Factors Influencing People's Continuous Watching Intention and Consumption Intention in Live Streaming: Evidence from China

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Abstract

Purpose – This research aims to investigate what factors can affect people's continuous watching and consumption intentions in live streaming.

Design/methodology/approach – This research conducted a mixed-methods study. The semi-structured interview was deployed to develop a research model and a live streaming typology. Survey was then used for quantitative assessment of the research model. Survey data was analyzed using partial least squares structural equation modeling.

Findings – The results suggest that sex and humor appeals, social status display and interactivity play considerable roles in the viewer's behavioral intentions in live streaming and their effects vary across different live streaming types.

Research limitations – This research is conducted in the Chinese context. Future research can test the research model in other cultural contexts. This study can also be extended by incorporating the roles of viewer gender and price sensitivity in the future.

Practical implications – This study provides managerial insights into how live streaming platforms and streamers can improve their popularity and profitability.

Originality/value – The paper introduces a novel form of social media and a new business model. It illustrates what will affect people's behavioral intentions in such a new context.

Keywords: Live Streaming, Consumption Intention, Interactivity, Social Status Display, Stimuli

Article Type: Research Paper

1. Introduction

Live streaming is now a new trend worldwide: with a live streaming app, anyone can broadcast anything, from eating, gaming to singing; and people can watch all kinds of live streams anytime and anywhere. Data shows that in 2017, 48% of Internet users in the U.S. watched live streaming at least once a week (Kats, 2017). Based on the report published by China Internet Network Information Center, live streaming users in China reached 422 million by 2017, accounting for more than half of China's whole Internet population (CNNIC, 2018). At times, the number of viewers for a particular live stream can go beyond one million during the broadcasts by popular streamers. Another remarkable fact of live streaming lies in the large revenue it can generate. The market size of live streaming in China was valued at USD 3 billion in 2016 which was an increase of 180% compared to 2015 (iResearch, 2017a). Goldman Sachs estimated that by 2020, China's live streaming market could expand to USD 15 billion (Cheng, 2017). The novel function embedded in live streaming- the consumption of virtual gifts- has led to the emergence of a new monetization model. Virtual gifts are digital pictographs such as virtual flowers or virtual yachts offered by live streaming platforms with the price ranging from RMB 0.10 (around USD 1.45 Cents) to RMB 10,000 (around USD 1,451). Viewers can purchase virtual gifts via online payments during the broadcast of a live stream to express their appreciation for the streamer. The virtual gifts received by the streamer can be converted into cash and the revenue is then split between the streamer and the platform. The consumption of virtual gifts contributes to the vast majority of live streaming revenues (The Economist, 2017). In China, popular streamers can potentially earn a lot. For example, it is reported that Yu Li, who came from a hardscrabble area in North China and used to fix trucks in a small city, now earns USD100,000 per month as a streamer (Rauhala, 2017).

Different from other forms of social media, live streaming can be seen as a hybrid involving video content, real-time communication and consumption (Li et al., 2018). It is also worth noting that in contrast with the consumption in online shopping, the consumption made in live streaming is mainly to express appreciation. Despite the popularity of live streaming and its distinctive features, live streaming has not received much research attention. Previous literature on social media has mainly focused on addressing the issues of social media adoption (Zolkepli and Kamarulzaman, 2015), users' engagement (Labrecque, 2014) and knowledge contribution (Majchrzak et al., 2013), as well as how social media serves as a marketing intelligence tool for marketers (Lamberton and Stephen, 2016). Limited attention has been paid to users' continuous participation or consumption in social media. The study by Kim *et al*. (2012) has investigated members' purchase of virtual items for themselves in social network sites for self-identity communication purpose. However, lacking in previous research is an explanation of people's behavior of purchasing virtual gifts for others in live streaming. The lack of a theoretical understanding of this phenomenon offers an opportunity to explore the extent to which existing theories can explain people's behavior in such a new context. How can live streaming platforms survive in the intensified market competition? How can they continuously attract people's attention and create value? These are the concerns of the live streaming industry. A better understanding of the factors influencing viewers' willingness to participate continuously and to purchase virtual gifts can yield the potential of guiding streamers and platforms to refine their strategies.

The gaps in existing literature and the practical problems faced by the live streaming industry serve as motivations for our study. This research aims to investigate the factors that can influence people's intentions of continuous watching and consumption in live streaming. Consumption intention here refers to viewers' intention to purchase and give virtual gifts to steamers. Due to the

limited research in this area, a mixed-methods research design was applied (Furneaux and Wade, 2011; Venkatesh *et al.*, 2016). This study adopts a theoretical lens from the Uses and Gratification Theory (UGT) which suggests that people's behavior in social media is affected by the extent to which their needs are satisfied (Zolkepli and Kamarulzaman, 2015). This study thus focuses on people's core psychological needs –entertainment and social interaction. The initial theoretical framing was used to guide a series of semi-structured interviews with viewers to identify salient influences. The research framework and hypotheses evolved based on the interview results were empirically tested via survey using partial least squares structural equation modeling (PLS-SEM).

This research makes several important contributions. First, we employ a mixed-methods research design to explore the viewer's behavioral intentions in live streaming, extending our understanding of social media-enabled business models. Second, the theoretical framework developed explores how people's core needs in terms of entertainment and social interaction are satisfied in live streaming. It combines interactivity, social status display and stimuli together to explain people's continuous watching intention of live streaming and consumption intention of virtual gifts. Our findings suggest that interactivity, social status display, humor appeal and sex appeal are important factors influencing the viewer's behavioral intentions in live streaming. Third, the relationships are examined under three types of live streaming respectively, namely event, education and personal sharing. We highlight how these factors can shape viewer behavior differently under different live streaming types. Accordingly, practical suggestions can be provided to platforms and streamers.

2. Live Streaming

The world has witnessed the emergence of live streaming. The global live streaming market was predicted to expand from USD 30.29 billion in 2016 to USD 70.05 billion by 2021 (Research and Markets, 2016). Live streaming is particularly popular among the young generation. For example, in 2016, 63% of the U.S. Internet users aged between 18 and 34 watched live streaming (EMarketer, 2017). In China, more than three quarters of mobile live streaming users were below the age of 36 (Cheung, 2017).

One feature of live streaming lies in the social aspect, that is, the real-time interaction. Viewers can post real-time questions and comments which are visible to the streamer and all other viewers. The streamer can therefore react immediately. The next remarkable feature lies in the new monetization model – the consumption of virtual gifts provided by the platform. It is visible to both the streamer and other viewers regarding what the gifts are, whom the gifts are from, and how many gifts in total are received by the streamer. The new monetization model has created considerable value. For example, YY, a popular live streaming platform in China, achieved roughly USD 1 billion net revenue in 2016, most of which was from viewers' consumption of virtual gifts (Chen, 2017). Figure 1 shows examples of live streaming in China.

Figure 1 Examples of Live Streaming in China

Despite its rapid growth, live streaming also faces challenges. The competition is increasingly fierce. For example, a live streaming platform named *Guangquan* recently shut down as it struggled to keep up with its rivals (Yu, 2017). Moreover, among the viewers in China, only 21.4% purchased virtual gifts although the consumption of virtual gifts is the major revenue contribution of most live streaming platforms (iResearch, 2017a). Further monetization of the traffic is a big challenge for the live streaming industry. In order to enhance the competitiveness of live streaming platforms and the performance of streamers, there is a need for a deep understanding of the factors influencing viewers' behaviors.

3. Theoretical Framing

3.1. Uses and Gratification Theory

In this study, we introduce the UGT to investigate whether live streaming attracts people by satisfying their psychological needs. The UGT has already been used to explain why people watch video game streaming on platforms such as Twitch (Sjöblom and Hamari, 2017). It assumes people to be active users in terms of media choice. User choice of certain media is driven by the gratifications the media brings. Prior studies have attempted to classify different types of needs that motivate people to choose certain media. For instance, West and Turner (2010) have categorized five types of motivation: cognitive, affective, personal integration, social integration and tension release. Affective motivation refers to the need for entertainment (Wei and Lu, 2014). Tension release can also be incorporated as a dimension of entertainment (Korgaonkar and Wolin, 1999). Accordingly, we believe that the need for entertainment can be a type of people's core needs motivating people to use certain media. Other dimensions such as personal integration and social

integration reflect one's need for social interaction. Based on prior studies, entertainment and social interaction can be the core needs that motivate people to use social media (Zolkepli and Kamarulzaman, 2015; Liu *et al.*, 2017; Sjöblom and Hamari, 2017; Dux, 2018).

3.2. Social Interaction

Given that people's need for social interaction is critical in driving them to use live streaming (Sjöblom and Hamari, 2017), interactivity and presence are system features that should be considered as they enable smooth and effective communication (Bao et al., 2016). Moreover, it is found that people use social media to express and enhance their social status (Sjöblom and Hamari, 2017). Hence, the features enabling people to display and express their social status may also influence viewer behavior in live streaming. The following three factors are thus proposed:

3.2.1. Interactivity

Interactivity is seen as a key element in online communication (Ou *et al*., 2014; Tajvidi *et al.*, 2017). It refers to the extent to which people are allowed to communicate in real time (Steuer, 1992). It encompasses three dimensions, namely active control, two-way communication and synchronicity (Liu, 2003). Active control refers to the degree of control that participants have over the information exchanged; two-way communication indicates that the interaction allows two-way flow of information; and synchronicity means the degree to which participants are able to communicate synchronously. Previous studies have shown that interactivity is closely related to positive attitudes such as trust and satisfaction (Bao et al., 2016; Teo et al., 2003). In e-marketplace, interactivity plays a critical role in building good relationships between buyers and sellers as it helps achieve high-quality communication (Ou *et al*., 2014). As such, we believe that interactivity may account for viewer behavior in live streaming.

3.2.2. Presence

Presence is one's perception of being in an environment (Steuer, 1992). It often consists of two dimensions: telepresence and social presence. Telepresence is defined as one's sense of being present in an environment induced by the medium (Kim and Biocca, 1997). It describes the feeling of physical closeness to a remote person. Social presence refers to one's awareness of other people and interpersonal relationships during the interaction (Khalifa and Shen, 2004; Lowry et al., 2009). It reflects psychological distance between the communicator and the other (Khalifa and Shen, 2004; Richardson and Swan, 2003). While telepresence reflects the extent of physical proximity one feels, social presence reveals the degree of psychological proximity in terms of human contact, human sensitivity and warmth (Gefen and Straub, 2004; Ou *et al.*, 2014). Presence can lead to rich interpersonal relationships and contribute to the purchase and repurchase intentions in online shopping (Gefen and Straub, 2004; Ou *et al.*, 2014; Jin *et al.*, 2017). Thus, it is possible that presence in live streaming is appreciated by viewers.

3.2.3. Social Status Display

It is suggested that 'social status is frequently thought of as the relative ranking of members of each social class in terms of specific status factors' (Schiffman and Kanuk, 2004, p. 372). Consumption as a manifestation of one's social status was first prescribed in the study of O'Cass and Frost (2004) where conspicuous consumption is a characteristic of the social class with certain accumulated wealth. Studies have shown that people's consumption motivations are driven by how consumption can allow individuals to associate themselves with a higher social status and boost their self-esteem (O'Shaughnessy and O'Shaughnessy, 2002). Apart from the enhancement of self-esteem, another reason for social status display can be the desire to achieve social compliance (Goldsmith *et al.*, 1996). People with higher social status are more likely to gain social approval

within the group (Solomon, 1983; Ger and Belk, 1996; Goldsmith *et al*., 1996). In live streaming, many viewers do not purchase virtual gifts, so the consumption behavior can differentiate viewers who buy virtual gifts from average viewers. Some viewers may show off their financial power by buying expensive virtual gifts. Therefore, social status display is considered in live streaming.

3.3. Entertainment

Entertainment can be the core need that drives people to use social media. Advertising studies have already elaborated how stimuli (e.g., humor appeal and sex appeal) can shape people's behavior by satisfying their needs for entertainment (Whiting and Williams, 2013).

3.3.1. Stimuli

In live streaming, streamers seek to retain viewers' attention and to stimulate their consumptions. Live streams thus can be considered not only as the products or services that streamers offer and 'sell', but also as advertisements that streamers use to promote themselves and attract viewers. Advertisements are persuasive stimuli (Moore and Lutz, 2000; Bart *et al*., 2014). Accordingly, we expect that live streams can also serve as advertising stimuli and have persuasive power.

A well-recognized advertising stimulus in marketing literature is humor. Humor appeal is often characterized with incongruent framing, such as bringing together frames beyond people's expectation or reinterpreting the original frames (Conway and Dubé, 2002). With humor appeal, people tend to experience pleasure and emotional release (Spielmann, 2014; Sternthal and Craig, 1973). Moreover, humor appeal may attract people's attention toward the message and stimulate information processing. The increased attention is likely to enhance comprehension, yielding, retention and action regarding the message. In addition, humor appeal may activate arousal,

causing positive affect (Lammers et al., 1983). Prior literature has also suggested that humor can function as a reward which in turn affects persuasion (Markiewicz, 1974).

Another commonly studied advertisement stimulus is sex appeal. Sex appeal involves sexually erotic features including body display, sexual and suggestive behaviors, and sexual referents (Reichert, *et al*., 2001; Reichert, 2002). Body display is about displaying the human body in revealing ways. There are different levels of body display depending on what clothes are worn and how much is revealed. Sexual behaviors are provocative actions. For example, exposing the neck and talking in seductive tone are commonly used sexual behaviors in advertisements. Sexual referent involves using verbal and/or visual elements for sexual innuendo or suggestive double entendre. Previous studies (e.g., Das *et al*. 2015) have suggested that sex appeal may affect the effectiveness of advertisement through four mechanisms. First, sex appeal tends to elicit momentary and prolonged attentional responses. Second, sex appeal may stimulate positive (e.g., attraction) or negative (e.g., embarrassment) affective responses. Third, sex appeal may cause misattribution of arousal where people misinterpret their physiological activities as caused by the interest in the brand or product. In addition, sex appeals may also influence information processing and distract people from elaborating informational content.

Humor and sex appeal are common in live streams. Although encouraging the use of humorous communication skills and employing good-looking individuals are widely-used strategies in live streaming, few studies have empirically investigated their impacts. Therefore, this study adopts the concepts of humor appeal and sex appeal from marketing literature to study their effects on viewers' continuous watching intention and consumption intention.

4. Qualitative Exploration

There is limited consolidated research investigating the live streaming phenomenon in a systematic way. According to Venkatesh *et al*. (2016), when researchers try to holistically investigate a phenomenon that lacks systematic and conclusive studies, a mixed-methods research design should be applied. Therefore, a sequential mixed-methods research design is employed in this study. Following Furneaux and Wade (2011), this research started with an exploratory qualitative study and then a quantitative study was conducted to test the refined framework.

The initial theoretical foundation aims to develop an understanding of potential factors that may play important roles in live streaming. We expected that knowledge about the phenomenon would increase as the study progressed. This research adopted the semi-structured interview to explore the following questions: What types of live streaming did people watch? What factors might have salient influences on continuous watching and consumption intentions in live streaming?

The semi-structured interview method was selected for the following reasons. First, it enables in-depth investigation of research questions from each participant's independent perspective (Furneaux and Wade, 2011). Furthermore, it can avoid potential embarrassment of sharing opinions in front of a group. It also enables researchers to raise new issues during the process (Bryman and Bell, 2011). An interview guide was developed based on the initial theoretical framing for qualitative investigation. It also incorporated questions about participants' watching habits such as the types of live streaming they often watched.

The criterion-based sampling was used to look for participants who had diversified experience of watching live streaming or spending money in live streams (Furneaux and Wade, 2011). Participants were university students (selected from different universities) as the main users of live

streaming are from the younger generation. According to recent reports and news, around 70% of live streaming users were under 30 years old and university students played a dominant role in the growth of live streaming industry (Larson, 2017; Lin and Lu, 2017). The interview participants of this study had rich experience of watching and/or consumption experience in different types of live streaming. We continued seeking participants until no new type of live streaming was mentioned and each type of live streaming was equally mentioned (Strauss and Corbin, 1998). A total of 16 participants were interviewed. The general information about the participants is illustrated in Appendix A. Each interview was held for around 35 minutes. All interviews were radio recorded with participants' consent. The interviews were conducted in Chinese and then transcribed into English based on the recordings by one researcher and one translator independently. The final version of the transcript was decided upon the agreement between the researcher and the translator (Brislin, 1970; Temple and Young, 2004).

4.1. Data Analysis

The texts were analyzed using manual coding. Two coders were required to independently and iteratively read the transcripts, as well as to label the texts to identify all possible motivations and any other relevant factors. This was to ensure that the salient factors came from the data set instead of the prejudice of researchers (Furneaux and Wade, 2011; Strauss and Corbin, 1998). When each concise code set was established, the codes were checked to ensure coding consistency. The process stopped when coders reached an agreement on the codes (Bryman and Bell, 2011). Based on the agreed coding scheme, two coders processed the full transcripts and discussed the inconsistencies until reaching an agreement on the final version.

Typology of live streaming was identified based on the information provided by the participants. Participants were asked to describe the live streams they had watched and to nominate as many live streaming categories as possible. The mentioned live streaming categories were then assembled and disassembled into types to ensure external heterogeneity between types and similarity within one type (Kluge, 2000). The typology was mainly descriptive. It was iteratively checked with participants.

4.2. Results and Hypotheses Development

According to the interview, live streaming was classified into three broad types based on content, namely event, education and personal sharing (see Table 1). Event live streaming refers to the live stream that broadcasts large events such as e-sport matches. Education live streaming is the live stream that offers the teaching of certain skills. For example, several participants mentioned that they learned make-up skills from streamers who provided step-by-step tutorials in real time. In such cases, they may gain certain knowledge which they could not obtain from mainstream educational resources (e.g., how to make a model of an anime character on one's own). Personal sharing live streaming involves sharing of an individual's life or talents. This can be a showcase of talent, such as singing, dancing or gaming. It can also be the sharing of personal life like showing one's pet and just eating or sleeping.

Type	Event	Education	Personal Sharing	
Examples	Sport/E-Sport Concert Press conference News	Language Beauty and makeup Game guide Photoshop skill	Singing Dancing Playing game Eating	Talk show Talent show Reality show Pet show

Table 1. Typology of Live Streaming

In terms of the concepts from the initial theoretical framing, changes were made based on the responses from interviewees. Participants pointed out that in live streaming they could interact with the streamer freely, which was more entertaining than passively receiving the content. They could also ask questions and communicate with others, which encouraged further engagement in the environment. There was also evidence from participants showing that they spent money because it showed their 'importance' among the viewers as they were making significant contributions to the streamer. With regards to the appeal from streamers, there were participants emphasizing that they stayed in the live stream room because the streamer was funny, good looking or sexy. They were willing to buy virtual gifts if the streamer was attractive. Therefore, interactivity, social status display, humor appeal and sex appeal were reflected from and supported by the data. We originally considered presence as a potential factor encouraging viewers to visit a live stream room repeatedly. However, the participants' responses provided relatively little evidence to indicate that the feeling of or desire for presence was important. When the researchers discussed presence related questions, the responses from most participants indicated little importance of presence. Hence, the concept of presence was not incorporated in the refined

theoretical framework. Based on the literature and the qualitative findings, the hypotheses were developed accordingly (see Table 2).

4.2.1. Interactivity

We argue that interactivity contributes to high-quality inter-personal communication in live streaming. The interactive communication process makes viewers feel that the streamer is approachable. They can freely deliver their thoughts and messages in real time. At the same time, the streamer can get feedback from viewers and react simultaneously. The high efficiency and effectiveness, reciprocal communication and active control experienced by viewers enhance the interaction quality and result in favorable attitudes (Chiang and Hsiao, 2015). Furthermore, interactivity can increase viewers' perceived value of the live stream (Bao et al., 2016; Teo et al., 2003). Streamers can show that they care about what viewers expect and act according to what viewers request. The favorable attitudes such as satisfaction or sense of fun may enhance viewers' loyalty and motivate them to continue watching. Therefore, we propose:

H1: Interactivity is positively associated with continuous watching intention.

4.2.2. Social Status Display

As only few viewers tend to purchase virtual gifts in live streaming, consumption of virtual gifts can be considered as one's manifestation of financial power (Huang, 2012). Since the consumption is visible to all other viewers, those who make purchases can be considered as the rich class by others. Moreover, a viewer who purchases gifts may have more power in shaping the content and the streamer's performance as other viewers are willing to follow up the requests posted by her or him. This indicates that one may attempt to demand social compliance through the consumption of virtual gifts in live streaming. Therefore, we propose:

H2: Social status display is positively associated with consumption intention.

4.2.3. Humor Appeal

A humorous message tends to enhance people's perception of source credibility and liking for the source, which further helps create a positive attitude and increase the persuasive effect of the message (Sternthal and Craig, 1973). In live streaming, a humorous streamer can first serve viewers' entertainment purposes. The enjoyment or relief from emotional strain experienced by viewers may lead to their favorable attitudes toward the streamer. The enjoyable environment created by the streamer can induce positive evaluations and boost credibility, which in turn motivates viewers to watch continuously. Additionally, humor also promotes persuasive effects, leading to a greater impact of the message delivered by the streamer. When a humorous streamer shows interests in gifts, viewers are more likely to be affected and to send virtual gifts. Thus, the favorable attitudes and persuasive effects stimulated by humor may increase viewers' willingness to buy virtual gifts in live streaming. Therefore, we propose:

H3a: Humor appeal is positively associated with continuous watching intention.

H3b: Humor appeal is positively associated with consumption intention.

4.2.4. Sex Appeal

Sex appeal is found to be attention grabbing, emotion inducing, sex suggestive and memorable. It thus can have positive effects on people's processing of messages and purchase intention (Reichert *et al.*, 2001). Live streams with sex appeal are more likely to grab viewers' attention and to win their limited information processing resources, thus standing out from numerous other live streams. As sexual content tends to be memorable, it can be easier for the viewer to recall the streamer's

performance, which encourages the viewer to watch the streamer's live streams in the future. Moreover, live streams with sex appeal may lead to a stronger sense of engagement and gratification. As behavioral scientists suggest, if a communicator is considered to stimulate gratification, favorable attitudes are likely to be developed toward her or him, which enhances persuasion effects (Brand et al., 2012; Caballero and Pride, 1984). In addition, sex appeal has emotional effects. By inducing positive valence and high arousal emotions toward the streamer, sex appeal again may lead to positive attitudes and evaluations toward the streamer. Such positive attitudes and evaluations would further stimulate viewers' continuous watching intention and consumption intention. Based on the above, we propose that:

H4a: Sex appeal is positively associated with continuous watching intention.

H4b: Sex appeal is positively associated with consumption intention.

Research model is shown in Figure 2.

Hypotheses	Support from Participants

H1	'…He is the only one who answers my question. That's why I go for him…' (Participant 15)
H2	'…sometimes I did feel like sending expensive gifts to make others jealous of me…' (Participant 14)
H3a	'…I like watching him because he is funny…' (Participant 3)
H3b	'…I think delivering such content in such an exciting way is challenging, so I just want to show my appreciation (with gifts) …' (Participant 12)
H4a	'…I like him because of his physical characteristics, like his voice is sexy…' (Participant 1)
H4b	'…She is my type of girl. I enjoy supporting what she is doing…' (Participant 16)

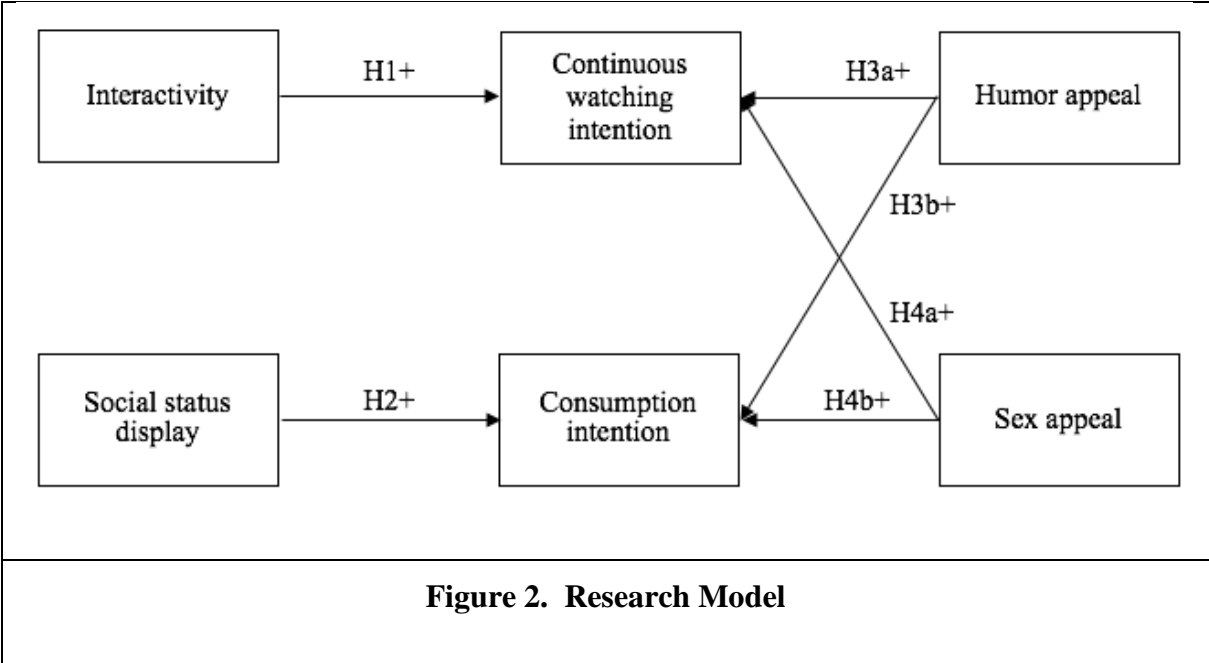**Table 2. Qualitative Findings and Corresponding Hypotheses**

Figure 2. Research Model

5. Quantitative Assessment of Research Model

5.1. Methodology

5.1.1. Measurement Development and Survey Design

Survey method was used to test the proposed model as it is an effective way to obtain personal attitudes and beliefs, along with the benefits of the generalizability of findings (Kerlinger, 1973). All measurements were adapted from prior studies. The scale for interactivity was adapted from Liu (2003). The scale for social status display was adapted from Souiden *et al*. (2011). The humor appeal scale was adapted from Zhang (1996) and Cho (1995), and the sex appeal scale was adapted from Benzeval *et al*. (2013). The scales for continuous watching intention and consumption intention were adapted from Venkatesh *et al*. (2012) and Pavlou (2003) respectively. The measurement items of all the constructs are listed in Appendix B. All items were measured through a seven-point Likert scale where '1=Strongly Disagree' and '7= Strongly Agree'. The typology of live streaming derived from the interview was used to investigate what type of live streaming people watched. An open option labeled 'others___' was added to this item in case possible new type occurred.

An English questionnaire was developed first, and the content validity was checked by 5 staff members and 10 students in a large university. The questionnaire was then translated into Chinese as the study was conducted in China. To ensure the translational equivalence, one translator first translated the original English questionnaire into Chinese, and another translator translated it back into English (Brislin, 1970). A pilot study was conducted with a small sample of 8 live streaming users to get feedback on the scale items. After further adjustments on the items, an agreement on the final version of questionnaire was reached. In the survey, we employed the recall method to

obtain respondents' perceptions. Respondents were asked to recall their watching experience of the live stream they liked most and to respond to items based on the experience. The recall method is a commonly used approach in the marketing field to collect perceptual data by tapping into one's memory for personal experience (Fang et al., 2014). Information systems research has also shown that the recalling process facilitates people's access to the long-term memory to shape perceptions (Kim, 2009). Thus, we believe that the recall method is applicable to the live streaming context.

5.1.2. Data Collection

Questionnaires were distributed online and offline. In total, we received 350 responses. As this study focuses on people's continuous watching and consumption intentions in live streaming, an upfront question was set to filter out those who had no experience of watching live streaming. Respondents who chose 'no experience of watching live streaming' at the beginning were directly led to the end of the questionnaire and therefore did not complete the questionnaire. 140 (40.0%) respondents who had no experience of watching live streaming were eventually removed from the sample, and 210 (60.0%) valid responses were left for analysis. The 210 valid responses were answered by respondents from different areas of China. Among them, 26 (12.4%) respondents' highest education was high school or below, 15 (7.2%) respondents' highest education was college diploma, 112 (53.3%) respondents had a bachelor 's degree, and 57 (27.1%) respondents had a master 's degree or above. This is consistent with the composition of the live streaming user population in China where over 70% of live streaming users have a college diploma or a higher degree (iResearch, 2017b). The age and gender of the 210 valid respondents are shown in Table 3.

	Gender	Age	

Live Streaming Type	Female	Male	18-25	26-35	36-45	> 45	Total Number of Respondents
Event	30	39	38	21	8	2	69 (32.9%)
Education	25	24	30	17	0	2	49 (23.3%)
Personal Sharing	57	35	49	35	8	0	92 (43.8%)
Total	112 (53.3%)	98 (46.7%)	117 (55.7%)	73 (34.8%)	16 (7.6%)	4 (1.9%)	210

Table 3. Demographic Details of Questionnaire Respondents

Possible nonresponse bias was assessed by comparing the early and late respondents on the variables in this study (Armstrong and Overton, 1977). Respondents that completed the questionnaire within the first three days of data collection were considered as the early respondents, while those who completed the questionnaires within the last three days were considered as late respondents. We found no significant differences between the early and late respondents on our key measures for each live streaming type, confirming that nonresponse bias was not a problem for our study.

5.2. *Data Analysis and Results*

PLS-SEM was used to test the research model and hypotheses (Hair et al., 2017). Analyses were conducted based on the overall sample including all three types of live streaming and on each type respectively.

5.2.1. Measurement Model

The measurement model was assessed on its validity and reliability. Interactivity is a second-order construct and was measured following the repeated indicators approach. Composite Reliability (CR) was assessed to evaluate the reliability of measurement items, and Average Variance Extracted (AVE) and Fornell-Larcker criterion were assessed to verify the convergent and discriminant validity (Hair *et al.*, 2011). The results are shown in Table 4 and Table 5. In the tables, 'I' represents Interactivity which is a reflective-formative second-order construct measured by Active Control (I_AC), Two-way Communication (I_TC) and Synchronicity (I_SN); 'SSD' represents Social Status Display; 'HA' represents Humor Appeal; 'SA' represents Sex Appeal; 'CWI' represents Continuous Watching Intention; and 'CI' represents Consumption Intention.

	Overall		Event		Education		Personal Sharing	
	CR	AVE	CR	AVE	CR	AVE	CR	AVE
I_AC	0.831	0.620	0.875	0.701	0.840	0.637	0.761	0.517
I_TC	0.921	0.743	0.948	0.821	0.926	0.758	0.899	0.690
I_SN	0.896	0.743	0.909	0.769	0.915	0.783	0.882	0.713
SSD	0.973	0.797	0.979	0.836	0.977	0.826	0.965	0.753
HA	0.946	0.853	0.957	0.881	0.948	0.860	0.935	0.828
SA	0.907	0.712	0.902	0.698	0.881	0.656	0.919	0.740
CWI	0.953	0.871	0.958	0.885	0.953	0.872	0.949	0.861
CI	0.963	0.895	0.961	0.892	0.969	0.914	0.959	0.886

Table 4. Composite Reliability and Average Variance Extracted of Constructs

For the analysis of the total sample, the value of CR for each construct ranged from 0.831 to 0.973, which was well above the acceptable level of 0.70. Moreover, the value of AVE ranging from 0.620 to 0.895, all exceeded the threshold of 0.50. In addition, a construct's correlations with other constructs were all below the square root of the construct's AVE, fitting with the Fornell-Larcker criterion. Therefore, the model was reliable and valid when considering the total sample. When separating the types of live streaming, all constructs' CR values were higher than the required 0.70 and their AVE values were higher than the required 0.50 for all types of live streaming. The construct correlations were also below the square root of each construct's AVE on all occasions. Thus, the reliability and validity were also verified for each live streaming type.

Several efforts were made to address common method bias. All respondents were made clear that they should choose the answers they considered correct and appropriate, and that the responses would be kept anonymous. Also, all measurement items and scales were adopted from existing studies. Harman's single factor test was performed to check for common method bias. The results revealed that the total variance for a single factor was less than 50%, confirming that common method bias was not a concern in the study.

Overall

	I	I_AC	I_TC	I_SN	SSD	HA	SA	CWI	CI
I	--								
I_AC	0.784	*0.787*							
I_TC	0.913	0.570	*0.862*						
I_SN	0.865	0.602	0.657	*0.947*					
SSD	0.332	0.408	0.195	0.333	*0.986*				
HA	0.310	0.149	0.362	0.224	0.093	*0.973*			
SA	0.314	0.372	0.191	0.316	0.523	0.252	*0.952*		
CWI	0.403	0.270	0.414	0.316	0.266	0.512	0.334	*0.976*	
CI	0.313	0.333	0.240	0.272	0.538	0.250	0.479	0.454	*0.981*

Event

	I	I_AC	I_TC	I_SN	SSD	HA	SA	CWI	CI
I	--								
I_AC	0.882	*0.837*							
I_TC	0.951	0.759	*0.906*						
I_SN	0.895	0.708	0.773	*0.877*					
SSD	0.327	0.352	0.266	0.302	*0.914*				
HA	0.303	0.184	0.389	0.190	0.171	*0.939*			
SA	0.408	0.406	0.378	0.338	0.628	0.428	*0.835*		
CWI	0.221	0.202	0.267	0.095	0.303	0.475	0.445	*0.941*	
CI	0.262	0.353	0.179	0.229	0.603	0.198	0.484	0.383	*0.944*

Education

	I	I_AC	I_TC	I_SN	SSD	HA	SA	CWI	CI
I	--								

Personal Sharing

	I	I_AC	I_TC	I_SN	SSD	HA	SA	CWI	CI
I	--								

I_AC	0.774	*0.798*								0.650	*0.719*							
I_TC	0.924	0.565	*0.871*							0.885	0.397	*0.831*						
I_SN	0.911	0.633	0.751	*0.885*						0.825	0.469	0.527	*0.844*					
SSD	0.452	0.504	0.307	0.452	*0.909*					0.203	0.344	0.039	0.251	*0.868*				
HA	0.250	0.068	0.363	0.136	0.058	*0.927*				0.353	0.188	0.312	0.313	0.018	*0.910*			
SA	0.260	0.425	0.071	0.312	0.536	0.058	*0.810*			0.203	0.264	0.063	0.259	0.417	0.200	*0.860*		
CWI	0.429	0.287	0.430	0.375	0.292	0.592	0.190	*0.934*		0.540	0.309	0.485	0.455	0.205	0.468	0.319	*0.928*	
CI	0.377	0.405	0.245	0.403	0.702	0.286	0.524	0.555	*0.956*	0.310	0.289	0.239	0.258	0.448	0.222	0.496	0.436	*0.941*

Note: Correlations among formative constructs are highlighted in gray. Interactivity is the second-order construct that is formatively measured by Active Control, Two-way Communication and Synchronicity. All other constructs are reflectively measured first-order constructs. Square root of each construct's AVE is shown in italics.

Table 5. Fornell-Larcker Test

5.2.2. Structural Model

SmartPLS 2.0 was used to test the hypotheses. Interactivity is a reflective-formative second-order construct, and this study used the repeated indicator approach to obtain the latent variable scores of the first-order constructs. Those latent variable scores were then used as indicators to form the second-order construct. The results of the structural model are shown in Figure 3 and Table 6.

The results indicate that the relationship between interactivity and continuous watching intention is significant if the live streaming type is not specified. When considering the live streaming type, such relationship is significant for education and personal sharing live streaming, but not significant for event. Thus, H1 is partially supported. In terms of social status display, it is positively and significantly associated with consumption intention without specifying the live streaming type. For each type of live streaming, this association is also consistently positive and significant. Therefore, H2 is supported. Humor appeal is found to significantly and positively influence continuous watching intention for all live streaming types. Hence, H3a is supported. However, the relationship between humor appeal and consumption intention is not significant when type is not taken into consideration. When types are specified, this relationship appears to be significant for education live streaming. Thus, H3b is partially supported. For sex appeal, it does not significantly affect continuous watching intention without considering live streaming types. Taking types into account, the relationship between sex appeal and continuous watching intention is found significant for event and personal sharing live streaming. Therefore, H4a is partially supported. Moreover, sex appeal is significantly related to consumption intention when types are not distinguished. While testing the relationship in different live streaming types, the

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relationship is found significant for education and personal sharing live streaming but not significant for event live streaming. Based on the results, H4b is also partially supported.
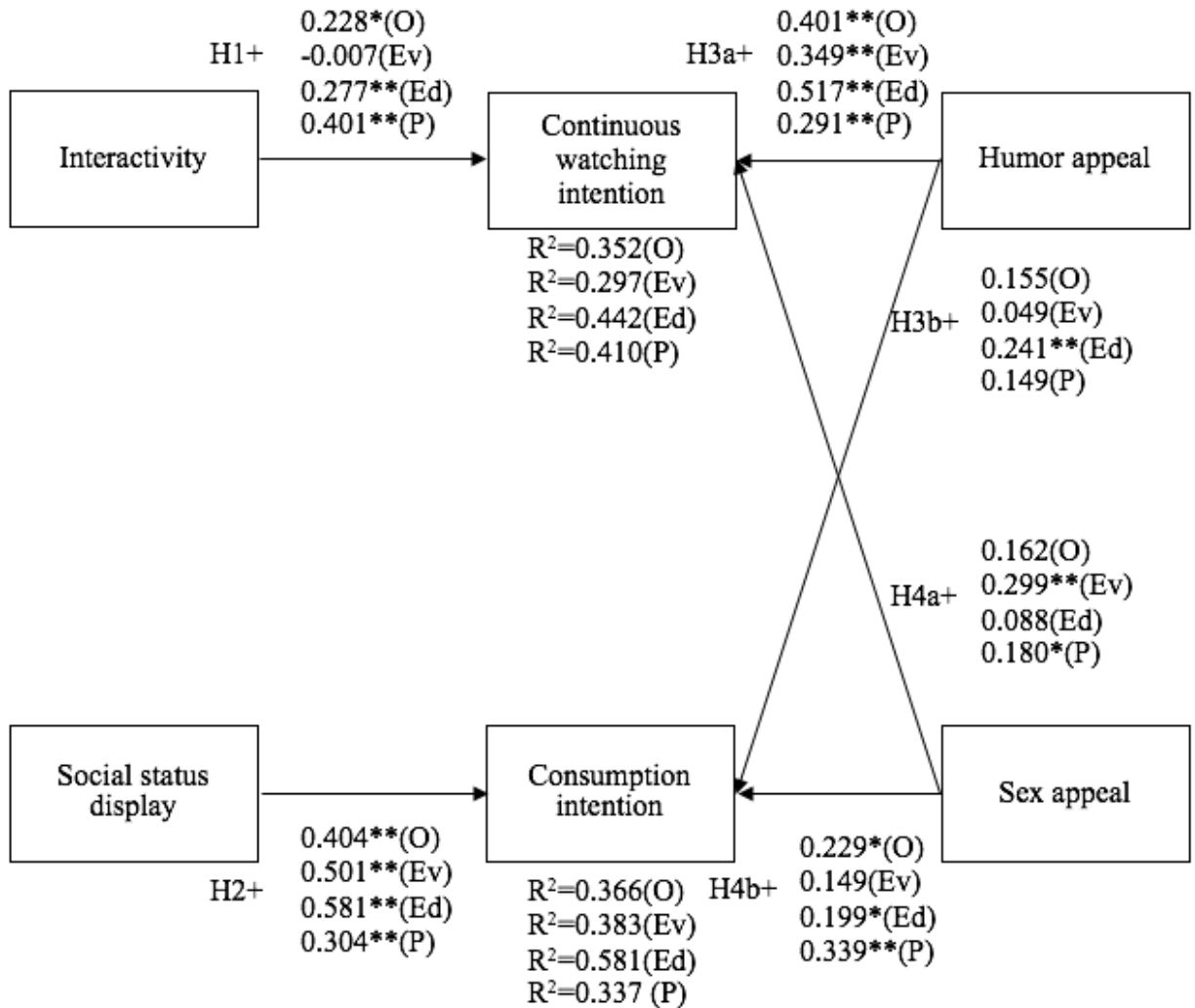
Note: 'O' represents Overall; 'Ev' represents Event; 'Ed' represents Education; and 'P' represents Personal Sharing. ** represents p<0.01 and * represents p<0.05.

Figure 3. Research Model Results

Hypothesis		Overall			Event			Education			Personal Sharing		
		Path Coefficient	T Value	S/NS	Path Coefficient	T Value	S/NS	Path Coefficient	T Value	S/NS	Path Coefficient	T Value	S/NS
H1	I->CWI	0.228	2.194*	S	-0.007	0.071	NS	0.277	4.190**	S	0.401	3.837**	S
H2	SSD->CI	0.404	3.943**	S	0.501	4.761**	S	0.581	7.785**	S	0.304	3.044**	S
H3a	HA->CWI	0.401	3.879**	S	0.349	3.317**	S	0.517	6.149**	S	0.291	2.934**	S
H3b	HA->CI	0.155	1.762	NS	0.049	0.523	NS	0.241	3.365**	S	0.149	1.848	NS
H4a	SA->CWI	0.162	1.679	NS	0.299	2.730**	S	0.088	0.839	NS	0.180	2.095*	S
H4b	SA->CI	0.229	2.016*	S	0.149	1.157	NS	0.199	2.123*	S	0.339	3.199**	S

Note: ** represents p<0.01 and * represents p<0.05. 'S' represents Supported and 'NS' represents Not Supported.

Table 6. Hypotheses Test

6. Discussion

There are several key findings based on the results. First, social status display is found to strongly motivate people to purchase virtual gifts in all types of live streaming. Streamers tend to show their gratitude toward those gift senders in front of other viewers. In such cases, the gift senders can show their social status to others and are likely to feel their self-esteem enhanced, as suggested by previous research (Ger and Belk, 1996; Solomon, 1983; Thruong et al., 2008). Moreover, demonstrating social status through the purchase of virtual gifts may grant gift senders with higher social power, which is consistent with prior studies arguing that conspicuous consumption is able to bring social compliance (Goldsmith et al. 1996). The results also imply that in the live streaming context, people tend to buy virtial gifts to show off their wealth no matter what type of live stream they are watching.

Second, our results highlight the role of sex appeal in both continuous watching and consumption intentions. The encouraging effects of sex appeal on people's behavioral intention can be illuminated by extant literature in advertising. Sex appeal like sexual arousal can easily draw people's attention and trigger people's favorable attitudes toward the live stream (Caballero and Pride, 1984; Reichert, 2002). Nevertheless, for education live streaming, sex appeal does not seem to be an incentive for continuous watching. One possible explanation can be that, in event and personal sharing live streaming, entertainment is the focus and sex appeal is likely to increase the entertainment value of live streaming (MacInnis *et al*., 1991). However, for viewers who watch education live streams, learning is the main purpose and sex appeal is not supposed to facilitate learning. Surprisingly, although sex appeal does not encourage continuous watching in education live streaming, it contributes to people's willingness to purchase virtual gifts in this type of live

streaming. This may be because sex appeal provides extra value in addition to the initially expected benefits and viewers tend to be willing to pay for such additional value (Kuo et al., 2009; Zeithaml, 1988). This also happens in personal sharing live streaming. When it comes to event live streaming, the marginal entertainment value from the streamer's sex appeal may be masked by viewers' emphasis on the event itself. Hence, sex appeal does not lead to consumption intention in event live streaming.

We find humor appeal to positively influence continuous watching intention for all types of live streaming. This is because humor appeal functions effectively in fulfilling one's desire for enjoyment and relief of emotional strain (Spielmann, 2014; Sternthal and Craig, 1973). However, humor appeal only affects consumption in education live streaming. One possible explanation is that humor appeal is perceived as an additional value in education live streaming since it helps viewers learn in a relaxing way. People watch event and personal sharing live streaming mainly for entertainment while they watch education live streaming mostly for learning. Therefore, event and personal sharing live streaming are likely expected to be entertaining, whilst viewers are less likely to assume education live streaming to be funny. The marginal value of humor appeal can be stronger in education live streaming than any other types. Consequently, viewers are more likely to purchase virtual gifts to reward the the streamer with humor appeal in education live streaming.

Finally, interactivity enhances continuous watching intention in all types of live streaming except for event live streaming. It is supported by extant studies that high interactivity brings high involvement and high-quality communication experience, which in turn increases perceived value of live streaming and strengthens favorable attitudes of viewers (Bao et al., 2016; Teo et al., 2003). The results can also be explained by prior research on perceived sense of community: people may expect certain level of interactivity in online activities that involve multiple participants (Drouin

and Yartanian, 2010). For education and personal sharing live streaming, real-time interaction not only enriches content but also ensures the quality of viewers' experiences. In contrast, event live streaming does not emphasize interactivity. For example, viewers prefer to focus on what is going on in events rather than commit to two-way communication or unnecessary interruption. Thus, interactivity does not lead to continuous watching intention for this type of live streaming. The summary of findings is illustrated in Table 7.

	Continuous Watching Intention			Consumption Intention		
	Event	**Education**	**Personal Sharing**	**Event**	**Education**	**Personal Sharing**
Interactivity	Not Supported	Supported	Supported	--		
	Viewers focus more on the event itself	Improves the communication experience				
Social Status Display	--			Supported	Supported	Supported
				Demonstrates financial power and high class		
Humor Appeal	Supported	Supported	Supported	Not Supported	Supported	Not Supported
	Enhances enjoyment and relieves emotional strain	Facilitates learning	Enhances enjoyment and relieves emotional strain	Supposed to be entertaining, no additional value	Viewers pay for additional value	Supposed to be entertaining, no additional value
Sex Appeal	Supported	Not supported	Supported	Not supported	Supported	Supported
	Makes the event more fun	Irrelevant to learning purpose	Makes sharing more entertaining	Viewers focus more on the event itself	Viewers pay for additional value	

Table 7. Summary of Findings

7. Conclusion, Implications and Future Research

This paper employs a mixed-methods research design to investigate factors that influence continuous watching and consumption intentions in live streaming. Based on the interview results,

we categorize live streaming into three types (i.e., event, education and personal sharing). We also propose a theoretical framework with factors from two dimensions: interactivity and social status display from the social interaction dimension; and humor appeal and sex appeal from the entertainment dimension. The model is then tested quantitatively. Our results confirm that in general, continuous watching intention is affected by interactivity and humor appeal while consumption intention is influenced by social status display and sex appeal. The effects of these factors are found to vary across different types of live streaming.

This paper has three main theoretical contributions. First, our study provides a starting point to examine the phenomenon of live streaming. We have developed a theoretical understanding of this new form of social media from two dimensions – social interaction and entertainment. Drawing on UGT, our study is among the first to theorize and empirically verify factors that drive people to continuously watch live streaming and purchase virtual gifts. Second, although prior literature has highlighted the importance of interactivity, social status display, humor appeal and sex appeal in shaping people's attitudes and behaviors, most studies have investigated their effects separately. This study incorporates these factors into one framework and tests their influences together in the live streaming context. Moreover, our study not only focuses on finding the factors that affect viewers' behavioral intentions in live streaming, but also investigates how these factors work differently in different live streaming types.

This paper also provides significant insights into how live streaming platforms and streamers can better design their strategies and maximize their value. We recommend that to retain viewers, platforms should promote interactive communication especially when the content is related to education and personal sharing. For example, platforms can reward viewers with user credits to encourage them to express ideas. Platforms can also offer monetary incentives to streamers to

encourage them to respond to viewers actively. To increase financial benefits, platforms and streamers can fulfill viewers' desire to show their social status in public for all live streaming types. For example, platforms may design features that can highlight the names of viewers who send gifts, and streamers can acknowledge these viewers' names during their broadcasts. When developing business strategies, platforms and streamers should also take humor appeal and sex appeal into consideration. We suggest streamers of all types of live streaming to inject humor into their content as viewers are more likely to continuously watch live streams from a humorous streamer. Streamers who are humorous in an education live stream can also make viewers more willing to purchase virtual gifts. Platforms can provide guidance and tips for streamers on how to tell jokes, especially for streamers broadcasting education-type streams. Platforms should also recruit streamers who are good looking and sexy, especially when the live streaming content is related to personal sharing. This is because sex appeal in personal sharing can not only enhance viewers' stickiness to the streamer but also help turn the traffic into monetary values.

Future studies can extend this research in the following ways. Firstly, our study is conducted in China and future research can test the research model in other contexts. Moreover, in the Chinese context where there is a strong materialistic culture (Podoshen *et al*., 2010), viewers mainly 'purchase' gifts for streamers. In some Western contexts, gifts may be framed as being 'donated' to streamers. Future research can thus compare the differences in live streaming design between different cultures. Next, though the sample used for data analysis in this study is representative of live streaming users, whether the initial sample is representative of the whole Internet population is not confirmed. Future study is recommended to test the generalizability of our conclusion. Besides, this study did not consider viewers' gender differences. Previous studies have found that the effects of stimuli could be different for different genders. Therefore, future research can extend

our current study by incorporating viewers' gender. In addition, different live streaming platforms have different pricing strategies. Future research can also consider the effect of viewers' price sensitivity on their consumption intention.

8. Acknowledgement

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Appendix A: Information of Interview Participants

No.	Demographics (age, gender)	LS Type	CW	C	No.	Demographics (age, gender)	LS Type	CW	C
1	21, female	Online gaming, Teaching, Singing	Yes	No	9	25, male	Gaming, Beauty	Yes	No
2	25, female	Teaching, Eating	Yes	No	10	29, female	Gaming	Yes	No
3	23, male	Online gaming	Yes	Yes	11	26, male	Movie, Sports	Yes	No
4	24, female	Photoshop teaching, Study experience sharing	Yes	No	12	25, female	Teaching	Yes	No
5	27, female	Education, Celebrity life sharing	Yes	No	13	25, male	Teaching	Yes	Yes
6	28, male	Gaming competition, Singing and dancing	Yes	No	14	32, female	Fashion show	Yes	Yes
7	24, female	Fashion sharing	Yes	No	15	23, female	Celebrity life sharing	Yes	Yes
8	32, male	Gaming, Beauty	Yes	No	16	27, male	Teaching, Beauty	Yes	Yes

Note: 'No.' represents Participant Number; 'LS' represents Live Streaming; 'CW' represents

Continuous Watching; and 'C' represents Consumption.

Appendix B: Questionnaire Items

Interactivity: Active Control -Adapted from Liu (2003)		**Humor Appeal** -Adapted from Cho (1995) and Zhang (1996)	
1	I felt that I had a lot of control over my experience.	1	I think the streamer is funny.
2	I could choose freely what I wanted to see.	2	I think the streamer is humorous.
3	My actions decided the kind of experiences I got.	3	I think the streamer is amusing.
Interactivity: Two-way Communication -Adapted from Liu (2003)		**Sex Appeal** -Adapted from Benzeval *et al.* (2013)	
1	The streamer was effective in gathering viewers' feedback.	1	I think the streamer is sexy.
2	This streamer facilitated two-way communication between herself/himself and viewers.	2	I think the streamer is good looking.
3	The streamer made me feel she/he wanted to listen to her/his viewers.	3	I think the streamer's clothing is revealing.
4	This streamer gave viewers the opportunity to talk to her/him.	4	I think the streamer has sexual suggestive behavior.
Interactivity: Synchronicity -Adapted from Liu (2003)		**Social Status Display** -Adapted from Souiden *et al.* (2011)	
1	This streamer responded to my questions very quickly.	1	I want to tell something about my success.

2	I was able to obtain the information I wanted without any delay.	2	I want to tell something about my prestige.
3	I felt I was getting instantaneous information.	3	I want to indicate my wealth.
Continuous Watching Intention -Adapted from Venkatesh *et al.* (2012)		4	I want to indicate my achievement.
1	I intend to continue watching live streaming in the future	5	I want to boost my image in front of others.
2	I will always try to watch live streaming in my daily life	6	I want to enhance my status.
3	I plan to continue to watch live streaming frequently	7	I want to gain respect.
Consumption Intention -Adapted from Pavlou (2003)		8	I want to enhance my popularity.
1	Given the chance, I intend to spend money in live streaming	9	I want to make me noticed by others.
2	Given the chance, I predict that I should spend money in live streaming in the future.		
3	It is likely that I will spend money in live streaming in the near future		