The Investigation of Hedonic Consumption, Impulsive Consumption and Social Sharing in E-commerce Live-streaming Videos

Completed Research Paper

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Abstract

The use of online live-streaming videos to promote brands and products in e-commerce is "exploding" in China. Whereas, little is known about the mechanism underlying viewers/ audience participating behavior in the rapidly growing online live-streaming videos for commerce phenomenon. Based on the stimulus–organism–response paradigm, this study endeavors to investigate the effects of content and social features (information quality, broadcaster attractiveness and para-social interaction) of on customers cognitive and emotional state (cognitive assimilation and emotional energy) and the subsequently their responses (hedonic consumption, impulsive consumption, and social sharing). 200 valid respondents were collected via cross-sectional online survey websites. The research results provide empirical evidences to support most of our hypotheses, indicating that hedonic consumption and social sharing behavior are determined by emotional energy and cognitive assimilation. These cognitive and emotional states, are influenced by information quality, broadcaster attractiveness, and para-social interaction. Impulsive consumption is only determined by emotional energy.

Keywords: S-O-R, live-streaming videos, consumption, social sharing

Introduction

The live streaming sector has continued to flourish in recent years. In China, up to July 2018, China had 425 million live streaming users (CNNIC 2018 July, p51). The annual revenue of OLSV service in 2017 have increased 40% compared to it in 2016 (CNNIC 2018, January). And in the E-commerce field, the use of OLSV to promote brands and products is "exploding" in China. Watching OLSV is rapidly becoming a mainstream activity for mobile-savvy millennials who "crave interactive, real-time and reality content," according to the report (Alizila, 2016). The online live-streaming videos for e-commerce (OLVE) uses the platforms enabling live-streaming functions, e-commerce (e.g. Taobao), social network sites (e.g. Facebook), online video platform (e.g. YouTube), gaming sites or app, and independent online streaming platform (e.g. Douyu). It's a similar model to home-shopping channels,

using live video typically with a host, either a KOL (key opinion leader, e.g. a popular V-blogger) or a paid celebrity actor. The nature of live video streaming activity not only offers a real-time watching experience for audiences, but also provides opportunities to communicate and socialize among broadcasters and other co-viewers, such as using the bullet-screen comments (Hu et al., 2017; Sjoblom et al., 2017). It's a platform integrating entertainment, social interaction, and commerce in a seamless way, creates the synergy for potential consumption.

Compared with flourishing development in practice field, academic realm has paid unequal attention to live streaming video activity (Hu et al., 2017). Few studies have investigated the online live-streaming videos as a medium for approaching games (Sjoblom et al., 2017; Sjoblom and Hamari, 2017; Bruce et al., 2018; Zhao et al., 2018) or the talent show videos (Hu et al., 2017), while little research has focused on the OLVE. In addition, with the rise of OLVE, both the audience and broadcasters are playing key roles in influencing the content and progress of the videos, which dramatically changed the factors influencing consumers' decisions making process. The environmental stimuli are determined by both parties, broadcasters and viewers, which is largely different from the traditional e-commerce shopping channel. In other words, the content aspects (e.g. product information, broadcaster attractiveness) and the social interaction aspects (e.g. para-social interaction) are facilitated by the fact that are being broadcast in real-time, in contrast to more traditional broadcast media such as television. The novel phenomenon of OLVE calls for the exploration of contextual stimulus influencing viewers' behaviors, while existing studies mostly focus on the technological stimulus, special clues, or e-store designs in traditional e-commerce context (Eroglu et al. 2003; Chan et al., 2017).

Moreover, the design of OLVE have added real-time social interactions and entertainment features for providing rich user experience and sustain users, which have been identified as critical elements to induce the potential consumptions and enhance social behavior (Huang and Benyoucef, 2013). Viewers gather in an OLVE room to obtain overarching information of products, enjoy social interaction with broadcaster and other co-viewers, relax and have fun. Hence, OLVE has provided a novel and social environment for users to conduct future hedonic and impulsive shopping as well as social behaviors. Whereas, previous research mainly investigated viewers' continuance watch intention, subscription, frequency or length of watch, and engagement (Hu et al., 2017; Sjoblom and Hamari, 2017), and few studies discussed the gift giving behavior as one type of consumption behaviors. Little research has explored distinct consumption behaviors and the social sharing behavior in this novel shopping context, and these viewer behaviors are significant outcomes of commercial, entertaining, and social features of OLVE. Consequently, it is still unclear how the viewers' behaviors are determined in the OLVE context.

Filling the research gaps, this study aims to (i) identify the unique feature as the contextual clues in OLVE and (ii) explicate their impacts on viewers' behaviors. The key research question is proposed: what are the factors influencing viewers' behaviors in OLVE? Hence, this paper explores the effects of content aspects and social features on viewers' hedonic consumption, impulsive consumption, and social sharing behavior. Specifically, we suggest that the characteristics of OLVE, namely information quality, broadcaster attractiveness and para-social interaction, acting as environmental stimuli in our research model based on S-O-R framework, will influence the viewers' cognitive and emotional state as the organism, which will further impact the consumption and social sharing behaviors.

We extend the literature on both the online live-streaming videos and e-commerce by examining how environmental stimuli including content features and social relationship features can shape a viewer's decision process of consumption and social behavior. Our findings, based on primary survey data collected from 300 viewers of OLVE, support our theoretical model and validate the theoretical lens of S-O-R in studying the phenomenon.

Theoretical Development and Research Model

Online Live-streaming Videos for E-commerce

OLVE creates a vivid context which connects entertainment, social interaction and commerce online in a way that enable consumers to feel comfortable buying products promoted. Unlike other shopping channels or existing media forms, the content on a live streaming platform is broadcast and viewed

synchronously (Scheibe et al., 2016; Hilvert-Bruce et al., 2018). Broadcasters usually act as the endorsers of products and brands, but broadcast their own screens and receive live comments from viewers around the world. To enhance interaction, the OLVE broadcaster engages in dialogues and interactions with his/her audiences while broadcasting (Hu et al., 2017; Sjoblom and Hamari, 2017; Zhao et al., 2018), for maintaining potential consumers and promoting products (Hamilton et al., 2014; Lim et al., 2012). Viewers can actively participate in, and influence OLVE broadcasts' presentation of the products he or she is interested in (Sjoblom and Hamari, 2017; Sjoblom et al., 2017). The audiences naturally develop a sense of virtual connection and bond with the broadcaster (para-social interaction), which is an important predictor of loyalty and engagement in virtual communication studies (Badrinarayanan et al., 2015; Hilvert-Bruce et al., 2018). These features of OLVE influence the viewers' cognitive state. In other words, OLVE is a way for consumers to learn more about products they are interested in, gaining more understanding and trust in what they are actually buying. Besides, a heightened emotional state may be derived from the process of watching OLVE, and the interaction with broadcasters and other viewers. For example, viewers are often aroused and feel exited due to the highly interactive experience, the entertaining content, and novelty of shopping on it (Alizila, 2016).

Stimulus – organism - response Model

Stimuli-Organism-Response (S-O-R) framework was proposed by Mehrabian and Russell (1974) initially, which was later modified by (Jacoby 2002). There are three critical elements in S-O-R model, namely stimuli, organism and response. The environmental stimulus may manifest in different formats, such as the websites features, marketing stimulus, internal stimulus and situational stimulus (Chan et al., 2017). The "organism" as a second component refers to the customers' affective condition (e.g. affective state and arousal) and cognitive condition (e.g. cognitive state of products and mechanism attractiveness), and it consists of the entire processes that intervene between both stimuli and responses to the customers (Liu et al., 2013). The last component of "S-O-R framework" is 'response'. Approach-and-avoidance behavior is usually studied as the response of consumers. Approach behaviors refer to all positive actions that might be directed toward a particular setting, for example, the purchase behavior and online communication (Chang et al., 2017).

In the next subsections, we propose that the broadcaster attractiveness, para-social relationship and information quality of products as a stimulus that influences the online streaming viewers' cognitive assimilation of the product and affective reactions referred as emotional energy while watching and interacting with broadcaster and other viewers, which ultimately affect the viewers' a variety of behaviors referred as impulsive consumption, hedonic consumption, and social sharing.

The Stimuli in E-commerce Live-streaming Videos

In this study, we focus on three atmosphere cues, namely information quality, broadcaster attractiveness, and para-social relationship. Information quality in this study refers to the goodness and usefulness of information in the live-stream with respect to people's expectations of information or in regard to other information available (Rieh 2002). The product information quality is improved by the technological and non-technological facets in OLVE. The technology used to convey information and the mechanism of OLVE , have enable the information quality presented better than it is in recorded video, static image or text on regular e-commerce website (Hilligoss and Rieh 2008).

Broadcaster attractiveness represents an important stimulus in OLVE mechanism design, and is defined as the physical attractiveness such as appearance, mental skills, personality, lifestyle, and talent the audiences perceive of an OLVE broadcaster in this study. In live-streaming videos, product cues and merchandise images are represented and endorsed by broadcasters (Chen and Lin, 2018). Leading the overall process of OLVE, the broadcasters play the key role in influencing the exposure of product information to potential consumers.

Para-social interaction is conceptualized as the imagination of interpersonal involvement and intimacy of the media user with a broadcaster (Schramm and Hartmann, 2008; Xiang et al., 2016). OLVE provides abundant opportunities for audience to communicate and socialize with the broadcasters and other co-viewers (Hu et al., 2017). The viewers naturally develop a sense of virtual connection and bond with the

broadcaster, (Badrinarayanan et al., 2015). Hence, we argue the para-social interaction facilitating the virtual involvement and intimacy with the broadcaster, is one strong stimuli in the live streaming environment.

The Organism in E-commerce Live-streaming Videos

In this study, we focus on cognitive assimilation as the cognitive state and emotional energy as the emotional state. Cognitive reactions from the stimulus, refer to the mental processes occurring in an individual's mind when he or she interacts with the stimulus (Eroglu et al. 2001, 2003). In this study, cognitive assimilation refers to the extent to which viewers' existing cognitions, beliefs or attitudes are adjusted through the acquisition, assimilation and absorption of external influences (e.g. new information and social influences) in live-streaming videos (Jiang et al., 2009).

In contrast, affective reactions can reflect the pleasure and excitement when interacting with a broadcaster, desirability of certain products, and heightened intention to share the content of live-streaming videos (Russell and Pratt, 1980; Chan et al., 2017). The affection in online live-streaming is a stable emotional state, and it is the outcome of the accumulation of long-term watching, interaction with broadcaster and other viewers, namely emotional energy Collins' (1987, 2004). It is developed through the perpetual circulation and connection with others in long-term interactive activities (Hu et al., 2017; Cottingham, 2012). Compared to arousal, emotional energy is 'a strong steady emotion state, not a short term disruption of a situation (Maloney, 2013).

The Responses in E-commerce Live-streaming Videos

Impulse buying covers a significant portion of retail turnover (Floh and Madlberger, 2013), and has been defined as "a purchase that is unplanned, the result of an exposure to a stimulus, and decided on the spot" (Piron 1991, p. 512). Similarly, impulse consumption in this study refers to the unanticipated purchases during the live-stream. A broadcaster often shows each details of the product, try on it as the viewers asked, illustrate the useful tricks, and interact with each viewer at real time. A suggestive impulse purchase may take place in live-streaming videos when a viewer has no plan for purchase, but sees a product recommended by a broadcaster and visualizes a need for it (Parboteeah, 2009).

Hedonic consumption in this study refers to the viewer's feeling of enjoyment through shopping via the live-stream. Hirschman and Holbrook (1982) advocated greater attention to hedonic consumption and the myriad ways in which consumers seek pleasure and enjoyment (Alba and Williams, 2013). OLVE enables consumers to feel comfortable buying products while enjoying the entertainment, novelty and pleasant social communication (Sjoblom and Hamari, 2017; Zhao et al., 2018). For some viewers, seeking and acquisition of products, such as something different, are hedonic rewards, not any utility resulting from purchase (Hausman, 2000; Alba and Williams, 2013).

Social sharing refers to an OLVE viewer's sharing behavior of live-stream experiences through a social network. For example, a viewer may share the live-streaming broadcaster's video showing make-up tips and products on her own Facebook page. For individual consumers, information sharing behavior in social network enhances interactions and provides information and knowledge (Tajvidi et al., 2018; Godey et al., 2016; Goel et al., 2013).

The Effects of "Stimulus" in E-commerce live-streaming Videos

The Effects of Broadcaster Attractiveness

The broadcaster attractiveness is mapped as the "stimuli" in this research model. While recommending a product or brand to viewers, broadcasters play the role of the representative or "endorser" of the product or brand. Research has shown that consumers tend to form positive stereotypes about the people attractive to them (Baker and Churchill 1977). And attractive endorsers are more useful in changing beliefs (Baker and Churchill 1977) and facilitating purchase decisions (Friedman et aI. 1976; Xu et al., 2017). The following hypothesis is developed:

H1a. Broadcaster attractiveness is positively associated with the cognitive assimilation.

Emotional energy in this study reflects the sustained exhilaration or enthusiasm that viewer feels in a live-streaming video, which induces initiative responses (Collins, 2004). Consumers usually have more enthusiastic to explore the products in an appealing shopping environment (Shen and Khalifa, 2012). In online-streaming videos, the broadcaster attractive to viewers is the key element of an appealing shopping environment, which can motivate the viewers' endured exhilaration.

H1b. Broadcaster attractiveness is positively associated with the emotional energy.

The Effects of Para-social Interaction

Para-social interaction presents a sense of friendship formed by audience members with media personalities (Rubin and Perse, 1987), such as the online live-streaming broadcaster. Viewers who experience para-social interactions may regard broadcasters as intimate friends, treat their suggestions as social cues to make decisions (Hu et al., 2017), and adjust their prior beliefs and attitude accordingly, namely cognitive assimilation in this study. In addition, studies have suggested that viewers are inclined to be more emotionally attached to and identified with media personas that provide richer experience of parasocial interaction (Brown, 2015; Frederick et al., 2012). This implies that viewers who engage in a para-social interaction with a broadcaster will be more likely to have high emotional energy to enact suggested responses. The hypotheses are proposed:

H2a Para-social interaction is positively associated with cognitive assimilation.

H2b Para-social interaction is positively associated with emotional energy.

The Effects of Information Quality

The information quality, such as product-related information (e.g. product features, price offers, and return policies) or the effectiveness of information content, is widely studied as the typical environmental cues influencing the cognitive state (Richard et al. 2010; Mollen and Wilson, 2010; Floh a,1, Maria and Madlberger, 2013). Due to the features of online live-streaming videos, several facets of the information quality are perceived to be good, such as the completeness, accuracy, currency and reliability (Hilligoss and Rieh 2008). Thus, viewers are more likely to adjust their previous cognitions accordingly. Through the lens of the S–O–R theory, the stimulus of live-streaming information quality is considered to influence viewers' cognitive states, that is, the cognitive assimilation. The hypothesis is proposed:

H3. Information quality is positively associated with cognitive assimilation.

The Effects of Organism on Responses in E-commerce Live-streaming Videos

The Effects of Cognitive Assimilation

In the cognitive assimilation process, a viewer absorbs the recommendation provided by broadcaster and adjusts the existing attitude accordingly. As the outcome of the cognitive assimilation, this study assumes that the consumers may respond in two forms of consumption behaviors. On the one hand, a viewer has no plan for purchase may generate new needs of a product, develop a belief that the product recommended can match the exiting needs, the desire to take the advantage of a special offer, or a pure impulse purchase. On the other hand, online live-streaming videos is entertained in nature, and cognitive assimilation is a pleasant and enjoyable process for customers. Cognitive assimilation may arouse the customers' experience of the novelty of shopping from live-streaming videos, which lead the viewers to obtain the hedonic gratification from the consumption. The hypothesis is proposed:

H4a. Cognitive assimilation is positively associated with impulse consumption.

H4b. Cognitive assimilation is positively associated with hedonic consumption.

Social media are ideal tools for social sharing behaviors, consumers can generate and spread live-streaming videos related information to their friends, peers, and other acquaintances without constraints (Kim and Ko, 2012; Vollmer and Precourt, 2008). OLVE viewers may obtain more social benefit by social sharing behavior, since they can interact with others in the social networks about their newly adjusted attitude or beliefs (Godey et al., 2016). We argue that, the more a viewer adjust the attitudes

and beliefs to be in accordance with the information in live-streaming videos, including the broadcaster, the products or brand, and other viewers, the more he or she would like to share the information in the social network sites. The hypothesis is proposed:

H4c. Cognitive assimilation is positively associated with social sharing behavior.

The Effects of Emotional Energy

According to Mehrabian and Russell's theory, the level of emotion experienced by an individual will determine his/her approach-avoidance response. The desire to enter or leave a particular environment – approach-avoidance behavior – includes three important aspects: a desire to explore an environment, a desire to communicate/interact with others in the environment and a reported satisfaction with the surroundings (Donovan and Rossiter, 1982). Emotional energy in this study indicating a sustained affection state of engaging in OLVE. Emotional energy is an indicator of "motivational power" (Poels and Dewitte, 2008). Viewers with high emotional energy feels stimulated and active to initiate approaching behavior. Emotional energy as the affective state are related with long time excitement to engagement in certain behavior, such as father's engagement with infants (Goldberg et al., 2002). Prior studies have revealed its relationship with shopping behavior, such as over-money spend behavior (Babin and Darden, 1995) and hedonic value of the shopping (Wang et al., 2007), and the social interaction (Ridgway et al., 1989). Similarly, viewers with high emotional energy are more incline to the impulsive consumption, hedonic consumption, and social sharing in the context of online live-streaming videos. The hypotheses are developed:

H5a. Emotional energy is positively associated with impulse consumption.

H5b. Emotional energy is positively associated with hedonic consumption.

H5c. Emotional energy is positively associated with social sharing behavior.

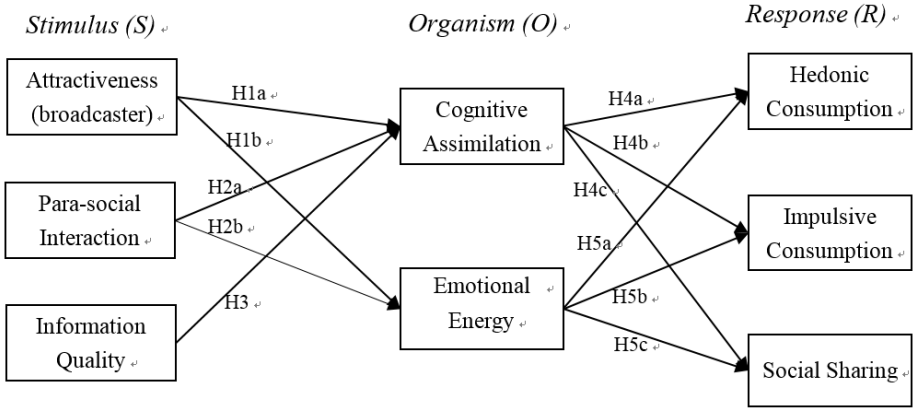

Figure 1. Research Model

Research Design

Measurement Development

The first stage in this study constructs a conceptual framework and develops the measures. We began the scale development process by surveying the extant literature for validated scales that could be used in our study. The majority of the scale items were adopted from prior work but modified slightly for the online live-streaming video context. For instance, the broadcaster attractiveness items were adapted from Ha and Lam (2016). The information quality items were adapted from Chen et al. (2018) and Dong et al. (2014). The measures for para-social interaction were taken from Metiu and Rothbard (2013) and Rubin et al. (1985). The measures for impulsive consumption (IC) were modified from Beatty and Ferrell (1998) and Hausman (2000). The measures for hedonic consumption were adapted from Hausman (2000). And the social sharing is modified from Galbreth et al. (2012) and Godey et al. (2016).

In order to ensure the content validity of the instrument, a small scale pretest and personal interviews were conducted. The feedback from the pilot respondents resulted in minor modifications to the wording

of 32 survey items. Eventually, the questionnaire consists of three parts, including motivation letter, background information and the items measuring the constructs of the research model. The construct items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Sampling and Data Collection

The proposed research model was tested with data collected from a web survey website (https://www.sojump.com/) and WeChat. The empirical data was collected during October 3 to October 16, 2018. Participants with experience of watching online live-streaming videos were cordially invited to support this survey. Every respondent who completed the questionnaire were offered reward such as lottery or money. After a strict screening and examining procedure, we use 200 valid questionnaires for further data analysis. According to the descriptive statistical results, 62% of the respondents are females, and 38% are males. And 77.4% 0f the respondents are 20 to 34 years old. To be more specific, 28% respondents are 20-24 years old, 26.7% respondents are 25-29 years old, and 22.7% of the respondents are 30-34 years old. As for the occupations of the respondents, students seem to be the largest population of OSLE viewers, and the proportion is 24.7%; whereas, the ratio of respondents from technological industry, service industry, teachers and government are 13.3%, 12%, and 10.6%. 54.3% of the respondents watch OLVE 1 to 4 times a week. And 68.7% of the respondents watch OLVE for 0.5 to 2 hours each time.

Analysis Methods

SEM techniques are best suited to data analysis in confirmatory research (Gefen, Straub, and Boudreau, 2000). As the second generation data analysis techniques (Chin, 1998; Gefen et al., 2000), partial least squares (PLS) were used in this study to assess the measurement model within the context of its theoretical mediated model, making it superior to multiple regression. In the measurement model the psychometric properties of all scales were assessed through a confirmatory factor analysis (CFA). This step was used to assess the reliability and validity of the measurement model and to test whether the empirical data conformed to the presumed model. A bootstrapping procedure was then used to estimate the statistical significance of the parameter estimates for path coefficients of the structural model.

Data Analysis and Research Results

Measurement Properties

The assessments of reliability, convergent validity, and discriminant validity were conducted. The reliability of the instruments was assessed by examining the composite reliability (Bagozzi and Yi, 1988; Bearden et al., 1993). The convergent validity is assessed by factor loading and Average Variance Explained (AVE) (Barclay et al., 1995; Chin, 1998; Fornell and Larcker, 1981). The discriminant validity is evaluated using the square root of the AVE criteria and the items load on their associated factors compared with the item loads on other factors (Chin, 1998). The results demonstrate a satisfactory fit.

As shown in Table 1, all of the factor loadings on their corresponding constructs are over the threshold of 0.707 and exhibit an acceptable quality of item reliability (Straub, 1989). Table 1 shows the composite reliability, Cronbach's alpha reliability, and square root of the AVE, as well as the correlations between the constructs. The values of Cronbach's alpha, composite reliability, and average variance extracted (AVE) of the constructs are all over the thresholds of 0.7, 0.7 and 0.5, respectively. The squared roots of AVE are also higher than their correlations with other constructs. Thus, the convergent and discriminant validity of all constructs in the proposed research model can be assured.

Table 1. Inter-construct Correlations

Construct	BA	PSI	IQ	EE	CA	HC	IC	SS
Attractiveness (BA)	(0.806)							

Para-social interaction (PI)	0.657	(0.820)						
Information quality (IQ)	0.626	0.668	(0.824)					
Emotional energy (EE)	0.632	0.657	0.692	(0.837)				
Cognitive assimilation (CA)	0.520	0.524	0.582	0.515	(0.780)			
Hedonic consumption (HC)	0.693	0.630	0.566	0.666	0.564	(0.809)		
Impulsive consumption (IC)	0.407	0.483	0.531	0.687	0.369	0.440	(0.880)	
Social sharing (SS)	0.526	0.548	0.647	0.749	0.468	0.592	0.679	(0.883)
Composite Reliability	0.881	0.891	0.894	0.904	0.861	0.883	0.932	0.934
Cronbach's Alpha	0.820	0.836	0.842	0.858	0.785	0.823	0.902	0.906
Minimal Factor loading	0.749	0.740	0.764	0.834	0.743	0.818	0.840	0.828

Note: Diagonal elements are the square roots of the AVE

Structural Model

The path coefficients and explained variances for the conceptual model in this study are shown in Fig. 2. The structural model was examined and the effects among those latent constructs were tested. Hypotheses testing were performed by examining the size, the sign and the significance of the path coefficients and the weights of the construct dimensions, respectively. The statistical significance of the weights can be used to determine the relative importance of the indicators in forming a latent construct. Fig. 2 shows the effects from all of the antecedents in the conceptual framework, accounting for 52.6%, 47.2%, and 57% of the variance in hedonic consumption, impulsive consumption, and social sharing respectively. The magnitude and significance of these path coefficients provide further evidence in support of the nomological validity of the research model. As a whole the research model has strong explanatory power for the three dependent variables, namely hedonic consumption, impulsive consumption and social sharing.

The causal relationship in the proposed research model, hypothesis H1 (a, b) are strongly supported, according to the significant path coefficient from broadcaster attractiveness to cognitive assimilation ($\beta = 0.193$, $p < 0.01$), and emotional energy ($\beta = 0.352$, $p < 0.001$). This result implies that the OLVE audience who perceive a higher level of broadcaster attractiveness are more likely to experience a higher level of cognitive assimilation and emotional energy. Similarly, H2 (a, b) are strongly supported, according to the significant path coefficient from para-social interaction to cognitive assimilation ($\beta = 0.161$, $p < 0.05$), and emotional energy ($\beta = 0.426$, $p < 0.001$). The direct effect drawn from information quality to cognitive assimilation is confirmed by the significant path coefficient ($\beta = 0.354$, $p < 0.001$), which strongly support H3. In addition, as show in Fig 2, cognitive assimilation exerts strong influence on hedonic consumption ($\beta = 0.274$, $p < 0.01$) and social sharing behavior ($\beta = 0.112$, $p < 0.05$), whereas, its effect on impulsive consumption is not statistically significant. H4a and H4b are supported by the empirical evidences. Emotional energy exerts significant and positive effects on impulsive consumption, hedonic consumption and social sharing behavior. Hence, H5 (a, b, c) are all strongly confirmed by the research results.

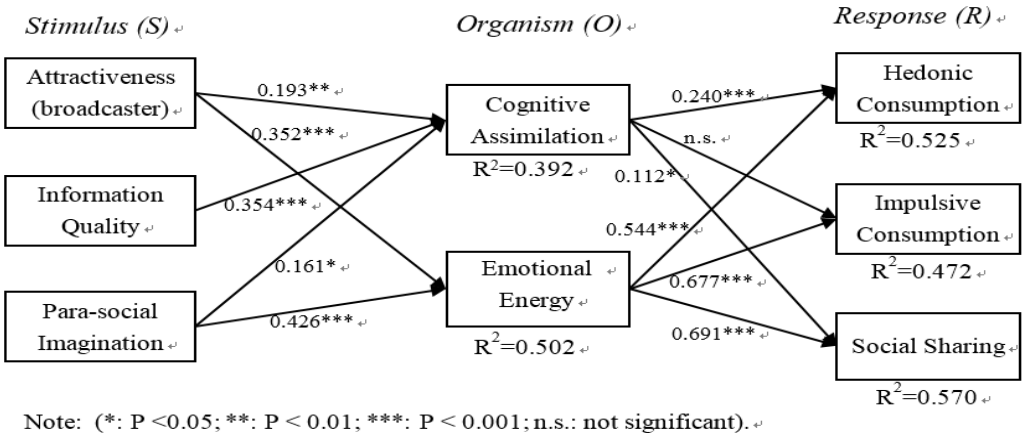

Figure 2. Structural Model

Discussion and Implication

Discussion

Our results suggest that both the content features and social relationship features influence the cognitive state and emotional state of viewers in online live-streaming videos, which, in turn, influence their purchase decision of product recommended and social sharing behavior. More specifically, regarding content features, the research results reveal that both product information quality and broadcaster attractiveness has a significant and positive impact on cognitive assimilation and emotional energy. As for the social features, para-social interaction is found to have a strong effect on both cognitive assimilation and emotional energy. Moreover, our results demonstrate that there are positive causal relationships between emotional energy and three types of responses, namely impulsive consumption, hedonic consumption, and social sharing behavior. Whereas, cognitive assimilation has a strong effect on viewers' hedonic consumption and social sharing behavior, although no such significant impact was observed on impulsive consumption.

Furthermore, the results have revealed several interesting findings. Firstly, among the three stimulus, para-social interaction exerts the most significant impact on emotional energy. The result corresponds to prior studies indicating that viewers are inclined to be more emotionally attached to and identified with media personas that provide richer experience of para-social interaction (Brown, 2015; Frederick et al., 2012). Secondly, information quality exerts the strongest influence on cognitive assimilation. It is not out of expectation, since the high information quality is positively associated with low risk of transaction (Chen and Lin, 2018), and further influence the cognitive assimilation process. Thirdly, the study provides statistical evidences to conclude that emotional state exert much stronger effects than cognitive state does on a variety of behaviors in the context of online live-streaming videos. In fact, numerous studies have indicated that emotional state (e.g. arousal, pleasure, affection) significant influence on a variety of behaviors (e.g. shopping and social behavior) (Chan et al., 2017).

Implication and Limitation

This paper makes several contributions to research. First, we find the results of this study to offer deeper insights to the phenomenon of online live-streaming video activity. Based on the S-O-R framework, we explain and validate the significant role of environmental stimuli including content clues and social relationship features in influencing the viewers' hedonic consumption, impulsive consumption, and social sharing behavior. Second, this research confirms the appropriateness of the S–O–R framework for investigating online live-streaming viewers' behaviors and therefore provides a reliable theoretical lens in studying the newly emerging phenomenon.

This research informs practitioners with several important implications. The results show that the content stimulus, including information quality effects the impulsive consumption, hedonic consumption and social sharing behavior via cognitive assimilation and emotional energy. Platform providers should develop the ability to create attract content to meet the viewers' expectancies. Besides,

providers should allocate more resources to the attractive broadcasters, based on the viewers' preference on broadcasting style, broadcaster personality, appearance and specialties, since the broadcaster attractiveness is a key determinant in influencing viewer's approaching behaviors.

Several limitations exist in this study. First, it is acknowledged that the research context selection and data collection process might restrict the generalizability of the results. We conducted the investigation in mainland China and collect data mainly from one online survey website. Future studies are suggested to extend current research scope to including other platforms. Meanwhile, cross national analysis is encouraged to offer a more inclusive understanding of online live-streaming phenomenon. In addition, regarding the proposed framework and selected constructs, future studies might explore additional antecedents, moderators, and control variables to develop a more holistic understanding of live video streaming consumption.

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