

Ho, Chaang-Iuan; Liu, Yaoyu; Chen, Ming-Chih

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*Corresponding author: Chaang-Iuan Ho, Leisure Services Management, Chaoyang University of Technology, Taiwan
E-mail: ciho@cyut.edu.tw

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MARKETING | RESEARCH ARTICLE

Antecedents and consequences of consumers' attitudes toward live streaming shopping: an application of the stimulus–organism–response paradigm

Chaang-Iuan Ho^{1*}, Yaoyu Liu² and Ming-Chih Chen²

Abstract: The purpose of this paper is to present an integrated model for live streaming shopping (LSS) to examine the antecedents and consequences of consumers' attitudes. Based on the stimulus–organism–response (S-O-R) paradigm, this study investigates marketing stimuli effects within a live streaming commerce context on viewers' cognitive and affective states by drawing from their unified knowledge of technology acceptance model (TAM), utilitarian gratification theory (UGT) and the theory of reasoned action (TRA) underpinnings and their subsequent responses. Data collected from 402 live streaming shoppers of several reputable retailers in Mainland China were used to empirically test the proposed framework via structural equation modelling. The theoretical framework found support for most hypothesized relationships. The research results confirm that the 7Ps marketing mix strategies as the stimuli factors positively influence the consumers' cognitive and emotional states represented by perceived usefulness, perceived value, information gratification, entertainment gratification, and social interaction. These factors have been found to be the direct predictors of consumers' attitudes toward LSS. Furthermore, consumers' response in terms of their attitudes influences their intention to watch the show and subsequently affect their purchase intention. This paper bridges a gap in LSS studies, contributing to develop a more

ABOUT THE AUTHORS

Chaang-Iuan Ho is an associate professor in the Department of Leisure Services Management at Chaoyang University of Technology (Taiwan). She awarded PhD from University of California at Davis, USA, in 1997. Her research interests cover Internet-based tourism information search, e-commerce in the tourism industry, tourist behaviour, and transport/tourism studies. She has published refereed papers in leading international journals in the field of travel and tourism, including *Tourism Management*, *Journal of Marketing Management*, *Current Issues in Tourism*, *Journal of Sustainable Tourism*, *Journal of Hospitality and Tourism Research*, *Journal of Hospitality and Tourism Technology*, *Asia Pacific Journal of Tourism Research*, *Cogent Social Sciences*, *Economies*, and *Information*. Her e-mail address is ciho@cyut.edu.tw

Yaoyu Liu is a Ph.D student in the Graduate Institute of Business Administration at Fu Jen Catholic University (Taiwan). He received BA and MBA degree in Providence University, Taiwan. His recent research work has been published in *Information*. His e-mail address is lyy19951022@gmail.com

Ming-Chih Chen is a professor in the Graduate Institute of Business Administration and Director of the AI Development Center at Fu Jen Catholic University (Taiwan). She received PhD from Texas A & M University, USA in 1994. Her research interests include data mining, reliability and maintainability, optimisation and operations research. Her work has appeared in a variety of journals, including *Annals of Operation Research*, *International Journal of Environmental Research and Public Health* and *International Journal of Reliability, Quality and Safety Engineering*. Her e-mail address is 081438@mail.fju.edu.tw

comprehensive framework and provide a better understanding of the factors that influence the the formation of consumers' attitudes, and the influence of the formed attitudes on the intention to engage in LSS before actually making a purchase decision. The findings enable managers to determine how resources should be allocated to improve platform's competence.

Subjects: Management of IT; Business, Management and Accounting; Information Technology

Keywords: consumer behavior; live streaming shopping; stimulus-organism-response paradigm; consumers' attitudes; purchasing intention

1. Introduction

As a new method of shopping that includes social commerce and unique media attributes (Cai et al., 2018), live streaming commerce (LSC) is considered a subset of social commerce and e-commerce (Sun et al., 2019). It has become one of the important platforms for consumers shopping, interaction, entertainment and spending time (Kang et al., 2021). Due to the global outbreak of COVID-19, the implementation of the closed policy has prompted consumers to change the way of shopping, resulting in the explosive growth of LSC. In China, the market size of LSC exceeds 1.2 trillion yuan, with an annual growth rate of 197%; it is expected to exceed 4.9 trillion yuan in 2023 (iResearch, 2021b). As a results, major brands and manufacturers are deploying LSC (iResearch, 2021a). At the same time, the enterprises related to LSC have also emerged accordingly: there were 8,862 companies in 2020, an increase of 360.8% compared with the number in 2019, it increased 360.8%, and more than one million broadcasters sold products/services in LSC platforms in 2020 (iResearch, 2021b). The competition among the entrepreneurs is fierce. How to attract and retain customers has become a critical issue for companies to survive and succeed in the LSC industry.

The emerging phenomenon of LSS has attracted researchers to explore the motivations behind the consumers' adoption of this shopping mode and the factors that affect their engagement (Cai et al., 2018; Chen & Lin, 2018; Lee & Chen, 2021; Scheibe et al., 2016; Sun et al., 2019; M. Zhang et al., 2020; W. Zhang et al., 2021). These studies have been mainly conducted from the perspective of consumers. Very little, from the seller's perspective, has fully and systematically discussed the marketing factors that influence consumers' purchases or viewers' followership (Ho et al., 2022; Wongkitrungrueng et al., 2020). Some scholars, however, have adopted the S-O-R paradigm and have proved that the framework is salient when it comes to exploring the factors that influence consumer behavior of LSS (Lee & Chen, 2021; Xu et al., 2020). Indeed, in the novel shopping environment of LSC, consumers (or viewers) receive multiple external stimuli including the marketing-related information and then make purchases based on their own internal evaluations.

As a matter of fact, the features of LSC make its marketing unique. One of the most important features of LSS is the buying process, which involves a high degree of interdependence between buyers and sellers (Wongkitrungrueng et al., 2020). The application of the concept of the marketing mix 7P's (Booms & Bitner, 1982) as external stimuli may be an issue that makes their effects on the consumers' purchase intention worth investigating. Furthermore, previous studies employing the holistic approach of the S-O-R framework offer only a partial analysis of the consequence of LSS involved (see, Table 1). Current literature is fragmented, with a concentration of very few antecedents of environmental stimuli or the cognitive and affective reactions of LSS. In addition, there are various forms as to the content of LSC customers' organismic states and responses, implying that the mechanism involves highly complex processes which may operate multiple viewpoints. In-depth research on the empirical evidence of a model from multiple perspectives that can explain the antecedents in the process of LSS usage and play in shaping LS shoppers'

Table 1. Previous LSS research using S-O-R framework

	Stimulus	Organism	Response
Chen et al. (2022)	Perceived expertise, Perceived similarity, Perceived familiarity, Perceived likeability	Swift guanxi	Purchase intention
Dong et al. (2022)	Information quality, System quality, Service quality, Social presence, Telepresence	Green Trust	Green purchase intention
Hu and Chaudhry (2020)	Financial bonds, Social bonds, Structural bonds	Affective commitment to the broadcaster, Affective commitment to the online marketplace	Consumer engagement
Kang et al. (2021)	Responsiveness, Personalization	Tie strength	Customer engagement behaviors
Lee and Chen (2021)	Attractiveness, Trustworthiness, Expertise, Product usefulness, Purchase convenience, Product price	Perceived enjoyment, Perceived usefulness	Urge to buy impulsively
Liu et al. (2018)	Perceived familiarity, Perceived similarity, Perceived expertise	Normative influence, Informational influence	Purchase intention
Wang et al. (2021)	Live characteristic	Social presence, Flow experience	Consumption intention, Involvement
Xu et al. (2020)	Streamer attractiveness, Para-social interaction, Information quality	Cognitive assimilation, Arousal	Hedonic consumption, Impulsive consumption, Social sharing

loyalty behaviour is scarce. The missing link appears to be an integrated model that can reflect such complexities.

To fill the above-mentioned research gaps, the primary research objective of this study is to develop a more comprehensive model that explains LSS behavior. We attempt to overcome the shortcoming in prior studies, as researchers endeavor to support the fulfillment of the follow-up work. Grounded within an S-O-R framework, a unified model that is founded on sound theoretical underpinnings is proposed. We synthesize the findings of state-of-the-art research into the concept of 7Ps and propose the marketing strategies of the broadcasters as environmental stimuli within the context of LSC (S). We then examine the impact of these stimuli on consumers' perceptions toward LSS. Our approach builds on the TAM and on the uses and UGT to investigate the consumers' perceived ease of use and usefulness of LSS, as well as their intrinsic motivations including information gratification, entertainment gratification and social interaction that reflect cognitive and emotional states (O). Through the lens of the theory of reasoned action (TRA), it provides an explanation of the factors that influence the formation of consumers' attitudes toward LSS behavior, and the influence of the formed attitudes on the intention to engage in LSS before actually making a purchase decision. We then examine the impact of the organism states in terms of motivating the behavioral responses of consumers' attitudes, the watching intention in relation to LS broadcast shows and purchase intentions (R).

This study is one of the latest empirical endeavors that proposed an integrated model and examined factors affecting attitudes toward LSS in China. It sheds light on the factors that determine LS shoppers' attitudes as an antecedent to consumers purchase intentions and has two contributions. First, the proposed S-O-R framework attempts to explore the interplay of the

relationships among cognitive and emotional states, marketing mix strategies, and the individuals' attitudes, watching and purchase intentions of LS shoppers in China. Our model puts forwards a justifiable approach to investigate features of LSC as marketing stimuli; it enables the analysis of the role that cognitive and emotional states of the marketing mix strategies of LSC platforms play in shaping users' shopping behaviors. Second, complete coverage of all potential factors and issues related to LSS is not possible; nevertheless, this study includes as many empirical findings/pieces of evidence regarding the influential factors in LSS as possible. Both integrating seller and customer perspectives and testing the integrated model empirically provide a better understanding of the underlying variables and their linkages to shoppers' behavior. From a managerial viewpoint, uncovering the importance of antecedents and consequences as triggers for viewers to commence LSS enables retailers to take more appropriate and proactive actions to improve customer retention.

The remainder of this paper is organized as follows. We begin by providing the theoretical background and a summary of the literature. Then, we propose the research framework and formulate the hypotheses for this study. Afterwards, we describe the research method. Following the results of the empirical analysis by testing the model, we present the conclusion by outlining the study's theoretical and practical implications, limitations, and proposed research directions for research in future studies.

2. Literature review

2.1. Live streaming shopping and related studies

Researchers have so far already paid attention to the phenomenon of LSS. Cai et al. (Cai et al., 2018) conducted a content analysis of LSC to determine its utilitarian and hedonistic motives, focusing on why viewers and sellers use live streaming from the early stage. From the perspective of information technology capabilities (such as the visibility affordance, metavoicing affordance, etc.), Sun et al. (Sun et al., 2019) discussed the participation and shopping intention of consumers. Scheibe et al. (Scheibe et al., 2016) indicated that the primary motivations of customers include the ease of streaming, the need for self-presentation, boredom, and the acceptance of YouNow (a social live broadcast service) by the community. Zhang, Qin, Wang and Luo (W. Zhang et al., 2021) indicated that live broadcast strategies have an indirect impact on customers' online purchase intention by reducing psychological distance and perceived uncertainty. Hou et al. (Hou et al., 2020) examined purchase intention from the perspective of the LSC strategy, reducing the psychological distance, uncertainty and emotional commitment of consumers participating in a social structure bond. Attention has also been paid to the interpersonal relationships (Chen et al., 2022). Wongkitrungrueng and Assarut (Wongkitrungrueng & Assarut, 2020) examined the relationships among the customers' perceived value of live streaming, customer trust, and engagement. In a recent study, Chandruangphen et al. (Chandruangphen et al., 2022) have investigated the effects of LSC attributes on customers' intentions to watch and purchase in LSS. The research results of Ho et al. (Ho et al., 2022) reveal that promotion, placement, and physical evidence have positive effects on customers' purchase intentions.

2.2. Employing the S-O-R framework for LSS studies

The S-O-R framework provides a structural approach to exploring LSS behavior. The concept of this framework was originally developed from stimulus response theory and the model was proposed by Mehrabian and Russell (Mehrabian & Russell, 1974), which describes how individuals respond to external stimuli by incorporating the concept of organism. It includes three key elements: environmental cues as stimuli that influence an individual's (organism) cognitive and emotional process, which in turn affect the individual's internal cognitions and emotions. This results in approaching behaviors (a response). In the LSC context, stimulus factors include LSC characteristics such as social interaction (Xu et al., 2020), social bonds (Hu & Chaudhry, 2020) and product price (Lee & Chen, 2021). An organism refers to the individual's internal cognitions and emotional states such as commitment (Hu & Chaudhry, 2020), perceived enjoyment (Lee & Chen, 2021) and

social presence (Wang et al., 2021). Response includes factors such as customer engagement (Kang et al., 2021; Xu et al., 2020), hedonic consumption (Xu et al., 2020) and purchase intention (Chen & Lin, 2018; Dong et al., 2022; Liu et al., 2018; Wang et al., 2021). Table 1 summarizes the factors identified in the S-O-R framework in the existing literature, indicating its successful applications. In spite of the different forms of environmental stimuli and organism (even the response) adopted among the studies, this framework provides a theoretically justified and holistic way to look into which contextual cues influence consumers' emotional and cognitive decision processes and how the external cues and the customers' internal states affect their buying behavior.

2.3. Theoretical background of the present study

Grounded on the previous research, the present study may enrich the current literature by further proposing an alternative model that depicts the related phenomena more comprehensively. According to the S-O-R framework, the marketing mix 7P by the LSC sellers (or live streamers) (S) may influence consumers' perceived ease of use, perceived usefulness, perceived value of LSS, information gratification, entertainment gratification, and social interaction (O), which in turn may affect consumers' attitudes, their watching intention in relation to LS broadcast shows and their purchase intention (R). Therefore, the marketing mix strategies of LSC relate to consumers' cognitive and emotional states and correspondingly enhance buying behavior.

2.3.1. Marketing mix strategies 7Ps as environmental stimuli (S)

Van Waterschoot and Van Den Bulte (Van Waterschoot & Van den Bulte, 1992) define the marketing mix as "the mixture of elements useful in pursuing a certain market response". McCarthy (McCarthy, 1960) proposed the 4Ps of the marketing mix—product, price, place and promotion. Later, Booms and Bitner (Booms & Bitner, 1982) added three elements—people, physical evidence (the physical surroundings and all tangible cues) and process—to propose the new 7Ps of the marketing mix construct.

All the elements of the 7Ps are briefly explained as follows. The aim of the product/service is to plan and develop the marketable goods and/or services. It covers a core product that fulfills the consumers' primary need and supplementary services such as information offered and handling exceptions. The following characteristics are usually included: functionality, form, quality, appearance, reliability, packaging, value added services and benefits. Price refers to how much consumers are willing to pay for the product, including the aspects of monetary costs and time spent. The pricing strategies may comprise discounts, offers, credit terms, allowances and the like. Promotion refers to the communication and education for customers about the benefits of products and services. It is related to providing information to the target market about products or services and encouraging consumers to buy, which includes the following aspects: promotion strategies (push and pull), advertising, sales development and public relations. Place in the service industry plays a role in delivering the products to the target market. It also represents the accessibility of the product/service. The related issues include distribution channels (channel partners), logistics, inventory management, stock control, the selection of transport modes, reduction of distribution costs, location, and shelf layout. People refer to those who are in charge of delivering products/services, in other words, employees/staffs. Their appearance, skills and attitudes are emphasized during the process of service delivery. Process relates to the implementation of service production and delivery, including the procedures and service flow in the service creation and consumption phase. Physical evidence has been regarded as one of the concrete components that facilitate interactions and communication between the service providers and consumers. It includes items such as furnishing, equipment, space and the layout of the interior building, and decorations.

Kushwaha and Agrawal (Kushwaha & Agrawal, 2015) argue that a marketing mix does not result in a single marketing "P" strategy and it may be the interplay of all of the 7P elements at the same time. LSC as a new channel with the characteristics of interactive media require modifications to its marketing strategies. Within the LSC context, the commercial activities, social events, and situational factors have been integrated. Consumers find it easy to obtain product information

and compare products and prices. LSC has changed e-commerce from the traditional model of “people looking for products” to “products looking for people” (CTBC, 2019). Low price and a huge discount have been ranked as the first reason (47.7%) for livestreaming shopping (Weiboyi, 2020). It is very common for sellers to propose unique pricing schemes to attract customers and only those who watch the livestreams enjoy the discounts and pricing incentives (Hu & Chaudhry, 2020; Lu et al., 2020). In order to enhance customers’ engagement or impulse buying, various interactive games or benefits are provided, such as gift-giving games and lucky draws (Hu & Chaudhry, 2020; Sohn & Kim, 2020). Such promotions may make sellers more popular and even attract new followers. In addition, LSC provides consumers with an entertaining media experience, allowing human interactions with the live streamer and other consumers in real-time (Chen & Lin, 2018; Chen et al., 2022; Hilvert-Bruce et al., 2018; Xu et al., 2020). Live streamers have played a critical role in service delivery in LSS (Hu & Chaudhry, 2020; Xu et al., 2020). Large numbers of followers are attracted to the products or the brands endorsed by the live streamers. Based on the survey results (CTBC, 2019; Weiredian, 2020, 2021), convenience was the main reason why consumers used LSS due to ease of use and the approach being time-saving. The novel shopping model, Message Box +1 facilitates the transaction and brings much convenience to customers. LS shoppers have often experienced the immersive atmosphere of the shopping environment where the decoration, furnishings and configuration cause viewers to become more engaged in the context (M. Zhang et al., 2020) and such a circumstance easily stimulates their attention and enthusiasm for participation (Sun et al., 2019). Their shopping experiences have been enhanced through various consumption scenarios, such as in person demonstrations and comprehensive and dynamic product displays, to spur enthusiasm and elicit consumer purchases (Hu & Chaudhry, 2020). Viewers are easily prompted to follow along and place orders within the context of strong buying interest in the live stream room. Ho et al. (Ho et al., 2022) have analyzed guests’ watching and purchasing intentions from a marketing perspective and their findings indicate that place characteristics (placement) and the physical environment are the most important marketing strategies in LSC.

Indeed, LSC operators may obtain different degree of influence on consumers’ purchase intention by initiating different types of marketing strategies. Information regarding the marketing mix to which consumers are exposed can be regarded as an external stimulus (Xiang et al., 2016), and external information is the driver of consumer behavior (Schmidt & Spreng, 1996). Based on the aforementioned existing studies, some elements such as product, price, personnel and process have been measured as the constructs individually (please see, Table 1). The 7Ps marketing mix concept as a whole on the LSS platform has not been embedded into the S-O-R framework. It is unclear whether the 7Ps marketing mix is effective in enhancing consumers’ purchase intention in the long run, and if it is, how does it affect the consumers’ purchase intention? Therefore, in the present study, 7Ps marketing mix strategies are considered as the stimuli, and the analytical findings of previous research provide clues for developing the current research model and the related hypotheses.

2.3.2. *The organism in LSC*

The organism plays an intermediary role between the stimuli and responses, which has been regarded as an internal state of consumers which comprises cognitive and emotional statures. Based on the S-O-R paradigm, Lee and Chen (Lee & Chen, 2021) adopt perceived usefulness (PU) and perceived enjoyment as the organism in the context of LSC. However, perceived ease of use (PEOU) has also been used to represent the consumers’ organism in the context of online grocery shopping (Sreeram et al., 2017). PU and PEOU are two important constructs regarding beliefs in the technology acceptance model (TAM) which assumes that beliefs about the information system influence attitudes, in turn lead to intention, and then generate the actual usage of a system (Davis, 1989). PU is defined as “the degree to which a person believes that using a particular system would enhance his/her job performance,” and PEOU refers to “the degree to which a person believes that using a particular system would be free of physical and mental effort.” TAM asserts that the influence of external variables on user behavior is mediated through user

beliefs and attitudes. Beliefs refer to people's subjective assessments regarding performing a behavioral action with a specific consequence, whereas attitudes refer to people's positive or negative affective feelings toward exhibiting the behavior. Therefore, in the present study, PU and PEOU are represented as consumers' cognitive states.

An organism state of LSC consumers include the cognitive and emotional aspects in their consumption experiences. However, only perceived enjoyment may not sufficiently reflect the emotional states. Lv et al. (Lv et al., 2022) argued that the LSS environment include three core characteristics: informativity, entertainment, and interactivity. These features are essential in capturing viewers' attention and inciting them to become immersed. Once viewers have product interest, they may engage in immediate buying behavior through generating buying desires. Such a shopping environment provides a vivid setting with interactivity and entertainment to facilitate viewers' purchase decision making processes. Accordingly, additional constructs are required to encompass the consumers' organism.

Camilleri and Falzon (Camilleri & Falzon, 2021) integrate the key constructs of TAM and uses and gratifications theory (UGT) into their research framework to investigate the effects of users' perceptions and motivations on their intentions to use online streaming services. Lim (Lim, 2015) has applied both TAM and UGT to provide an improved understanding of the acceptance and usage of e-shopping. UGT assumes that individuals use media to enhance their gratifications; it seeks to explain why and how individuals are intrigued to use media to satisfy their specific needs (Katz et al., 1973). Thus, individuals will have different motivations for using identical media, and may exhibit divergent levels of gratifications. UGT considers not only the pleasure of users using media but also their attitudes toward the medium and its content. Aluri et al. (Aluri et al., 2015) have adopted UGT and identified variables including the search for information, enjoyment and perceived social interaction as factors that directly influence travelers' satisfaction by using social media. Therefore, according to the aforementioned studies, entertainment gratification (EG) in UGT takes the form of perceived enjoyment into the domain of the organism in the present study. Both information gratification (IG) and social interaction (SI) also extend the domain.

In addition, the benefits (e.g., swift quanxi or green trust) may go through the inner organism assessment to direct buying behavior (Chen et al., 2022; Dong et al., 2022). In a study by Carlson et al. (Carlson et al., 2018), customers' perceived value has been found to drive some engagement behavioral intention (e.g., feedback and collaboration) within the S-O-R framework. Zeithaml (Zeithaml, 1988) states: "value is the customer's overall assessment of the utility of a product based on perceptions of what is received and what is given." The common definition of perceived value is "a ratio or trade-off of total benefits received to total sacrifices" (Patterson & Spreng, 1997). Indeed, while marketing strategies are utilized to motivate consumers to feel excited and engage in LSS, value-seeking considerations may be a prominent emotional state in determining the motivation to fulfill their needs.

Therefore, in the present study, PU, PEOU, IG, EG, SI and perceived value (PV) are seen as inner assessments of LSC consumers under external stimuli acting as the mediating factors to influence their responses.

2.3.3. Responses in LSC

The past studies that employ the S-O-R framework have shown that purchase intention has been used to represent behavioral outcomes in an LSC context (Chen et al., 2022; Dong et al., 2022; Liu et al., 2018). For this reason, we use purchase intention in our study as the response of consumers. In addition, watching intention which refers to viewers' ongoing preference for LS shows has been regarded as a proxy for viewers' loyalty, being important for buying behavior in generating ongoing revenue (Hou et al., 2020; Hu et al., 2017; Lv et al., 2022). Recent studies have identified the relationship between consumers' watching intention in relation to LS shows and their purchase

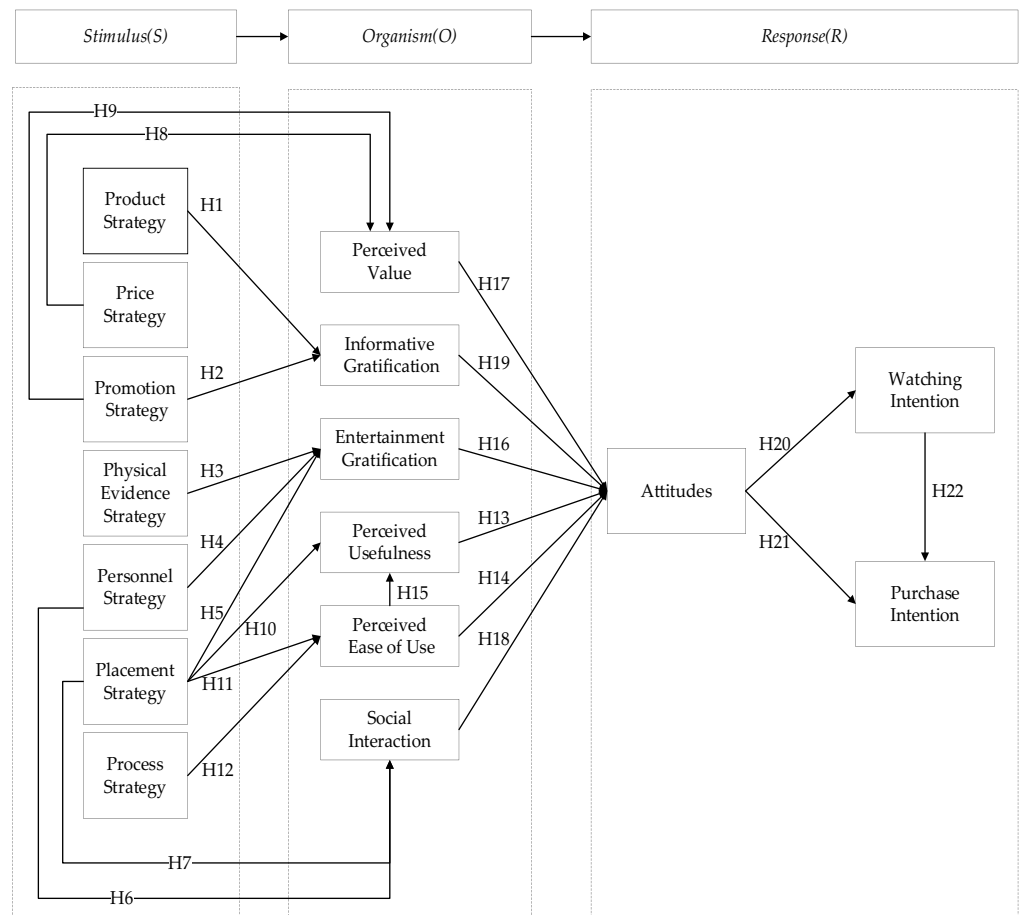
intention (Chandruangphen et al., 2022; Ho et al., 2022). Thus, apart from purchase intention, we seek to reveal the importance of the watching intention as a response variable.

Furthermore, according to the theory of reasoned action (TRA) and the theory of planned behavior (TPB; Ajzen, 1985, 1991; Azjen, 1980), the LSC customers' attitude is a major predictor of their behavioral adoption intention. The empirical evidence indicates that online shoppers' attitudes have a positive impact on shopping intention (Lim, 2015). Thus, it is assumed that this is the case with the significant influence on the watching intention in relation to LS shows and purchase intention. A consumer's attitude toward a behavior is defined as an individual's positive or negative evaluation or appraisal of the relevant behavior; it comprises an individual's salient beliefs regarding the perceived consequences of performing a certain action (Ajzen, 1980). This theoretical lens provides the foundation of our study in order to investigate the determinants of LSC consumers' intended behaviors, including attitudes, the watching intention in relation to LS shows and purchase intention on the LSC platform.

3. Research framework and hypotheses development

Based on the S-O-R paradigm, we propose an explanatory model and a corresponding set of hypotheses. The research model is illustrated in Figure 1 which depicts the relationship between the identified constructs. The model postulates that 7Ps marketing mix strategies (including product, price, promotion, place, people, process and physical evidence) represent stimuli (S) that affect the consumers' organism state (O) which include PU, PEOU, IG, EG, SI, and PV, resulting in customers' responses (O), represented by attitudes (AT), watching intention (WI) and purchase intention (PI).

Figure 1. Research framework.



Information gratification refers to the extent to which the media provides resourceful and helpful information to users (Katz et al., 1973). LSC has changed e-commerce from the traditional model of “people looking for products” to “products looking for people” (CITIC, 2020). Most products sold through social commerce are general and extremely similar; the advantages of the sellers may be identified if the products sold are unique and differentiated (Kaushik et al., 2020). To attract consumers’ attention, products should also be highly functional, practical, and trendy (Zheng et al., 2020). The LSC platform makes it easy for sellers to present the uniqueness of products to customers (M. Zhang et al., 2020). The product information can be provided and delivered through sight, sound, and motion, thereby raising information authenticity and enriching information content which help LSC consumers evaluate the product quality and its good value for money. This also satisfies the consumers’ need for information regarding the products sold. Thus, we propose the following hypothesis:

Hypothesis 1 (H1). The product strategy is positively associated with the LSC consumers’ IG.

The promotion strategy is to attract LSC customers by providing a short-term incentive (Sieber, 2000). To arouse customers’ curiosity and expectation and then achieve the promotional effect, sellers often announce the start time and content of the broadcast in advance (Huang & Suo, 2021). During the live broadcast, various pieces of interactive information or benefits such as discount coupons, gift-giving games and luck draws (Hu & Chaudhry, 2020) are provided to enhance not only customers’ impulse buying but also the knowledge domain. According to Bloch et al. (Bloch et al., 1986), some consumers have the need to acquire promotion information to enhance their expertise or even become an expert who construct a bank of potentially useful data. In addition, acquiring information may be regarded as a strategy for risk reduction and uncertainty reduction as well (Bettman, 1979; Locander & Hermann, 1979). Thus, the following hypothesis is proposed:

4. Hypothesis 2 (H2). The promotion strategy is positively associated with the LSC consumers’ IG

According to Eighmey and McCord (Eighmey & McCord, 1998), entertainment gratification is the degree to which web media is fun and entertaining. In a study by Lim (Lim, 2015), it was found that e-shopping sites please shoppers and motivate them to purchase online. Web atmospherics which refer to a well-organized website structure and an attractive design positively influences e-shoppers’ EG. In addition, design aesthetics has been found to have significant impact on entertainment value which signifies that a professionally designed and attractive website enhance consumers’ enjoyment during their online-shopping sessions (Sreeram et al., 2017). Similarly, consumers tend to desire the entertainment pleasures when shopping on the LSS platform (Hilvert-Bruce et al., 2018). They often experience the immersive atmosphere of the shopping environment where the decoration, furnishings and configuration enable viewers to become more engaged in the context (M. Zhang et al., 2020), and this atmosphere easily stimulates their attention and enthusiasm for participation (Sun et al., 2019). Thus, the following hypothesis is proposed:

Hypothesis 3 (H3). The physical evidence strategy is positively associated with the LSC consumers’ EG.

Customers’ experiences are enhanced through various consumption scenarios, such as in person demonstrations as well as comprehensive and dynamic product displays to spur enthusiasm (Hu & Chaudhry, 2020). Hiring popular live streamers is an important strategy for attracting customers, especially when well-known Internet celebrities or artists are invited to the LSC platform (Weiredian, 2020). The streamer’s attractiveness has been identified as an important content

stimulus in live streaming commerce and is a key element to motivate the viewer's state of exhilaration and the elevation of emotion (Xu et al., 2020). The survey results of the China Consumers Association (CCA, 2020) have indicated that customers are mainly attracted by "humorous and funny" (45.9%) and "interesting life" content (44.8%); 30% focus more on the appearance of the streamers. Many buyers become regular viewers because of the broadcasters' rapport with the audience and personal charisma. Fans have been encouraged to participate in the live broadcast and even add more topics to the show. Thus, we propose the following hypotheses:

Hypothesis 4 (H4). The personnel strategy is positively associated with the LSC consumers' EG.

Hypothesis 5 (H5). The placement strategy is positively associated with the LSC consumers' EG.

LSC enables consumers to feel comfortable buying products while enjoying the entertainment, novelty and pleasant social communication (Xu et al., 2020). Such a buying environment is entertaining in nature, with viewers able to recognize, absorb and understand interesting information, enjoy the pleasure during the shopping process, arouse novel experiences and obtain hedonic gratification from the consumption. Furthermore, an LS show/broadcast provides an entertaining media experience (Hilvert-Bruce et al., 2018). The live content is more interesting because of human interaction, which is a major advantage of LSS (Altay et al., 2022; Ham & Lee, 2020). Indeed, customers can interact with sellers and other customers while watching the live show/program. LSC facilitates real-time interactions between the participants. Such a formation of strong interpersonal relationships between people is regarded as social interaction (Chen & Lin, 2018). Thus, we propose the following hypotheses:

Hypothesis 6 (H6). The personnel strategy is positively associated with the LSC consumers' SI.

Hypothesis 7 (H7). The placement strategy is positively associated with the LSC consumers' SI.

It is critical to deliver the benefits derived from consumption experiences to the customer to emerge as the so-called perceived value and influence their buying behavior (Carlson et al., 2018). According to a survey conducted by the China Consumers Association (CCA, 2020), the top three reasons for LSC are the high-cost performance of products (59.6%), favorite products (56%) and preferential prices (53.9%). Obviously, customers prefer to feel that the products provide good value for money. Low prices and huge discounts are ranked as the main reasons (47.7%) for LSS (CNNIC, 2020). Sellers often propose unique pricing schemes to attract customers and only those who watch the live streams enjoy the discounts and pricing incentives (Hu & Chaudhry, 2020; Lu et al., 2020). Except for various interactive games or benefits, including gift-giving games and lucky draws to attract customers, communicating and educating customers about the benefits of products and services is also required. A survey conducted by CBNDData (CBNDData, 2021) found that the self-broadcast strategy of brand stores was to provide an explanation with high-frequency over a long period of time. Such a push promotion strategy increased the number of viewers and buyers per hour by constantly introducing products/services (providing related information) and encouraging consumers to buy. Therefore, we propose the following hypotheses:

Hypothesis 8 (H8). The price strategy is positively associated with the LSC consumers' PV.

Hypothesis 9 (H9). The promotion strategy is positively associated with the LSC consumers' PV.

Sustaining effort-saving and time-saving are the key factors as to why people are shifting to online channels (Sreeram et al., 2017). Likewise, purchase convenience is an important aspect of

LSC (Lee & Chen, 2021). Shopping through a real-time live broadcast is instantaneous and faster than being at a brick-and-mortar store or through textual communication. Consumers are able to interact with other customers who are experts in the products and brands. This allows potential buyers to ask questions or request opinions about the product and interact with salespersons in real-time (Chen & Lin, 2018; Hilvert-Bruce et al., 2018; Xu et al., 2020). It has been found that consumers' impulse buying behavior is affected by the convenience with which the interfaces of the LSC platform could be manipulated (Lee & Chen, 2021). In addition, customer experience is highly related to the process of product or service delivery (Colla & Lapoule, 2012). Past research on e-commerce has revealed that failures to provide fast delivery may prompt consumers to abandon an online shopping platform (Zheng et al., 2020). Based on the research findings, this study holds that shopping and transaction processes are important LSC components. For example, customers do not need to jump to the webpage to complete the purchase of goods. The shopping model, Message Box +1 facilitates the transaction and brings much convenience to customers. Consumers perceive convenience (CITIC, 2020; Hou et al., 2020), including ease of use and saving time, as the main reason for LSS. Thus, the following hypotheses are proposed:

Hypothesis 10 (H10). The placement strategy is positively associated with the LSC consumers' PU.

Hypothesis 11 (H11). The placement strategy is positively associated with the LSC consumers' PEOU.

Hypothesis 12 (H12). The process strategy is positively associated with consumers' PEOU.

Lim (Lim, 2015) found that PEOU and PU positively influenced e-shoppers' attitudes toward e-shopping. Simultaneously, PEOU affects shoppers' attitudes toward e-shopping indirectly through PU. Prior research in Internet shopping has also confirmed the importance of PEOU, indicating that it is a significant factor in predicting consumers' attitudes (Wu & Liao, 2011). Within the LSC context, it is easy for viewers/consumers to receive stimuli (information) and the shopping activities are undertaken (Lee & Chen, 2021). To sum up, we propose the following hypotheses:

Hypothesis 13 (H13). The LSC consumers' PU is positively associated with their attitudes towards LSS.

Hypothesis 14 (H14). The LSC consumers' PEOU is positively associated with their attitudes towards LSS.

Hypothesis 15 (H15). The LSC consumers' PEOU is positively associated with their PU.

According to Luo (Luo, 2002), the value of media entertainment include escapism from the real world, hedonistic pleasure, aesthetic enjoyment, and/or emotional release. Prior research indicates that online retailers that provide higher entertainment value to audiences create favorable attitudes among users and motivate them to patronize more often (Lim, 2015). Likewise, consumers tend to desire these entertainment pleasures when shopping on the LSC platform (Lee & Chen, 2021; Wang et al., 2021; Xu et al., 2020). Thus, the following hypothesis is addressed:

Hypothesis 16 (H16). The LSC consumers' EG is positively associated with their attitudes towards LSS.

Lim's (Lim, 2015) finding has indicated that consumers' attitudes toward e-shopping is influenced by value-seeking considerations. That is, PV is a major factor forming consumers' attitudes. A similar finding indicates that the higher the benefits perceived by online shoppers, the more favorable attitudes they will have toward online shopping web sites (Al-Debei et al., 2015). The results of Shang and Wu (Shang & Wu, 2017) also indicated that PV is the antecedent of the adoption intention of e-commerce. In the context of LSC, it is expected that the attitudes of consumers will be affected by their perceptions in relation to the benefits (i.e. convenience, time savings, and cost savings). As for SI, referring to exchanges between the audience and the streamer, or exchanges among viewers watching the same LS broadcast, the study by Chen and Lin (Chen & Lin, 2018) has shown its impact on the LS user's attitude. Prior research in LSS indicates that high quality information is a critical stimulus in the S-O-R framework (Xu et al., 2020). In order to facilitate buying decisions, sellers provide the desired information to fulfill viewers/consumers' needs. Apart from the provision of product information, the interactivity also enhances the inter-relationship and thus create favorable attitudes among viewers and motivates the follow-up behavior (e.g., visiting the site more often). Based on the aforementioned discussion, we propose the following hypotheses:

Hypothesis 17 (H17). The LSC consumers' PV is positively associated with their attitudes towards LSS.

Hypothesis 18 (H18). The LSC consumers' SI is positively associated with their attitudes towards LSS.

Hypothesis 19 (H19). The LSC consumers' IG is positively associated with their attitude towards LSS.

Studies on the impact of attitudes on intention in the contexts of online shopping (Lim, 2015; Wu & Liao, 2011) have empirically supported the notion that attitudes constitute an important factor influencing consumers' behavioral intention. It has been found that the impact of LS users' attitudes on watching intention was significant (Chen & Lin, 2018). Once viewers become interested in streamers and possess favorable attitudes towards or identify with them, the audiences can be driven to continue watching (Hou et al., 2020). For instance, viewers may choose to follow specific hosts' live streams (Hu et al., 2017). It is expected that the consumers' attitudes will in turn impact purchase intention. Recently, a few studies have identified the relationship between the consumers' intention to watch a live stream show and their purchase intention (Chandruangphen et al., 2022; Ho et al., 2022). Thus, the following hypotheses are proposed:

Hypothesis 20 (H20). The consumers' attitudes towards LSS is positively associated with their watching intention of LS broadcast shows.

Hypothesis 21 (H21). The consumers' attitudes towards LSS is positively associated with their purchase intention.

Hypothesis 22 (H22). The consumers' watching intention in relation to LS broadcast shows is positively associated with their purchase intention.

5. Research methods

5.1. Questionnaire design and data collection

In order to test the research hypotheses, data were collected using a web-based survey. The questionnaire was mainly developed from the literature. Some scales were slightly modified to fit

the context of LSC. All the items for measuring the constructs are attached and shown in Appendix A. Each scale item was measured on a 5-point Likert scale, ranging from “disagree strongly” (1) to “agree strongly” (5). Besides, the basic information about respondent characteristics (including gender, age, education level, occupation, income level and marital status) and the usage of LSC was collected as well.

For the purpose of improving the content validity of the questionnaire, both the pre-test and the pilot test were conducted. The pretest involved 15 respondents who were LSC buyers. Respondents were asked to comment on the length of the instrument, the format and the wording of the scales. After the pilot test that involved 30 respondents, the survey was conducted. This study used the service of a popular web-survey website (<https://www.wjx.cn/>) which is a well-known marketing research institute in China to collect empirical data. The participants with buying experiences on the LSC platform were invited to support the survey. A total of 402 valid responses were obtained. The background information of the respondents is presented in Table 2.

5.2. Data analysis

To ensure that the scale items referred to effectively represented the opinions of the respondents, some preliminary analysis was performed to test the reliability and validity of the scales (Churchill, 1979). First, a series of exploratory factor analysis (EFA) was conducted to delineate the factors underlying each construct. Then, each scale was subjected to a Cronbach-alpha reliability test. The scales were all unidimensional constructs.

The proposed model and associated hypotheses were tested using structural equation modeling because the evaluation of both the measurement and the structural model could be performed sequentially. The Partial Least Squares Structural Equation Modeling (PLS-SEM) approach was adopted in the present study, and the non-parametric bootstrapping technique was also used. Compared with the covariance-based structural equation model, PLS is variance-based and suitable for predictive applications and theory building. There are two steps to test the goodness of model fit. First, the measurement model was tested using a confirmatory factor analysis (CFA) to assess the discriminant and convergent validity. Structural model analysis was performed to test the significance of the path coefficients and validate the hypothesis of the research hypothesis. SmartPLS 2.0 software was employed as an analytical tool (<http://www.smartpls.de/forum/index.php>).

6. Results and discussions

6.1. Assessment of the measurement model

The assessment of a measurement model should examine (1) reliability, (2) convergent validity, and (3) discriminant validity. The reliability of each construct is assessed by Cronbach's alpha, and as suggested by Hair et al. (Hair et al., 2021), the values as shown in Table 3 all exceed the acceptable cut-off value of 0.70. According to Hair et al. (Hair et al., 2021), there are three common approaches to ensure the convergent validity used by researchers: standardized factor loading (0.5 or greater), average variance explained (AVE) (0.5 or higher) and composite reliability (0.7 or above). The results (shown in Table 3) indicate that the factor loading of most items exceeded the suggested value of 0.7. Anderson and Gerbing (Anderson & Gerbing, 1988) argue that convergent validity can be assessed from the measurement model by determining whether each item's estimated maximum likelihood loading on its designated construct is significant. The factor loadings were high (> 0.50) and significant ($p < 0.01$), which reflect adequate convergent validity. With regard to construct reliabilities, the composite reliabilities demonstrated by the scales were reliable because they met the recommended level of 0.70 (Kline, 2015). In addition, most of the values of AVE exceed their cut-off levels of 0.5 (see, Table 3). Therefore, these measures exhibited adequate convergent validity. Finally, the test of discriminant validity was performed by examining whether the squared correlation between two constructs exceeded the average variance extracted (AVE) for each construct. The criterion for discriminant validity was achieved because the values of

Table 2. Profiles of the respondents (N = 402)

Items	Percentage	Items	Percentage
Gender		Watch time (every time)	
Male	33.8%	Under 10 minutes	2.2%
Female	66.2%	11 ~ 30 minutes	35.3%
Age		31 ~ 60 minutes	48.0%
Under 20	2.0%	1 ~ 2 hours	11.9%
21 ~ 24	15.2%	2 ~ 3 hours	2.5%
25 ~ 29	27.4%	Watching frequency	
30 ~ 39	44.8%	Nearly every day	17.4%
40 ~ 49	8.2%	2 ~ 4 times a week	58.9%
50 or older	2.5%	Once a week	12.7%
Education level		2 ~ 3 times a month	8.5%
High school or below	2.5%	Once a month or less	2.5%
Junior college	11.9%	Shopping frequency per month (times)	
Bachelor	75.9%	1 ~ 3	46.3%
Graduate	9.7%	4 ~ 6	36.6%
Professional		7 ~ 9	12.2%
Student	10.4%	More than 9	5.0%
Freelance	6.7%	Consumption amount (RMB)	
Service	12.2%	Under 100	2.5%
Finance	8.9%	101 ~ 200	24.6%
Manufacturing	29.9%	201 ~ 600	33.8%
Public institution	14.4%	601 ~ 1000	18.4%
Information Technology	12.2%	1001 ~ 1500	7.2%
Others	5.0%	1501 ~ 2000	3.7%
Marital Status		More than 2001	9.8%
Married	68.7%	Contact time	
Unmarried	31.1%	Less than 6 months	5.0%
Others	0.2%	6 months to 1 year	30.8%
Monthly income (RMB)		1 ~ 1.5 years	27.9%
Under 1500	4.5%	1.5 ~ 2 years	24.1%
1500 ~ 2999	7.2%	More than 2 years	12.2%
3000 ~ 4999	14.2%	LSC platform types (Multiple choices)	
5000 ~ 5999	10.4%	Tao Bao	96.50%
6000 ~ 6999	14.4%	Jing Dong	63.70%
7000 ~ 7999	16.2%	Mo Gujie	19.20%
Above 8000	33.1%	Sina Weibo	13.90%
		Others	18.70%

the square root of AVE exceeded those of the bivariate correlations between the main constructs (shown in Table 4). To sum up, the measurement model empirically projects evidence for convergent and discriminant validity, and reliability.

To check the issue of multicollinearity, the variance inflation factor (VIF) among constructs was examined. The outer VIF values show the collinearity among the items in constructs and inner VIF shows the collinearity among the latent variable. Hair, Ringle and Sarstedt suggested that the value of VIF should be less than five. Table 5 shows the collinearity statistics among the constructs

Table 3. Scale properties of measurement model

Constructs	Items	Mean	Std.	VIF	Loading	t-values	CR	AVE
Product Strategy (PRD)	PRD1	3.86	0.80	1.08	0.70	12.32	0.77	0.63
	PRD2	3.87	0.77	1.08	0.88	26.76		
Price Strategy (PRI)	PRI1	4.24	0.70	1.10	0.69	7.56	0.78	0.64
	PRI2	3.91	0.83	1.10	0.90	18.50		
Promotion Strategy (PRM)	PRM1	4.05	0.90	1.17	0.75	13.34	0.74	0.49
	PRM2	4.18	0.75	1.16	0.67	9.95		
	PRM3	4.06	0.83	1.04	0.67	10.57		
Physical Evidence Strategy (PHY)	PHY1	3.89	0.88	1.28	0.74	17.22	0.81	0.58
	PHY2	3.79	0.91	1.24	0.80	27.11		
	PHY3	4.36	0.69	1.24	0.74	20.69		
Personnel Strategy (PER)	PER1	4.25	0.72	1.11	0.67	10.85	0.75	0.50
	PER2	4.01	0.82	1.14	0.73	16.40		
	PER3	3.86	0.92	1.11	0.72	15.31		
Placement Strategy (PLC)	PLC1	4.02	0.87	1.01	0.73	11.33	0.71	0.55
	PLC2	4.07	0.82	1.01	0.76	13.19		
Process Strategy (PRC)	PRC1	4.29	0.67	1.06	0.65	7.53	0.71	0.44
	PRC2	4.12	0.81	1.06	0.65	8.57		
	PRC3	4.06	0.77	1.04	0.70	9.00		
Perceived Value (PV)	PV1	3.76	0.89	1.12	0.76	17.30	0.79	0.66
	PV2	3.96	0.81	1.12	0.86	31.17		
Informative Gratification (IG)	IG1	3.97	0.87	1.20	0.72	19.96	0.81	0.59
	IG2	3.80	0.88	1.30	0.76	23.13		
	IG3	3.77	0.89	1.36	0.82	38.83		
Entertainment Gratification (EG)	EG1	3.89	0.83	1.20	0.75	26.04	0.82	0.61
	EG2	4.11	0.79	1.47	0.81	30.41		
	EG3	3.98	0.83	1.41	0.78	29.77		
Perceived Usefulness (PU)	PU1	4.05	0.80	1.09	0.70	13.06	0.72	0.46
	PU2	4.21	0.72	1.05	0.67	16.29		
	PU3	3.81	0.95	1.07	0.67	13.38		
Perceived Ease of Use (PEOU)	PEOU1	4.04	0.78	1.05	0.75	17.34	0.76	0.61
	PEOU2	3.96	0.84	1.05	0.81	23.94		
Social Interaction (SI)	SI1	3.75	1.01	1.39	0.79	27.21	0.82	0.61
	SI2	3.48	1.13	1.42	0.82	37.55		
	SI3	3.70	1.06	1.23	0.73	23.53		
Attitude (AT)	AT1	4.00	0.82	1.18	0.74	18.45	0.77	0.54
	AT2	4.00	0.80	1.24	0.82	46.37		
	AT3	4.05	0.70	1.13	0.63	13.72		
Watching Intention (WI)	WI1	4.28	0.70	1.20	0.75	24.68	0.78	0.55
	WI2	4.01	0.82	1.24	0.77	23.98		
	WI3	3.66	1.02	1.14	0.69	16.30		
Purchase Intention (PI)	PI1	3.68	0.83	1.35	0.81	31.20	0.79	0.56
	PI2	4.24	0.76	1.26	0.76	25.16		
	PI3	4.01	0.81	1.14	0.68	18.71		

(inner VIF); similarly, for outer VIF, refer to Table 3. All the values of VIF are less than two. This implies that there is a lack of concern for collinearity problems in this study.

Common method bias (CMB) frequently occurs when data for both independent and dependent variables have been collected at the same time from the same respondents. The easiest way to find CMB is to refer to the approach of Bagozzi, Yi and Phillips (1991) which suggests finding CMB through the correlational matrix; if the correlation between variables is less than 0.9, then there is no CMB issue in the data. The correlational matrix between the main constructs is shown in Table 4. All correlational values are less than 0.8, which shows there is no CMB in the data. In PLS estimations, CMB could be identified through VIF collinearity. The values of VIF are less than two thereby showing that there is no CMB in data.

6.2. Analysis of the structural model

The structural equation model was examined to test the structural equations among the latent constructs, determining their significance as well as the predictive ability of the model. The bootstrap re-sampling method (5,000 re-samples) was used to determine the path coefficients and the R^2 values. The results (as indicated in Table 5 and Figure 2) reveal that most of the links in the model for the general goods were significant at the 5% level. Except for one hypothesis (H14) that was rejected, all the other hypotheses were accepted. Note1: Dotted line was insignificant path. Note 2: * denotes $p < 0.05$; ** denotes $p < 0.01$; *** denotes $p < 0.001$.

First, the findings indicate that all research hypotheses regarding the 7Ps marketing mix strategies influencing consumers' cognitive and emotional states are supported. Among the 7Ps, product and promotion strategies have positively and significantly affected IG (H1: $\beta = 0.35$, $t = 7.82$; H2: $\beta = 0.25$, $t = 4.80$). Physical evidence, personnel and placement strategies have positive and significant impacts on EG, providing support for the hypotheses H3 ($\beta = 0.39$, $t = 6.61$), H4 ($\beta = 0.19$, $t = 3.27$) and H5 ($\beta = 0.12$, $t = 2.24$), respectively. The findings also show that personnel and placement strategies have positively and significantly affected SI (H6: $\beta = 0.32$, $t = 7.04$; H7: $\beta = 0.34$, $t = 6.69$). Meanwhile, price and promotion strategies have positive and significant impacts on PV, providing support for H8 ($\beta = 0.23$, $t = 4.41$) and H9 ($\beta = 0.25$, $t = 4.78$). Finally, placement strategy has positively and significantly affected PU (H10: $\beta = 0.21$, $t = 3.59$), in addition, placement and process strategies have positively and significantly affected PEOU (H11: $\beta = 0.25$, $t = 4.83$; H12: $\beta = 0.33$, $t = 6.91$).

As for how consumers' cognitive and emotional states jointly influence their shopping behavior in the LSC environment, the analytical results show that all related hypotheses, except H14, were found to be significant. H13, H14 and H15 are basic relationships derived from TAM (Davis, 1989), i.e., PU has a significant impact on LS shoppers' attitudes (H13: $\beta = 0.17$, $t = 3.78$), but PEOU does not have a positive impact on their attitudes (H14: $\beta = 0.06$, $t = 1.28$), PEOU has positive impact on PU (H15: $\beta = 0.41$, $t = 8.27$). The findings confirm that TAM relationships and support the previous study which contends that PEOU is an antecedent of PU, and not behavioral intention (Sreeram et al., 2017). PEOU has an indirect impact on consumers' attitudes via PU. It has also been found in our study that EG (H16: $\beta = 0.31$, $t = 5.93$), PV (H17: $\beta = 0.12$, $t = 3.05$), SI (H18: $\beta = 0.19$, $t = 3.97$) and IG (H19: $\beta = 0.25$, $t = 2.80$) exerted strong effects on LS shopping attitudes, respectively.

Also, the findings indicate that consumers' attitudes influence their watching intention of LS broadcast shows (H20: $\beta = 0.57$, $t = 13.51$) and purchase intention on the LSS platforms (H21: $\beta = 0.54$, $t = 12.62$). Furthermore, consumers' watching intention has a positive and significant impact on their purchase intention ($\beta = 0.24$, $t = 5.37$), providing support for H22.

The R^2 value refers to the percentage with which the exogenous variables explain the variation in the endogenous variables, which is used as an indicator of the overall predictive power of the model. Figure 2 show the path coefficients between the exogenous and endogenous variables for the model, as well as the R^2 values of the constructs ranging from 0.16 to 0.49, which were greater

Table 4. Bivariate correlations between main constructs and square roots of average variance extracted

	Mean	Std.	PRD	PRI	PRM	PHY	PER	PLC	PRC	PV	IG	EG	PU	PEOU	SI	AT	WI	PI
PRD	3.87	0.61	0.80															
PRI	4.08	0.62	0.38	0.80														
PRM	4.10	0.63	0.24	0.26	0.70													
PHY	4.01	0.78	0.44	0.38	0.24	0.76												
PER	4.04	0.71	0.27	0.33	0.47	0.48	0.71											
PLC	4.05	0.72	0.33	0.11	0.31	0.40	0.24	0.74										
PRC	4.16	0.62	0.29	0.38	0.34	0.31	0.32	0.23	0.67									
PV	3.86	0.65	0.45	0.30	0.32	0.46	0.35	0.33	0.28	0.81								
IG	3.85	0.78	0.41	0.21	0.34	0.52	0.32	0.31	0.23	0.43	0.77							
EG	3.99	0.66	0.40	0.31	0.34	0.53	0.41	0.32	0.32	0.47	0.50	0.78						
PU	4.02	0.75	0.35	0.33	0.35	0.49	0.32	0.34	0.44	0.37	0.42	0.45	0.68					
PEOU	4.00	0.71	0.34	0.31	0.30	0.44	0.30	0.33	0.39	0.37	0.31	0.45	0.48	0.78				
SI	3.64	1.20	0.42	0.17	0.56	0.55	0.40	0.42	0.22	0.45	0.48	0.44	0.41	0.31	0.78			
AT	4.02	0.56	0.43	0.31	0.38	0.54	0.42	0.40	0.37	0.50	0.52	0.62	0.52	0.43	0.54	0.73		
WI	3.98	0.88	0.34	0.20	0.34	0.46	0.42	0.37	0.34	0.40	0.46	0.55	0.46	0.35	0.51	0.57	0.74	
PI	3.98	0.63	0.41	0.19	0.37	0.50	0.38	0.39	0.29	0.52	0.48	0.54	0.46	0.42	0.56	0.67	0.54	0.75

Note: Please refer to Table 3 for the Table 3 for the abbreviations of the constructs.

Table 5. Results of structural equation modeling

Hypotheses	Path	Coefficients	VIF	t-value	Supported
H1	Product strategy → Information gratification	0.35	1.06	7.82***	Yes
H2	Promotion strategy → Information gratification	0.25	1.06	4.80***	Yes
H3	Physical evidence strategy → Entertainment gratification	0.39	1.46	6.61***	Yes
H4	Personnel strategy → Entertainment gratification	0.19	1.31	3.27***	Yes
H5	Placement strategy → Entertainment gratification	0.12	1.19	2.24**	Yes
H6	Personnel strategy → Social interaction	0.32	1.06	7.04***	Yes
H7	Placement strategy → Social interaction	0.34	1.06	6.69***	Yes
H8	Price strategy → Perceived value	0.23	1.07	4.41***	Yes
H9	Promotion strategy → Perceived value	0.25	1.07	4.78***	Yes
H10	Placement strategy → Perceived usefulness	0.21	1.12	3.59***	Yes
H11	Placement strategy → Perceived ease of use	0.25	1.06	4.83***	Yes
H12	Process strategy → Perceived ease of use	0.33	1.06	6.91***	Yes
H13	Perceived usefulness → Attitude	0.17	1.56	3.78***	Yes
H14	Perceived ease of use → Attitude	0.06	1.47	1.28	No
H15	Perceived ease of use → Perceived usefulness	0.41	1.12	8.27***	Yes
H16	Entertainment gratification → Attitude	0.31	1.70	5.93***	Yes
H17	Perceived value → Attitudes	0.12	1.51	3.05***	Yes
H18	Social Interaction → Attitudes	0.19	1.52	3.97***	Yes
H19	Information gratification → Attitudes	0.25	1.59	2.80**	Yes
H20	Attitudes → Watching intention	0.57	1.00	13.51***	Yes
H21	Attitudes → Purchase intention	0.54	1.48	12.62***	Yes
H22	Watching intention → Purchase intention	0.24	1.48	5.37***	Yes

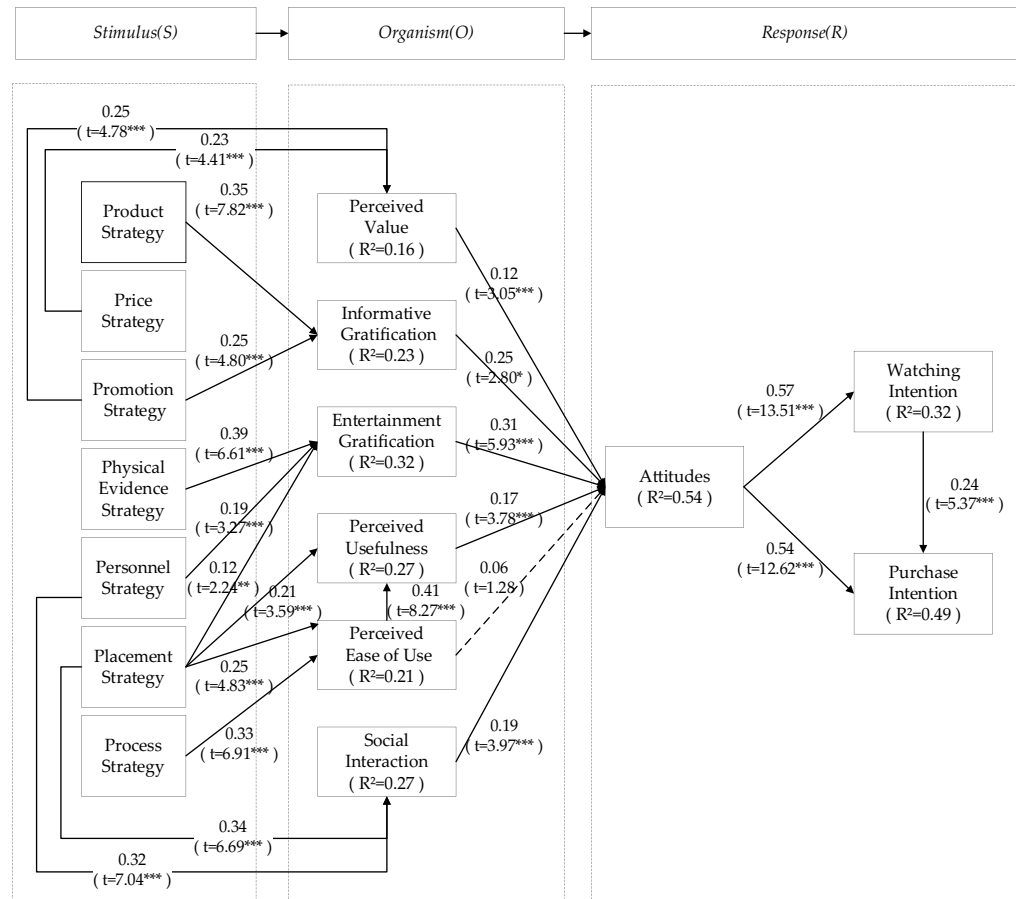
Note 1: Please refer to Table 3 for the abbreviations of the constructs.

Note 2: * denotes $p < 0.05$; ** denotes $p < 0.01$; *** denotes $p < 0.001$.

than the recommended 0.15 value (Chin, 1998). Another assessment in the PLS-SEM literature is referred to as cross-validated redundancy measures (Hair et al., 2021). Using the blindfolding procedure for the estimations, all values of Q^2 are larger than zero (ranging from 0.08 to 0.28), suggesting predictive relevance in explaining the endogenous latent variables and the adequate prediction quality of the model.

We further examined the role of the six factors regarding the cognitive and emotional states in mediating the effects of the 7Ps marketing mix strategies on consumers' attitudes. In referring to the approach recommended by Preacher and Hayes (Preacher & Hayes, 2008), multiple mediation analyses were conducted using a bootstrapping procedure with 5,000 iterations by the software of SmartPLS 2.0. Table 6 summarizes the results of the indirect (mediating) effects. The indirect effects of the 7Ps marketing mix strategies on consumers' attitudes through five organism factors were significant. It was interestingly found that PV fully mediated the effects of the price and promotion strategies on consumers' attitudes. Meanwhile, IG, EG, SI, and PU exert partial mediation effects on the marketing mix strategies related to consumers' attitudes. In addition, it was found that the indirect effect of consumers' attitudes on their purchase intention through watching intention was significant. Thus, the analytical results imply that marketing stimuli may influence consumer behavior via the organism in accordance with the assumptions of the S-O-R framework and TRA.

Figure 2. Results of hypotheses testing.



Thus, the research results provide support for the proposed model; in other words, nearly all the proposed relationships in the model were confirmed by the data, in addition to achieve an acceptable structural model fit. The following section provides a discussion of the implications of the study's findings.

6.3. Discussion and implications

The primary objective of this research was to gain a better understanding of how the 7Ps marketing mix strategies influence consumers' cognitive and emotional states and how these factors jointly influence consumers' shopping behavior in the LSC environment. Overall, the research results illustrate that the proposed model was reliable. The 7Ps marketing mix strategies encourage consumers to generate cognitive and emotional states and then further generate attitudes, watching intention in relation to LS broadcast shows and purchase intentions. Each part is now discussed in light of the empirical results with corresponding implications.

6.3.1. 7Ps marketing mix strategies for consumers' cognitive and emotional states

The main findings of this study are that the 7Ps marketing mix strategies of LSC had significant effects in terms of forming consumers' cognitive and emotional states although they served as influential factors with different magnitudes. Product and promotional strategies positively affected IG; place and process strategies positively affected PEOU; and placement strategy positively affected PU. It was found that consumers' cognitive states could be influenced by these four marketing strategies. As for consumers' emotional states, price and promotion strategies positively affected PV; place, personnel and physical evidence strategies positively affected EG; and place and personnel strategies positively affected SI. It appears that the five marketing strategies have impacts on consumers' emotional states. The results prove that the 7Ps play a role in providing

strong stimuli to consumers adopting LSC. Although researchers have mentioned some marketing elements in their studies (Lee & Chen, 2021), we are the first to provide a comprehensive analysis of marketing mix strategies as the stimuli for the consumers' organism in terms of LSC consumers' buying behavior.

6.3.2. LSC consumers' cognitive and emotional states and their attitudes

This study identifies that PU, PV, IG, EG and SI positively influenced LSC consumers' attitudes. These research findings are in line with those of Lim (Lim, 2015) except that there is no direct relationship between PEOU and consumers' attitudes. In spite of this, PEOU affected their attitudes toward LSC indirectly through PU; there was an indirect effect of PU on the link between PEOU and consumers' attitudes. This finding was consistent with that of Camilleri and Falzon (Camilleri & Falzon, 2021). According to Lim (Lim, 2015), most online shoppers did not perceive shopping online to be a complex activity although most sites were easy to use. Likewise, most LSC platforms have been developed and designed to be user-friendly. Thus, PEOU may no longer be the main advantage compared to other shopping modes.

Our study indicates that the LSC sites may attract shoppers by using their marketing strategies, for example, to emphasize the fulfillment of EG and SI which is the main differences between web-based shopping and LSC. Both the personnel and physical evidence strategies essentially enhance the effectiveness of LSC shopping toward entertainment and social interactivities. Streamers play an critical role in the conveyance of the message by professionally providing product information, responding to viewers' questions, making suggestions for purchases and gaining viewers' trust (Hu & Chaudhry, 2020; Lee & Chen, 2021). With the endorsement of the streamers for the products, viewers have been encouraged to participate in the live broadcast show and may then accept the recommendation, absorb product information, and adjust their previous perceptions and attitudes accordingly (Xu et al., 2020). Human interactions also make the live content more interesting, and it is a major advantage of LSC (Altay et al., 2022; Sohn & Kim, 2020). While there is a strong buying interest in the live stream room, viewers are prompted to follow along and even place orders. Besides, LSC consumers often experience the immersive atmosphere of the shopping environment where the layout makes viewers more engaged in the context (M. Zhang et al., 2020), and such an atmosphere easily harness their attention for participation and interactivities with the streamers and other shoppers (Sun et al., 2019). Furthermore, various consumption scenarios, such as in-person demonstrations as well as comprehensive and dynamic product displays enhance viewers'

Table 6. Summary of indirect effects

Total indirect effects			Indirect effects		
	Coef.	Bootstrap 95% CI		Coef.	Bootstrap 95% CI
PRD→AT	0.130**	[0.040:0.087]	PRD→IG→AT	0.046*	[0.011:0.087]
PRI→AT	0.053	[-0.039:0.152]	PRI→PV→AT	0.029*	[0.009:0.055]
PRM→AT	0.064	[-0.039:0.175]	PRM→PV→AT	0.033**	[0.011:0.059]
			PRM→IG→AT	0.033*	[0.008:0.064]
PHY→AT	0.258***	[0.144:0.359]	PHY→EG→AT	0.122***	[0.074:0.178]
PER→AT	0.150**	[0.042:0.262]	PER→SI→AT	0.061***	[0.030:0.095]
			PER→EG→AT	0.060**	[0.023:0.110]
PLC→AT	0.170**	[0.074:0.267]	PLC→EG→AT	0.039*	[0.004:0.081]
			PLC→PU→AT	0.035*	[0.012:0.067]
			PLC→SI→AT	0.065**	[0.030:0.108]
AT→PI	0.541***	[0.454:0.620]	AT→WI→PI	0.134***	[0.080:0.193]

Note 1: Please refer to Table 3 for the abbreviations of the constructs.

Note 2: * denotes $p < 0.05$; ** denotes $p < 0.01$; *** denotes $p < 0.001$.

impression, spur their enthusiasm and elicit consumer purchases (Hu & Chaudhry, 2020). The marketing strategies regarding the streamers and the shopping environment such as interactive chat and the interface design of the shopping platform may increase consumers' involvement within the context because their influences on consumers' EG and SI may determine whether an evoked attitude toward LSC shopping is favorable or not.

6.3.3. LSC consumers' shopping intention

The results of this study show that consumers' attitudes had profound impacts on their intentions to watch the broadcast show and purchase goods through the LSC platform, which was similar to the findings of Lim (Lim, 2015) with regard to e-shopping. It was also found that the intention to watch could lead to an intention to purchase, which conformed to the findings of Chandruangphen et al. (Chandruangphen et al., 2022) and Ho et al. (Ho et al., 2022). This proves that the watching intention is a prerequisite of the purchase intention. Therefore, the streamers should fully grasp the characteristics of this marketing channel, implement appropriate marketing strategies and form consumers' positive attitudes that attract consumers and encourage them to develop the watching habit and go shopping. Once viewers have developed an inclination for watching the shows, they may naturally and gradually make purchases.

7. Conclusions

In line with the established theories and empirical studies, this study proposes a comprehensive model that builds on the S-O-R framework and integrates TRA, TAM and UGT and the 7Ps marketing mix strategies to explain and determine how different factors influence consumers' LSS behavior. The results of the empirical investigation show support for our proposed research model. The findings confirm that the 7Ps marketing mix strategies as the stimuli factors positively influence the consumers' cognitive and emotional states represented by PU, PEOU, IG, PV, EG and SI. These factors have been found to be the direct predictors of consumers' attitudes toward LSS. Furthermore, consumers' response in terms of their attitudes toward LSS influences their intention to watch the show and subsequently affect their purchase intention on the LSC platform. Thus, our research results provide a detailed account of the key factors underpinning LSS regarding the acceptance and usage of related sites. It may lead to the enhancement of site traffic and increase the shopping transactions. This study advances the LSC literature on the S-O-R framework that depicts the booming LSS phenomenon.

7.1. Theoretical contribution

By applying and synthesizing the theoretical underpinnings from TAM, UGT and TRA embedded into the S-O-R framework, this study contributes to a more comprehensive understanding of the influence of the antecedents on the LSC consumers' shopping behavior. It reveals the importance of a set of constructs in the LSS process, describing how LSC consumers view the functional mechanism of 7Ps marketing mix strategies when they engage in the LSS activity and providing more insights into how their cognitive and emotional states motivate the relevant shopping behavior. Through confirming the factors that impact the acceptance and usage of LSC, this study also provides a comprehensive framework that can be translated into the knowledge of the current state of the LSC phenomenon and offers clear directions as to where the streamers or sites believe their successes on the LSC could be achieved. The efficient marketing mix strategies may serve as intelligent stimuli to better manage and expand the psychological factors of consumers to fulfill their needs within the LSS site environment. The present study has also confirmed the findings of Ho et al. (Ho et al., 2022) that although the marketing mix strategies may not have a direct impact on consumers' watching and purchasing intentions, they are important stimuli that strongly influence the organism of consumers.

This study also reveals PU, IG, PV, EG and SI as representing cognitive and emotional states that serve as key drivers facilitating consumers' shopping behavior. The findings provide a richer understanding of the organism effect on consumers' responses and identify these factors as the mediators within the framework of S-O-R in the LSC context. Since consumers may perceive PU, PEOU, IG and PV through e-commerce or traditional online shopping, we present statistical

evidence to support the view that EG and SI in regard to the emotional states exert stronger effects when forming consumers' attitudes. This is consistent with the studies of Sjöblom and Hamari (Sjöblom et al., 2017) and Xu et al. (Xu et al., 2020), as it identifies obtaining entertainment and pleasant experiences as critical factors in using LSS.

Another theoretical contribution of this study may be that it identifies consumers' attitudes and the watching intention in relation to the LSC show as playing a critical mediatory role in affecting cognitive and emotional states of the purchase intention. Despite TRA stating their relationships, our findings broaden the understanding of the interplay within the responses.

7.2. Managerial implications

In the highly competitive environment of the LSC industry, management efforts directed toward gaining a better understanding of the factors influencing consumers' shopping behavior may improve a platform's managerial competence. The results of this study may provide specific implications for the platform managers in two respects: the software and the hardware.

The research findings enable a manager to determine which organism factors are the most influential in forming consumers' attitudes. The five factors may work independently. Among these factors, EG and SI may play the most vital role by serving as a bridge to more efficiently change consumers through the marketing strategies of personnel and physical evidence. In view of the critical role played by the streamers in effectively evoking the viewers' excitement and spontaneous purchase (Xu et al., 2020), managers should first identify, recruit and introduce qualified streamers to viewers (Chen & Lin, 2018). The marketing mix is an integral part of any platform's operation. In considering the role of the streamers to effectively convey marketing information, including the product, price, promotion and content to the extent that other marketing elements are integrated, the platform managers can then allocate resources to the streamers to attract the viewers' attentions. Streamers have to present complete product and price information, display the product use occasions, and clearly explain instant discounts or exclusive offers (Xu et al., 2020). The streamers should also create interesting topics to interact with their viewers and respond to them instantly (Hilvert-Bruce et al., 2018), instead of merely posting promotional messages that may have little or no effect on the viewers. Thus the LSC platform managers may provide adequate training regarding a popular broadcasting style and equip streamers with interaction skills to attract an audience and transform potential customers into real purchasers (Hu et al., 2017).

The hardware of a LSC platform includes the layout of the broadcast room and the operational mechanism for consumers, while also representing the characteristics of the streamer. To implement the strategy of physical evidence, the platform managers should focus on the environment of the studio and the related equipment used for the show to fit the style of the streamer. The environment created by the LSC platforms may not only enhance customers' shopping experiences but also enhance the service quality delivery (Hu et al., 2017). Apart from the aesthetic design, it should create attractive content, help the viewers digest the information received and facilitate the social functions that fulfill their needs (Hu et al., 2017; Sjöblom et al., 2017).

Such efforts from the personnel (streamers) and physical evidence (platform environment) strategies may be effective in building the brand image of the LSC platform to satisfy consumers' expectations in terms of shopping on this distribution channel. Thus, this would be a comprehensive approach to wrapping up the LSC platform performance in an effective way.

Furthermore, emphasis should be placed on LSC's role in forming consumers' attitudes due to its critical role in responding to and mediating the watching and purchase intentions. For rational consumers to satisfy their IG, and enhance PV and PU of LSC, platform managers have to develop an advanced LS mechanism with innovative functions to shape consumers' perceptions as they receive information. Apart from the platform's equipment, developing a good script for the streamers may be critical. Their performance not only form or reinforce consumers' positive

perceptions of the platform brand, but also delivers the related marketing information about the product, price, promotion and process. Consumers with hedonic motivations as a result, both receive the needed information for making purchases and enjoy the streamers' show. A good and well-designed script which contains informative and emotional messages, facilitates entertainment and communication with consumers through the streamers' performance and delivery. Thus, it also justifies the personnel strategy setting.

7.3. Limitations and directions for future research

Some limitations of this study have to be emphasized and they suggest avenues for future studies. First, to some extent, replications of the current research model in different countries/regions would most likely strengthen and validate the study's findings. Future studies could expand the geographical areas and perform cross-cultural analysis to identify the similarities and differences between the various studies. Secondly, based on a study by Lv et al. (Lv et al., 2022), immediate buying behavior has been regarded as a short-term behavior, and the continuous watching intention has been denoted as the long-term behavioral intention. The former affects the latter. However, in this study, we have found that the watching intention influences the viewers' purchase intention. Two types of behavior among viewers may be classified as part of the engagement. Some researchers have regarded customer engagement as a cyclical process (Brodie et al., 2013; Sashi, 2012). Future research could be conducted to generate insight into customer engagement behaviors using a longitudinal assessment. Third, the measurement items of the constructs in this study have mainly been adopted from previous studies. Applying the old items may be insufficient to build a robust role for the constructs due to the distinctions derived from the rapid development of the LSC industry. For future studies, the conceptualization and scale development of the relevant constructs would be important to further understand the LSC context. Finally, future research could also use a qualitative research design and methodology to provide a deeper understanding of consumers' attitudes and behaviors toward LSC in China and elsewhere.

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Author details

Chaang-Iuan Ho¹
 E-mail: ciho@cyut.edu.tw
 Yaoyu Liu²
 Ming-Chih Chen²

¹ Department of Leisure Services Management, Chaoyang University of Technology, Taichung, Taiwan.

² Fu Jen Catholic University, Taipei, Taiwan.

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Appendix A. Measurement items in the research model

Constructs/ variables	Items	Source
Product strategy (PRD)	Merchandise is sold exclusively on LSS (PRD1). Products have good prices and are of high quality (PRD2).	Ho et al. (2022)
Price strategy (PRI)	Sellers offer discounts on products (PRI1). Discounted prices are only available during LSS (PRI2).	Ho et al. (2022)
Promotion strategy (PRM)	Lucky draws are often held (PRM1). Some promotional activities (e.g., free gift with purchase, free shipping, buy one get one free, limited time flash sales) are launched (PRM2). The live streaming programs provide the skills for using the products (e.g., teaching how to dress or cook) (PRM3).	Ho et al. (2022)
Physical evidence strategy (PHY)	The broadcast room is clean, and the decoration and furnishings are bright and tidy (PHY1). The live broadcast setting matches the style of the products (PHY2).	Ho et al. (2022)
Personnel strategy (PER)	The host is friendly and enthusiastic (PER1). The broadcasting style of the host is interesting (e.g., interesting things to say, having an acting talent) (PER2). The host is handsome/pretty (PER3).	Ho et al. (2022)
Placement strategy (PLC)	The content of the live streaming program is authentic (cannot be edited, pre-recorded, or is difficult to modify/fake) (PLC1). I can see the product reviews of other customers in real time (PLC2).	Ho et al. (2022)
Process strategy (PRC)	Easy and quick purchase (for example, directly clicking on a link to buy during the live broadcast) (PRC1). There is no need to jump to any interface; customers complete the purchase process simply by clicking on the corresponding link (PRC2). There is a smooth network connection and clear pictures during the live broadcast (PRC3).	Ho et al. (2022)
Perceived value (PV)	Saving more money when shopping with LSC than when shopping using other shopping methods (PV1). LSC provides a good selection of products (PV2).	Aluri et al. (2015)
Information gratification (IG)	LSC is one of the ways of collecting information (IG1). To learn about unknown things (IG2). To learn about useful things (IG3).	Ko et al. (2005)
Entertainment gratification (EG)	LSC is fun for its own sake (EG1). Watching LSC is a form of entertainment (EG2). Watching LSC is one of the ways I kill time (EG3).	Camilleri and Falzon (2021); Lee and Chen (2021)
Perceived usefulness (PU)	Using LSC can increase my shopping productivity in searching and buying products (PU1). I can watch LSC in any place (PU2). LSC makes it easier for me to satisfy my needs (PU3).	Camilleri and Falzon (2021)
Perceived ease of use (PEOU)	I find it easy to use LSC to obtain what I want (PEOU1). I find it easy to use LSC than when shopping using other shopping methods (PEOU2).	Camilleri and Falzon (2021)
Social Interaction (SI)	I often communicate with users in LSC (SI1). I will provide suggestions to LSC (SI2). In order to get information, I will register as a member of LSC (SI3).	Liu et al. (2018); Xu et al. (2020)

(Continued)

(Continued)		
Constructs/ variables	Items	Source
Attitude (AT)	I like to purchase what I need from LSC (AT1). I feel shopping with LSC is a wise choice (AT2). I hold a positive evaluation of LSC (AT3).	Lim (2015)
Watching Intention (WI)	If possible, I will continue to watch the broadcasting shows in future (WI1). I plan to watch the shows when I have time (WI2). Even if I don't need to shop, I still plan to watch the shows to gain relevant experience (WI3).	Ho et al. (2022)
Purchase Intention (PI)	I prefer LSS to other shopping approaches (PI1). I plan to shop via LSC more often in the future (PI2). When I need to buy a particular product, I will consider the way of LSC (PI3).	Ho et al. (2022)



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