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Elaboration Likelihood Model (ELM) Analysis of User Respond on Douyin Advertising Placement

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Abstract

With the development of mobile Internet technology, short-video social media with the characteristics of lower costs, wider dissemination, stronger interactive capabilities, and more precise marketing positioning, has gradually entered people's world. Douyin is currently one of the most influential short-video social media that is becoming more and more popular with the public. Advertising placement is an increasingly frequent marketing tool used by advertisers on Douyin. In this context, it is very important to explore how users to process advertising placement in a short-video environment. This research studied the relationship between User Activity and Elaboration Participation based on the Elaboration Likelihood Model, and then infer which ELM routes were users with different activity tend to choose. In terms of specific theoretical framework, this article divided User Activity into two dimensions, User Viscosity and User Engagement, and maede them as independent variables, and constructed a cross-relationship model with two subordinate dimensions of Elaboration Participation: Scrutiny and Ads Involvement, which were regarded as dependent variables. This study adopted quantitative research methods, and SPSS24.0 as well as Office Excel 2016 was used to analyze the 158 valid data collected from the survey. Based on the data results, the following conclusions were drawn: a) User Activity is positively related to Elaboration Participation; b) User Viscosity is positively related to Ads Involvement; c) User Engagement is positively related to Ads Involvement. According to the conclusions drawn in this article, a series of theoretical and practical implications were generated, which guided both academic researchers and practitioners in short-video-related industries. At the same time, the limitations of this article and the suggestions for future researchers were also discussed simply and clearly in relevant sections.

Key words: Elaboration Likelihood Model (ELM); Advertising placement; Short-video social media; User Activity; Douyin

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INTRODUCTION

The rapid growth of information and media technology has greatly contributed to the formation and development of social media networks. (Hamouda, 2018) Short video apps such as Douyin, Wesee, and Watermelon Video are some of the most popular social media currently, which enable the users to record, process, publish, and disseminate video content (a video form that less than 3 minutes or even just a few seconds). Users can also interact with others through likes, comments, or sharing in these Apps, thereby greatly facilitates their content participation and social engagement. In addition, with the upgrading of mobile Internet technology and the development of user needs, many short video apps have been equipped with multiple functions such as live broadcast, online shopping, chatbox, and even mini-games. Douyin is currently one of the typical short video apps with the largest number of users in mainland China, as well as a social media with a high degree of completeness in multiple aspects and mature operation

foundation. As of June 2020, Douyin monthly active users have reached 513.36 million, and the average monthly usage time per capita was as high as 1759.5 minutes. (Wang, Ye and Yu, 2020) As its increasing influence in the pan-entertainment social media, there are many academic researchers today studying its communication logic and user operation mode.

Advertising placement is a very popular marketing method for advertisers, which mainly refers to the streaming media content where products or services are embedded for brand exposure. (Voorveld, Noort, Muntinga, and Bronner, 2018) As short video content in Douyin has the characteristics of lower costs, wider dissemination, stronger interactive capabilities, and more precise marketing positioning, businesses in all industries (especially e-commerce companies) are keen to adopt advertising placement for brand exposure. The current advertising placement in Douyin are mainly divided into the following types: 1) Plot Placement, which refers to the integration of the story with a short video; 2) Link Placement, which refers to a hyperlink inserted into the video page (usually can be triggered and linked to the product introduction page); 3) Oral Placement, refers to the dictation of product information by characters in the video (usually appears in live broadcast scenes); 4) Intuitive Placement, refers to the products that directly placed in the video scenes. Relying on massive and concentrating user traffic in these medium platforms, these advertising usually have a stronger contextuality and appeal than traditional advertising, thus may easily trigger positive user respond and shape their brand perception.

Although there has been a lot of communication research on short video social media before, very little research has been conducted on advertising placement in Douyin especially. Furthermore, there was almost no literature exactly discussing how users process receiving a persuasive message in a short video environment. More importantly, most previous studied on social media advertising only focused on the analysis of advertising content attributes, whereas ignored the influence of users and their relationship with the media (an important factor affecting the media ecology) on the reception and process of advertising information, leading to imprecise academic findings. To fill these gaps, based on the Elaboration Likelihood Model (ELM), a communication theory model proposed in the 1980s on how users interpret and process persuasive information and change their attitudes, the research mainly discussed user responses on advertising placement in Douyin. The research question that this study tried to answer was: What is the relationship between User Activity and the choice of two Elaboration Likelihood Model routes (Central Route & Peripheral Route) after receiving advertising placement in Douyin? To better discuss the research question, this research divided User Activity into two dimensions: User Viscosity and User Engagement; and used the concept of Elaboration Participation, which consisted of Scrutiny and Ads involvement, to represent the degree to which user choose the central route of ELM. In addition, a quantitative research method was adopted to mathematically analyze the data collected through the online survey. Through cross-analysis of the data of various indicators, correlation conclusions can be drawn among each dimension, to verify each hypothesizes. Finally, some practical implications for the placement of short-video advertisements, as well as some theoretical suggestions for future studies, were also provided in the research.

1. LITERATURE REVIEW

1.1 Research on Elaboration Likelihood Model

The Elaboration Likelihood Model (ELM) was proposed by social psychologists Richard E. Petty and John T. Cacioppo in the 1980s. As the model well reveals the mode of information processing and attitude formation or transformation after the user receiving the persuasive content, it is widely used in many fields such as marketing, psychology, and communication. The basic theory of the ELM is: when users are more ability and motivative in the issues, they tend to choose (1) Central Route, that is, rationally and actively participate in information processing (higher elaboration); on the contrary, they tend to choose (2) Peripheral Route, that is, perceptually and passively participate in information processing (lower elaboration). (Griffith, Nolder, and Petty, 2018)

Lien (2001), a scholar from National Taiwan University, conducted a systematic review of the Elaboration Likelihood Model focusing on customer research. In his research, it was mentioned that there were two very important factors in advertising content that affect customers' choice of ELM routes: fact-based message and feeling-based claims. These two factors evoke users' logical, objective rational thoughts, and emotional, empathic sentimental thoughts, about advertising content respectively. An important concept, Scrutiny, was also simply mentioned in his research. He pointed out that the increase of Scrutiny may directly lead to the increase of "central cues", which directly or indirectly leads to the user's selection of the central route in ELM. He also believed that ELM was not completely perfect yet, and needed more follow-up theories to continuously improve. Because there were a variety of user factors that is hard for variable controlling, such as "temporal persistence, resistance, and their ability", affected the situation of study. Elaboration Likelihood Model was commonly used for scholars to study Internet social media. Many scholars used this model to study social media content, and the information credibility of the research content was one of the hot topics currently.

Overall, relatively few scholars studied the relationship between user attributes and information processing based on this model.

1.2 Research on short video marketing and advertising placement

Short video marketing refers to marketing activities carried out on short video social media platforms through short videos that are usually less than three minutes in length. (LIU, GAO, LI, and ZHANG, 2019) Advertising placement is an important method of short video marketing. Because it can be directly produced and disseminated on mobile phones and can be accurately delivered to users through the big data algorithms of the platform, it has strong advertising effectiveness and is favored by more and more enterprise advertisers.

Four scholars, Gaofu LIU, Pengchao GAO, Yuchun LI, and Zhouping ZHANG, have conducted in-depth research on social media short video marketing. They innovatively defined social media short video marketing in three dimensions: interesting content, scene-based experience, and user participation interaction. The research focused on the relationship between the social media short video marketing variable and brand perception and further inferred the relationship between it and brand attitude. Based on the quantitative analysis of the survey, the authors concluded that the social media short video marketing composed of the above three dimensions had a positive correlation with the formation of the user's brand attitude, in which brand perception acted as an intermediary between the two concepts. In addition, some scholars focused on Douyin short video marketing advertisements to study the impact of consumer behavior. Many scholars mentioned the two concepts of content interest and advertising popularity in related academic research and used these two variables as quantitative indicators for in-depth analysis. Most of their studies finally showed that these two factors had a positive effect on the formation of user attitudes. (LI, HUANG, and LI, 2019)

2. THEORETICAL BACKGROUND AND HYPOTHESES

According to the review and study of previous research, the Elaboration Likelihood Model was used as the theoretical basis for this article. The research explored the relationship between User Activity and Elaboration Participation based on ELM to study the user response after receiving Douyin advertising placement and judged which route of ELM the user chooses through their degree of Elaboration Participation. And the theoretical framework for the research is as shown in Figure 1:

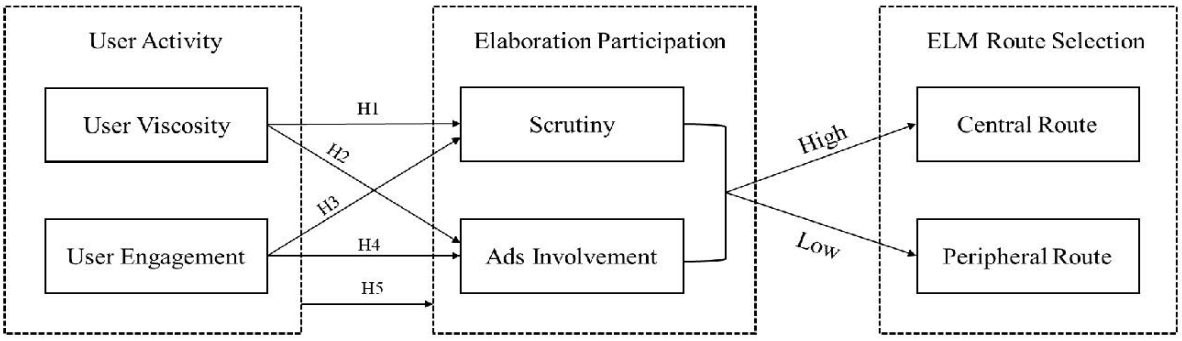

Figure 1
Theoretical Framework

2.1 User Activity

There was no precise definition of User Activity in the previous study. Nevertheless, active user is a very popular term in the current Internet industry, which mainly refers to users who frequently generate activities in a software. According to the research direction of this article, User Activity is a more accurate term evolved from active user, which mainly refers to the degree of dependence and participation in Douyin software. In this study, User Activity was divided into two dimensions for discussion: User Viscosity and User Engagement. User Viscosity mainly referred to the extent of the connection between users and Douyin, which was divided into two constructs for measurement: Usage and Dependence. User Engagement mainly referred to the degree of social interaction between users and Douyin, which can be measured as a single indicator.

2.2 Elaboration Participation

It should be mentioned that Elaboration Participation is a term that has not appeared in the previous theoretical research on ELM, whereas its concept is vaguely mentioned by many scholars. Researchers used terms like "engagement" or "interaction" to describe them (Voorveld, Noort, Muntinga, and Bronner, 2018). However, based on the relationship between users and advertising placement, participation is a broader concept than interaction and engagement, thereby participation is a more accurate expression for this research.

The reason for using "Elaboration Participation" here was to define two crucial factors influencing ELM route

selection: (1) the degree to which users are subjectively and objectively capable for the elaboration of content (Ability); (2) the degree to which users are subjectively and objectively engaged in the short- video advertisements (Motivation). (Lien, 2001) Base on the core principles of the ELM model theory, the more the users are involved in Elaboration Participation, the more they will be likely to choose the Central Route; on the contrary, they tend to choose the Peripheral Route. Elaboration Participation was divided into two dimensions: Scrutiny and Ads Involvement. Scrutiny mainly represented the rationality of the user's information process after receiving advertising placement, which was used as an independently measured variable. Ads Involvement was about the extent of user engagement in advertising placement content, which was consisted of two constructs: Interest Relevance and Interaction.

2.3 Hypotheses

Based on the research question and academic framework, this research speculated that users with strong User Activity in Douyin might have stronger awareness and greater familiarity with this social media. Therefore, it would be more capable and motivating for them to engage in more Elaboration Participation, hence it was more likely to choose the central route in ELM. To ensure academic rigor, this article analyzed the relationship between each dimension. Thus, the following four hypotheses were formulated:

H1: User Viscosity is positively related to Scrutiny.

H2: User Viscosity is positively related to Ads Involvement.

H3: User Engagement is positively related to Scrutiny.

H4: User Engagement is positively related to Ads Involvement.

H5: User Activity is positively related to Elaboration Participation.

3. RESEARCH METHODOLOGY

In order to verify the above hypotheses of the research question, an online survey was adopted for data collection, and the collected data results was analyzed by SPSS 24 and Office Excel 2016. The unit of analysis was individuals who use Douyin. Because the survey was distributed in mainland China, the original language of the survey was Chinese, and the results were translated into English after data collection. At the same time, as this article was mainly based on the research of Douyin's short video ad placement, the target survey group was respondents who have used Douyin. Respondents who have never used Douyin were just investigated for their expected attitudes towards Douyin and the advertising placement in this platform. And their data results would not be analyzed, which greatly improved the accuracy of this research.

3.1 Survey Design

In order to ensure the reliability of the sample and reduce bias, a close-ended structured survey was adopted in this research. The survey was mainly divided into three parts: the first part was the user's basic information, mainly to investigate the demographic attributes of the user; the second part was the user's use of Douyin, mainly to study User Viscosity and User Engagement; the third part was the user's the response of Douyin advertising placement, which was mainly to study Scrutiny and Ads Involvement. In addition, to avoid misunderstanding, the survey also explained to the respondents that the survey results were only used for academic purposes. Besides, in order for them to have a deeper understanding of the survey in this research, but not to fully understand the content of the survey that resulted in deviations, a vague summary of the investigation propose was provided to the respondents in each section.

3.2 Measurement

Considering the need to ensure the accuracy of the measurement results of all items in the survey, this study uniformly used the 5-point Likert Scale (strongly agree = 1; agree = 2; general = 3; disagree = 4; strongly disagree = 5) method to assign values to each option of each question. In view of the influence of question setting and contextual expression, the option assignment of some questions was set in reverse. For items that cannot be measured by the Likert Scale, each option was given equal scale values according to the overall 5-point standard. At the same time, the research on the various factors of Douyin required coherence, thereby certain matrix problems were used in conjunction with the 5-point Likert Scale. The relationship between variables and dimensions and measured items are shown in Table 1.

For the measurement of the first construct in User Viscosity (UV), Usage (USG), the survey asked the respondents the initial using time, daily usage time, daily usage frequency in Douyin platforms. The second construct, Dependence (DEP), under User Viscosity (UV) was mainly to measure the degree of dependence and inseparability of users on Douyin. This indicator was measured by a set of matrix questions containing questions like "You always want to start the software in your free time" and "It is always very difficult to stop after you start to watch the Douyin short video." In terms of the measurement of User Engagement (UE), the survey focused on figuring out the respondents' habits of using likes, comments, sharing, content production, and chatbox in Douyin. The measurement was accomplished through asking respondents questions such as "You will submit likes to the short video content you are interested in", "You will participate in the comments under the short video content" and so on.

Table 1
Relationship Between Variables

Core variable	Dimension	Construct	Item
User Activity (UA)	User Viscosity (UV)	Usage (USG)	USG1. When did you use Douyin for the first time?
			USG2. How long do you use Douyin every day on average?
			USG3. How often do you turn on Douyin every day?
		Dependence (DEP)	DEP1. You always want to start the software in your free time.
			DEP2. You feel difficult to stop when watching the Douyin short video.
			DEP3. You can get satisfaction from the use of Douyin short videos.
			DEP4. You think Douyin has become a necessary part of your life.
			DEP5. You think there is no APP that can better replace Douyin.
	User Engagement (UE)		UE1. You usually submit likes to the short video content you interested
			UE2. You usually participate in the comments under the short video content
			UE3. You usually share the short videos you like with others
			UE4. You usually follow interested video bloggers or official media
			UE5. You usually produce personal short video content and publish it to the platform
			UE6. You usually often use the Douyin private messaging function
Elaboration Participation (EP)	Scrutiny (SCRU)		SCRU1. You think that high-traffic blogger is more credible than small-traffic blogger
			SCRU2. The advertising with high playback volume and likes is easier to gain your trust
			SCRU3. If a product is recommended by your favorite Douyin influencer, you will pay special attention even generate purchase intention.
			SCRU4. Among the products recommended by Douyin placement ads, you will pay more attention to official product introductions rather than user reviews.
			SCRU5. For the products recommended in the Douyin placement ads, you usually get more product information from multiple channels before purchase
	Ads Involvement (AI)	Interest Relevance (IR)	IR1. The user experience of watching Advertising Placement in Douyin and other short video content is not much different.
			IR2. Douyin's advertising placement content is very relevant to your personal preferences.
			IR3. You have no objection to the platform serving you more customized advertising content.
		Interaction (INTR)	INTR1. Even if you know it's an ad, you're willing to watch it all
			INTR2. Even if you know it is an advertisement, you are willing to watch it many times
			INTR3. You will voluntarily follow the publisher of the ad, in order to obtain follow-up information
			INTR4. You will voluntarily like or comment on the placement of ads
			INTR5. You will voluntarily share or povide any form of secondary dissemination for placement ads

The measurement of Scrutiny (SCRU) was mainly to investigate the rationality of the respondent after receiving the Douyin advertising placement content. In this part, respondents were asked to indicate the extent to which they were affected by different types of advertising content, as well as external factors that affected the formation or transformation of their ideas. A series of questions surrounding this investigation purpose, such as " You think that high-traffic blogger is more credible than small-traffic blogger" and " The advertising placement with high playback volume and likes is easier to gain your trust " and so on, were provided to respondents to answer. In terms of Ads Involvement (AI), two constructs were used for measured: Interest Relevance (IR) and Interaction (INTR). Interest Relevance was mainly used to understand the degree of interest of the respondents in Douyin advertising placement, which was more reflected in the attitude rather than behavior. "The user experience of watching Advertising Placement in Douyin and other short video content is not much different." and "Douyin's advertising placement content is very relevant to your personal preferences." were two very important items to measure this construct. Interaction was set to capture user's reactions after receiving Douyin's advertising placement, which was more about behavior rather than attitude. Items of playback situation, likes, comments, sharing were measured, which was very similar to the measurement of User Engagement in this study. However, the investigation context of User Engagement was based on all kinds of Douyin short videos, while the investigation context of Engagement under Ads Involvement was just based on the advertising placement of the platforms.

In order to ensure the accuracy of data processing, all the above-mentioned dimensions and construct measurements were the weighted average of their Items. Based on the measurement results, the indexes of the two core variables, User Activity (UA) and Elaboration Participation (EP), were also calculated. User Activity (UA) was the arithmetic average of User Viscosity (UV) and User Engagement (UE), and Elaboration Participation (EP) was the arithmetic average of Scrutiny (SCRU) and Ads Involvement (AI).

3.3 Data Collection

Considering that users who used Douyin must own a smartphone, this survey was distributed randomly through three channels: WeChat group chat, WeChat Moments, and Weibo. The survey was distributed on two days, March 31, 2021, and April 5, 2021. In order to avoid the influence of uncontrollable external factors on the results, the survey adopted a question item, "Have you ever used Douyin APP in person?", to filter the respondents. Only respondents who answered "yes" were included in the valid data. There was a total of 261 respondents filled out the survey. After filtering out 103 invalid answers (people who have not used Douyin), the study finally got 158 valid answers that can be used for testing the research hypotheses, with the valid rate reaching 60.54%. The demographic information of respondents is as shown in Table 2:

Table 2
Demographic Information of Respondents

Item	Category	Frequency	Proportion (%)
Gender	Male	75	47.5
	Female	83	52.5
Age	19 years old and below	34	21.5
	20-29 years old	86	54.4
	30-39 years old	20	12.7
	40-49 years old	14	8.9
	Over 50 years old	4	2.5
Education Level	High school and below	113	71.5
	College degree	20	12.7
	Bachelor degree	14	8.9
	Master degree	11	7.0
	PhD degree	0	0.0
Monthly Income	Less than 2000	36	13.8
	2000~5000	170	65.1
	5000~10000	18	14.6
	10000~30000	15	5.8
	More than 30,000	2	0.8

4. RESULTS

4.1 Descriptive Statistics

In this study, a descriptive statistical analysis of 4 variables (dimensions) of 158 valid answer sheets was carried out by using SPSS24 software. Among them, the mean, standard deviation, maximum and minimum values of each data were tested. The analysis results of each variable (dimension) and constructs are shown in Table 3, and the analysis results of each item are shown in Table 4:

Table 3
Variable (Dimension) and Constructs Descriptive Analysis (N=158)

Dimension/ Construct	Mean	Standard Deviation	Minimum	Maximum
User Viscosity (UV)	3.09	0.77	1.38	4.77
Usage (USG)	2.93	0.87	1.31	5.00
Dependence (DEP)	3.14	1.03	1.00	5.00
User Engagement (UE)	3.34	0.81	1.00	5.00
Scrutiny (SCRU)	2.92	0.43	1.80	3.80
Ads Involvement (AI)	2.82	0.83	1.00	4.60
Interest Relevance (IR)	3.00	0.92	1.00	5.00
Interaction (INTR)	2.65	1.11	1.00	4.60

Table 4
Items Descriptive Analysis (N=158)

Dimension/ Construct	Mean	Standard Deviation	Minimum	Maximum
USG1	3.03	1.28	0.83	5.00
USG2	2.41	1.38	1.00	5.00
USG3	3.36	1.48	1.25	5.00
DEP1	3.15	1.32	1.00	5.00
DEP2	3.21	1.20	1.00	5.00
DEP3	3.21	1.22	1.00	5.00
DEP4	2.81	1.27	1.00	5.00
DEP5	2.81	1.33	1.00	5.00
UE1	3.75	1.10	1.00	5.00
UE2	3.01	1.25	1.00	5.00
UE3	3.69	1.14	1.00	5.00
UE4	3.85	1.07	1.00	5.00
UE5	2.76	1.34	1.00	5.00
UE6	2.97	1.27	1.00	5.00
SCRU1	2.63	1.08	1.00	5.00
SCRU2	2.49	1.05	1.00	5.00
SCRU3	2.37	1.05	1.00	5.00
SCRU4	3.34	1.07	1.00	5.00
SCRU5	3.75	1.14	1.00	5.00
IR1	2.87	1.08	1.00	5.00
IR2	3.13	1.12	1.00	5.00
IR3	3.00	1.12	1.00	5.00
INTR1	2.79	1.28	1.00	5.00
INTR2	2.64	1.27	1.00	5.00
INTR3	2.61	1.28	1.00	5.00
INTR4	2.63	1.22	1.00	5.00
INTR5	2.56	1.27	1.00	5.00

4.2 Reliability and Validity Analysis

This study used SPSS24 for reliability and validity analysis, mainly relying on the Cronbach' α model, Kaiser-Meyer-Olkin test, and Bartlett test to measure various variables and items' alpha value. As shown in Table 5: a) the overall Cronbach's α value of scale as well as variables was greater than 0.70, indicating high internal consistency of the scale; b) the KMO of scale as well as variables was greater than 0.50, and the significance of Bartlett Test was less than 0.01,

indicating that the scale had good structural validity for further hypotheses testing.

Table 5
Reliability and Validity Analysis

Variables	Measurement items	Cronbach's α after deleting the item	KMO	Sig. of bartlett test
User Viscosity (UV) Cronbach's α = 0.826	USG1	0.837	0.545	<0.01
	USG2	0.834	0.698	
	USG3	0.841	0.749	
	DEP1	0.827	0.743	
	DEP2	0.833	0.698	
	DEP3	0.827	0.681	
	DEP4	0.823	0.729	
	DEP5	0.827	0.644	
User Engagement (UE) Cronbach's α = 0.763	UE1	0.838	0.702	<0.01
	UE2	0.827	0.762	
	UE3	0.834	0.717	
	UE4	0.841	0.669	
	UE5	0.825	0.566	
	UE6	0.833	0.678	
Scrutiny (SCRU) Cronbach's α = 0.767	SCRU1	0.852	0.752	<0.01
	SCRU2	0.854	0.666	
	SCRU3	0.852	0.698	
	SCRU4	0.840	0.807	
	SCRU5	0.846	0.803	
Ads Involvement (AI) Cronbach's α = 0.869	IR1	0.834	0.804	<0.01
	IR2	0.838	0.785	
	IR3	0.832	0.785	
	INTR1	0.826	0.616	
	INTR2	0.827	0.513	
	INTR3	0.828	0.729	
	INTR4	0.827	0.638	
	INTR5	0.827	0.633	
Overall Reliability Cronbach's α = 0.840			0.820	<0.01

4.3 Testing Hypotheses

This study mainly used correlation analysis to the relationship between various variables (dimensions), and the Pearson correlation model was adopted. As shown in Table 6, the correlation index and 2-tailed significance (p-value) between the four variables were examined. These two values were mainly used for measuring the degree of correlation among variables. For the parameters with significance less than 0.05, SPSS24 software automatically added one "*" behind the figures, and for those with significance less than 0.01, two "*" were added.

H1: *User Viscosity is positively related to Scrutiny*, was tested by examining the correlation between UV and SCRU. The Pearson Correlation Index was below 0, which meant there was no positive correlation between these two variables. As the absolute value of the correlation coefficient was less than 0.1 and the significance (2-tailed) was greater than 0.05, the correlation between these two variables was weak. Therefore, H1 was not supported by the data of this study. H2: *User Viscosity is positively related to Ads Involvement*, was tested by examining the correlation between UV and AI. The Pearson Correlation Index was 0.261, and the significance (2-tailed) was below 0.01, indicating the two had a weak positive correlation. Therefore, H2 was supported by the data of this study and is accepted to a certain extent. H3: *User Engagement is positively related to Scrutiny*, was tested by examining the correlation between UE and SCRU. The Pearson Correlation Index was -0.183, which indicated that the correlation was negative rather than positive. Besides, as the significance (2-tailed) was less than 0.05 and greater than 0.01, the correlation of the two was weak. Therefore, H3 was rejected in this study. H4: *User Engagement is positively related to Ads Involvement*, was tested by examining the correlation between UE and AI. The Pearson Correlation Index of these two was 0.472, and the significance (2-tailed) was below 0.001, which meant these two variables were positively correlated. Therefore, H4 was accepted in the study. H5: *User Activity is positively related to Elaboration Participation*, was tested by examining the correlation between UA and EP. The Pearson Correlation Index of these two variables was 0.353, and the significance (2-tailed) was below 0.001, which meant these two variables were positively correlated with high accuracy. Therefore, H4 was supported by the data and accepted in the study.

Table 6
Correlation Analysis

		UA	*EP*	*UV*	*UE*	*SCRU*	*AI*
UA	Pearson Correlation	1	.353**	.795**	.818**	-0.140	.429**
	Sig. (2-tailed)	/	0.000	0.000	0.000	0.080	0.000
	N	158	158	158	158	158	158
EP	Pearson Correlation	.353**	1	.238**	.329**	.278**	.869**
	Sig. (2-tailed)	0.000	/	0.003	0.000	0.000	0.000
	N	158	158	158	158	158	158
UV	Pearson Correlation	.795**	.238**	1	.302**	-0.039	.261**
	Sig. (2-tailed)	0.000	0.003	/	0.000	0.629	0.001
	N	158	158	158	158	158	158

To be continued

Continued

		UA	*EP*	*UV*	*UE*	*SCRU*	*AI*
UE	Pearson Correlation	.818**	.329**	.302**	1	-.183*	.427**
	Sig. (2-tailed)	0.000	0.000	0.000	/	0.021	0.000
	N	158	158	158	158	158	158
SCRU	Pearson Correlation	-0.140	.278**	-0.039	-.183*	1	-.233**
	Sig. (3-tailed)	0.080	0.000	0.629	0.021	/	0.003
	N	158	158	158	158	158	158
AI	Pearson Correlation	.429**	.869**	.261**	.427**	-.233**	1
	Sig. (3-tailed)	0.000	0.000	0.001	0.000	0.003	/
	N	158	158	158	158	158	158

5. DISCUSSION

This article focused on the study of which ELM path users with different levels of activity were more inclined to choose after receiving the Douyin advertising placements. At the same time, on the basis of this research direction, this paper also conducted a dimensional analysis of these two core variables. In order to better clarify the relationship between these two core variables, the study not only analyzed the relationship of User Activity and Elaboration Participation but also their subordinate dimensions: User Viscosity, User Engagement, Scrutiny, and Ads Involvement.

Overall, the study had verified that User Activity and Elaboration Participation have a positive correlation. In other words, if a user is more dependent on Douyin or has a higher degree of participation, he or she is more inclined to participate more in elaboration thinking and independent analysis after receiving the Douyin advertising placement, thereby more likely to select Central Route in Elaboration Likelihood Model. According to the above-verified hypotheses, H2 and H4, this phenomenon can be explained. On the one hand, the user with higher User Viscosity is more likely to involve more in the advertising placement. This may be because users are more familiar with the media ecology of Douyin and are more easily to accept the marketing content. On the other hand, User Engagement is positively related to Ads Involvement, which means the users who are more willing to participate in social interaction on Douyin, are more likely to participate in Douyin placement ads. Because Douyin recognizes user preferences based on the user's usage data, to distribute the advertising content to users who interested in, thereby increase the conversion rate of advertising placement. The surprising finding was that there is a negative correlation relationship between Scrutiny and Ads Involvement. This means that users who are willing to think carefully about the advertising content are not willing to participate in the interaction of advertising content too much. However, this finding was not in the set of hypotheses preset in this article, and its rationality needs to be further-academic verified.

5.1 Theoretical and Practical Implication

After categorizing and summarizing some of the academic achievements of the previous literature, this research put forward some new conceptual elements for filling the knowledge gap of the application of ELM in short-video media ecology. For example, concepts such as User Viscosity and Scrutiny. This kind of emerging element promoted the development of ELM in short-video advertising, which may facilitate subsequent researchers to conduct in-depth research in such fields. Secondly, exploring the relationship between user activity and ELM route selection was an academic direction that few people have tried. Therefore, the research framework of this article was also of reference for subsequent research

Based on the research direction in this article, some of the theoretical results can also guide practitioners of short-video marketing or advertising. First, because highly active users are more willing to choose the central path, advertisers can place more emphasis on the information of performance, parameters, or other objective quantitative indicators that reflect product quality when distributing advertising for highly active users. Secondly, users with higher User Viscosity and User Engagement are more involved in advertising content, which also means that users with higher user activity are more likely to participate in advertising placement. Therefore, to better improve the advertising exposure, for obtaining more advertising revenue from advertisers, the Douyin platform can set up a series of reward activities, such as: sharing to get a cash red envelope; giving comments to participate in a lottery, etc. These mechanisms can induce users to operate more in the platform, which allows them to gradually develop a sense of trust and familiarity with the platform, making them easier to participate more in advertising content.

5.2 Limitation and Future Research

Although this research had a certain innovative contribution in the new era's ELM development, as well as practical guidance for media and advertising practitioners, many limitations also existed. First, all the inferences in this article were based on the premise

that the ELM model was completely correct. Although the use of ELM in the social-media field was common, it was rarely used in the short-video field. Short-video social media was fundamentally different from all existing electronic media in operational logic. There were also many uncertain factors in its current development. Whether ELM conforms to its media ecology required further research. Secondly, the research target in this article was theoretically all people who have been exposed to Douyin advertising placement. However, the final valid sample size was only 158, which was a very small figure for the study and may lead to certain data deviations. At the same time, quantitative social science research for all users of Internet platforms was very difficult, it had very high requirements for the control of external factors, such as location, time and etc., in questionnaire delivery.

Therefore, in future ELM-based short-video social media research, the validity of this academic model in this type of media should be verified. Based on the exploratory experience of this research, quantitative research using the inductive methodology can be tried. On the one hand, the effectiveness of ELM in the new media ecology can be tested, on the other hand, it can also continuously facilitate the update and iteration of ELM. In addition, user segmentation is also necessary for future research. As the Internet industry becomes more mature, the conclusions for subdivided users will be more valuable. At the same time, subdivided users are easier to target, and the requirements for overall data volume are relatively low, which means higher feasibility in research execution.

5. CONCLUSION

With the increasing popularity of advertising placement in the short video social media Douyin, it is necessary to further study the information processing model of users for advertising content. Therefore, this article used the Elaboration Likelihood Model to explore the relationship between the User Activity in Douyin and the extent of Elaboration Participation in advertising placement information and to directly infer which ELM route users with different levels of activity may choose. According to the data result, this research finally verified that users with high User Activity are more willing to participate in Elaboration Participation, and therefore more willing to choose the central route. At the same time, the study also verified that users with higher User Viscosity or User Engagement are more willing to participate in advertising placement. Based on the research conclusions, a series of theoretical and practical implications have also been proposed. In addition, current limitations of this research were mentioned, such as the applicability of ELM in the short video media ecology that needed to be verified, and the research on segmented users was insufficiently targeted. Therefore, in future research, it is expected that the knowledge gaps mentioned above can be gradually filled.

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