

# How IT Affordance Influences Engagement in Live Commerce: An Empirical Analysis Focusing on Social Cues as Moderating Effect

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## ABSTRACT

With the development of technology and media and the pursuit of non-face-to-face due to the corona pandemic, the influence of live commerce, a real-time streaming shopping channel, is growing. Starting from China, the popularity of live commerce is growing all over the world, and it has become an interesting topic among many practitioners and researchers. However, compared to its popularity, there are few studies on live commerce. Therefore, we build a theoretical model in terms of IT affordance such as visibility, guidance shopping, trading, and meta-voicing and investigate how live commerce affects engagement with customers. We empirically measure 428 individuals who have used live commerce using survey data. In addition, we conduct four types of scenario experiments on whether social cues on exposures of other consumers, influence customer engagement. Our results show that trading affordance has the most significant effect. This shows that the live commerce platform may want to devise a program that helps make payment easier for users who prefer a quick and simple process. Our study contributes to the literature by presenting the importance of IT affordance for live commerce.

*Keywords:* IT Affordance, Engagement, Live Commerce, Social Cues, Para-Social Interaction

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## I . Introduction

Through the COVID-19 pandemic, the era of non-face-to-face communication has begun with the development of internet technology and the expansion of consumers' engagement with online shopping.

Many social networking sites have started offering live streaming services in recent years, giving small merchants the opportunity to sell directly to consumers through the streaming service. Live streaming allows e-commerce to provide customers with a richer shopping experience (Ko and Chen, 2020). The devel-

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opment of information and communication technology and the expansion of media are dramatically changing our way of life. As a result, live streaming shopping on a platform has become a new model of social commerce. Product sales on e-commerce platforms have shifted from simple text and photos to formats that include more vivid, real-time consumption content, such as live commerce.

In addition, the consumers of the MZ generation are familiar with digital cultures such as social media, mobile video, and the Internet. Because information search and communication methods are different from previous generations, consumption patterns and life values are different, live commerce is not just shopping, but fun content. Such live streaming can enhance the shopping experience through social presence and interaction, reduce shopper uncertainty, and increase the level of trust in e-commerce merchants (Lu and Chen, 2021). Some e-commerce such as Facebook and Taobao, have begun using live streaming services. In China, a live commerce service platform that combines video content and e-commerce is already popular (Wang et al., 2018). Taobao, China's representative e-commerce platform, is being broadcast more than 2,000 times a day, and the cumulative number of viewers has already exceeded 10 million, establishing itself as a representative commerce platform.

According to statistics, as of February 2020, the number of Taobao merchants reached 1 million (iiMedia Research, 2020). Naver Live commerce in Korea is linked to Naver Pay and allows payment easily by clicking, increasing the access rate of many consumers. Live commerce has a conversion rate of 5 to 8%, whereas e-commerce has a conversion rate of 0.3 to 1%. (Shin, 2021). Accordingly, experts predicted that the domestic live commerce market, which was worth about 3 trillion won in 2020, will grow

to 8 trillion won by 2023. Large corporations have also begun to take an interest in live commerce platforms due to the new growth in the post-COVID-19 era (Ko, 2020). Live commerce has become very popular in recent years and there is a lot of interest in research on this topic. There hasn't been enough research on live commerce yet. Despite the growing popularity of live streaming shopping, few studies have investigated how live streaming affects customer engagement. While live-streaming shopping has been found to build customer engagement (Wongkitrungrueng and Assarut, 2018), it is still unclear whether enhancing IT affordances will positively impact customer engagement in live commerce. Previous studies of live streaming shopping have mainly focused on the motivations of viewers and streamers to use live streaming (Chen and Lin, 2018; Sjoblom and Hamari, 2017; Zhao et al., 2018) or most have considered the main system information (Ko et al., 2017) and traditional online commerce characteristics (Song and Lee, 2020). Additionally, the majority of factors are related to the characteristics of the platform, the show host, and the purchase intention (Kim, 2017; Kim and Huh, 2021).

Therefore, a theoretical framework that can explain the technical affordance and customer engagement of live commerce is needed and it is necessary to conduct empirical verification. This paper presents a theoretical background to live commerce using the affordance theory. In addition, to live commerce technical features, affordances help us to understand customers' behavior when they interact with these features (Leonardi, 2013; Parchoma, 2014). Affordance is created when customers use and interact with live streaming shopping (Aladwani, 2017). In this paper, we are conducting a study of online commerce on IT affordance (Dong and Wang, 2018; Sun et al., 2019). Therefore, we believe that this affordance con-

cept is appropriate to study live commerce as a new form of social commerce.

Also, there was also a live commerce research paper using para-social interaction as a mediator variable in this paper. (Ko and Chen, 2020). Xiang et al., (2016) found that socially relevant factors are also determinants of para-social interactions. A streamer not only provides information about products and instructions for use in Live commerce but also shares product preferences or experiences with viewers. Hence, viewers may prefer broadcasts that increase their para-social interaction with live streamers.

In addition, previous studies (Qi et al., 2016) have suggested that there is an influence of opinion spam, that is, authenticity or low-quality reviews and customer requirements may vary due to unverified reviews. For this reason, this study investigated whether the opinions and impressions of other consumers, such as online reviews, affect customer engagement in live commerce. Due to the background of this live commerce and the characteristics of IT affordance, the research questions were materialized.

To fill this gap, the following research questions were examined in this research:

1. What is the most effective affordance in developing the strategies on live commerce for customer's bonds?
2. Do consumers consider their interactions with show hosts (streamers) to be human relationships?
3. Do other consumers' presence and opinions, such as online reviews, affect engagement?

Unlike prior research, our research aims to investigate how live streaming influences customer engagement in social commerce.

To achieve this goal, we develop a research model

emphasizing IT affordance and customer engagement via para-social interaction. We also explored whether social cues influence engagement. The study's novelty and theoretical contributions are three-fold. First, our research proposes the influence mechanism of live commerce on customer purchasing from the perspective of IT affordance and customer engagement. Second, it was studied whether para-social interaction affects customers' perceptions thereof as parameters. Third, our study used social cues that were not in previous studies. The seller considered the exposure and empathy of other customers, that is, social cues, as variables. In addition, customer engagement according to low-involvement and high-involvement products was studied. Our research also provides some practical suggestions for merchants and e-commerce platforms to better utilize live streaming to effectively use their products to increase customer engagement.

## II. Theoretical Perspective and Literature Review

### 2.1. Live Commerce

Live commerce refers to e-commerce activities and transactions through live streaming platforms, along with product introduction broadcasts. It includes a live streaming space, live streaming technology, and infrastructure to provide a cyber environment that provides real-time interaction, entertainment, social activity, and commerce with seamless affordance cues.

Live streaming commerce sends out by using one or more communications. A technology that instantly transmits images and sounds to another location, allowing users to recognize their presence. (Chen and Lin, 2018). A live streaming space creates a virtual space for streamers to broadcast and allows viewers to view

and interact with streamers. In traditional e-commerce, consumers could only search one way, and they used content such as pictures or text online to obtain product information (Xu et al., 2020). Therefore, sellers can communicate with many customers at the same time to introduce products and do product Q&A.

Live commerce is a sub-concept of e-commerce that enables real-time interactions, including live video and text-based chat channels (Cai and Wohn, 2019; Hamilton et al., 2014). Live commerce has emerged along with the development of e-commerce and is an e-commerce method in which consumers purchase products through product introduction and promotion by show hosts and creators while watching broadcasts (Yu et al., 2018).

The beginnings of live streaming were used to broadcast sporting events or news issues on TV. With the growing popularity of the mobile internet, anyone can now broadcast themselves through live streaming applications (Hamilton et al., 2014). In addition, the reason for the rapid growth of live commerce can be explained by the convergence of entertainment and event-driven formats, celebrity participation, and simple payment services (Celine, 2017).

In the context of social commerce, Wongkitrungrueng and Assarut (2018) found that live streaming can increase customer engagement through customer perceived value. However, there are still few studies that consider both the precedent and consequences of customer engagement in the context of live streaming shopping. A previous study (Sun et al., 2019) explored the relationship between IT affordance and purchase intention in live commerce, but in this study, it is important to use engagement and social cues as mediator variables. Understanding live streaming commerce in terms of social media and e-commerce helps to identify theories that can be applied to research in these areas.

## 2.2. Affordance lens

Affordance is commonly referred to as inducement to action. It is understood to mean that an environment provides a stimulus that can naturally induce specific behaviors (Aladwani, 2017). This concept was established by the ecological psychologist Gibson (1986). He defined affordance as everything provided and stimulated by the environment around a human being (Gibson, 1986). Accordingly, Norman (1988) applied the concept of induction of action to the interaction between humans and computers, and at this time, the perspective of induction of action was utilized in research related to technology and IT which is called IT affordance (Faraj and Azad, 2012; Leonardi, 2011; Zammuto et al., 2007). IT affordance emerges from the relationship between objects and goal-oriented actors. This is because the actor is either unaware or does not interact with the object before recognizing what the object is best for. Technology affordance refers to “the action possibilities and opportunities emerging from actors participating in key technologies” (Faraj and Azad, 2012). It does not belong to a specific target technology or user, but merely to the interrelationship between the user’s purpose and the capabilities of the technology. And it focuses on the symbiosis between the capabilities of technology and the actions it can take (Majchrzak et al., 2013).

In this previous study in the social commerce literature, researchers used empirical methods to examine the positive correlation between social commerce affordance and customer purchase intentions (Lin et al., 2019; Sun et al., 2019). Affordance theory asserts that affordance is the ability to influence a user to behave in a particular way (Bygstad et al., 2016). IT affordance combines the function of e-commerce and social media to give users simultaneous access

to both products and people (Grange and Benbasat 2013).

In order to understand the impact of IT on human behavior and to investigate the different characteristics that influence an individual's use of IT, some researchers have identified several sub-dimensions of IT affordance at the organizational or individual level (Majchrzak et al., 2013; Strong et al., 2014). Dong et al. (2016) defined the IT behavioral inducibility of online social commerce as the possibility of purchase-oriented behavior provided to sellers and consumers through technological targets. Concepts were classified into six dimensions: visibility, meta-voicing, triggered attending, guidance shopping, social connecting, and trading. Among them, this study adopted the affordances of trading, visibility, meta-voicing, and guidance shopping as factors of the technological system based on previous studies (Sun et al., 2019; Wang et al., 2020) examining the IT affordance of live commerce.

### 2.3. Para-Social Interaction Theory

Horton and Wohl (1956) were the first to define the concept of para-social interaction and define it as "the illusion of an individual's face-to-face relationship with the media personality." They described para-social interaction as a form. This includes indirect and weak bonds that media users (e.g., audiences) form with media characters (e.g., actors) through advertisements, TV shows, interviews or programs. In a more recent approach, Hartman and Goldhoorn (2011) reinforce more recent socio-psychological insights into social interaction. They validated certain cues provided by media performers (e.g., gaze, body-directed cues) effectively trigger the user's automatic mind-reading activity, resulting in a para-social experience. They also understood the in-

tuitive feeling of users participating in normal social interactions. The theory of para-social interaction has been investigated from various perspectives in the media and communication literature in general (McQuail et al., 1972; Rubin and McHugh, 1987; Sokolova and Kefi, 2020). Parasocial interaction is an important factor in determining users' online commerce intentions. Therefore, practitioners should pay a lot of practical attention to this part.

The theory of para-social interaction has been extensively studied in media fields such as TV programs and reality TV shows, as well as online live streaming channels, in order to explore the relationship between traditional broadcast media and viewers (Tian and Yoo, 2015). para-social interaction is a special relationship involving real-world interpersonal relationships that expresses the viewer's desire for deep interaction with the performer in order to maintain a one-sided, fictitious relationship. Researchers applied para-social interaction theory to examine the relationship between customers and brands in social commerce (Labrecque, 2014).

### 2.4. Social Cues

By allowing the anchor to deliver product information and interact with viewers in real time, live-streaming differs from general e-commerce modes in that its social capabilities can serve to capture the audience's attention and enhance the effect of social cues (Kukar-Kinney and Xia, 2017; Windels et al., 2018). E-commerce live streaming, therefore, should consider both the anchor of the product as well as the consumers' attention as endogenous attention. Contrary to exogenous attention, triggered by distracting cues, exogenous attention is a consequence of an involuntary response to a sudden stimulus (Serences and Yantis, 2007).

During a live broadcast of an e-commerce website, social cues, such as herding messages and interactivity text, appear suddenly on the screen. Consequently, social cues may also be viewed as endogenous distractions for viewers who result in uncertain effects. In e-commerce live streaming, previous literature may not have adequately addressed the complex interaction between social cues and internal and external attention (Fei et al., 2021)

As studies on social influence have shown, consumers tend to refer to purchasing behaviors of other consumers when making purchasing decisions. At the same time, attention to the herding message may also positively impact purchasing intentions (Chou et al., 2015). Also a positive social cue can influence consumer opinions, beliefs, and purchases (Zhao et al., 2018).

Therefore, in this study, we planned a scenario experiment using variables related to social cues and tried to investigate whether it affects customer engagement.

## 2.5. Price Involvement

A consumer's involvement in price is determined by a variety of psychographic factors. Price conscious consumers only care about paying low prices (Lichtenstein et al., 1993), Value conscious consumers are more concerned about the price paid versus value received (Lichtenstein et al., 1993), and deal prone consumers aim to get a good deal when shopping.

It is noteworthy that even though both Price consciousness and Deal proneness seemingly revolve around low prices, the former dimension emphasizes the degree to which consumers focus exclusively on finding low prices (Tsalis, 2020). However, the latter dimension underlines the degree to which consumers aim for getting good deals, and not necessarily only low-priced goods, which gives them a sense of being

smart and competent shoppers (Völckner, 2008). A price-quality schema is used by consumers to determine whether the product is good or bad (Lichtenstein et al., 1993). Furthermore, consumers who use prices of goods to indicate their social status are said to demonstrate prestige sensitivity (Lichtenstein et al., 1993). In other words, in this experiment, we divided the products into high-involvement products and low-involvement products in the price to see if they affect engagement, which is the dependent variable.

## 2.6. Customer Engagement

Customer engagement is variously defined as a state of mind, a type of behavior, and a type of psychological process. Bowden (2009) provided a conceptual framework for "customer engagement", which focuses only on existing customers, but suggests that customer-brand relationships and customer engagement strategies may differ depending on whether the customer is a first-time or re-purchase. Islam and Rahman (2017) has been defined customer engagement as an organism state based on Stimulus-Organism-Response (SOR) framework (Brodie et al., 2011). defines live streaming shopping engagement as psychological states based on live streaming shopping situations. Wongkitrungrueng and Assarut (2018) defined customer engagement as "the expression of customer behavior toward a brand or company beyond purchase" in live streaming shopping, and found that the perceived value of customers positively influences live streaming shopping engagement. Customer engagement requires trust and commitment to the buyer-seller relationship. When customers trust the seller and the product, they can be expected to become supporters of the seller (Sashi, 2012).

Based on previous research (Van et al., 2010), the

definition of customer engagement in a customer-to-business relationship focuses on the behavioral aspects of the relationship. The concept of behavioral customer metrics has received extensive attention in customer management. It can be defined in relation to the level of customer (or potential customer) interaction, the brand or company's products, and activities initiated by the organization or customer (Vivek et al., 2012). Therefore, we are interested in examining customer engagement, which is considered to be the most important benefit corporate expectations exist on social media (Sashi, 2012).

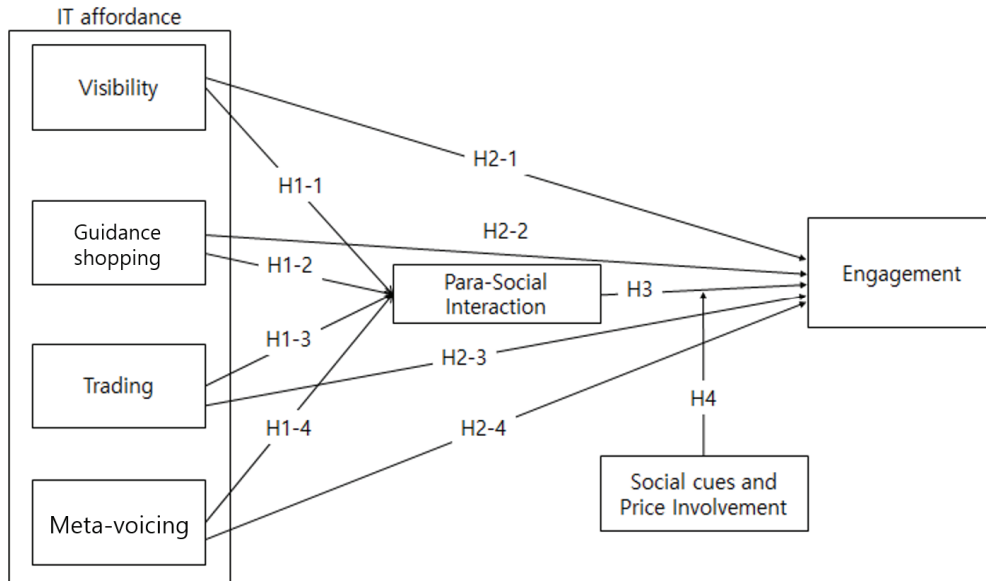
information. It is visible to the customers and helps reduce perceived risk levels by reducing product uncertainty. Visibility affordances allow merchants to simultaneously present product photos and relevant customer engagements. Additionally, buyers rely primarily on text descriptions or product images online (Bai et al., 2015). However, in live commerce, consumers can see the product vividly. Also, based on the visibility affordance, the customer can see the seller, so they are recognized as a "real person" and social presence. This affects para-social interactions. In traditional online commerce, sellers could only answer questions about products through text or phone calls without seeing their faces. However, in live commerce, the face of the seller is checked and communication is performed in real time. We suggest that visibility affordance helps improve customer engagement as visibility stimulates the interaction potential of sellers and buyers. Therefore, we hypothesize that:

### III. Research Model and Hypotheses Development

#### 3.1. Visibility Affordance and Live Commerce Engagement

Visibility affordance creates product photos and

*H1-1. Visibility affordance is positively related to*



<Figure 1> Research Model

*para-social interaction*

*H2-1. Visibility affordance is positively related to Engagement*

### 3.2. Guidance Shopping Affordance and Live Commerce Engagement

Guidance Shopping affordance helps customers by providing personalized service. The product recommendation technology is similar to that described above in that it can make recommendations for products that meet the consumer's needs since it takes as input an individual consumer's explicit or implicit preferences or interests related to their products (Xiao and Benbasat, 2011). In live streaming shopping, the guidance provided by the streamer is based on the personalized needs of the customer. This helps customers focus their attention on watching live streaming shopping, creating an immersive and social experience (Yim et al., 2017). The interactive nature of social media, with its ability to build conversations between individuals and businesses in merchant and customer communities, and engage customers in content creation and value creation, is an advantage in serving customers better and meeting their needs (Sashi, 2012). Guidance shopping affordance also helps customers to solve problems when using live streaming shopping. The market is an alternative mechanism for satisfying customer needs and needs, either by relying on market mechanisms and choosing to purchase products needed to meet their needs or the organizational bodies that can make them (Williamson, 2000). It is possible for customers to ask the streamer for help with their purchase, and the streamer can provide product information based on the customer's specifications. As well, guidance shopping affordance can enhance interactions between customers and streamers (Dong

and Wang, 2018). Therefore, we hypothesize that:

*H1-2. Guidance shopping affordance is positively related to para-social interaction*

*H2-2. Guidance shopping affordance is positively related to engagement*

### 3.3. Trading Affordance and Live Commerce Engagement

Trading affordance provides buyers with a variety of payment options to facilitate smooth transactions. When the buyer pays the bill, it means the transaction is complete. Consumers want to ask a lot of questions with the seller right before they purchase. The reason is that consumers need more information in order to reduce uncertainty or failure in the online environment rather than face-to-face such as live commerce or online commerce. Therefore, it can be seen that communication with consumers is active in the pre-purchase stage. Here, the seller may want to communicate not only before the purchase but also after the purchase for a continuous relationship with the consumer. The seller wants to turn this one-time transaction into a repurchase action. They also want buyers to post positive reviews and disseminate product information on social networks. Therefore, transaction affordance can further enhance the interaction between buyers and sellers (Dong and Wang, 2018). Hansen et al. (2018) emphasizes the relevance of trust in online communication transactions. This is especially important when users evaluate risk in online transactions. Therefore, hypothesize that:

*H1-3. Trading affordance is positively related to para-social interaction.*

*H2-3. Trading affordance is positively related to Engagement.*



### 3.4. Meta-Voicing Affordance and Live Commerce Engagement

Meta-voicing affordances allow buyers and sellers to rate each other during interactions and provide feedback on products. When buyers provide feedback on the online shopping platform, we use informal, two-way, interactive channels to exchange product-related information with sellers and help resolve transaction-related issues. By incorporating individual voices and feedback into an interactive conversation, meta-voicing affordance enhances the level of buyer-seller interaction (Dong et al., 2016). Meta-voicing helps guide others to particularly interesting ideas by “reacting online to other people’s presence, profiles, content and activities.” (Majchrzak et al., 2013). With regard to meta-voicing affordance, users are motivated to find valuable information about the target object. If a customer has follow-up questions, they can ask the streamer and the streamer will provide additional answers.

Therefore, meta-voicing affordance enables direct real-time communication between the customer and the streamer, giving the consumer a warm and friendly impression and narrowing the perception distance between the consumer and the streamer (Lv et al., 2018).

Meta-voicing affordance can make the interaction better between customers and streamers (Dong and Wang, 2018). Meta-voicing-Engaging in the ongoing online knowledge conversations conducted by online reactions to the presence, profile, content and activity of others (Majchrzak et al., 2013). Therefore, we hypothesize that:

*H1-4. Meta-voicing affordance is positively related to para-social interaction*

*H2-4. Meta-voicing affordance is positively related*

*to engagement*

### 3.5. Para-Social Interaction and Engagement

The theory of para-social interaction defines the relationship between the performer and the fantasies of the same intimacy with the audience and ‘real’ interpersonal relationships (Dibble et al., 2016; Horton and Wohl, 1956). Such a relationship is self-established and the other person could be unaware of the relationship and influence it (Kelman, 1958). Additionally, when viewers have a good experience with the product the streamer is promoting, para-social relationships can be strengthened, which can increase trust and affection for the streamer (Chen and Lin, 2018). In a way, this can be similar to the relationship between social media users and online influencers. There is a positive correlation between the extent to which people share tastes and preferences with celebrities and the extent to which they engage in para-social relationships (Yoo, 2016). Thus, multiple followers can form an online community where members share similar values, beliefs and interests to streamers (Nambisan and Watt, 2011). It was expected the strength of para-social relationships in the live commerce would be positively associated with customer engagement. This expectation led to the following hypotheses:

*H3. Para-social interaction is positively related to engagement*

### 3.6. Social Cues/ Price Involvement and Engagement

A social cue is an interactive text that pops up on the screen during live streaming of e-commerce

live streaming of a pastoral message. Previous findings on the positive effects of social cues on decision-making may support the speculation that greater interactive more interactive cognition using social cues may induce more endogenous attention to focal stimuli (Windels et al., 2018). Unlike offline environments, where information about others can be obtained from external parts (impressions, attitudes) of others through direct encounters with others, or where the attitudes or evaluations of others formed in this way indirectly affect product purchases, the online situation is different, in the online world where you cannot face other people, you perceive the presence of others according to the clues set by the marketer on the web interface (Dahl et al., 2012). This means that live commerce enhances purchase intention by displaying real-time chat, number of viewers, number of likes, and purchase reviews, in addition to expressing that others are also interested in the same product. Compared to traditional e-commerce methods, live streaming is differentiated through affordances of more effective social features that allow streamers to communicate product information and engage viewers in real time to engage them, further enhancing the effectiveness of social cues in live streaming, make it complicated (Fei et al., 2021).

An array of psychographic factors underlie consumers' price-related marketplace behavior, which is termed consumer price involvement. Prices are the top concern for consumers who exhibit price consciousness (Lichtenstein et al., 1993), value is the top concern for consumers who exhibit value consciousness (Lichtenstein et al., 1993), and deal proneness is the focus of consumers who seek good deals when shopping (Jensen, 2006). However, while both Price consciousness and Deal proneness are concerned with low prices, the former stresses the extent to which consumers prioritize finding low prices, whereas the

latter stresses consumers' aim at getting good deals, rather than just low priced goods, which makes them feel as if they are smart shoppers (Völckner, 2008). In other words, price involvement is likely to influence consumer behavior.

Therefore, we hypothesize that:

*H4. social cues and price involvement are related to engagement*

## IV. Research Design

### 4.1. Questionnaire Design and Variable Measurements

The items of visibility affordance (VSB), guidance shopping affordance (GSP), trading affordance (TRD) and meta-voicing affordance (MTV) are adapted from Dong and Wang (2018). The item of para-social interaction (PSI) is adapted from Thorson and Rodgers (2006) and the item of Engagement is adapted from Hu and Chaudhry (2020) and Wongkitrungrueng and Assarut (2020). Social cue is modified from Fei et al. (2021).

Also, price involvement is modified from Park and Ko (2013).

### 4.2. Data Collection

We collected the survey data using Micromill Embrain, one of the biggest online research firms in Korea. Subjects were surveyed online for seven days from August 6 to August 12, 2021. We used a 5-point Likert scale to our studies, with minor changes for each item to fit our research context. The questionnaire was translated back into Korean using the translation-back-translation tool since al-

&lt;Table 1&gt; Measurement Tool Variable Names and Questionnaire Contents.

Item	Questionnaire	Reference
Visibility Affordance (VSB)	Live commerce provides me with detailed pictures of the products.	Dong and Wang (2018).
	Live commerce makes the product attributes visible to me.	
	Live commerce makes information about how to use products visible to me.	
	Live commerce helps me to visualize products like in the real world.	
Guidance Shopping Affordance (GSP)	Sellers on Live commerce can provide me with information on all alternative products I intend to buy.	Dong and Wang (2018).
	Sellers on Live commerce can help me establish my product needs without any restrictions.	
	Sellers on Live commerce can help me identify which product attributes best fit my needs.	
	Sellers on Live commerce can provide me with personal product customization based on my requirements.	
Trading Affordance (TRD)	Live commerce offers me multiple payment options to complete a purchase.	Dong and Wang (2018).
	Live commerce helps me to finish a transaction in an effective way.	
	Live commerce enables me to complete a transaction smoothly.	
	There is no difficulty in the live commerce payment method.	
Meta-Voicing Affordance (MTV)	Live commerce allows me to comment on products.	Dong and Wang (2018).
	Live commerce allows me to react to sellers' feedback on products.	
	Live commerce allows me to share in sellers' opinion about products.	
	Live commerce allows me to share shopping experiences with sellers.	
Para-Social Interaction (PSI)	I found myself comparing my opinion about products and brands with what show host said.	Thorson and Rodgers (2006).
	The show host responds quickly to my questions sent during live commerce.	
	I communicate with show hosts and other consumers about products through the chatting.	
	I enjoy exchanging opinions about products with show hosts through the chatting.	
Engagement (ENG)	I will revisit the seller page to see the new live commerce in the near future.	Hu and Chaudhry (2020).
	I will recommend sellers who use live commerce to friends.	
	I will definitely buy products from sellers using live commerce in the near future.	
	I consider a live commerce seller to be my first choice when buying a product.	

most every item was originally designed in English.

First, we translated all items from English to Korea. Second, we invited 5 sellers with experience of live commerce to sell and 5 consumers with experience of live commerce to buy check whether the measurement items are easy to understand and appropriate to answer. Third, we conducted a pre-test with 20 random consumers. Finally, we asked the research firm for responses from more than 400 consumers.

And we got 435 responses, of which 7 were inappropriate, and we got 428 results. Based on the demographic variable of the data obtained through data collection, consisted of 129 males (30.1%) and 299 females (69.9%). The age range of participants was 19 years old and under 6 (1.4%), 20 - 29 year old 129 people (30.1%), 30 - 39 year old 172 people (40.2%), 40 - 49 year old 85 people (19.9%), comprised 36 (8.4%) of 50 - 59 years old. Preferred live commerce

viewing times are 5AM ~ 11AM 3 (0.7%), 11AM ~ 2PM 36 (8.4%), 2PM ~ 5PM 42 (9.8%), 5PM ~ 7PM 67 (15.7%), 7PM ~ 10PM It consisted of 248 people (57.9%), 31 people (7.3%) from 10PM to 2AM, and 1 other person (7.3%). The main shopping items were fashion and general goods 100 people (23.4%), beauty 53 people (12.4%), food 224 people (52.3%), digital and home appliances 26 people (6.1%), furniture and interior 4 people (0.9%), 10 (2.3%) of baby products and 11 (2.6%) of others. (See <Table 2>).

## V. Data Analysis and Results

### 5.1. Reliability and Validity Tests

For the research model and hypothesis verification of this study, we use SPSS 18.0 and AMOS 25. The AMOS analysis method has the advantage of being able to verify the suitability of the entire research model through the structural equation model and securing the consistency of the research results, so it is highly preferred in general social science research. Next, a feasibility analysis was conducted to verify

<Table 2> Descriptive Statistics of Respondents

Item		Quantity	Percentage	Item		Quantity	Percentage
Gender	Male	129	30.1	Preferred live commerce viewing time	5AM~11AM	3	0.7
	Female	299	69.9		11AM~2PM	36	8.4
Age	Under 19	6	1.4		2PM~5PM	42	9.8
	20~29 years old	129	30.1		5PM~7PM	67	15.7
	30-39 years old	172	40.2		7PM~10PM	248	57.9
	40-49 years old	85	19.9		10PM~2AM	32	7.5
	Over 50	36	8.4		Highest Education	High School and Below	29
Monthly Income	less than 100 million won	38	8.9	Junior College		63	14.7
	100-200 million won	33	7.7	Undergraduate		287	67.1
	200-300 million won	133	31.1	Master's Degree and Above		49	11.4
	300-400 million won	101	23.6	Main shopping items		Fashion	100
	400-500 million won	45	10.5		Cosmetics	53	12.4
over 500 million won	78	18.2	Food		224	52.3	
Preferred Shopping Mall	NAVER	286	66.8		Digital electronics	26	6.1
	COUPANG	36	8.5		Furniture	4	0.9
	TIMON	10	2.3		Baby product	10	2.3
	LOTTE	17	4.0		etc	11	2.6
	HYUNDAI	17	4.0				
	KAKAO	27	6.3				
	BAE MIN	27	6.3				
	GRIP	8	1.9				
Number		428 people		100 percent (%)			

whether the concepts and properties of the variables used in the questionnaire were accurately and clearly implied.

Exploratory factor analysis was performed using factor extraction analysis and VARIMAX rotation method. Factor analysis was performed on all variables used in the questionnaire, and items with a discretion

of 0.5 or more were classified. As a result of factor analysis, Kaiser-Meyer-Olkin (KMO) was found to be 0.922, which is more than the appropriate reference value of 0.8. As a result of Bartlett's test, the significance probability ( $p = 0.000 < 0.05$ ) was obtained as a significant value as presented in <Table 3>.

<Table 3> Factor Analysis for Metrics

Rotated Factor Matrix a						
	Factor					
	PSI	TRD	ENG	MTV	VSB	GSP
q110	0.689					
q111	0.684					
q109	0.669					
q107	0.638					
q41		0.713				
q42		0.691				
q40		0.662				
q39		0.512				
q145			0.694			
q147			0.676			
q146			0.606			
q148			0.537			
q46				0.666		
q45				0.666		
q43				0.640		
q44				0.539		
q32					0.686	
q31					0.675	
q30					0.583	
q33					0.397	
q37						0.667
q35						0.635
q36						0.563
q34						0.511
Extraction method: Axis factor extraction. Rotation method: Verimex with Kaiser regularization.						
Kaiser-Meyer-Olkin: 0.922						
a. The factor rotation converges in 7 iterations.						

Moreover, the discriminative validity was tested. The correlation coefficient between the square root of each variable' AVE value and other variables was observed. The results are shown in <Table 4>. The diagonal values in the table are the square root of the AVE value of each variable. The comparison shows that all diagonals' values are larger than the correlation coefficients. Therefore, we conclude that the measures satisfy the criteria for convergent and discriminant validities. The calculation results show that the standard factor loadings of all measurement items are higher than 0.4. Also, the average extraction variance (AVE) of all variables is more significant than 0.5. The composite reliability (CR) is more significant than 0.8, indicating that the questionnaire has suitable aggregate

validity (Fornell and Larcker, 1981).

Then, the discriminant validity of the measured variables was identified through the correlation analysis between the variables presented in <Table 5>. In this analysis, the AVE value of each latent factor is calculated as the sum of squares of the correlations of each variable derived in <Table 5>. In comparison, if the AVE value of each latent factor is higher than the square value of the correlation, it can be said that it has discriminant validity and does not exhibit multicollinearity. As a result of the analysis, the sum of the squares of correlations between all variables It was found to be lower than the AVE value, so it was concluded that it has discriminant validity and that multicollinearity does not appear.

<Table 4> Reliability, Validity Index, and Calculation Results

Variable	Measurement Item	Standard Factor Loading	Cronbach's $\alpha$	AVE	CR
Visibility (VSB)	VS1	0.4970	0.808	0.5204	0.8881
	VS2	0.5868			
	VS3	0.5806			
	VS4	0.4173			
Guidance Shopping (GSP)	GS1	0.4679	0.816	0.5289	0.8654
	GS2	0.5256			
	GS3	0.5595			
	GS4	0.5625			
Trading (TRD)	TD1	0.4900	0.856	0.5727	0.9052
	TD2	0.5791			
	TD3	0.6561			
	TD4	0.5655			
Meta-voicing (MTV)	MT1	0.4032	0.807	0.5143	0.8798
	MT2	0.4830			
	MT3	0.6115			
	MT4	0.5595			
Para-Social Interaction (PSI)	PSI1	0.5285	0.831	0.5363	0.8501
	PSI2	0.5227			
	PSI3	0.5535			
	PSI4	0.5402			
Engagement (ENG)	ENG1	0.4998	0.850	0.5786	0.8773
	ENG2	0.6448			
	ENG3	0.6131			
	ENG4	0.5565			

<Table 5> The Results of Correlation Analysis

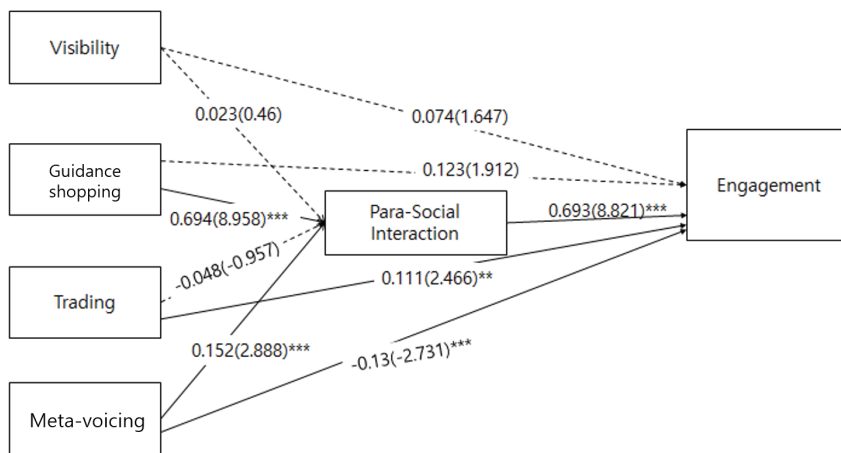
	VSB	GSP	TRD	MTV	PSI	ENG	AVE
VSB	1						0.5204
GSP	0.3612	1					0.5289
TRD	0.5852	0.2673	1				0.5727
MTV	0.4173	0.4020	0.4096	1			0.5143
PSI	0.1267	0.4225	0.0853	0.1910	1		0.5363
ENG	0.1444	0.3457	0.1163	0.1116	0.4462	1	0.5786

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

### 5.2. Model Fitting and Hypotheses Testing

The fitting indicators and recommended indicators

of each model (Bentler, 1990; Doll et al., 1994; Kim and Shin, 2015; MacCallum and Hong, 1997; Marsh et al., 1988) are shown in <Table 6>.  $\chi^2/df = 2.354$ ,

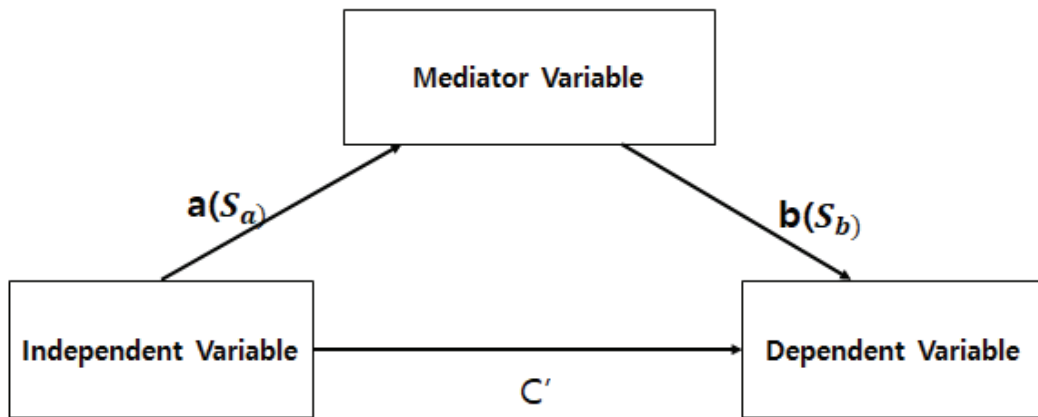


<Figure 2> Structural Model Testing Results

Note: \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, ns: insignificant at the 0.05 level

<Table 6> Model Fitting Indicators

Index	Standard	Value
$\chi^2/df$	< 3 (Marsh et al., 1988)	2.354
RMSEA	< 0.08 (MacCallum and Hong, 1997)	0.056
CFI	> 0.9 (Bentler, 1990)	0.93
GFI	> 0.8 (Doll et al., 1994)	0.892
AGFI	> 0.8 (Doll et al., 1994)	0.865
IFI	> 0.9 (Kim and Shin, 2015)	0.93
TLI	> 0.9 (Kim and Shin, 2015)	0.919



<Figure 3> Aroian Test Concept

RMSEA = 0.056, CFI = 0.93, GFI = 0.892, AGFI = 0.865, IFI = 0.93, TLI = 0.919. Hence, all the relevant indicators meet the recommended standards.

Using AMOS 25.0 for hypothesis testing, the model path analysis results are shown in <Figure 2> and <Table 7>. The coefficient for visibility affordance on para-social interaction is 0.023, the p-value is over the condition of 0.05. Therefore, H1-1 was not supported.

The coefficient for guidance shopping affordance on para-social interaction is 0.694, the p-value is significant under the condition of 0.05. Therefore, H1-2

was supported. The coefficient for trading affordance on para-social interaction is -0.048, the p-value is 0.339 ( $p < 0.005$ ). Therefore, H1-3 was not supported. The path coefficient for meta-voicing affordance on para-social interaction is 0.152, the p-value is significant under the condition of 0.05. Thus, H1-4 was supported. The coefficient of visibility affordance on engagement is 0.074, but the p-value is not significant. Therefore, H2-1 was supported. The path coefficient for guidance shopping affordance on engagement is 0.123, ( $p = 0.056$ ). Thus, H2-2 was slightly not

<Table 7> Hypothesis Test Results

Hypotheses	Path	Estimate	Standard Path Coefficient	T-Value	P-Value	Hypothetical Test
H1-1	VS→PSI	0.028	0.023	0.46	0.646	Not Support
H1-2	GS→PSI	0.629	0.694	8.958	***	Support
H1-3	TD→PSI	-0.058	-0.048	-0.957	0.339	Not Support
H1-4	MT→PSI	0.187	0.152	2.888	0.004	Support
H2-1	VS→ENG	0.094	0.074	1.647	0.1	Not Support
H2-2	GS→ENG	0.137	0.123	1.912	0.056	Not Support
H2-3	TD→ENG	0.144	0.111	2.466	0.014	Support
H2-4	MT→ENG	-0.171	-0.13	-2.731	0.006	Support
H3	PSI→ENG	0.74	0.693	8.821	***	Support

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , ns: insignificant at the 0.05 level.



supported. The path coefficient for trading affordance on engagement is 0.111, and the p-value is significant. Therefore, H2-3 was supported. The path coefficient for meta-voicing affordance on engagement is -0.13, with the p-value significant at the 0.01 level, and therefore H2-4 was confirmed. The path coefficient for para-social interaction on engagement is 0.693 ( $p < 0.001$ ). Thus, H3 was supported.

### 5.3. The Mediating Effect of Para-Social Interaction.

$$Z\text{-Value} = \frac{A * B}{\sqrt{B^2 \times S^2_a + A^2 \times S^2_b + S^2_a + S^2_b}}$$

a: Path coefficients between independent variable (IV) and Mediator Variable(MV)

b: Path coefficient between Mediator Variable and dependent variable (DV)

Sa: A standard error of the path

Sb: B standard error of the path

The formula of the Aroian test method was used. The advantage of this method is that it is widely used in social science research because it does not

require the assumption that the standard error occurring in the causal relationship between independent and parametric parameters and dependent variables is very low. Strict mediating effect analysis is possible because it is assumed that there is a mediating effect at the 95% significance level when it exceeds 1.96. Therefore, as shown in <Table 8> it was found that there was a mediating effect that satisfies 95% significance level and t-value of 1.96 or more only between MTV→PSI→ENG (T = 2.719, P = 0.0049).

### 5.4. The Moderating Effect of Social Cues and Involvement.

In this study, a scenario experiment was conducted to examine the moderating effects of social cues and price involvement between para-social interaction and engagement relationship. It is significant because it is an experiment that was not widely used in previous live commerce studies. Four types of scenarios were created by changing only the conditions for social cue and price involvement for exposure to others.

**In type 1**, social cues were provided by exposing the consensus or opinions of other users. At this

<Table 8> The Result of Mediating Effect

MV (C)	IV (A)	DV (B)	Path Coefficient (A-C)	Path Coefficient (C-B)	T-Value
			Std Err (A-C)	Std Err (C-B)	P-value
VSB	PSI	ENG	0.028	0.74	0.4660
			0.06	0.084	0.6433
GSP	PSI	ENG	0.629	0.74	0.8714
			0.07	0.084	0.3835
TRD	PSI	ENG	-0.058	0.74	-0.9393
			0.061	0.084	0.3475
MTV	PSI	ENG	0.187	0.74	2.719
			0.065	0.084	0.0049***

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



<Type 1> Social Cues (Comments, Number of Viewers Indicated) / High Involvement Products.



<Type 3> Social Cues (Comments, Number of Viewers Indicated) / Low-Involvement Products.



<Type 2> Social Cues (Comments, Number of Viewers Not Indicated) / High Involvement Products.



<Type 4> Social Cues (Comments, Number of Viewers Not Indicated) / Low-Involvement Products.

time, the viewer can check the number of comments or other viewers' access or reactions through the chat screen. The product was a high-involvement product and sold luxury bags worth more than 1 million won (over \$1,000).

**In type 2**, you could not see the connection status, opinions, or comments of other users. The product was a high-involvement product and sold luxury bags worth over 1 million won (over \$1,000).

**In type 3**, social cues were provided by exposing the consensus or opinions of other users. At this time, the viewer can check the number of comments or other viewers' access or reactions through the chat screen. The product was an inexpensive eco-bag, a low-involvement product that can be easily bought, priced at 10,000 won (\$10).

**In type 4**, You could not see the connection status, opinions, or comments of other users. The product was an inexpensive eco-bag, a low-involvement product that can be easily purchased, priced at 10,000 won (\$10).

Also, after showing the scenario experiment photo, to verify the scenario, several questions were asked as follows, and the verification was confirmed.

1. **“What level of involvement do you think the products you are buying in the preceding scenario are? (With a detailed description of the involvement.)”**

2. **Did you notice that on the product sales page of Live Commerce that you saw, there were comments about the number of other buyers, the number of likes, and the products?**

According to the results of analyzing the moderating effect by using SPSS.18, the value of  $R^2$  in Model 1 was 31.2%, the value of  $R^2$  in Model 2 was 31.8%, and the value of  $R^2$  in Model 3 was 32.3%. As for the significance probability of each step, the 1st step

significance probability ( $p = 0.000$ ) derived statistically significant result values, but both the 2nd step significance probability and the 3rd step significance probability were greater than 0.05, so statistically significant result values could not be derived. Therefore, it was confirmed that social cues and price involvement did not moderate the relationship between para-social interaction and engagement see <Table 9>.

Therefore, social cues and involvement exposed to others do not have a significant impact on engagement.

## VI. Conclusions and Discussions

### 6.1. Discussion

In this study, the importance of the relationship between IT affordances and engagement in live commerce was confirmed and the effect of para-social interaction between them was investigated. In addition, four types of scenario experiments were conducted to analyze the moderating effect of social cues and involvement between para-social interaction and engagement. The analysis results are as follows. First, our purpose was to modify the existing research (Dong and Wang, 2018; Sun et al., 2019) that dealt with the technical functions of live commerce affecting consumer engagement. We believe in IT affordances (including visibility affordance, guidance shopping affordance, trading affordance and meta-voicing affordance) have impacts on engagement in live commerce. However, in the previous study, all variables were valid, but in this study, not all variables were. Visibility affordance and trading affordance had no significant effect on para-social interaction, and guidance shopping affordance and a trading affordance had positive effects. Visibility affordance and

<Table 9> Results for the Moderating Effect

Social Cues and Involvement (<Type 1>) Moderating Effect on Para-Social Interaction (PSI)							
Steps	Independent	R	R <sup>2</sup>	Adj R <sup>2</sup>	F	p-Value	Durbin-Watson
1	PSI	.617a	0.381	0.380	262.407	0.000	
2	PSI, Type1	.619b	0.383	0.380	1.329	0.250	
3	Interaction	.623c	0.388	0.384	3.370	0.067	2.094
Note: Dependent variable is engagement and interaction was calculated as PSI x <Type 1>.							
Social Cues and Involvement (<Type 2>) Moderating Effect on Para-Social Interaction (PSI)							
Steps	Independent	R	R <sup>2</sup>	Adj R <sup>2</sup>	F	p-value	Durbin-Watson
1	PSI	.617a	0.381	0.380	262.407	0.000	
2	PSI, Type2	.618b	0.382	0.379	0.338	0.562	
3	Interaction	.618c	0.382	0.378	0.478	0.490	2.098
Note: Dependent variable is engagement and interaction was calculated as PSI x <Type 2>.							
Social Cues and Involvement (<Type 3>) Moderating Effect on Para-Social Interaction (PSI)							
Steps	Independent	R	R <sup>2</sup>	Adj R <sup>2</sup>	F	p-value	Durbin-Watson
1	PSI	.617a	0.381	0.380	262.407	0.000	
2	PSI, Type3	.619b	0.383	0.380	0.953	0.330	
3	Interaction	.619c	0.383	0.379	0.264	0.608	2.103
Note: Dependent variable is engagement and interaction was calculated as PSI x Type3.							
Social cues and Involvement (<Type 4>) Moderating Effect on Para-social interaction (PSI)							
Steps	Independent	R	R <sup>2</sup>	Adj R <sup>2</sup>	F	p-value	Durbin-Watson
1	PSI	.617a	0.381	0.380	262.407	0.000	
2	PSI, Type4	.618b	0.381	0.379	0.176	0.675	
3	Interaction	.624c	0.389	0.385	5.258	0.022	2.100
Note: Dependent variable is engagement and interaction was calculated as PSI x Type4.							

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

guidance shopping affordance did not appear to affect engagement. The effect of trading affordance on engagement was positively significant, and the effect of meta-voicing on engagement was negatively affected. Second, para-social interaction was found to have a significant positive effect on engagement. However, as a mediating role of para-social interaction, an unexpected result appeared that only affected meta-voicing affordance. Finally, the moderator variables, social cues and involvement, did not appear to have any particular effect between para-so-

cial interaction and engagement.

## 6.2. Theoretical Implications

First, most of the previous studies were conducted in China in the maturity stage. This study was conducted on the Korean market, which is in the introduction or growth stage. Therefore, it is meaningful that the academic approach to the subject of live commerce was brought closer to researchers in many countries except for China in the future.

Second, Previous live commerce studies dealt with the general characteristics of the platform and the characteristics of the show host, or the previous studies (Liu et al., 2021; La and Oh, 2021) that dealt with IT affordance focused on purchase intention. In this study, a new academic approach was taken to identify IT affordance and engagement, and in particular, to use para-social interaction as a parameter. Third, Using social cues and involvement as moderators, creating and experimenting with scenarios has implications for live commerce research. Previous studies have mainly conducted by randomly bringing photos to live commerce, but this study has a big difference in that it directly created and conducted a live commerce scenario. Although the moderating effect was not confirmed, there is the implication for a new attempt.

Finally, this study provides different results from previous studies (Dong and Wang, 2018). In previous studies, visibility and guidance shopping were influential, but the results showed no or less effect. Although Visibility was an influential variable in Dong and Wang's study, in this study, Visibility was the only one that did not affect para-social interaction and engagement. The reason for this is that not so long ago, being able to visually see, make video calls, and watch videos online was a special activity. However, at present, such visual IT utilization is not special at all, but one of the natural functions. In particular, this study mainly answered the MZ generation. For the MZ generation, concepts such as on-tact and meta-verse are not special, but normal and acceptable. Therefore, unlike in 2016~2017, when Dong and Wang's research was conducted, more and more rapidly consumers are seeing that live commerce is just a shopping channel and that visuals have no special meaning.

Another major variable is the easy payment, which

is a characteristic of the trading variable. This does not affect the special relationship, but it has been shown to affect the active participation of customers. Against this, modern people who want quick and easy payment are accustomed to one-touch payment. Therefore, it seems to be a good result showing the phenomenon that people purchase and repurchase the product directly when payment is convenient. Consumers seem to prefer a place where they can do it all at once because they have a previous payment history if the price does not differ much. Therefore, it is important for startups and sellers who are designing or using a live commerce platform to design a payment system simply.

### 6.3. Practical Implications

First, live commerce is being used by more and more people, and not only the MZ generation but also various age groups are using it. In addition, the most influential variable in this study was trading affordance, which is characteristic of modern people who pursue quick and easy things. A few years ago, when paying online, a card was also required, and security procedures were difficult. But these days, many shopping malls (such as Amazon and Coupang) have made it possible to pay with one touch. In other words, no matter how famous and fun live commerce is, if payment is inconvenient or difficult, it will be difficult to engage with consumers. Therefore, platform officials and founders should devise a program to make payment easier and faster. Finally, it was emphasized that para-social interaction influences engagement. Therefore, this study proves that viewers form a new super-social relationship in live commerce that makes them feel friendly even though they can't meet with the seller. Marketers believe that consumers are with them when selling, providing insight that

developing content will further increase engagement and bond with customers.

#### 6.4. Limitations and Future Research Directions

Although this study has significance in creating and experimenting with scenarios, it is disappointing that the results are transversal. In the next study, we would like to conduct a longitudinal study to provide more convincing evidence and to increase the accuracy of the causal relationship. (Dillon and Goldstein, 1984). In the scenario experiment, a bag, a fashion product, was used, and it is expected that

the result would be disappointing because there is a difference in gender and taste. Therefore, in the next study, it is recommended to select and experiment with foods or unisex products that can be widely handled in live commerce. In addition, it will be a good study if experiments are conducted next time like previous researchers (Tucker and Zhang, 2011; Yoo et al., 2016). For example, in the next study, if we study the difference between live commerce and offline or the difference between live commerce and general online shopping commerce, more accurate figures can be compared and it will be an interesting topic.

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