Electronic Commerce Research
https://doi.org/10.1007/s10660-022-09651-8

A study on the influence of the characteristics of key opinion leaders on consumers' purchase intention in live streaming commerce: based on dual-systems theory

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Accepted: 2 December 2022

Abstract

Drawing on the dual-systems theory (DST), this study proposes a research model that focuses on how the characteristics of the key opinion leader influence consumers' purchase intention in live streaming commerce (LSC). We collected data through questionnaire surveys from samples of consumers in China ($N = 467$), which indicated that key opinion leader's characteristics (i.e., attractiveness, trustworthiness, expertise) are all positively related to purchase intention. Importantly, the mediator analyses indicated that the effect of systems 1 on the relationship between attractiveness and purchase intention persisted is persistent, regardless of the type of goods purchased by the consumers (utilitarian or hedonic). This finding highlights the importance of attractiveness and reveals unconscious thought (UT) of consumers when shopping in LSC. This study provides a new theoretical perspective (i.e., DST) to identify attractiveness as a determinant of purchase intention in LSC and influence purchase intention by activating systems 1, thus solving the problem of identifying key factors in stimulus–organism–response theory. Besides, our results identify and test UT in LSC. The practical implications of these findings are to provide guidance for the selection of key opinion leaders in LSC and the development of live streaming industry.

Keywords Live streaming commerce · Dual-systems theory · Key opinion leader · Unconscious thought · Characteristics · Purchase intention

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Published online: 17 December 2022

1 Introduction

Live streaming commerce (hereinafter LSC) is an emerging subset of e-commerce embedded with real-time social interaction on a live streaming platform between consumers and live streamers [12]. A growing number of people are attracted to LSC because they receive comprehensive and high-quality information about product, perceive hedonic value and a sense of belonging during synchronous communication with a live streamer [119]. LSC is now all the rage in China, as reflected in "double eleven" (a.k.a. singles' day or 11–11), which began at the end of October (the duration is at least half a month). "Double eleven" had become the largest online shopping festival worldwide. The total sales of product in the 2021 festival were up to 965.12 billion yuan, which is continuing the upward trend [20]. In this background, the key opinion leader (KOL) plays a significant role in increasing product sales by providing a comprehensive evaluation of the product based on real use experience and expertise in product. Consequently, this improves trust levels among consumers, who believed that KOL's recommendations are more likely to be accepted [120]. According to statistics, the product sales of top live streamers in Taobao reached 18.905 billion yuan, which accounted for almost 31.7% of the total sales during the 2021 "double eleven" online shopping festival [20]. Therefore, considering the significant influence of KOL on consumers' purchase intention, selecting appropriate KOL to increase purchase intention in LSC is both a practical need for enterprises to sell their products and an important theoretical issue worth exploring.

We generally categorized research which provides references on KOL selection into three groups by reviewing literature on the selection of live streamers, celebrity endorses, and opinion leaders: (1) personal assessment toward opinion leader, (2) social network of opinion leader, and (3) personal characteristics. The methodology in the first group normally adopts self-selection [42] and staff selection [31], using narrative data which was collected through observation, survey, and interview [11, 62, 113] to select opinion leaders. This group of research suffers from a common problem that the validity in the results is affected by observation bias [4]. For the second group, researchers prefer selecting opinion leaders by their social network [54] because opinion leaders will have more social ties to other people [44]. Lastly, in the third group, some studies have shown that the characteristics of live streamers, celebrity endorsers, and opinion leaders are positively related to consumers' engagement behavior, purchase behavior, impulse buying behavior, and purchase intention [61, 72, 75, 122]. By determining the positive effects of personal characteristics on consumers' purchase behavior, researchers can indirectly use personal characteristics as the criteria for selecting key actors.

In using LSC, consumers can observe a product up close and hear comments from the live streamers about how the product feels, looks, or smells in real-time social interactions, thus increasing the authenticity, visualization, and interactivity of online shopping [52] and improving consumers' purchase intention [119]. Hence, the main advantage of LSC is to provide a "face-to-face" interaction

between consumers and live streamers. Based on this advantage, the personal characteristics of KOL were selected for our study because consumers are more likely to perceive characteristics than social networks when interacting face-to-face with live streamers. Meanwhile, characteristics can be measured by questionnaires to avoid the observation bias caused by narrative data. Besides, a contextual simulation method (e.g., ask subjects to imagine a context in their minds, e.g., impulse buying) [98] can be adopted in the research design to simulate an LSC context.

However, previous research has focused more on consumers' perceived utilitarian, hedonic, and social values in LSC and explored the positive impact of personal characteristics on consumers' purchase intention from the perspective of consumer motivation [119]. Nevertheless, consumers are not the only participants in LSC. Sellers are also participants. They improve consumers' purchase intention through the price-cutting promotional campaign, as a straightforward way to influence consumers' purchase intention and value perception to maximize profits [129]. When consumers enter the live streaming platform, many flash sales, coupons, two-for-one, and lotteries are available. In addition, discounts are available on a wider range of product categories, quantities, and styles. Therefore, from the perspective of consumers' decision-making, they need to make decisions in the context of consumption with various product information and attributes, which intangibly increases the complexity of consumer decision-making [28]. Indeed, LSC have a "double-edged sword" effect for consumers because it can bring utilitarian, hedonic, and social values, meanwhile complicate the decision-making process. Dijksterhuis [27] indicated that unconscious thought (UT) would contribute to a satisfying decision rather than rational thought in complex decision-making. Recently, researchers have introduced UT into complex decision-making areas, such as car purchases [27] and diet food purchases [70]. Moreover, they explored how consumers use UT to solve complex decision-making problems [29, 114], but they are still mainly focused on the daily offline purchase context. Given the increasingly prevalence and possible consumer's UT in LSC, our research introduces UT into the context of LSC to analyze purchase intention driven by consumer's decision-making.

Overall, our research explores how KOL's characteristics affect consumers' purchase intentions in the context of UT in LSC. Specifically, our research categorized KOL's characteristics into attractiveness, trustworthiness, and expertise [120, 122]. We then classified the types of products that consumers are willing to purchase as utilitarian or hedonic goods. Further, this study aims to address the following questions: (1) From the perspective of consumer decision-making, how do KOL's characteristics affect consumer's purchase intention? (2) Is there a difference in the mechanism of KOL's characteristics on consumer's purchase intention affected by UT when consumers purchase utilitarian or hedonic goods?

To determine the answers, our research develops a research model based on dual-systems theory (DST). Our research model consists of two pathways: "attractiveness → systems 1 → purchase intention" and "expertise and trustworthiness → systems 2 → purchase intention." We use questionnaires to collect data and set up two purchase contexts (utilitarian and hedonic goods purchase) at the beginning to achieve contextual simulation. Moreover, we randomly assign participants to

the utilitarian or hedonic good purchase group. The results show that attractiveness can drive systems 1 regardless of whether they are purchasing utilitarian or hedonic goods, thereby increasing the consumers' purchase intention. In addition, our research also demonstrates the following meta-analysis findings: the more complex the decision-making, the more conducive to the UT generation [108]. Our research contributions are as follows: (1) We used DST to solve the problem of the identification of key factors, which cannot be determined using SOR theory. (2) This study highlights the significance of attractiveness in KOL through a new theoretical perspective. (3) It improves the deficiencies in the research on UT by manipulating product attributes to affect the complexity of consumers' decision-making. (4) Lastly, this study applies DST to empirically test the existence of UT in LSC.

2 Theoretical research framework and hypothesis development

2.1 The characteristics of KOL

KOL was roughly described as the minority of people who had a considerable influence in a particular field [43, 116]. In practice, individuals can play the roles of KOL, live streamer, or celebrity endorser simultaneously. More precisely, a live streamer with high popularity is also a KOL [128]. For example, Austin is one of the top live streamers on Taobao, notably improves the purchase intention of fans who rely on their huge influence. Similarly, a celebrity endorser can also become a KOL. Knoll and Matthes [67] indicated that celebrity endorsers positively affect consumers' cognitive, affective, and purchase behavior toward their recommendations. KOL can function as a celebrity endorser due to their great influence in a particular field. For example, Lebron James was engaged by Nike as a celebrity endorser, and Nike generated nearly $600 million in annual revenue because of his great impact on the sports community [21]. In summary, our research defines KOL as "the minority of people who have a considerable influence in consumers' decision-making, attitude, and behavior" based on the definition of opinion leader [43, 97]. On the one hand, the definition of KOL in our study reflects the functions of live streamer and celebrity endorse; however, it also highlights the definition of KOL as "the minority of people who have a considerable influence in a particular field". The above analysis reveals the commonalities of the concepts such as KOL, opinion leader, live streamer, and celebrity endorser. Therefore, to rigorously obtain the characteristics

Table 1 The characteristics of opinion leaders, live streamers, and celebrity endorsers

Opinion leaders	Persuasive, Knowledge, Social connectivity [44]; Professional knowledge, Product involvement, Interaction, Reputation [75]; Interactivity, Authority, Activity [77]; Professional knowledge, Product involvement, Visual cues, Interactivity, Functional value, and trust [82]
Live streamers	Attractiveness [34, 60, 72, 104]; Expertise [34, 72]; Trustworthiness [2, 34, 72]
Celebrity endorsers	Good looking [76, 92]; Warmhearted [14, 80]; Expertise [69]; Sense of humor [32, 50]; Passionate [5]

of KOL, our research summarizes the common characteristics of opinion leaders, live streamers, and celebrity endorsers in existing studies as shown in Table 1. Xiong et al. [120], and Xu et al. [122] categorized KOL characteristics into attractiveness, trustworthiness, and expertise, which are also common characteristics of opinion leaders, live streamers, and celebrity endorsers, thus our research considers attractiveness, trustworthiness, and expertise as the characteristics of KOL.

2.2 The product category

Products can be classified according to many criteria. For instance, Chintagunta and Haldar [18] divided products into two categories based on their property: durable goods (e.g., clothes washers and dryers) and non-durable goods (e.g., food). Meanwhile, Le Roux et al. [73] also categorized products into genuine and counterfeit based on the same criteria. In addition, the criteria provided by authoritative databases, such as Stanford Market Basket Database, which can be used as the basis for classifying products [6]. Nelson [86] categorized products into search and experiential products from the perspective of information acquisition on consumers. Afterward, Biswas and Biswas [9] considered the online shopping conditions and divided products into digital and non-digital products. Digital products have attributes that can be communicated through the Internet, whereas non-digital products are defined as those that can only be evaluated through physical inspection. In addition to the aforementioned criteria, Kotler [68] realized that the meaning of product classification is to meet the different demands of consumers; thus, Hirschman and Holbrook [49] and Okada [89] classified products into utilitarian and hedonic goods according to the different types of consumer demands. Utilitarian goods provide consumers with perceived utilitarian value, whereas hedonic goods meet consumers' demand for perceived hedonic value. Compared with other category criteria, the category criteria of utilitarian and hedonic are more in line with the demands of consumers in the LSC. In LSC consumers can not only receive comprehensive information about the product, but also perceive hedonic value in the process of synchronous communication with a live streamer, which satisfies consumers' utility and hedonic demands [119]. Therefore, this study categorizes products into utilitarian and hedonic goods.

Utilitarian goods (e.g., digital products and home appliances) are products or services characterized by instrumentality and functionality. This requires consumers to gather as much relevant product information as possible, pay more attention to the attributes and knowledge of the product, and compare more options based on the consumers' rational cognition when making a purchase decision [66]. In contrast, hedonic goods (e. g., jewelry, designer clothes, and bags) refer to products or services that are primarily characterized by emotional and sensory experiences such as aesthetic, sensory enjoyment, fantasy, and pleasure. The purchase decision is motivated by the experience of pleasure [110], spirit and multiple senses, and emotional satisfaction [19] that mostly rely on consumer's experiential cognition. Notably, the attributes of products are more constructed by consumers themselves rather than the product itself [115]. For example, some consumers regard a watch as a utilitarian

good because it can tell the time. However, others may regard it as a hedonic good because it is used as decoration. To avoid differences in consumers' perceptions of utilitarian and hedonic goods, studies usually emphasized different attributes of the same product to manipulate product types [23]. Taking the research of Jin and Zhu [56] as an example, we determine that the description of a utilitarian good aims to highlight its wear-resistant attribute of utility. In the context of a sneaker, the definition of a utilitarian good is as follows: "This is a very utilitarian sneaker which is the king of wear-resistant so you will not be afraid of wear and tear in any place." To highlight the unique look and design philosophy attributes of enjoyment, the hedonic goods are described as follows: "This is a stylish sneaker, known as the king of style, which adapts to your various outfit styles."

2.3 Dual systems theory and stimulus–organism–response theory

DST and SOR are common theories in the field of consumer behavior research, which are often used to explain consumer's purchase decisions, purchase intentions, product evaluations, information seeking and the need for recognition [123, 125]. DST indicates that the generation and difference of consumer behavior depend on the attributes of information received by the consumer [1, 64]. In particular, systems 2, also known as the cold systems [83], the rational systems [34], and the reflective systems [121], is activated when the information received by the consumer is more complex, characterized by slow processing [84], reliance on conscious analysis [26], and information integration [16]. In other words, the activation of systems 2 is conscious, relies on individual analysis, and requires individuals to concentrate on thinking and integrating information, which is relatively slow. However, the quality and accuracy of decision-making are higher. In contrast, systems 1, also known as the hot systems [83], the experiential systems [33], the impulsive systems [121], etc., is activated when the consumer received simpler information [83]. It is characterized by rapid processing [83], unconsciousness [107], and reliance on instinctive and emotional analysis [26]. In other words, the activation of systems 1 is commonly unconscious and relies on the individual instinct to quickly help process the information without careful thinking [59]. Corresponding to systems 1 and 2, people have produced two modes of thinking have been generated to support the operation of the system: the experiential thinking model and the rational thinking model. The experiential thinking model is a hot model that provides a flash judgment to support the process of systems 1 based on individual instinct. Meanwhile, the rational thinking model is a cold model that supports systems 2 based on careful consideration [33, 51].

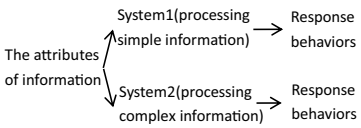
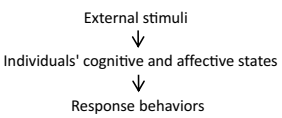
SOR was originally developed on the basis of the classical stimulus–response theory, which explains individual behaviors as learned responses to external stimuli. However, the stimulus–response theory was questioned and accused of oversimplifying the causes of behavior and not considering individual mental states [125]. Therefore, Mehrabian and Russell [81] improved SOR by incorporating the concept of organism between stimulus and response, thus better reflecting the individual cognitive and affective states before their response behaviors. According to the SOR,

environmental cues act as external stimuli that affect individuals' internal cognition and emotion and then drive their corresponding behavioral responses.

To clarify the theoretical basis of our research on DST and SOR, based on Whetten's [117] understanding of the theory, our research summarizes and compares the application of SOR and DST in consumer behavior research from four parts including related concepts, the relationship between concepts, the mechanism between concepts, and context, as shown in Table 2. "Related concepts" refer to factors (variables, constructs, concepts) that should logically be considered as part of the explanation of social or individual phenomena. "The relationship between concepts" means how are factors related, such as positive or negative. "The mechanism between concepts" can be regarded as the mechanism and principle of the relationship between factors. "Context" is a limitation on the theoretical model, in other words, it can be regarded as a boundary condition of the theory. By comparing the concepts and context associated with DST and SOR, our analysis embodies the broader power of SOR in explanations and predictions, because SOR is not limited to the attributes of information but also includes network characteristics, and interaction characteristics, among others. In addition, SOR applies to a wider range of contexts than DST (e.g., Culture, Price, Need for uniqueness).

However, the main difference between DST and SOR is reflected in the mechanism between the concepts, which is precisely the crucial part of the theoretical

Table 2 DST and SOR in the research of consumer behavior

	DST	SOR
Related concepts	The attributes of information received by the consumer	External stimuli, included content characteristics, network characteristics, interaction characteristics, and other characteristics
The relationship between concepts	Positive/negative	Positive/negative
The mechanism between concept		
Context	Different types of information	Content type, culture, price, need for

composition [117]. Although the description of SOR mechanisms shows its explanatory power on the consumers' decision-making process [65], DST could describe the formation of individual decisions in more detail. The DST shows the individual decision-making process under the action of dual systems rather than explaining the reasons for the formation of decisions from a single "stimulus–response" pathway. Our research explores how KOL characteristics influence consumers' purchase intentions. Related researches on the consumer decision-making process model have revealed the influence of purchase decisions on purchase intentions [55, 85, 103]. DST is more advantageous because this theory describes consumers' decision-making process in more detail. Furthermore, our research focuses on how KOL characteristics influence consumers' purchase intention under different categories of products. DST posits that different information types drive different decision-making systems, therefore, products containing different information types may affect the relationship between KOL characteristics and systems 1 and 2. Based on the earlier discussion, we think DST theory is suitable for our research questions. Meanwhile, DST also avoids the problem pointed out by Sparrowe and Maye [106], which refers to falling into the trap of choosing a broad theory that lacks unique explanatory power for research questions.

2.4 KOL characteristics and purchase intention

The characteristics of KOL can be categorized into expertise, trustworthiness, and attractiveness. Expertise refers to the knowledge, experience, and related skill of a product that KOL owns and transmits to fans or more audiences during the live streaming [65]. Trustworthiness represents the quality of personal integrity and sincerity that KOL exhibits [63]. Meanwhile, attractiveness can be reflected in the KOL's exquisite appearance, body, and sweet voice [88]. Social influence theory indicates that individuals' views, attitudes, behaviors, and decision-making are influenced by others [17, 71, 74]. Therefore, the characteristics of KOL will affect consumers' purchasing behavior during real-time social interaction with consumers.

Expertise is a characteristic of KOL, which is a key feature that an influencer should have to be successful, well-recognized and followed [25]. According to Schouten et al. [100], expertise will not only shape the level of credibility perceived in the influencers but also shape the customers' buying behavior and intention. When consumers are shopping, they are usually not exactly knowledgeable about the product; thus, they tend to seek help from people with better product knowledge [47]. Expertise can just meet the needs of consumers because the professional product information of KOL makes up for the lack of consumers' understanding. It becomes the criteria for consumers to evaluate whether to buy the product or not [10]. Xiong et al. [120] pointed out that consumers have a stronger purchase intention for products when the expertise of KOL is higher. Consequently, we posit the following as our first hypothesis:

H1 Expertise is positively related to consumers' purchase intention.

KOL serves as an external source of information for consumers when shopping in LSC. Research has shown that the higher the credibility of the information source is, the more consumers will transfer the positive evaluation of the information source to the corresponding product or service, thereby enhancing a favorable impression and recognition of the product, and even forming brand trust [127]. Therefore, trustworthiness, as a characteristic of KOL, determines consumers' favorable impression and recognition of the product by affecting consumers' perceived trust. Several studies have found a clear link between trust and intention [84], for example, Zhou [130] reported that trust can increase Chinese consumers' intentions to use mobile banking. Furthermore, trust can be used to indirectly predict consumers' intentions through the mediation of perceived risk [90]. Shao et al. [102] demonstrated the role of trust in reducing perceived risk when consumers purchase products, and the purchase intention of consumers has been improved. The above discussions lead to our second hypothesis:

H2 Trustworthiness is positively related to consumers' purchase intention.

Attractiveness is partly rooted in aesthetics [109]. Individuals are generally attracted to objects or people with aesthetically appealing features and appearances [30]. In the shopping context, the influencer, who enjoys the high level of attractiveness, is more likely to shape their followers' intention to purchase [46]. Therefore, attractiveness as a characteristic of KOL, consumers' attention to products recommended by KOL can be improved by higher attractiveness, which stimulates consumers' curiosity and desire for products, thereby enhancing consumers' purchase intention [46]. Accordingly, our research posits the following hypotheses:

H3 Attractiveness is positively related to consumers' purchase intention.

2.5 The mediating effect of systems 1 and 2

Based on DST, the individual decision is influenced by systems 1 and 2. Samson and Voyer [99] pointed out that systems 1 relies on individual intuition and affective clusters. KOL's attractiveness, such as appearance and personality, does not seem to be directly related to the product, but indirectly determines the consumer's positive impression of the product [7], which becomes the basis for consumers to make quick decisions based on intuition [57]. Meanwhile, attractiveness is also a part of affective clusters [53], Principe and Langlois [94] argued that more attractive faces could evoke positive affective reactions, which indicated a positive relationship between attractiveness and affective. Accordingly, attractiveness is related to systems 1. Compared to systems 1, systems 2 relies on the logical evaluation of evidence rather than individual intuition, and on reflective clusters rather than affective clusters [99]. The expertise of KOL provides consumers with accurate information about products [65, 100], which is the key to improving the quality and accuracy of decision-making [48] and enables consumers to evaluate and reflect product information [38]. The trustworthiness of KOL reflects

the degree of confidence that consumers place on influencers' intent to convey the information they consider most valid [88]. As a complement to the expertise [100], trustworthy KOL seems to earn more trust from consumers for product information when shopping than untrustworthy KOL [48, 100], thus, consumers are more willing to make purchase decisions based on the information provided by KOL. Therefore, expertise and trustworthiness of KOL are more related to systems 2 than systems 1. Related researches on consumer decision-making models shows that there is a relationship between consumer decision-making and consumer purchase intention [55, 85, 105]. Hence, KOL's characteristics can drive the operation of consumer decision-making systems, thereby enhancing consumers' purchase intention.

Product properties are a major factor that consumers consider when purchasing utilitarian goods [66]. The expertise and trustworthiness of KOLs can provide consumers with more accurate and comprehensive information, satisfy consumers' information demands in purchasing utilitarian goods [99], and stimulate consumers' information discrimination thinking [34]. Therefore, "expertise and trustworthiness → systems 2 → purchase intention" becomes the main pathway to influence consumers' purchase intention when purchasing utilitarian goods. However, consumers prefer to seek sensory pleasures when purchasing hedonic goods [101]. The attractiveness of KOLs inspires consumers' emotional discrimination thinking [35]. Consequently, consumers will be more joyful because they are following the recommendation of KOLs with appearance advantages and personal charm [95], thus satisfying their emotional and experiential demands in the purchasing process. Therefore, "attractiveness → systems 1 → purchase intention" becomes the main pathway that affects consumers' purchase intention when purchasing hedonic goods.

Consumers need to process and analyze the information about the products they are willing to purchase. However, they will also be influenced by uncertain factors in their purchase, such as limited-time promotions, limited-quantity promotions, and lottery, when deciding a purchase in LSC. Many diverse product categories, quantities, and styles are sold at discounted prices, which increases the amount of information that customers have to process and thus the difficulty of processing information. Therefore, according to the description of complex decision-making situations [28], consumers in LSC will face more complex decision-making situations than daily shopping. In this context, consumers prefer quick, intuitive, rational decisions, rather than thoughtful ones, because they adopt UT for decision-making [27]. Gao et al. [41] showed that UT is more significant when the quality of decision information is higher. Therefore, based on the DST, the operation of systems 2 is more dependent on high-quality information than systems 1, which means that the partway of "expertise and trustworthiness → systems 2 → purchase intention" may generate UT when purchasing utilitarian goods. Under the influence of UT, "attractiveness → systems 1 → purchase intention" becomes the main pathway to influence consumers' purchase intention when purchasing utilitarian goods. Based on the previous discussion, our research proposes the following hypothesis:

H4 No matter in purchasing utilitarian or hedonic goods, "attractiveness → systems 1" becomes the main pathway for consumers to make decisions rather than

"expertise and trustworthiness → systems 2", thereby enhancing consumers' purchasing intention.

Overall, a theoretical research framework is constructed, as shown in Fig. 1.

3 Research methodology

3.1 Sample and data collection

According to the *Estimates of Global E-Commerce 2019 and Preliminary Assessment of COVID-19 Impact on Online Retail 2020*, global e-commerce sales have grown dramatically during the COVID-19 pandemic. From 2018 to 2020, China has been ranked first in total online retail sales. In 2018, 2019, and 2020, the total sales were $1060.4, $1233.6, and $1414.3 billion, respectively. The United States ranked second, with three-year total sales of $519.6, $598, and $791.7 billion, respectively. Sales in China are increasing year by year (an increase of 33.37% in 2020 compared to 2018). Given that our research focuses on consumers' purchase intention in LSC, we use a sample of Chinese consumers as they remain highly engaged in online shopping during the COVID-19 pandemic. Moreover, according to the *47th Statistical Report on Internet Development in China*, the age group of netizens in China is 20–49 years old (57.1% of the total number of netizens). Students account for 21% of the total number of netizens. However, given the limited purchasing power of most students and the relatively simple types and needs of products purchased, the occupation of the sample is not limited to students, but covers as many occupations as possible to maximize the variation of the sample.

Our research used the Credamo platform to edit and post the questionnaire online after determining the attributes of the sample. The questionnaire was divided into utilitarian and hedonic goods purchases. Then, we used the logic function of the Credamo platform to set up a "random distribution of utilitarian or hedonic good purchases to the subjects" after posting the questionnaire to randomly classify participants into the utilitarian and hedonic goods purchases groups. The questionnaire was then divided into three parts. The first part simulated the LSC context, and asked subjects to write down a KOL they followed. Then, they were asked to imagine browsing a live streaming platform to find the KOL they were following during the live streaming. Thus, they entered the live streaming room. To ensure the

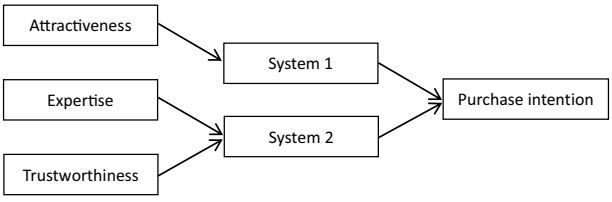


Fig. 1 Theoretical research framework

authenticity and accuracy of the contextual simulation, the following methods were adopted in our study: (1) The period or date of the questionnaire distribution coincides with the online shopping festival in LSC, as a large number of product promotions often accompany the online shopping festival, thus complicating the decision-making conditions. The temporal overlap can strengthen the link between simulated and real conditions. Accordingly, the questionnaires will be posted form December 30, 2021, to January 12, 2022, which is the New Year holiday and the Taobao New Year's shopping festival. Taobao New Year's shopping festival is an annual online shopping festival, which coincides with the Chinese New Year holiday. Because it is a Chinese traditional holiday, the consumers' consumption desire has significantly increased, with quite a large number of people participating in online shopping. Besides, with the popularity of LSC in China, the online shopping festival has also adopted the mode of live streaming with goods, providing real-time social interaction between consumers and live streamers, winning the favor of consumers, and increasing sales of products. (2) We first introduced the definition of KOL and then asked subjects to write down a KOL they followed. This method can stimulate the subject's judgment on the personal characteristics of the KOL by evoking the KOL concerned in the subject's mind. In addition, the KOL written by the subjects can also be used as a criteria for screening invalid questionnaires. The researcher can screen the questionnaires by judging whether the KOL written by the subjects conforms to the definition of KOL in our research. (3) Our research refers to the words of live streamers of major platforms in terms of product sales and strives to achieve the true restoration of the live streaming room scene.

Following Jin and Zhu [56], we selected sneakers as the products that consumers want to buy. Moreover, we adopted the approach of Crowley et al. [23], which emphasizes different attributes of the same product to control the product type. Our research collected information on the utilitarian and hedonic attributes of the products on the official website of sneakers. During the questionnaire distribution process, brand information was hidden and replaced with brand A to avoid the influence of consumers' personal preferences on the results. The KOL's recommendations on the utilitarian and hedonic attributes of sneakers were used to manipulate utilitarian and hedonic types during the live streaming to ensure that the groupings are as

Fig. 2 Utilitarian goods purchases

Fig. 3 Hedonic goods purchases

accurate as possible (Figs. 2, 3). The second part of the questionnaire is to measure the core variables of the research, and the third part is to collect the personal information of the subjects.

The participants were asked to imagine entering the live streaming room of a KOL, who was selling a sneaker, saying, "This is the brand A's new sneaker, this sneaker is made of stretchy Flyknit material, light and breathable, easy to take off. At the same time, these Sewn Swoosh and TPU heel clips, paired with the soft and extraordinary VaporMax cushioning configuration, create an extraordinary stride experience to help you perform at your best in sports, hurry up and place your order!".

The participants were then asked to enter the live streaming room of a KOL, who was selling a sneaker, saying "This is the new brand A's sneaker, this sneaker follows the traditional appearance of the brand, with a fashionable midsole, creating a new combination of retro and modern fashionable. The bright upper design creates a fashionable choice for trendy shoes. Simple color matching creates a neat appearance, which helps you easily control different styles of wear, hurry up and place an order!".

A total of 550 questionnaires were collected, including 275 for each of the utilitarian and hedonic goods purchase groups. After that, we screened out invalid questionnaires based on the KOLs filled in by the subjects, including (1) multiple KOLs were filled in simultaneously, such as Austin, Viya, and Luo Yonghao (2) KOLs only have a fairly high popularity in the minds of the subjects, but they are not well known to the public. To avoid misjudgment, we conducted a search on major platforms and websites, and conducted a comprehensive study and judgment based on the number of followers and popularity of individuals. Invalid responses also include (3) ambiguities in the KOL filled in, for example, "Li Ning," which is both a person's name and a company's name, or "leader," which itself contains a variety of meanings, or Austin's live streaming room, which can refer to either Austin himself or other people in Austin's live streaming room. It also includes (4) wrong filling omissions, such as directly filling in "KOL," "Key opinion leader," "None," and "I do not know." After screening according to the aforementioned criteria, this paper

Table 3 Demographic statistics ($N = 467$)

Characteristic	Category	Number	%
Gender	Male	194	41.54
	Female	273	58.46
Education background	Bachelor and below	393	84.15
	Master or Ph.D	74	15.85
Age	0–20	26	5.57
	21–30	249	53.32
	31–40	145	31.05
	41–50	37	7.92
	> 51	10	2.14
Monthly income (Yuan)	0–3000	88	18.84
	3000–5000	85	18.20
	5000–10,000	191	40.90
	> 10,000	103	22.06
The number of times participating in the LSC	1–5	62	13.28
	6–10	151	32.33
	> 10	254	54.39
Occupations	Full-time student	87	18.63
	Civil servant	12	2.57
	Work at state-owned enterprises	90	19.27
	Work at private enterprises	195	41.76
	Work at public institutions	49	10.49
	Work at overseas-funded enterprise	25	5.35
	Others	9	1.93

Results are rounded to two decimal places

finally obtained 467 valid questionnaires, including 247 in the utilitarian goods purchases group and 220 in the hedonic goods purchases group. The demographic statistics are shown in Table 3.

3.2 Variables measurement

In our research, the questionnaire that has been adopted in the existing research was selected to ensure the reliability and validity of the measurement tools. Simultaneously, considering that the subjects are Chinese consumers, our research strictly followed the translation/back-translation procedure and translated them into Chinese to ensure that the meaning of the measurement items was equivalent. Additionally, we sent the questionnaire to peers for evaluation and received the feedback on the following questions: (1) "You think this KOL is sexy" appears in the items of attractiveness, and "sexy" may contain different meanings in Chinese and Western contexts at the same time. (2) There should not be too many items on one side of the questionnaire, and the items of the same variable should be placed on a separate

page to avoid common method bias. After comprehensively considering these suggestions, we revised the questionnaire. The response options for each item were derived from the 7-point scale (1 = *strongly disagree/extremely unlikely*, 7 = *strongly agree/very likely*), except for control variables using categorical variables.

Attractiveness, expertise, and trustworthiness of KOL After overall consideration of the translation modifications and peer-reviewed comments on the scale by Chinese scholars, we used 11 items adopted from Ohanian [88] and Zhang et al. [126]. The measurement of attractiveness includes four items, for example, "The reason why you watch KOL is because the appearance of KOL attracts you." Meanwhile, the measurement of expertise includes four items, such as "You think the KOL you watch has a lot of experience with the recommended products." The measurement of trustworthiness includes three items (e.g., "You think the content of KOL's live streaming are credible.").

Systems 1 and 2 Our research draws on the scale of experiential and rational thinking used by Novak and Hoffman [87] because systems 1 and 2 are supported by experiential and rational thinking. The scale has eight items, of which the measurement of experiential thinking includes four items, such as "When shopping in KOL's live streaming room, I will decide to buy or not to buy through the intuitive feeling of the product." At the same time, the measurement of the rational thinking model includes four items, such as "I will think carefully when shopping in KOL's live streaming room."

Purchase intention This study adopts the scale used by Fang [37], with three items, such as "You are very likely to consider purchasing products recommended by KOL."

Control variables Gender, age, and education background are commonly used in research as control variables [8]. In addition, the following control variables are selected for our study: personal monthly income, the number of times they participate in the LSC, and the type of occupation they are engaged. To some extent, personal monthly income represents an individual purchasing power. The number of times participating in the LSC represents individuals' enthusiasm for participation. Moreover, individuals engaged in different occupations may have different preferences for products. In view of this, choosing personal monthly income, the number of times participating in LSC, and the type of occupation individuals engage in as control variables can avoid influencing purchase intention.

Furthermore, to test the success of manipulating utilitarian and hedonic goods purchases group is successful, our research draws on the method of Jin and Zhu [56]. First, the subjects were informed of the definitions of utilitarian and hedonic goods, and then, they were asked to rate the products recommended by the KOL (1 = *completely utilitarian goods*, 7 = *completely hedonic goods*).

3.3 Statistical methods

Our research used SPSS 23.0 and Mplus 8.3 for statistical analysis. Specifically, it includes (1) confirmatory factor analysis of variables by using Mplus 8.3; (2) descriptive statistical analysis using SPSS 23.0; (3) regression analysis using SPSS

23.0 to test H1–H3; and (4) using *Process* function in SPSS to test the mediation effect (H4) by the bootstrap method.

4 Empirical analysis

4.1 Confirmatory factor analysis

Our research measures six variables: attractiveness, trustworthiness, expertise, experiential thinking, rational thinking, and purchase intention. The *AVE* and *CR* are $AVE_{AC}=0.377$, $AVE_{TC}=0.531$, $AVE_{EC}=0.394$, $AVE_{ES}=0.488$, $AVE_{RS}=0.703$, $AVE_{PI}=0.441$, $CR_{AC}=0.706$, $CR_{TC}=0.773$, $CR_{EC}=0.719$, $CR_{ES}=0.788$, $CR_{RS}=0.905$, $CR_{PI}=0.702$, respectively. Fornell and Larker [40] suggested that the values for AVE should be greater than 0.50, but the value of above AVE in some factors are unsatisfied with above criteria. But according to Credé and Harms [22], as follows: "Large AVE values indicate that the higher-order factor explains large amounts of variance in the lower-order factors but because AVE is an effect size indicator and not an inferential test statistic, researchers should not apply strict cut-off points in the interpretation of AVE but rather present AVE statistics together with other indexes that speak to the validity of the higher-order model (HOM).". We suppose there is no major problem with the value of AVE in our study. Additionally, the value of CR are all greater than 0.60 which satisfied with the criteria suggested by Fornell and Larker [40].

Using Mplus 8.3, we conducted a confirmatory factor analysis on these six models. Table 4 shows the fitting index for each model. As shown in Table 4, the fitting index of six-factor model is better than that of the other five models ($\chi^2/df=2.767$, $CFI=0.916$, $TLI=0.900$, $RMSEA=0.062$). Moreover, each index has also reached the academic level, indicating that the six main variables involved in our research have good discriminant validity. The relationship between variables can be tested in the next step.

Our research concluded that all six variables were filled in by one subject, and that there was a problem of data sources for the same variables and, therefore, a possible common method bias. For this reason, this study first uses Harman's single-factor test method to test the common method bias problem. Using SPSS 23.0 to conduct principal component factor analysis, we obtained results showing a 26.232% variance explained rate of the first factor. According to Podsakoff and Organ [93], if the variance explained rate of the first factor is below 50%, the common method bias is not a serious problem.

However, at present, the academic community believes that the Harman single-factor test method is unideal for the problem of common method bias [24]. Therefore, to ensure the rigor of the research, we also used the unmeasured latent method construct (ULMC) method to test for common method bias. On the basis of the six-factor model, the method factor (all items in the scale are indicators of the method factor) was added to our study to form a seven-factor model. According to Richardson et al. [96], we found that the model fit index of the seven-factor model was not significantly improved ($\chi 2/df=2.101$, $CFI=0.946$, $TLI=0.924$, $RMSEA=0.049$),

Table 4 The result of confirmatory factor analysis ($N=467$)

Model	χ^2	*df*	χ^2/df	$\Delta\chi^2$	*GFI*	*CFI*	*TLI*	*RMSEA*
Six-factor model(AC;TC;EC;ES;RS;PI)	536.809	194	2.767	/	0.906	0.916	0.900	0.062
five-factor model(AC;TC + EC;ES;RS;PI)	604.014	199	3.035	67.205**	0.893	0.901	0.885	0.066
four-factor model(AC + TC + EC;ES;RS;PI)	683.707	203	3.368	79.693**	0.878	0.883	0.867	0.071
three-factor model(AC + TC + EC + ES;RS;PI)	1220.742	206	5.926	537.035**	0.789	0.752	0.722	0.103
two-factor model(AC + TC + EC + ES + RS;PI)	2393.229	208	11.506	1172.487**	0.615	0.467	0.408	0.150
one-factor model(AC + TC + EC + ES + RS + PI)	2407.211	209	11.518	13.982**	0.614	0.464	0.407	0.150

AC stands for attractiveness. TC stands for trustworthiness. EC stands for expertise. ES stands for experiential thinking. RS stands for rational thinking. PI stands for purchase intention; "+" stands for combining two factors into one factor. $^{**}p<0.01$; results are rounded to three decimal places

compared to the six-factor model ($\Delta CFI = 0.030$, $\Delta TLI = 0.024$, $\Delta RMSEA = 0.013$). Therefore, our study does not suffer from serious common method bias.

4.2 Descriptive statistical analysis

The mean, standard deviation, and correlation coefficient of the main research variables are given in Table 5. As shown in Table 5, the Cronbach's α coefficient of each subscale is above 0.700, which is within the acceptable range. The attractiveness, trustworthiness, and expertise of KOL are significantly positively correlated with consumers' purchase intention ($r_{(AC,\ PI)} = 0.499$, $r_{(TC,\ PI)} = 0.627$, $r_{(EC,\ PI)} = 0.578$, $p < 0.01$). In particular, the attractiveness of KOL is significantly positively correlated with experiential thinking ($r_{(AC,\ ES)} = 0.172$, $p < 0.01$), which in turn is significantly positively correlated with purchase intention ($r_{(ES,\ PI)} = 0.273$, $p < 0.01$), thereby preliminary supporting this study's hypotheses.

4.3 Hypothesis test

To test H1, H2, and H3, we adopted hierarchical regression analysis, and the regression analysis results are shown in Table 6. As shown in Table 6, the consumer purchase intention is taken as the dependent variable. Moreover, after all control variables are incorporated in Model 1, attractiveness (Model 2), trustworthiness (Model 3), and expertise (Model 4), the results show that they are all positively correlated with consumers' purchase intention ($b_{AC} = 0.463$, $b_{TC} = 0.578$, $b_{EC} = 0.528$, $p < 0.01$). Besides, our research also includes the attractiveness, trustworthiness, and expertise of KOL (Model 5), indicating that the positive correlation is still significant ($b_{AC} = 0.185$, $b_{TC} = 0.367$, $b_{EC} = 0.227$, $p < 0.01$). Thus, H1, H2, and H3 are supported by the data.

To test H4, we used the Process function in SPSS to perform the bootstrap method and test the mediating effect. Before conducting the mediation effect analysis, we first tested the validity of the manipulation of the purchase groups of utilitarian and hedonic goods by means of an independent sample t-test method. The results showed that the manipulate was successful ($F = 9.165$, $p < 0.01$). Next, based on 5000 Bootstrap analyses, the mediation effect value and bias-corrected 95% confidence interval were obtained, as shown in Table 7. Regardless of whether the purchase group was utilitarian or hedonic, the bias correction 95% confidence interval of the "AC → ES → PI" pathway excluded 0, indicating that the data support the mediating effect of pathway. Simultaneously, the attractiveness has a significant positive correlation with the experiential thinking in both the utilitarian and the hedonic goods purchase groups (utilitarian goods purchase group: $b_{AC} = 0.152$, $t = 2.339$, $p < 0.05$, hedonic goods purchases group: $b_{AC} = 0.185$, $t = 2.714$, $p < 0.01$), the experiential thinking has a significant positive correlation with consumers' purchase intention (utilitarian goods purchase group: $b_{ES} = 0.214$, $t = 3.511$, $p < 0.01$, hedonic goods purchases group: $b_{ES} = 0.251$, $t = 4.119$, $p < 0.01$). In view of this, H4 is certified.

Table 5 The results of variable descriptive statistics and correlation analysis ($N=467$)

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1 Gender	0.415	0.493												
2 Education background	0.159	0.366	0.003											
3 Age	2.478	0.806	0.132**	0.085										
4 Monthly income	2.662	1.022	0.241**	0.132**	0.369**									
5 Participating times	2.411	0.713	−0.035	0.046	0.050	0.318**								
6 Occupations	3.469	1.475	0.112*	0.001	0.225**	0.508**	0.153**							
7 AC	5.155	0.893	0.056	−0.003	0.100*	0.159**	0.072	0.123**	(0.705)					
8 TC	5.802	0.694	0.031	0.011	0.145**	0.208**	0.218**	0.112*	0.477**	(0.772)				
9 EC	5.638	0.747	−0.019	−0.076	0.155**	0.174**	0.230**	0.080	0.522**	0.579**	(0.714)			
10 ES	4.790	1.037	−0.044	−0.031	0.017	0.037	0.130**	0.034	0.172**	0.170**	0.210**	(0.774)		
11 RS	5.149	1.183	0.149**	−0.014	0.190**	0.174**	−0.004	0.087	0.091	0.111*	0.164**	−0.364**	(0.904)	
12 PI	5.572	0.775	0.013	−0.028	0.140**	0.224**	0.298**	0.201**	0.499**	0.627**	0.578**	0.273**	0.018	(0.701)

*, ** represent $p<0.05$, $p<0.01$, respectively. The brackets on the diagonal are Cronbach's α coefficients of the corresponding variables. Results are rounded to three decimal places

Table 6 Analysis of the influence of KOL characteristics on consumers' purchase intention ($N=467$)

The categories of variables	The name of variables	PI				
		Model 1	Model 2	Model 3	Model 4	Model 5
Constant		4.390** (27.318)	2.553** (12.276)	1.180** (4.905)	1.790** (7.674)	0.500* (2.101)
Control variables	Gender	−0.018 (−0.389)	−0.027 (−0.681)	−0.015 (−0.422)	0.009 (0.240)	−0.008 (−0.247)
	Education background	−0.056 (−1.267)	−0.046 (−1.185)	−0.044 (−1.234)	0.002 (0.055)	−0.019 (−0.578)
	Age	0.085 (1.797)	0.062 (1.516)	0.031 (0.804)	0.017 (0.417)	0.012 (0.344)
	Monthly income	0.067 (1.164)	0.019 (0.387)	−0.002 (−0.052)	0.012 (0.256)	−0.019 (−0.450)
	Participate times	0.258** (5.554)	0.244** (6.007)	0.156** (4.121)	0.153** (3.837)	0.143** (3.998)
	Occupations	0.111* (2.176)	0.086 (1.929)	0.109** (2.653)	0.124** (2.893)	0.105** (2.760)
Independent variables	AC		0.463** (11.980)			0.185** (4.625)
	TC			0.578** (15.819)		0.367** (8.767)
	EC				0.528** (13.703)	0.227** (5.201)
	R^2	0.127	0.335	0.435	0.381	0.515
	ΔR^2		0.208**	0.308**	0.254**	0.388**
	F	11.173**	33.049**	50.518**	40.290**	53.859**

*, ** represent $p<0.05$, $p<0.01$, respectively, the t value is in the brackets, and the results are rounded to three decimal places

Table 7 The results of the mediation effect test (5000 times bootstrap)

Pathways	Mediating effect size	Bias corrected 95% confidence interval
Utilitarian goods purchases group ($N=247$)		
AC → ES → PI	0.019	[0.0011, 0.0441]
TC → RS → PI	−0.014	[−0.0404, 0.0041]
EC → RS → PI	−0.012	[−0.0447, 0.0066]
Hedonic goods purchases group ($N=220$)		
AC → ES → PI	0.029	[0.0059, 0.0593]
TC → RS → PI	−0.001	[−0.0143, 0.0110]
EC → RS → PI	−0.015	[−0.0422, 0.0041]

The results are rounded to three decimal places

5 Results and discussion

Our research focuses on the LSC, and supposes that the various types of commodity promotions in the LSC complicate consumers' decision-making, and then trigger UT. Therefore, we established a theoretical research framework based on the DST to explore the influence mechanism of KOL characteristics on consumers' purchase intention under the role of UT. According to the principle that different types of information drive different systems, two decision pathways were formed: "attractiveness → systems 1 → purchase intention" and "trustworthiness and expertise → systems 2 → purchase intention." First, our research discusses the influence of KOL characteristics on purchase intention. After obtaining the data through the questionnaire survey, data analysis revealed that KOL's attractiveness, trustworthiness, and expertise were positively correlated with the purchase intention. Many researches on the characteristics of celebrity endorsers and live streamers also support our findings, reflecting the positive role of personal characteristics in influencing consumer behavior.

Based on the research on the relationship between KOL characteristics and purchase intention, our research further explored the mechanism between KOL characteristics and purchase intention in the context of LSC. To restore the LSC situation as realistically as possible, and to highlight the UT generated by the objective existence of complex decision-making, our research simulated the shopping situation with reference to the real LSC content in the questionnaire section, and the questionnaire distribution time coincided with the actual online shopping festival time. Then, to test the existence of UT, our research randomly divided the samples into the utilitarian goods purchases group and hedonic goods purchase group, arguing that if the decision-making pathway changes from "trustworthiness and expertise → systems 2 → purchase intention" to "attractiveness → systems 1 → purchase intention" when purchasing utilitarian goods, it indicates that UT influences consumer's decision-making. The data analysis results show that the mediating effect of experiential thinking is always significant, whether buying hedonic or utilitarian goods, indicating that "attractiveness → systems 1" will become the main pathway for consumer decision-making in the LSC. This in turn enhances consumers' purchase intention and reveals the UT in the decision-making process. A methodological review of opinion leader selection by Bamakan et al. [4] reveals the dominance of mathematical selection models. In follow-up studies, the selection models of opinion leader and KOL is constantly refining contextual considerations (e.g., e-commerce business, uncertainty, time) [57, 78, 79]. Although our findings cannot provide a detailed mathematical model derivation process, our study identified a new context for improving the KOL selection model that UT existing in the LSC. In the LSC, the generation of decision-making does not necessarily need to rely on thoughtful analysis and thinking. Sometimes, the consumers' "impulse" due to physical attraction or emotional resonance is often more likely to promote the consumers' decision-making.

6 Theoretical contribution and practical implication

Our research's theoretical contributions are as follows: First, our research uses the DST to solve the key factor identification problem that cannot be solved in the research based on the SOR from a new theoretical perspective. The research of Zhang and Benyoucef [125] pointed out that in the research of consumer purchasing decisions, although the research based on the SOR has verified many antecedents that affect consumers' purchasing decisions, the research of this theory has not identified the key factors. Although Aslam and Luna [3] pointed out in research on brand Facebook page characteristics on consumer engagement behavior, customer contact quality only affects brand learning value, which promotes consumer engagement behavior. However, the aforementioned conclusions can only show that customer contact quality has a certain uniqueness in the effect, and cannot explain its criticality, because content quality will also affect the brand learning value and affect the hedonic value. To this end, the DST can realize the identification of key factors by means of "features of different types of information activate different systems," for example, different types of word-of-mouth referrals will activate a different system of consumers' decision-making [123]. Specifically, economic word-of-mouth referral will activate system 1, and public welfare word-of-mouth referral will activate system 2. Therefore, when consumers are in a decision-making situation where word-of-mouth referral is mostly in line with consumers' personal interests, economic word-of-mouth has become a key factor affecting consumers' decision-making to a certain extent. The aforementioned methods have also been used in research on the influence of different types of brand benefits [111], and different color brightness of food [13] on consumers' purchase intention. Our research is the first to try in terms of personal characteristics by simulating the LSC, exploring the influence of KOL characteristics on consumers' purchase intention under UT based on DST. The results show that "attractiveness → systems 1" becomes the main pathway for consumers to decide whether to buy utilitarian or hedonic goods, revealing the criticality of attractiveness in LSC.

Second, our research improves the insufficiency of UT research on how to influence the complexity of consumer decision-making by manipulating commodity attributes and explores UT in the LSC, and conducts an empirical test using the DST. In the research of UT, the complexity of consumer decision-making is often achieved by manipulating commodity attributes. For example, Dijksterhuis [27] described 12 car attributes in a classic car buying situation, which complicates consumers' decision-making by assigning different ratios of positive attributes (e.g., high safety) to negative attributes (e.g., noise) to cars, the combination of six positive and six negative attributes is deemed the most complex decision-making situation. However, Payne et al. [91] have adopted the same manipulation method, but have not found UT, which calls into question the validity of manipulating commodity attributes to alter the complexity of consumers' decision-making. To this end, our research attempts to explore the complex decision-making that exists objectively in the natural context, rather than

simulating the complexity of the decision through experimental manipulation. Our study conjectures the presence of objectively complex decision-making problems in LSC. Consumers must often face the promotion of various types of products when making purchase decisions; thus, they are forced to make decisions in a consumption situation with much product information, and different attributes, and strong uncertainty. Although our research simulates the LSC scenario by context importing in the data acquisition stage, in the process of the entire context importing, our research adopts the overlap of the questionnaire distribution time and the online shopping festival time in the real LSC, and the reference to each in terms of product sales, the live streamer of the big live streaming platform strive to restore the real live streaming business model situation as much as possible, in order to highlight the complex decision-making that exists objectively. Based on the DST, our research results confirm that UT exists in the context of LSC, which is reflected in the fact that the decision-making pathway for utilitarian goods purchases has shifted from "expertise and trustworthiness → systems 2 → purchase intention" to "attractiveness → systems 1 → purchase intention." This conclusion also further supports the view of Evans [36], Sloman [105] and Tversky and Kahneman [112], who mentioned that when a competitive relationship exists between systems 1 and 2 ($r_{(ES,\ RS)} = -0.364$, $p < 0.01$ in Table 4), irrational behavior in decision-making will appear, and systems 1 will dominate the decision-making.

Our research has practical implications for selecting KOL under the LSC and the development of the live streaming industry. Today's LSC has formed a basic operation chain of "supplier, MCN (Multi-channel Network) institution, live streamer, platform, and consumer," in which live streamer affects realizing value, stimulating unplanned demand of consumers, and the key to increasing purchase conversion rates. For the head live streamer choosing the right KOL according to personal characteristics has become a problem that enterprises and live streaming platforms must pay attention to when expanding their influence and increasing profits. This study concludes that in the LSC, whether the utilitarian or hedonic goods purchase, the attractiveness of KOL plays a key role in improving consumers' purchase intention. Therefore, companies and live streaming platforms must pay more attention to the attractiveness of individuals in the selection of KOL. Compared with personal professional ability, good looks and a humorous personality can more obviously stimulate consumers' purchase intention, by activating experience-based and fast decision-making rather than consequential and slow decision-making. The growing maturity of the LSC has driven the development of the live streaming industry. Some companies and institutions have begun to focus on the cultivation of streamers, which has made the types of live streamers more diversified, the scale of individuals engaged in the career of live streamer has surged, forming a huge ecosystem in which head live streamers, shoulder live streamer, and small and medium-sized live streamer coexist. The development of the industry has improved economic efficiency indicators, but it is also accompanied by the uneven output of content by live streamers, such as relying on personal attractiveness to output vulgar content. Although the research conclusion of our research emphasizes the importance of attractiveness in the LSC, how to correctly display the attractiveness of individuals still needs to be further standardized. With the improvement of the professionalization degree in

society, our research posits that the live streamer can also be regarded as professionals, who are trained professionally. Specifically, attractiveness should be regarded as a part of professional competence, but more importantly, both small live streamer and KOL must form their own professionalism, regard themselves as professionals in the field of LSC, regulate their own behavior, adhere to their own work standards.

7 Research limitations and prospects

Despite this study's contributions, it has the following limitations: (1) Only the influence of decision systems 1 and 2 on consumer decision-making is considered from the perspective of separation, whereas the possible joint effect between systems 1 and 2 is ignored. In fact, some scholars have put forward the view that systems 1 and 2 can simultaneously affect the decision-making process of individuals [107] and Ferreira et al. [39] proved the earlier view through the process separation procedure Hence, future research must pay attention to how systems 1 and 2 jointly affect the decision-making process of consumers under the LSC, such as starting systems 1 first and then starting systems 2, or vice versa, or starting simultaneously. Furthermore, future research can also focus on the mechanisms in the relationship between systems 1 and 2, for example, the interaction and dynamic changes between Systems 1 and 2 are also issues worth considering. (2) Only from a single perspective of individual characteristics and does not discuss the combination of characteristics. Similarity attraction theory states that people are attracted to those who are similar to themselves. Nowadays, consumer preferences are becoming increasingly diversified. Therefore, to meet the different preferences of consumers, KOLs as sellers of products in the LSC should have diversified characteristics to attract consumers with different preferences in real-time interaction, thereby improving consumers' purchase intention. Therefore, in future research, the influence of KOL characteristic combination on consumer decision-making can be explored, for example, the research of corporate live streamers and celebrity live streamers [15, 118, 124], summarizes the KOL characteristic combination into the enterprise type of "high professional ability-low social ability" and the star type of "low professional ability-high social ability", and then explores the influence of KOL characteristic combination on consumers' purchase intention.

Acknowledgements We would like to thank National Natural Science Foundation of China (Grant No. 72002088) and China Scholarship Council (Grand No. 202109800003) for providing funding for part of this research. The funding is National Natural Science Foundation of China (Grant No. 72272070).

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