Are You Watching Live Stream Shopping? An Investigation of Influential Factors on Audiences' Trust and Loyalty Intention from Elaboration Likelihood Model Perspective

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Abstract

With the proliferation of online live streaming applications, a new type of shopping environment has changed the way for sellers to interact with their potential buyers. How to win the trust and loyalty from the audiences is one of the major challenges for online sellers to provide product information through online live streaming. In this study, factors on the audiences' trusting belief and loyalty intention toward the broadcaster were examined from the perspective of Elaboration Likelihood Model (ELM), in which the information in live streaming was delivered through central route (e.g., argument quality) and the peripheral route (e.g., source credibility). In addition, two moderators were included: the product scarcity and product involvement. Scenario based laboratory experiment was conducted and the research results indicated that information delivered through peripheral route showed more significant influence on audiences' trusting belief and loyalty intention toward broadcasters. However, when the product was offered with amount limitation (product scarcity), the influence of argument quality will be strengthened. In addition, people who are high in product involvement will be more influenced by argument quality, while the source credibility showed more positive influence for participants with lower product involvement. Findings from this study can provide important implications for live streaming broadcasters and platforms.

Keywords: Shopping in live streaming, ELM, trusting belief, loyalty intention

你正在觀看購物直播嗎？從推敲可能性模型觀點探討線上直播平台觀眾之信任及忠誠意圖

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摘要

　　直播購物更加注重賣家與買家之間的關係，而行動裝置的普及，讓許多使用者可以隨時隨地觀看線上直播，因此直播購物成為許多賣家銷售的形式。本研究以推敲可能性模式（Elaboration likelihood model, ELM）為理論基礎，探討在線上直播環境下，買家如何透過中央路徑（直播主產品論述品質）及周邊路徑（來源可信度），形成對直播賣家的信任，並了解在產品稀少性及產品涉入高低程度調節下，對於信任的影響，以及透過信任所產生之忠誠意圖。研究結果共獲得 377 份有效完整數據，使用迴歸分析探究兩路徑下觀眾對直播主的信任影響。

　　研究結果發現，透過論述品質及來源可信度可增強觀眾的信任感，此外產品供給數量及觀眾對於產品涉入程度的不同也會影響觀眾對於直播主的信任。

關鍵詞：直播購物、推敲可能性模型、信任、忠誠意圖

1. Introduction

　　Online live streaming has become one of the major activities online worldwide. A variety of different types of content were delivered through live videos, such as daily life, online game, and product information, etc. Live stream shopping is one of the most popular application among the live stream activities. Compared to the traditional live shopping television, audiences and broadcasters have more interactions in online live stream. Statistics indicated that 87% of audiences prefer watching online live stream to traditional TV (Koeppel, 2017).

　　More than 50% of people watch live stream shopping on social media (TWNIC, 2018). Over 360 million users watch Facebook Live regularly, and about 200 million regular users watch Instagram live (Koeppel, 2017). The above data indicated the fierce competition among online streaming broadcasters to attract the audience attention, which

might in turn result in the increase of revenue.

The objective of this study is to examine the influential factors of audiences' trust and loyalty intention toward the online streaming broadcasters. The study was grounded in elaboration likelihood model (ELM) with the emphasis on the influence of different messages delivered to the audiences. Specifically, messages delivered on live streaming can be divided into two categories: the descriptions of product such as characteristics and specifications. The messages were the argument quality delivered through the central route. Another type of message was the environmental stimulus of live streaming such as the number of audiences, and interactions among the audiences and the broadcaster. The messages indicated the source credibility delivered through the peripheral route. Thus, the first research question is to understand the influence of messages delivered through central route and peripheral route on the audiences' trusting belief, which in turn is expected to influence the loyalty intention. Further, two product-related factors were considered as the moderators in this study: the product scarcity and the product involvement. The product scarcity addressed the amount limitation offered through live streaming video, and the product involvement focused on the personal relevance of product. Accordingly, the second and the third research questions are to understand the moderating effect of product scarcity and product involvement on the relationship between the types of information delivered and the trusting belief toward the broadcaster. Laboratory experiment was conducted to answer the above research questions and the findings from this study can provide implications to the live streaming broadcasters and platform managers.

2. Literature review

2.1　Elaboration likelihood model (ELM)

The elaboration likelihood model (ELM) of persuasion provide individual a process to evaluate the information into high issue-relevant or low issue-relevant (SanJosé-Cabezudo et al., 2009). According to ELM, individuals' evaluation of the information before making decision to buy a product may be influenced by two distinct routes: the central route and the peripheral route (Cacioppo, 1986; Petty and Cacioppo, 1981; Petty et al., 1981; SanJosé-Cabezudo et al., 2009).

The central route is defined as the process that people evaluate carefully and thoughtfully about the issue-relevant information. And the peripheral route is defined as

the process that people evaluate the information less cognitive effort (Cacioppo, 1986). The process to evaluate the information is dependent on individuals' motivation and ability. The ELM concept has been applied in a variety of research domains such as tourism (Meng and Choi, 2019), online review (Hess et al., 2019), education (Turner et al., 2019) and marketing (Wang and Lee, 2019).

According to the ELM, the central route can refer as argument quality, which means the persuasive strength of arguments in information (Bhattacherjee and Sanford, 2006). The basic of ELM, the message induced through central route was based on the quality of argument, and the cues induced through peripheral route was based on the credibility of source (Cyr et al., 2018; Kim and Benbasat, 2009). In live streaming, the product information that introduced by the live streaming broadcasters is contained in the description about the products can be view as argument quality, such as its material, specific, and the pros and cons about the products (Suh et al., 2013).

Contrast to the central route, the peripheral route identified the cues that spend less effort to evaluate the issue-relevant information such as number of prior users, expert image, website format, source attractiveness and source credibility (Bhattacherjee and Sanford, 2006; Cyr et al., 2018; Petty and Cacioppo, 1981; Petty et al., 1981; SanJosé-Cabezudo et al., 2009). In this research, the peripheral route is represented the source credibility among the products. Also, the receivers would judge the trustworthiness of the information source from the endorses, the experts, and the message which are recommended by other receivers (Bickart and Schindler, 2001; Kiecker and Cowles, 2002; Leong et al., 2019). Hence, the audiences evaluate the information in live streaming via peripheral route can be view as the numbers of audiences watching the processing at the same time, the professional knowledge and experience about the broadcaster, and the comments reply on the message area.

2.2 Trusting belief

Shopping has been considered as social activities (Lu et al., 2016). The e-commerce platform was treated as a social actor for the reason that buyers shopping and trading with the sellers on it (Kumar and Benbasat, 2002). Buyers interacted with sellers via the e-commerce system when shopping online. Thus, when interacting with each other, trust is considered as an important variable of e-commerce (Al-Adwan and Kokash, 2019; Balu, 1964).

According to the research from Kim and Benbasat (2009), the argument quality with

trust-assuring would have influenced on different content in E-commerce, such as the sources on websites, the contents for their customers. and the information with argument quality would be influenced on customers' trust (Racherla et al., 2012). In this study, we focus on the micro level of trust to identify the interactive behavior between the audiences and the broadcasters. In the e-commerce environment,

Trusting belief includes several different attributes such as ability, benevolence, integrity, competence, and goodwill (Kim and Tadisina, 2005; Mayer et al., 1995). In this research, however, we evaluate the ELM model of trusting belief with three factors: ability, benevolence, and integrity.

From the ELM perspective, the two persuasive processes would influence the audiences to receive the product information and the audiences develop their trusting belief toward a live streaming broadcaster through central or peripheral route (Racherla et al., 2012).

H1: In the context of live streaming, the argument quality of product information has a positive influence on the audiences' trusting belief toward the broadcaster.

H2: In the context of live streaming, the source credibility of product information has a positive influence on the audiences' trusting belief toward the broadcaster.

2.3 Loyalty intention

The loyalty can be focused on two dimensions: attitudinal and behavioral concepts (Jugenheimer, 1979). The behavioral dimension can be views as the sales promotion, or other rewards when choosing a product. The other research pointed out that shopping based on recommendation is also the behavioral approach. Loyalty intention is defined as a commitment to repurchase or follow up a product or a service via the same channel despite any possible interference to cause the behavior and attitude change (Neupane, 2015; Oliver, 1997; Yen and Lu, 2008). In e-commerce environment, to build up the buyers' loyalty intention would spend less effort and cost for a seller to search for new customers group (Jones et al., 2000; Payne et al., 1998). In this study, loyalty intention means the intention for audiences to follow up the broadcasters in live streaming after watching the video.

H3: In the context of live streaming, audiences' trusting belief toward the broadcaster has a positive influence on their loyalty intention.

2.4 Product scarcity

From the perspective of ELM, product scarcity would have influence on the process people evaluate the information (Grant et al., 2014), when the product is scarce, people would have the motivation to search for the detail information and elaborate on information.

Product scarcity would influence the process that people evaluate about the product information. When the products were limited supplied, people would show positive evaluation toward the product (Hamilton et al., 2019; Jung and Kellaris, 2004; Lee and Seidle, 2012). The product with scarcity in live streaming would influence individual to make decisions (Grant et al., 2014).

In this research, product scarcity is described as the insufficiency of product supply (Brock, 1968; Lee and Seidle, 2012; Lynn, 1989). The main type of product scarcity is the message delivered to the audience that each product is limited supplied via the live streaming video, such as "Each item only has only one for sale".

H4: In the context of live streaming, product scarcity will moderate the relationship between argument quality and source credibility on audiences' trusting belief toward the broadcaster.

2.5 Product involvement

Goldsmith and Emmert (1991) indicated the product involvement as the passionate feelings toward product categories for the customers. According to other research, Peter et al. (1999) defined involvement is related to customers' self-value, which depend on the importance of different product or different situation.

In ELM perspective, the two routes can be moderated by the levels of involvement (DeShields, 2015; Ghasemaghaei and Hassanein, 2015; Meng and Choi, 2019). When people engaged in high product involvement, it means that they feel the product is related to their self-value, thus they would cautious dealing with any decision about the product (Dholakia, 2001). In this research, we valuate the degree of product involvement toward each one by ten variables which was developed by Zaichkowsky (1985) as personal involvement inventory.
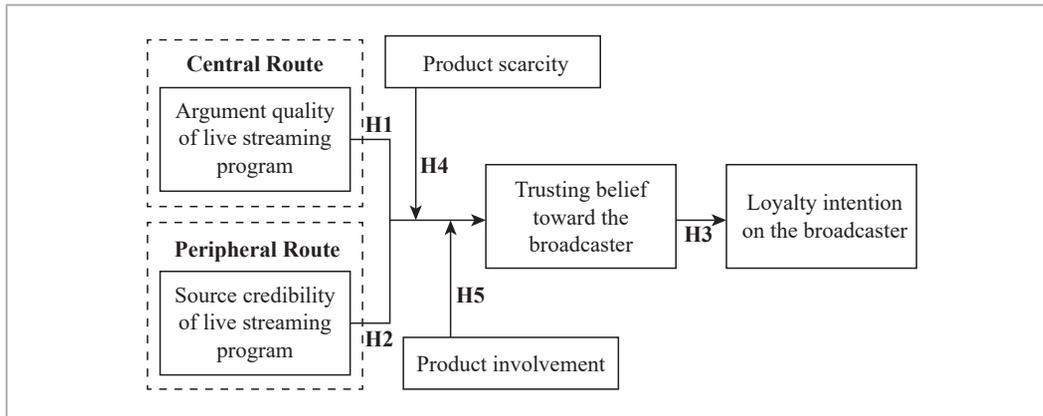
H5: In the context of live streaming, product involvement will moderate the relationship between argument quality and source credibility on audiences' trusting belief toward the broadcaster.

3. Research method

3.1　Research framework

According to the literature review, the research framework was developed and depicted in Figure 1.

3.2　Experimental design and manipulation

This research conducted a between-subjects factorial design experiment. The focal products in the experiment were T-shirts. The manipulated variables include the argument quality, source credibility and product scarcity. The product involvement, trusting belief and loyalty intention were measured by instruments. One live streaming broadcaster was invited to shoot the video for the experiment.

The product scarcity was manipulated in two different levels: scenario with product scarcity and without product scarcity message. In the scenario with product scarcity manipulation, the broadcaster emphasized that each product item has only one for sale, while enough inventory message was delivered in the scenario without product scarcity limitation.

The argument quality and source credibility was controlled across different scenarios. The argument quality describes the persuasive strength of arguments, such as product material, specifications of the products. In this study, the argument quality information was delivered in terms of the product that the broadcaster demonstrated, and the information that deliver to the audience. Further, the source credibility was defined as the expertise, and trustworthiness of the information, such as the number of audiences and the credibility of the broadcaster. In this study, the source credibility was demonstrated by using the

comments and feedback from other audience that have ever brought the products from the broadcaster.

3.3 Operational definition

The operational definitions of the variables in this research are described in Table 1.

▼ Table 1 Operational definitions

Variable	Definition	References
Argument quality	The persuasive strength of arguments information, such as material, and specifications of the products.	(Bhattacherjee and Sanford, 2006; Suh et al., 2013)
Source credibility	The expertise, and trustworthiness of the information, such as the number of audiences and the credibility of the broadcaster.	(Hovland et al., 1953)
Trusting belief	The perceived ability, benevolence, and integrity toward the broadcaster.	(Mayer et al., 1995)
Loyalty intention	A commitment to follow a live streaming broadcaster	(Neupane, 2015; Oliver, 1997; Yen and Lu, 2008)
Product scarcity	The insufficiency of product supply to the customers	(Jung and Kellaris, 2004; Lee and Seidle, 2012)
Product involvement	Customers' self-value which depend on the importance of different product.	(Peter et al., 1999)

3.4 Experimental procedure and measurement

Experimental stimulus was delivered through an experimental live streaming video. The participants were recruited online. They were instructed to watch the video before responding to the questionnaire. The demographic, trusting belief, loyalty intention and product involvement were measured by questionnaire, which include 33 items in total. Each item was measured on a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The questionnaire items in the study are shown in Table 2.

▼ Table 2　Measurement

Measurement	Questionnaire items	References
Trusting belief	T1: I believe that the broadcaster is honest with customers all the time. T2: I believe that the broadcaster is truly sincere in keeping promises made to customers. T3: I believe that the broadcaster is kind with customers all the time. T4: I believe that the product and services that the broadcaster provides must be of high quality. T5: I believe that the broadcaster has the expertise to provide product information to customers. T6: I believe that the broadcaster has the capacity to provide product information to customers.	(Kim and Tadisina, 2005)
Loyalty intention	RI1: I would like to continue watching the live streaming of this broadcaster in the future. RI2: I would not stop watching the live streaming of this broadcaster in the future. RI3: I would frequently watch the live streaming of this broadcaster in the future. RI4: I would like to watch the live streaming of this broadcaster again.	(Kim and Niehm, 2009; Yen and Lu, 2008)
Product scarcity	PS1: After watching the live streaming video, I think the T-shirt were a limited number supplied. PS2: After watching the live streaming video, I think the T-shirt would attract many people to buy it because limited supplied. PS3: After watching the live streaming video, I think the T-shirt would sell out fast. PS4: After watching the live streaming video, I think the T-shirt would be rushing to purchase. PS5: After watching the live streaming video, I think I had to buy the T-shirt quickly or I could not have it.	(Gupta, 2013)
Product involvement	PI1: T-shirt is important for me. PI2: T-shirt is valuable for me. PI3: I think I need T-shirt. PI4: T-shirt is indispensable for me. PI5: T-shirt is cheesy for me. PI6: T-shirt is matter to me. PI7: I am not desirable to have T-shirt. PI8: I am interesting to T-shirt. PI9: It means nothing to me to have T-shirt. PI10: T-shirt is of concern to my life.	(Peter et al., 1999)

4. Data analysis

The questionnaire in this research was posted on PPT board, Facebook, and line group. And the data collected was analyzed by using SPSS. The online experimental live streaming video was randomly distributed to the respondents, and if the respondents finished the questionnaire, and the sample is valid, then they would have the chance to obtain reward.

There were 459 questionnaires were collected online, and there were 377 valid sample, which means the effective ratio is 82%. Furthermore, each scenario was collected average, 193 samples were the description about product scarcity, and 184 samples were the description about no product scarcity.

4.1　Demographics

A total of 459 questionnaires were distributed. In the study, there were 82 invalid questionnaires, and a valid sample of 377 subjects, and the effective ratio is 82%. Of the respondents, there were 41.4% male, and 58.6% were female. There were 42.2% respondent age from 21 to 25 years old, and the education level was about 53.8% in college degree and 35% in master degree, thus, nearly 90% respondents had a high education. Also, the monthly income was 25.5% below 10,000 dollars and 27.9% between 30,001 and 40,000 dollars.

Furthermore, in the questionnaires, there were 87% respondents have ever watched live streaming, and almost 56.8% watched the live streaming 1 to 2 times in one week. From the live streaming topic that the respondents have ever watched, shopping live streaming was over 50%, and the highest ratio product category that has shopped in live streaming is clothes which there were 40.7%. Therefore, the demographics are illustrated in Table 3.

▶ Table 3　Demographics

Items	Frequency	Percentage	Items	Frequency	Percentage
Gender			**Experience of watching live streaming**		
Male	156	41.4%	Yes	328	87%
Female	221	58.6%	No	49	13%
Age			**Watching live streaming in one week**		
<25	166	44.1%	Never	49	13%
26-30	65	17.2%	1 time- 2 times a week	214	56.8%
31-35	56	14.9%	3 time- 4 times a week	63	16.7%
36-40	40	10.6%	5 time- 6 times a week	32	8.5%
41-45	7	1.9%	More than 7 times a week	19	5%
>46	43	11.4%			
Education			**The topic of live streaming has ever watched**		
Under junior high school	14	3.7%	Shopping live streaming	191	50.7%
Senior high school	28	7.4%	Video game live streaming	71	18.8%
College	203	53.8%	Sport live streaming	31	8.2%
Graduate school or above	132	35%	Social media live streaming	35	9.3%
Monthly income			**Shopping on live streaming experience**		
<10,000	95	25.2%	Yes	158	41.9%
10,001-20,000	39	10.3%	No	219	58.1%
20,001-30,000	64	17%			
30,001-40,000	105	27.9%			
40,001-50,000	33	8.8%			
50,001-60,000	18	4.8%			
>60,001	23	6.1%			
Occupation			**Product category that has shopped in live streaming**		
Student	100	26.5%	Clothes	125	40.7%
Finance/Insurance	16	4.2%	Boutique bag	39	12.7%
Information Technology	39	10.3%	Antique/crystal/jewelry	32	10.4%
Manufacturing	20	5.3%	Aquatic/meat	47	15.3%
Soldier/Policeman/Firemen	43	11.4%	Daily necessities and toys	64	20.9%
Housekeeper	30	8%			
Service	86	22.8%			
Between jobs	22	5.8%			
Others	21	5.6%			

4.2 Factor analysis and reliability

All the data in the study were analyzed the reliability and validity by SPSS. After deleting the items PS1 and PI5 which indicated "After watching the live streaming video, I think the T-shirt were a limited number supplied." (PS1) and "T-shirt is cheesy for me" (PI5). The results were shown in Table 4.

▼ Table 4   Factor analysis for the instrument

Constructs	Items	Factor loadings	Bartlett	KMO	Cronbach's alpha
Trusting belief	T1	0.891	1845.287	0.874	0.930
	T2	0.889			
	T3	0.821			
	T4	0.875			
	T5	0.860			
	T6	0.838			
Loyalty intention	RI1	0.936	1511.561	0.865	0.950
	RI2	0.933			
	RI3	0.936			
	RI4	0.925			
Product scarcity	PS1	0.609(Delete)	1111.497	0.851	0.919
	PS2	0.885			
	PS3	0.914			
	PS4	0.923			
	PS5	0.869			
Product involvement	PI1	0.764	2085.423	0.926	0.920
	PI2	0.778			
	PI3	0.816			
	PI4	0.822			
	PI5	0.420(Delete)			
	PI6	0.713			
	PI7	0.760			
	PI8	0.864			
	PI9	0.777			
	PI10	0.769			

4.3 Central route and peripheral route to trusting belief on regression analysis

According to the elaboration likelihood model, both argument quality and source credibility have influence on trusting belief for the audience. The regression analysis model ($F_{(376,1)} = 277.242^{***}$) result was provided in Table 5, which indicated that the two variables argument quality and source credibility revealed a significant effect on the trusting belief in live streaming. According to the result of regression analysis, the influence of source credibility on trusting belief is higher than the influence of argument quality. In ELM model, the audiences in live streaming are higher influenced by the peripheral route than by the center route on trusting belief. Therefore, H1 and H2 were supported.

▼ Table 5　Regression analysis on trusting belief

	Regression model
Argument quality	0.298***
Source credibility	0.504***
R^2	0.597
Adj. R^2	0.595
F	277.242***

*p<0.05; **p<0.01; ***p<0.001

4.4 Trusting belief to loyalty intention on regression analysis

The regression analysis in Table 6 described the influence of trusting belief on loyalty intention. The regression analysis ($F_{(376,1)} = 310.343^{***}$) result indicated that the trusting belief revealed a significant influence on loyalty intention. Therefore, H3 was supported.

▼ Table 6　Regression analysis on loyalty intention

	Regression model
Trusting belief	0.673***
R^2	0.453
Adj. R^2	0.451
F	310.343***

*p<0.05; **p<0.01; ***p<0.001

4.5　The moderating effect of product scarcity on the influence of trusting belief

A total of 377 valid sample, 193 subjects were exposed to product scarcity scenario, while another 184 subjects were assigned to the scenario without product scarcity cues. The regression analysis results were shown in Table 7.

▼ Table 7　Moderating effect testing of product scarcity on trusting belief

	Product scarcity	
	Product scarcity	No product scarcity
Argument quality	0.407***	0.205*
Source credibility	0.426***	0.598***
R^2	0.624	0.614
Adj. R^2	0.619	0.609
F	149.929***	150.830***

(*$p<0.05$; **$p<0.01$; ***$p<0.001$.)

With regarding to the hypotheses, the moderating effects of product scarcity from the perspective of elaboration likelihood model, the scenes without product scarcity would have higher influence on source credibility than the influence of argument quality in live streaming on audiences' trusting belief toward the broadcasters. However, in the scenes with product scarcity, both the central route and peripheral route have positive influence on audiences' trusting belief toward the broadcasters. The influence on peripheral route was higher than the influence on central route. Therefore, H4 was not supported.

4.6　The moderating effect of product involvement on influence of trusting belief

The regression analysis was again conducted to test moderating effect of product involvement. With the total of 377 valid sample, 181 respondents were in high involvement group, while another 196 respondents were in low involvement group. The moderating effect was shown in Table 8.

According to the moderating effect on product involvement, the influence via high product involvement on argument quality to trusting belief is significant than on source credibility. On the other hand, the influence via low product involvement on source credibility to trusting belief is significant than on argument quality. Therefore, H5 was supported.

▼ Table 8　Moderating effect testing of product involvement on trusting belief		
	Product Involvement	
	High	Low
Argument quality	0.536***	0.105
Source credibility	0.278*	0.616***
R^2	0.625	0.489
Adj. R^2	0.621	0.484
F	148.588***	92.488***

(*$p<0.05$; **$p<0.01$; ***$p<0.001$.)

5. Discussion and conclusion

The purpose of this research was to examine the factors on audiences' loyalty intention toward the broadcaster on live streaming based on elaboration likelihood model. The research framework indicated different factors in influencing the live streaming audiences' responses: (1) the argument quality (the product-relevant messages delivered by the broadcaster), and the source credibility (the number of audiences and the interaction among audiences and the broadcaster) would influence the audiences' trusting belief toward the broadcaster, (2) the amount of product supplied in live streaming would influence the process that the audiences evaluate the information; (3) the product involvement is expected to moderate the influence of messages on audiences' trusting belief, and (4) the trusting belief is expected to influence the audiences' loyalty intention toward the broadcaster.

Results from laboratory experiment indicated that the messages delivered through two message sources (the central route and the peripheral route) would influence the audiences trusting belief on broadcaster, which will in turn influence the loyalty intention to follow the broadcaster.

Findings from this study provide important managerial implications to the live streaming broadcasters and platform managers. First, the source credibility is a more influential factor on trusting belief than argument quality. This indicated that the number of audiences and the interactions between the audience and the broadcasters are more important than the product characteristics. The results indicated that the social cues delivered through the online live streaming video are significant predictors of trusting belief. The results are supported by prior studies on network externality (Katz and Shapiro,

1985) which addressed that the value of product/service can be delivered through the number of participants (i.e., the number of members as well as the number of audiences) (Kim et al., 2018; Zhou, 2015). Thus, given two similar products to be sold through the live streaming, the more number of audiences in live streaming video will attract more attention, especially when the products were provided without amount limitation.

Second, people showed higher product involvement were more influenced by the information delivered through central route (i.e., argument quality); while people who are less involved with the product were more influenced by the messages delivered through peripheral route (i.e., the source credibility). The result is consistent with prior findings that the messages delivered through different route will show different effect on consumer responses according to the product involvement level (Choi, 2019; Petty et al., 1981). Thus, it is suggested for the live streaming broadcasters to design different message strategies for consumers with different level of product involvement. For example, membership program can be designed for building customer loyalty as well as attracting people who are highly involved with the product. Special content can be delivered to those higher involved members with more detailed product information to result in higher level of trust. Meanwhile, people with lower involvement can be exposed to the messages with more emphasize on the number of participants and the interactions with the audiences to win consumers' trust.

In order to examine the messages delivered through the central route and peripheral route, the broadcaster, the messages delivered, the focal product and the interactions among audiences and broadcaster were controlled. However, there are some other potential influential factors such as the atmospheric and other environmental stimulus are suggested to be explored in future study.

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