interaction effect between interactivity and EULSIT on psychological proximity.

5. Discussion

This study investigates the mechanism of inducing consumer credibility perceptions of live streamers. The results of this study support the proposed research model. Specifically, we introduced two vicarious learning methods and examine their impacts on CPLSC. Based on the MEC framework, we found that both a CVL-related attribute (interactivity) and an IVL-related attribute (EULSIT) significantly facilitate consumers' benefits perception and further affect the CPLSC. In particular, these two attributes have a positive interaction effect on virtual presence and psychological proximity. The key findings are analyzed as follows.

5.1. Discussion of the key findings

Firstly, the result of this study suggests that vicarious learning-related attributes (both CVL-related attributes and IVL-related attributes) of live-streaming shopping have a significant effect on consumers' positive perceptions and behavior. Specifically, this study revealed that interactivity and EULSIT are critical components of communication technology for live-streaming shopping when predicting consumers' perceptions and behaviors. Such results are consistent with previous studies that verified the effect of live-streaming shopping on consumers' perception and behavior

(e.g., Sun *et al.*, 2019; Lin *et al.*, 2022; Bao and Zhu, 2022). Unlike these studies, we contribute to the literature on investigating the impact of IVL-related attributes of live-streaming shopping on consumers' perception and behavior, which provides a comprehensive lens for examining the role of live-streaming shopping in inducing consumers' purchase behavior. Furthermore, previous scholars adopted the SOR model, E-commerce system success model, and IT affordance theory to explain the role of live-streaming shopping on consumers' perception and behavior, which only provide a scheme to categorize the numerous stimuli of live-streaming shopping on consumers' behaviors and perceptions. This study adopted vicarious learning theory to explain the role of live-streaming shopping on consumers' perception and behavior, which provides a detailed explanation of the mechanism behind these relationships.

Secondly, our empirical results show that virtual presence and psychological proximity are two important psychological consequences that impact consumers' personal values. Specifically, this study revealed that virtual presence and psychological proximity have significant impacts on CPLSC. These results are in line with previous studies regarding the role of individuals' positive perception on CPLSC (e.g., Chen *et al.*, 2015; Pizzutti and Fernandes, 2010). Unlike previous studies, which mostly focused on the impact of consumers' perception of platform functional benefits on CPLSC, we examined the effect of psychosocial benefits (i.e., virtual presence and psychological proximity) on CPLSC. The result of this study supports the view that consumers' affective perception can shape their cognitive values, and provides a unique research perspective for studying the formation of CPLSC.

5.2. Theoretical implications

Firstly, this study advances the live-streaming shopping literature by identifying the important impacts of the vicarious learning-related attributes (both CVL-related attributes and IVL-related attributes) on CPLSC. The vicarious learning process has received extensive attention in IS research (e.g., Ye, 2022; Lee and Chiravuri, 2019). Recently, it has been divided by Myers (2018) into two different aspects, namely IVL and CVL. However, the impacts of IVL and CVL processes on consumers' attitudes and behaviors have not been fully examined. In addition, due to the real time interaction attribute of live-streaming shopping, previous studies of live-streaming shopping mainly focus on CVL-related attributes. IVL-related attributes, which are also a critical attribute of live-streaming shopping, have been overlooked. Since live-streaming shopping is a social commerce platform where consumers can learn from live streamers in multiple ways (i.e., through direct and indirect interactions with them), it is not profound enough to only consider direct interaction with live streamers. Our study bridges this research gap by investigating the impacts of CVL-related attributes and IVL-related attributes on CPLSC in the live-streaming shopping. Our empirical results provide the fine-grained analysis of communication technologies of live-streaming shopping by showing that both CVL-related and IVL-related attributes are important drivers of a CPLSC. This finding sheds light on the role of vicarious learning experiences in reducing consumers' uncertainty and further enhances their purchase behavior. Moreover, drawing on the vicarious learning perspective and the MEC framework, this study provides a possible explanation for the popularity of live-streaming shopping.

Secondly, this study enhances extant research by clarifying the important role of attributes

(interactivity and EULSIT) in the development of consumers' credibility perception. Despite the broad recognition that the communication attributes of a platform can impact consumers' perceptions and behaviors (Cai and Wohn, 2019; Sun *et al.*, 2019), current understanding of how such attributes facilitate credibility perception is at a basic level, especially our understanding of the theoretical linkages between these attributes. This study explains the impact of the specific attributes of live-streaming shopping on CPLSC from the vicarious learning perspective, which provides a more holistic understanding of how and why technology attributes facilitate consumers' positive perceptions.

Thirdly, our findings for H5 (virtual presence to CPLSC) and H6 (psychological proximity to CPLSC) support the arguments of construal level theory and verify its potential relevance for a better understanding of credibility phenomena. Virtual presence and psychological proximity are constructs from psychology and have not received much attention in the social commerce literature. Previous studies examining seller (live streamer) credibility have focused on functional benefits, such as source expertise, trust in platform, feedback profile, and privacy (e.g., Chen *et al.*, 2015; Pizzutti and Fernandes, 2010); however only limited attention has been paid to the impact of psychosocial benefits (i.e., virtual presence and psychological proximity) on perceived seller (live streamer) credibility. This study adopted virtual presence and psychological proximity as psychosocial benefits to reduce the consumer's uncertainty perception. The results of this study demonstrate that construal level theory could theoretically explain why certain psychosocial strategies work in reducing uncertainty. Moreover, by adopting both emotional and cognitive factors to understand consumers' decisions, we combined theoretical insights from both economics and psychology, which advances our understanding of consumers' decision making processes.

5.3. Practical implications

CPLSC is an important antecedent in improving live streamer's sale performance. Thus, live streamers should pay attention to facilitating consumers' credibility perceptions toward them. To increase consumers' credibility, live streamers should be dedicated to enhancing interactivity with consumers. Our study divided interactivity into three sub-dimensions, namely, active control, two-way communication, and synchronicity. The results revealed that consumers consider synchronicity to be the most important when interacting with live streamers. Thus, live streamers are encouraged to respond to comments posted by consumers in real time to meet those consumers' expectations for timely responses and information. In addition, live streamers should be aware of active control and effective two-way communication. For example, live streamers should follow the instructions of consumers, and try to provide information according to consumers' needs. Specifically, if consumers want to see a specific part of the product, live streamers need to meet their demands by showing them that part.

Secondly, the results of this study found that the EULSIT had a significant impact on the CPLSC. Thus, live streamers need to encourage experienced consumers to express their past transaction experience in live-streaming shopping. Meanwhile, live streamers should focus on the comments quality. Since there are an excessive number of "live comments" on screen, which must lead to information redundancy, it is important to limit the number of comments on screen and improve the quality of comments. For example, live streamers could provide guidelines to

consumers on how to contribute good comments, such as templates of product aspects (e.g., performance, look-and feel, and actual usage experience) or service. To do so, live streamers can give coupons to these active consumers. In addition, live streamers need to be friendly and professional during their broadcasts. As for live-streaming shopping retailers, they need to design more features of live-streaming shopping to help consumers assess live streamers. For example, they could add a live streamer rating system that allows consumers who have previously bought the product from the live streamers to rate them. Moreover, retailers also can improve the quality of the broadcasting equipment during the live-streaming shopping, so that consumers can see the quality of the products more clearly.

5.4. Limitations and future research

Firstly, findings from our online survey are from the general perception to live-streaming shopping experience. We did not consider the impacts of product types. Since different product attributes might have some impacts on the CPLSC, future research could consider different product types and categories (experiential or material products) and examine their influences on consumers’ perceptions and behaviors.

Secondly, we considered only two vicarious learning-related attributes (interactivity and EULSIT). Many other factors remain worthy of consideration and study (e.g., direct interaction with live-streamer via voice). Future research could focus on other vicarious learning-related factors of live-streaming shopping to help consumers seek transaction-related information.

Thirdly, the data were collected from live-streaming shopping websites located in China, which may influence the generalizability of the research findings to other contexts. In future, scholars may consider data collection in multiple organizations across different national cultures, and examine the impact of national cultures on the technology-driven adaptive behaviors.

6. Conclusion

This study investigates the impacts of CVL-related attribute and IVL-related attribute of live-streaming shopping on CPLSC and their purchase behavior. Based on the MEC framework and vicarious learning perspective, we identified two types of attributes of live-streaming shopping associated with CVL and IVL processes respectively: interactivity and EULSIT. Using data from a survey with 405 valid responses, we found support for our research hypotheses. Specifically, our empirical findings reveal that interactivity (CVL-related attribute) and EULSIT (IVL-related attribute) positively influences CPLSC via psychosocial benefit constructs (i.e., virtual presence and psychological proximity). This study serves as a stepping stone for future research on decreasing consumer’s uncertainty through vicarious learning from live streamers.

Appendix A. Measuring items for research model.

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Table AI. Measuring items for research model.
Interactivity: Measured by active control, two-way communication, and synchronicity
Interactivity: Active control – adapted from Ou <i>et al.</i> (2014).
I felt that I had a lot of control over my experience at this live streamer’s live-streaming

shopping site.
While I was watching this live streamer’s live-streaming shopping site, I could choose freely what I wanted to see.
Interactivity: Two-way communication – adapted from Ou <i>et al.</i> (2014).
During the live-streaming shopping, this live streamer facilitates two-way communication between him/herself and consumers.
During the live-streaming shopping, this live streamer gives consumers the opportunity to talk to him/her.
Interactivity: Synchronicity – adapted from Ou <i>et al.</i> (2014).
During the live-streaming shopping, this live streamer responded to my questions very quickly.
During the live-streaming shopping, I was able to get information from this live streamer very rapidly.
Virtual presence: Measured by telepresence and social presence
Virtual presence: Telepresence – adapted from Ou <i>et al.</i> (2014).
While watching this live streamer’s live-streaming shopping site, my body was in the room, but I felt my mind was inside the world created by this live streamer.
While watching this live streamer’s live-streaming shopping site, I felt that I was immersed in the world this live streamer had created.
This live streamer-generated world seemed to me to be “somewhere I visited” rather than “something I saw.”
I felt I was more in the “real world” than the “computer world” while I was watching this live streamer’s live-streaming shopping site.
Virtual presence: Social presence – adapted from Ou <i>et al.</i> (2014).
There is a sense of human contact in this live streamer’s live-streaming shopping site.
There is a sense of personalness in this live streamer’s live-streaming shopping site.
There is human warmth in this live streamer’s live-streaming shopping site.
There is a sense of human sensitivity in this live streamer’s live-streaming shopping site.
Psychological proximity: Measured by spatial proximity, temporal proximity, and social proximity
Psychological proximity: Spatial proximity – adapted from Lim <i>et al.</i> (2012).
While watching live-streaming shopping, I felt I was in the same place as the live streamer.
While watching live-streaming shopping, I felt I was spatially close with the live streamer.
While watching live-streaming shopping, I felt the live streamer responded to me closely.
While watching live-streaming shopping, I felt the live streamer interacted in the same place as I was.
Psychological proximity: Temporal proximity – adapted from Lim <i>et al.</i> (2012).
While watching live-streaming shopping, I felt I was interacting simultaneously with the live streamer.

While watching live-streaming shopping, I felt the live streamer was not temporally distant.
While watching live-streaming shopping, the live streamer gave quick responses to my actions.
Psychological proximity: Social proximity – adapted from Lim <i>et al.</i> (2012).
While watching live-streaming shopping, it was easy to become friends with the live streamer.
While watching live-streaming shopping, I felt I became more intimate with the live streamer.
While watching live-streaming shopping, I felt the live streamer held a socially important meaning to me.
EULSIT - adapted from Ou <i>et al.</i> (2014).
I feel confident that the live-streaming shopping's information presentation tool provides accurate information about this live streamer's reputation.
A considerable amount of useful feedback information about the transaction history of this live streamer is available through live-streaming shopping's information presentation tool.
I believe that the live-streaming shopping's information presentation tool is effective for consumers to know about this live streamer.
I believe that the live-streaming shopping's information presentation tool is reliable and dependable so as to help me evaluate this live streamer.
Did you use the live-streaming shopping's information presentation tool in your last transaction with this live streamer? Y/N.
CPLSC - adapted from Pavlou and Dimoka (2006).
I believe this live streamer will deliver to me a product that matches the posted description.
I believe this live streamer will deliver to me a product according to the posted delivery terms and conditions.
This live streamer is likely to be honest.
This live streamer is likely to be reliable.
This live streamer is likely to be credible.
Purchase intention - adapted from Wells <i>et al.</i> (2011).
Suppose you were watching the live-streaming shopping for the product. How likely would you be to purchase the product from this live streamer?
Suppose you were watching the live-streaming shopping for the product. How likely would you be to do business with the live streamer via this live-streaming shopping?
If you were watching the live-streaming shopping for the product, what is the likelihood that you would use this live-streaming shopping site to purchase the product?

References

- Armstrong, J.S. and Overton, T.S. (1977), "Estimating nonresponse bias in mail surveys", *Journal of Marketing Research*, Vol. 14 No. 3, pp. 396-402.
- Ali, I., Ali, M., Leal-Rodríguez, A.L. and Albort-Morant, G. (2019), "The role of knowledge spillovers and cultural intelligence in enhancing expatriate employees' individual and team creativity", *Journal of Business Research*, Vol. 101, pp. 561-573.
- Ang, T., Wei, S. and Anaza, N.A. (2018), "Livestreaming vs pre-recorded: How social viewing strategies impact consumers' viewing experiences and behavioral intentions", *European Journal of Marketing*, Vol. 52 No. 9/10, pp. 2075-2104.
- Ajzen, I. and Fishbein, M. (1980), *Understanding Attitudes and Predicting Social Behavior*, Prentice-Hall, New Jersey.
- Andreev, P., Heart, T., Maoz, H. and Pliskin, N. (2009), "Validating formative partial least squares (PLS) models: Methodological review and empirical illustration", in Proceeding of the 30th International Conference on Information Systems, Phoenix, Arizona, USA.
- Brislin, R., Lonner, W. and Thorndike, R. (1973), *Cross-cultural Research Methods*, John Wiley & Sons, New York.
- Bakhtiar, A., Webster, E.A. and Hadwin, A.F. (2018), "Regulation and socio-emotional interactions in a positive and a negative group climate", *Metacognition and Learning*, Vol. 13 No. 1, pp. 57-90.
- Bandura, A. (1977), *Social Learning Theory*, General Learning Press, New York.
- Breves, P. and Schramm, H. (2021), "Bridging psychological distance: The impact of immersive media on distant and proximal environmental issues", *Computers in Human Behavior*, Vol. 115, 106606.
- Blut, M. (2016), "E-service quality: Development of a hierarchical model", *Journal of Retailing*, Vol. 92 No. 4, pp. 500-517.
- Bao, Z. and Zhu, Y. (2022), "Understanding customers' stickiness of live streaming commerce platforms: An empirical study based on modified e-commerce system success model", *Asia Pacific Journal of Marketing and Logistics*, Vol. ahead-of-print No. ahead-of-print.
- Chen, X., Huang, Q., Davison, R.M. and Hua, Z. (2015), "What drives trust transfer? The moderating roles of seller-specific and general institutional mechanisms", *International Journal of Electronic Commerce*, Vol. 20 No. 2, pp. 261-289.
- Cai, J. and Wohn, D.Y. (2019), "Live streaming commerce: Uses and gratifications approach to understanding consumers' motivations", in Proceedings of the 52nd Hawaii International Conference on System Sciences, Hawaii, United States.
- Chen, Z., Cenfetelli, R. and Benbasat, I. (2019), "The influence of e-commerce live streaming on lifestyle fit uncertainty and online purchase intention of experience products", in Proceedings of the 52nd Hawaii International Conference on System Sciences, Hawaii, United States.
- Chen, C.C. and Lin, Y.C. (2018), "What drives live-stream usage intention? The perspectives of flow, entertainment, social interaction, and endorsement", *Telematics and Informatics*, Vol. 35 No. 1, pp. 293-303.
- Cheng, Y.S., Hsu, P.Y. and Liu, Y.C. (2018), "Identifying and recommending user-interested attributes with values", *Industrial Management & Data Systems*, Vol. 118 No. 4, pp. 765-781.
- Cenfetelli, R.T. and Bassellier, G. (2009), "Interpretation of formative measurement in information systems research", *MIS Quarterly*, Vol. 33 No. 4, pp. 689-707.
- Chevalier S. (2022), "Live commerce market size in the U.S. 2020-2026", available at:

<https://www.statista.com/statistics/1276120/livestream-e-commerce-sales-united-states/>
(accessed 3 March 2023).

- Clement Addo, P., Fang, J., Asare, A.O. and Kulbo, N.B. (2021), "Customer engagement and purchase intention in live-streaming digital marketing platforms", *The Service Industries Journal*, Vol. 41 Nos. 11-12, pp. 767-786.
- Chen, H., Zhang, S., Shao, B., Gao, W. and Xu, Y. (2022), "How do interpersonal interaction factors affect buyers' purchase intention in live stream shopping? The mediating effects of swift guanxi", *Internet Research*, Vol. 32 No. 1, pp. 335-361.
- Chen, H., Chen, H. and Tian, X. (2022), "The dual-process model of product information and habit in influencing consumers' purchase intention: The role of live streaming features", *Electronic Commerce Research and Applications*, Vol. 53, 101150.
- Edirisingha, P., Nie, M., Pluciennik, M. and Young, R. (2009), "Socialisation for learning at a distance in a 3-D multi-user virtual environment", *British Journal of Educational Technology*, Vol. 40 No. 3, pp. 458-479.
- Edwards, S.M., Lee, J.K. and Ferle, C.L. (2009), "Does place matter when shopping online? Perceptions of similarity and familiarity as indicators of psychological distance", *Journal of Interactive Advertising*, Vol. 10 No. 1, pp. 35-50.
- Fu, C.S. and Wu, W.Y. (2013), "Means-end matrix and deduction in consumption behavior research", *Methodology*, Vol. 9 No. 2, pp. 54-68.
- Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.
- Gutman, J. (1982), "A means-end chain model based on consumer categorization processes", *Journal of Marketing*, Vol. 46 No. 2, pp. 60-72.
- Gefen, D. and Straub, D.W. (2004), "Consumer trust in B2C e-Commerce and the importance of social presence: Experiments in e-Products and e-Services", *Omega*, Vol. 32 No. 6, pp. 407-424.
- Guo, L., Hu, X., Lu, J. and Ma, L. (2021), "Effects of customer trust on engagement in live streaming commerce: mediating role of swift guanxi", *Internet Research*, Vol. 31 No. 5, pp. 1718-1744.
- Gao, X., Xu, X.Y., Tayyab, S.M.U. and Li, Q. (2021), "How the live streaming commerce viewers process the persuasive message: An ELM perspective and the moderating effect of mindfulness", *Electronic Commerce Research and Applications*, Vol. 49, 101087.
- Guan, Z., Hou, F., Li, B., Phang, C.W. and Chong, A.Y.L. (2022), "What influences the purchase of virtual gifts in live streaming in China? A cultural context - sensitive model", *Information Systems Journal*, Vol. 32 No. 3, pp. 653-689.
- Huang, S.L. and Chang, C.Y. (2020), "Understanding how people select social networking services: Media trait, social influences and situational factors", *Information & Management*, Vol. 57 No. 6, 103323.
- Hair, J., Anderson, R., Tatham, R. and Black, W. (1998), *Multi-variate Data Analysis*, Prentice Hall, New Jersey.
- Harman, H.H. (1976), *Modern Factor Analysis*, University of Chicago press, Chicago.
- Hu, X., Chen, X. and Davison, R.M. (2019), "Social support, source credibility, social influence, and impulsive purchase behavior in social commerce", *International Journal of Electronic Commerce*, Vol. 23 No. 3, pp. 297-327.
- Hair, J.F., Ringle, C.M. and Sarstedt, M. (2011), "PLS-SEM: Indeed a silver bullet", *Journal of*

- Marketing Theory and Practice*, Vol. 19 No. 2, pp. 139-152.
- Hair, J.F., Hult, G.T.M., Ringle, C. and Sarstedt, M. (2016), *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, Sage Publications, California.
- iiMedia Report, “2022-2023 China’s live broadcast e-commerce industry operation big data analysis and trend research report”, available at: <https://www.iimedia.cn/c400/86233.html> (accessed 3 March 2023).
- Jung, Y. (2014), “What a smartphone is to me: Understanding user values in using smartphones”, *Information Systems Journal*, Vol. 24 No. 4, pp. 299-321.
- Kehrwald, B. (2008), “Understanding social presence in text-based online learning environments”, *Distance Education*, Vol. 29 No. 1, pp. 89-106.
- Lu, Z., Xia, H., Heo, S. and Wigdor, D. (2018), “You watch, you give, and you engage: A study of live streaming practices in China”, in Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, Montreal, Canada.
- Li, M., Min, Q., Hu, L. and Liu, Z. (2020), “Understanding live streaming shopping intentions: A vicarious learning perspective”, in Proceedings of the 23rd Pacific Asia Conference on Information Systems, Dubai, UAE.
- Lowry, P.B., Romano, N.C., Jenkins, J.L. and Guthrie, R.W. (2009), “The CMC interactivity model: How interactivity enhances communication quality and process satisfaction in lean-media groups”, *Journal of Management Information Systems*, Vol. 26 No. 1, pp. 155-196.
- Liu, Y. and Shrum, L.J. (2002), “What is interactivity and is it always such a good thing? Implications of definition, person, and situation for the influence of interactivity on advertising effectiveness”, *Journal of Advertising*, Vol. 31 No. 4, pp. 53-64.
- Lin, C.F. and Fu, C.S. (2018), “Evaluating online advertising effect: An approach integrating means-end conceptualization and similarity analysis”, *Electronic Commerce Research and Applications*, Vol. 32, pp. 1-12.
- Lee, E.J. and Park, J. (2014), “Enhancing virtual presence in e-tail: Dynamics of cue multiplicity”, *International Journal of Electronic Commerce*, Vol. 18 No. 4, pp. 117-146.
- Lee, C.H. and Chiravuri, A. (2019), “Dealing with initial success versus failure in crowdfunding market: Serial crowdfunding, changing strategies, and funding performance”, *Internet Research*, Vol. 29 No. 5, pp. 1190-1212.
- Liberman, N. and Trope, Y. (2008), “The psychology of transcending the here and now”, *Science*, Vol. 322 No. 5905, pp. 1201-1205.
- Lim, S., Cha, S.Y., Park, C., Lee, I. and Kim, J. (2012), “Getting closer and experiencing together: Antecedents and consequences of psychological distance in social media-enhanced real-time streaming video”, *Computers in Human Behavior*, Vol. 28 No. 4, pp. 1365-1378.
- Lee, A.R., Hon, L. and Won, J. (2018), “Psychological proximity as a predictor of participation in a social media issue campaign”, *Computers in Human Behavior*, Vol. 85, pp. 245-254.
- Lombard, M. and Ditton, T. (1997), “At the heart of it all: The concept of presence”, *Journal of Computer-mediated Communication*, Vol. 3 No. 2, pp. 1-43.
- Liberman, N., Trope, Y. and Stephan, E. (2007), *Psychological Distance*, Guilford Press, New York.
- Liberman, N. and Trope, Y. (1998), “The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory”, *Journal of Personality and Social Psychology*, Vol. 75 No. 1, pp. 5-18.
- Loch, K.D., Straub, D.W. and Kamel, S. (2003), “Diffusing the Internet in the Arab world: The

- role of social norms and technological cultururation”, *IEEE Transactions on Engineering Management*, Vol. 50 No. 1, pp. 45-63.
- Lo, P.S., Dwivedi, Y.K., Tan, G.W.H., Ooi, K.B., Aw, E.C.X. and Metri, B. (2022), “Why do consumers buy impulsively during live streaming? A deep learning-based dual-stage SEM-ANN analysis”, *Journal of Business Research*, Vol. 147, pp. 325-337.
- Lin, S.C., Tseng, H.T., Shirazi, F., Hajli, N. and Tsai, P.T. (2022), “Exploring factors influencing impulse buying in live streaming shopping: A stimulus-organism-response (SOR) perspective”, *Asia Pacific Journal of Marketing and Logistics*, Vol. ahead-of-print No. ahead-of-print.
- Li, L., Kang, K., Zhao, A. and Feng, Y. (2022), “The impact of social presence and facilitation factors on online consumers’ impulse buying in live shopping - celebrity endorsement as a moderating factor”, *Information Technology & People*, Vol. ahead-of-print No. ahead-of-print.
- Lu, B. and Chen, Z. (2021), “Live streaming commerce and consumers’ purchase intention: An uncertainty reduction perspective”, *Information & Management*, Vol. 58 No. 7, 103509.
- Ma, X., Zou, X. and Lv, J. (2022), “Why do consumers hesitate to purchase in live streaming? A perspective of interaction between participants”, *Electronic Commerce Research and Applications*, Vol. 55, 101193.
- Myers, C.G. (2018), “Coactive vicarious learning: Toward a relational theory of vicarious learning in organizations”, *Academy of Management Review*, Vol. 43 No. 4, pp. 610-634.
- Mollen, A. and Wilson, H. (2010), “Engagement, telepresence and interactivity in online consumer experience: Reconciling scholastic and managerial perspectives”, *Journal of Business Research*, Vol. 63 No. (9-10), pp. 919-925.
- Noe, R.A., Clarke, A.D. and Klein, H.J. (2014), “Learning in the twenty-first-century workplace”, *Annual Review of Organizational Psychology and Organizational Behavior*, Vol. 1 No. 1, pp. 245-275.
- Nisbett, R.E. and Ross, L. (1980), *Human Inference: Strategies and Shortcomings of Social Judgment*, Prentice-Hall, New Jersey.
- Ou, C.X., Pavlou, P.A. and Davison, R.M. (2014), “Swift guanxi in online marketplaces: The role of computer-mediated communication technologies”, *MIS Quarterly*, Vol. 38 No. 1, pp. 209-230.
- Papagiannidis, S., Pantano, E., See-To, E.W., Dennis, C. and Bourlakis, M. (2017), “To immerse or not? Experimenting with two virtual retail environments”, *Information Technology & People*, Vol. 30 No. 1, pp. 163-188.
- Pavlou, P.A. and Dimoka, A. (2006), “The nature and role of feedback text comments in online marketplaces: Implications for trust building, price premiums, and seller differentiation”, *Information Systems Research*, Vol. 17 No. 4, pp. 392-414.
- Prendergast, G.P., Li, S.S. and Li, C. (2014), “Consumer perceptions of salesperson gender and credibility: An evolutionary explanation”, *Journal of Consumer Marketing*, Vol. 31 No. 3, pp. 200-211.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), “Common method biases in behavioral research: A critical review of the literature and recommended remedies”, *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903.
- Petter, S., Straub, D. and Rai, A. (2007), “Specifying formative constructs in information systems research”, *MIS Quarterly*, Vol. 31 No. 4, pp. 623-656.
- Park, H.J. and Lin, L.M. (2020), “The effects of match-ups on the consumer attitudes toward

- internet celebrities and their live streaming contents in the context of product endorsement”, *Journal of Retailing and Consumer Services*, Vol. 52, 101934.
- Pavlou, P.A., Liang, H. and Xue, Y. (2007), “Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective”, *MIS Quarterly*, Vol. 31 No. 1, pp. 105-136.
- Pizzutti, C. and Fernandes, D. (2010), “Effect of recovery efforts on consumer trust and loyalty in e-tail: A contingency model”, *International Journal of Electronic Commerce*, Vol. 14 No. 4, pp. 127-160.
- Rice, R.E. and Love, G. (1987), “Electronic emotion: Socioemotional content in a computer-mediated communication network”, *Communication Research*, Vol. 14 No. 1, pp. 85-108.
- Rogers, E.M. and Shoemaker, F.F. (1971), *Communication of Innovations: A Cross-cultural Approach*, The Free Press, New York.
- Ringle, C.M., Sarstedt, M. and Straub, D.W. (2012), “Editor’s comments: A critical look at the use of PLS-SEM in “MIS Quarterly””, *MIS Quarterly*, Vol. 36 No. 1, pp. 3-14.
- Steuer, J. (1992), “Defining virtual reality: Dimensions determining telepresence”, *Journal of Communication*, Vol. 42 No. 4, pp. 73-93.
- Shen, K.N. and Khalifa, M. (2012), “System design effects on online impulse buying”, *Internet Research*, Vol. 22 No. 4, pp. 396-425.
- Stein, B.E. and Meredith, M.A. (1993), *The Merging of the Senses*, MIT Press, Cambridge.
- Shen, X.L., Li, Y.J., Sun, Y. and Wang, F. (2021), “Good for use, but better for choice: A relative model of competing social networking services”, *Information & Management*, Vol. 58 No. 3, 103448.
- Short, J., Williams, E. and Christie, B. (1976), *The Social Psychology of Telecommunication*, John Wiley and Sons, London.
- Sun, Y., Shao, X., Li, X., Guo, Y. and Nie, K. (2019), “How live streaming influences purchase intentions in social commerce: An IT affordance perspective”, *Electronic Commerce Research and Applications*, Vol. 37, 100886.
- Trope, Y. and Liberman, N. (2010), “Construal-level theory of psychological distance”, *Psychological Review*, Vol. 117 No. 2, pp. 440-463.
- Taylor, S.E. and Thompson, S.C. (1982), “Stalking the elusive “vividness” effect”, *Psychological Review*, Vol. 89 No. 2, pp. 155-181.
- Tan, C.W., Benbasat, I. and Cenfetelli, R.T. (2013), “IT-mediated customer service content and delivery in electronic governments: An empirical investigation of the antecedents of service quality”, *MIS Quarterly*, Vol. 37 No. 1, pp. 77-109.
- Vance, A., Elie-Dit-Cosaque, C. and Straub, D.W. (2008), “Examining trust in information technology artifacts: The effects of system quality and culture”, *Journal of Management Information Systems*, Vol. 24 No. 4, pp. 73-100.
- Wongkitrungrueng, A. and Assarut, N. (2020), “The role of live streaming in building consumer trust and engagement with social commerce sellers”, *Journal of Business Research*, Vol. 117, pp. 543-556.
- Woodruff, R.B. (1997), “Customer value: The next source for competitive advantage”, *Journal of the Academy of Marketing Science*, Vol. 25 No. 2, pp. 139-153.
- Xiao, L., Guo, Z. and D’Ambra, J. (2017), “Analyzing consumer goal structure in online group buying: A means-end chain approach”, *Information & Management*, Vol. 54 No. 8, pp. 1097-1119.

- Ye, H.(J). (2022), “Effects of learning and uncertainty on crowdsourcing performance of solvers: insights from performance feedback theory”, *Internet Research*, Vol. ahead-of-print No. ahead-of-print.
- Yu, F. and Zheng, R. (2022), “The effects of perceived luxury value on customer engagement and purchase intention in live streaming shopping”, *Asia Pacific Journal of Marketing and Logistics*, Vol. 34 No. 6, pp. 1303-1323.
- Zhou, J., Bi, G., Liu, H., Fang, Y. and Hua, Z. (2018), “Understanding employee competence, operational IS alignment, and organizational agility-An ambidexterity perspective”, *Information & Management*, Vol. 55 No. 6, pp. 695-708.
- Zhang, M., Liu, Y., Wang, Y. and Zhao, L. (2022), “How to retain customers: Understanding the role of trust in live streaming commerce with a socio-technical perspective”, *Computers in Human Behavior*, Vol. 127, 107052.