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Research on the Motives Affecting the Behavior of Short Video's Creators

XIANG BI^{1,2} AND CUNCHEN TANG²

¹School of Literature and Media, Hubei University of Arts and Science, Xiangyang 441053, China

²Public Opinion Research Center, Wuhan University, Wuhan 430072, China

Corresponding author: Xiang Bi (250825180@qq.com)

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ABSTRACT The research on the behavior of short video's creators is an important part of the research on short video communication mechanism, communication elements, short video public opinion evolution and its development situation prediction. Clarifying the motives that affect the behavior of short video's creators can achieve the accurate dissemination of short video content, which has a positive significance for the development of the short video industry and has practical value for the network content management department to guide the development of the industry. In the "video communication era", as a communication carrier, short video has been widely used in e-commerce, government information dissemination and other fields to improve the traditional form of communication, and many good results have already been achieved. However, there are few studies on the origin characteristics of short videos, that is, the motivation of short video's creators' behavior. In this article, first, a motivation analysis model of short video's creators' behavior is constructed, a questionnaire is used to obtain 2,582 short video's creators' behavior, motivation and other characteristic elements, followed by factor analysis, correlation analysis, reliability analysis and other methods to test the authenticity and validity of the variables; second, the stepwise multiple linear regression method is adopted to analyze the dependence relationship between behavior and motivation; finally, through the data analysis results, the degree relationship between the behavior and motivation of the short video's creator is obtained. The results show that information communication, economic benefits, emotional control, and self-expression are the main motives that affect the behavior of short video's creators. At the same time, it is found that there is a phenomenon of professional development in short video's creator groups, and the internal scale of their creations shows the same direction. This research provides new contributions to the establishment of an accurate short video content communication model and the governance of future short video-induced network public opinion.

INDEX TERMS Short video's creator, behavioral representation, creative motivation, empirical research, multiple linear regression.

I. INTRODUCTION

According to the 43rd Statistical Report on Internet Development in China (hereinafter referred to as the report) released by the China Internet Network Information Center (CNNIC) in Beijing on February 28, 2019. Up to December 2018, the number of short video's users in China reaches 648 million, and the user utilization rate is 78.2% [1]. From January

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to August in 2019, major short video media organizations have organized creators' meetings and successively launched a series of measures to support creation, enhance functions, and to enrich content: On January 24, 2019, Tencent Short Video Creation Alliance in Beijing held the first alliance conference and proposed to create "all-round creators" [2]; on July 30 of the same year, the fast-handed and short-listed creators of the fast-handed short video conference was co-hosted in Changsha. Yilifa supported content creators in Hunan, and was expected to cover nearly 10,000 creators [3]; on

August 24th, Douyin held a creators conference in Shanghai. Zhang Nan, President of Douyin, said in his speech that the development of short video was beyond imagination. It was expected that by 2020, the total number of daily active users in the short video industry would reach 1 billion [4]. It can be seen that the creator group has become an independent branch among short video's users. With so many short video's creators participating in content production, short video has become more and more influential in the fields of personal life and social public management. As far as short-video media agencies are concerned, maintaining a certain number of short-video creators and inspiring them to produce more non-homogeneous, high-quality content is the core issue of their concern.

At present, the research on the behavior of short video's creators is mostly based on the analysis of phenomena, using short video media to release information for simple accumulation or correlation analysis. The simple cumulative creator behavior is only considered from the two factors of behavior - quantity and behavior rules. It has fewer measurement dimensions and limited recognition ability, which cannot fully reflect the real situation of short video's users. At the same time, it also lacks a comparison of different short video's creators. The arrival of the era of big data has provided new data resources for the research and research on the behavior of short video's creators, and has also provided the conditions for innovative research methods on the behavior of short video's creators. In the context of open and real-time participation of short video media, the issue of how to introduce more analysis indicators to establish a more objective and comprehensive analysis model of creators' motivation and how to use the quantitative analysis method to clarify the dependence relationship between the short video's creator's behavior and motivation, and to achieve the accurate dissemination of short video content more accurately are key points of this article.

II. RESEARCH MOTIVATION AND GOALS

The short video is developed in the context of the mobile Internet, which has been widely used in practice and has aroused widespread concern in the academic world. In the literature, scholars mainly focus on the content of short videos. Due to restrictions on professional division of labor and media literacy of audiences, short video's creators are less concerned, so there is relatively less research on the behavior of short video's creators.

In the field of short video content research, there are many researches on content creation, mainly reflected in aspects such as creation scenes and techniques. For example, from the perspective of mainstream media developing short video services, Kuang Ye analyzes the communication power and influence of the methods in the creative process, and believes that the essence of design, strong interaction and scale is the short video creation laws [5]; based on the analysis of the award-winning works of the top ten news short videos in 2017, Liu Shuang finds that the creators of

empirical short videos should cultivate integration awareness, audience awareness, lightweight awareness, in-depth awareness, media awareness, and product awareness to achieve the optimization of creator production and communication promotion [6]; Gao Chong *et al.* find that short video content production modes include "reproduction" and "creation" [7]. Research on short video creation scenarios is reflected in youth online education [8], public health [9], remote medical diagnosis and knowledge popularization [10]–[12], etc. Short video has played a more significant role.

Since the creator is a part of the short video's users, and the short video's users are the component of the social media users, the academic research on the behavior of the social media users can be used as a reference for this article. Scholars mainly focus on three aspects: behavioral influencing factors, behavioral characteristics and behavioral relationships. In the study of behavioral influencing factors, scholars conduct research on the influencing factors of user behavior formation and the effect of behavioral effects on user behavior through the use and satisfaction theory, motivation theory and other classic theories [13]–[16] to explore the motivations that affect user behavior, especially on motivation perception user behavior prediction [17]. In the study of behavior characteristics, scholars focus on the generation of user's information, sharing, discussion, feedback, and commercialization. Most of them build a research model and grab specific information of the user's behavior in social media as a sample for analysis and discussion [18]–[21]; Some scholars adopt big data methods to obtain user's information, analyze the correlation among users, and have the research characteristics of computational communication [22]–[26]. The focus of behavioral relationship research is the research of social network relationships composed of user's behavior. Scholars use complex social network theory to analyze the interaction between users, to explain different information behaviors, and to predict possible behaviors [27], [28], usually taking Twitter, Facebook and other social media users as the research object, so that the dynamic changes of user behavior are dynamically studied through variables such as access degree, network density, and intermediary [29]–[31].

Many academic achievements provide a good research foundation for the research on short video's creators' behavior. The content research of short video focuses on short video's creation methods, and user's behavior research focuses on the feedback of short video audiences for creative content. Some studies have also proposed indicators of user's behavior, such as the number of plays, the number of likes, the number of comments, or the number of reposts [32]–[34]. However, the limited sample data will lead to inaccurate model results, making it difficult to fully feedback the dependence of short video's creators' behavior and motivation. At the same time, there is very little research on the behavior of short video's creators in the academic world. Most of them reflect the status of short video's creators through short video content, and there is a lack of research samples to support

the research conclusion. This article aims to build a short video's creator behavior motivation analysis model, by collecting short video's creator behavior and motivation characteristics, to explore the dependence relationship between short video's creator behavior and motivation, and to improve the accuracy and reliability of short video content accurate communication.

III. BASIC THEORY AND ANALYSIS METHODS

A. MOTIVATION THEORY

Motivation theory is a theory that studies the generation, mechanism, demand, behavior and goal relationship of motivation. Motivation is a continuation of demand, which will lead to the occurrence of behavior. This theory is developed and extended by American psychologist Clark Hull, and he puts forward the famous driving force theory [35]. He believes that the body needs to generate a driving force, which forces the body to move, but the kind of activities or reactions will depend on the objects in the environment to decide. As long as the driving state exists, appropriate external stimuli will inevitably elicit a certain response. The connection between this response and the stimulus is an innate instinct. In order to explain the role of the environment, Hull puts forward the concepts of inducement, habit strength, and self-inhibition in the structure of motivation theory. It is believed that the incentive is a stimulus to meet the needs of the individual, which has the role of inspiring or causing the individual to move toward the goal, and the incentives are closely connected with the driving force, and the internal needs are stimulated by the external goals; the habit intensity is the dynamic relationship between the incoming and outgoing nerve impulses, which promotes the occurrence of individual behavior; self-inhibition can offset the driving excitement. The theoretical formula of motivation driving force modified and proposed by Hull is:

$$P = D \times H \times K - I \tag{1}$$

In formula (1), P represents the potential of individual behavior, D is the driving force, H is the intensity of habit, K is the incentive, and I is self-inhibition.

Based on Hull's motivation driving theory, this article mainly studies the motivation of short video's creators who are still willing to complete relevant behaviors without any external environmental pressure, thus establishing an analytical research route as shown in Figure 1. The joint action of external motivation and internal motivation promotes the driving force of motivation, and forms individual habits, induces, and gathers to form creator behavior. Each creator has multiple behaviors, and multiple creators may also have consistent behaviors. It is clear that there is an inevitable relationship between behavior and motivation. Analyzing the dependence relationship between behavior and motivation can reflect the degree of influence of different motivations on behavior.

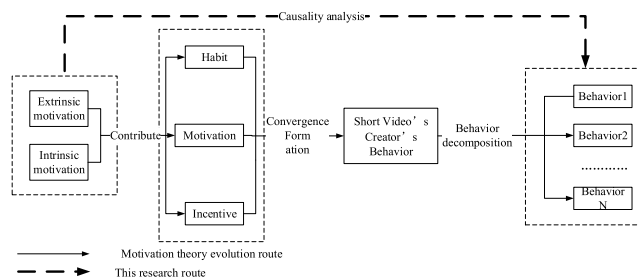


FIGURE 1. Research Route of short video's creator's Behavior.

B. ANALYTICAL METHOD

The analysis method is the method that needs to be used in the research of this thesis. In this section, the basic content and application model of the analysis method to be used will be described.

1) FACTOR ANALYSIS

The factor analysis method is a statistical analysis method that studies the correlation coefficient matrix between the variables, summarizes the intricate relationship between these variables into a few comprehensive factors, and classifies the variables accordingly. Since the number of concluded factors is less than the number of original variables, but contains the information of the original variables, this analysis process is also called dimensional reduction [36].

In the investigation and analysis of modern society, the KMO in factor analysis is often used to test the partial correlation and correlation between variables; the Bartlett sphere is used to test whether the variables in the correlation matrix are independent, and each question in the questionnaire is to verify the validity between items. The formula for calculating the KMO value is:

$$KMO = \frac{BB}{AA + BB} \tag{2}$$

In equation (2), AA represents the sum of squared partial correlation coefficients between items in the variable, and BB represents the sum of squared correlation coefficients between items in the variable. When the sum of squares of correlation coefficients between items is much larger than the sum of squares of partial correlation coefficients, the KMO value is close to 1. The correlation is stronger and the validity is better with the KMO value closer to 1; when the sum of squares of correlation coefficients between items is close to 0, the KMO value is close to 0, which means that the correlation is weak and the validity is poor. According to statistical requirements, when the KMO value is greater than 0.5, the correlation between items is better and has statistical significance [36].

Generally speaking, before performing the validity test, the hypothesis to be tested is called the null hypothesis and is denoted as H_0 ; the hypothesis opposite to H_0 is called the alternative hypothesis and is denoted as H_1 . The Bartlett

spherical test is used to calculate the statistics χ^2 , the test expression is as follows:

$$\chi^2 = - \left[n - \frac{2p + 11}{6} \right] \ln |R| \tag{3}$$

In equation (3), χ^2 is the Bartlett spherical test value, n is the number of data records, p is the number of variables for factor analysis, \ln is the natural logarithmic function, and $|R|$ is the determinant value of the correlation coefficient matrix R . Through the Bartlett spherical test χ^2 , you can look up the table to get the significance level P value, which is used to judge the error probability between the items. In the literature of many statistical analysis, the significance level P values that can be used are three standards: 1% (0.01), 5% (0.05), and 10% (0.1). The standard of $P < 5\%$ (0.05) is usually adopted in academia. It is judged to have a high statistical significance [36], that is, the independent variable has a better supporting effect on the dependent variable. The P value of the significance level in the research of this article also adopts this standard.

2) RELIABILITY ANALYSIS

The reliability analysis method is an internal consistency test of the respondent's answering situation after the questionnaire is recovered and screened. It is also called homogeneity reliability assessment. It is often used as a questionnaire reliability test in modern social survey analysis. The results are analyzed using 4 parameters of Cronbach's normalized α coefficient, Hotlin T^2 , F value and significance level.

The Cronbach's standardized α coefficient is a method to check the reliability. It is the most commonly used reliability analysis result in social science research, which overcomes the defects of the partial halving method. The Cronbach's standardized α calculation formula is as follows:

$$\alpha = \left(\frac{n}{n-1} \right) \left(1 - \frac{\sum S_i^2}{S_t^2} \right) \tag{4}$$

In formula (4), α is the reliability coefficient, n is the number of items in the variable, S_i is the variation of the scores of all items on the i -th question, and S_t is the variance of the total scores obtained by all the subjects. Generally speaking, the higher the α coefficient, the higher the reliability of the variable. In basic research, the reliability should be at least 0.80 to be acceptable. In exploratory research, the reliability should be 0.60 to be acceptable. Between 0.60-0.98 is high reliability, and below 0.35 is low reliability [37]. The contents of the research in this thesis are exploratory research, and the reliability test should be above 0.60.

Hotlin T^2 , also known as Hotlin statistics, is a univariate distribution and plays an important role in multiple hypothesis testing. In reliability detection, let X_1, \dots, X_N be independent $N_m(\mu, \Sigma)$ random vectors, \bar{X} , S are the sample mean value and the sample covariance matrix from $N_m(\mu, \Sigma)$ respectively, then there is the following relationship :

$$T^2(m, n, \mu) = N \bar{X}' S^{-1} \bar{X} \tag{5}$$

m, n are degrees of freedom, and μ is the overall mean. When $\mu = 0$, the T^2 statistic is often abbreviated as $T^2(m, n)$. Its distribution is called the T^2 distribution, which is written as: $T^2 \sim T^2(m, n)$.

The F test is also called the homogeneity test of variance, and the F test needs to be used in the t test of two samples. We mainly compare the variance S^2 of the two sets of data, to determine whether there is a significant difference in their precision. The variance S^2 is expressed as:

$$S^2 = \frac{\sum (X - \bar{X})^2}{(n-1)} \tag{6}$$

The calculation formula of F test is as follows:

$$F = \frac{S_{max}^2}{S_{min}^2} \tag{7}$$

Two sets of data in formula (7) can get two S^2 values, S_{max}^2 and S_{min}^2 . The calculated F value is compared with the F table value obtained from the table lookup. If $F < F$ table value, it indicates that there is no significant difference between the two groups of data; $F \geq F$ table value indicates that there is a significant difference between the two groups of data [37].

3) MULTIPLE LINEAR REGRESSION ANALYSIS

Linear regression is a statistical method that uses regression analysis in mathematical statistics to determine the relationship between two or more variables. It has universal applicability and extensiveness [38]. However, linear regression is a regression model based on an independent variable and a dependent variable. It is mainly used to measure the ability of the independent variable X to influence the dependent variable Y , and then to determine or to predict the development trend of the dependent variable Y . In a real environment, there may be more than one dependent variable Y , and the factors that affect the dependent variable Y are also diverse. There will be multiple independent variables that affect multiple dependent variables at the same time. This requires to study the relationship between them. This analysis is called multiple linear regression analysis.

Before using multiple linear regression analysis, it is necessary to perform weight assignment or mean calculation on multiple items of variables in the questionnaire and convert them into variable data results. In this article, no weight is assigned to each variable. The single item is the variable data, and the multi-item item takes the arithmetic average to obtain the variable data. The formula for calculating the arithmetic mean μ is as follows:

$$\mu = \frac{\sum_{i=1}^n x_i}{n} \tag{8}$$

In equation (8), n represents the number of samples, x represents a single sample value, and i represents the ordinal number of samples.

In probability statistics, standard deviation is the most commonly used measure of the degree of statistical distribution, which can reflect the degree of dispersion of a data

set. The calculation formula for the standard deviation σ is as follows:

$$\sigma = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2} \quad (9)$$

In equation (9), n represents the number of samples, x represents the value of a single sample, i represents the ordinal number of the sample, and \bar{x} represents the average value of multiple x in the sample.

The advantage of multiple linear regression is that the optimal combination of multiple independent variables can be used to predict or estimate the dependent variable, which is more comprehensive and effective than using one independent variable to predict or estimate, which is also realistic and more meaningful. The calculation formula of multiple linear regression model is:

$$Y = b_0 + b_1X_1 + b_2X_2 + \dots + b_nX_n \quad (10)$$

In formula (10), Y represents the dependent variable; b_0 represents the constant term, also known as the constant, which is the intercept of the regression line on the ordinate axis; b_n represents the n th partial regression coefficient; X_n represents the n th independent variable. Partial regression coefficient b_1 refers to the average change of dependent variable Y caused by each unit change of independent variable X_1 while other independent variables remain unchanged, $b_2 \dots b_n$ and so on. The purpose of establishing a multiple linear regression model is to find each partial regression coefficient b_n . Generally, the least square method is used to find the best function estimate by minimizing the sum of squares of errors.

Based on the multiple linear regression analysis model, the model formula applicable to the research of this article is established: there are m samples, the dependent variable of a certain type of questionnaire is Y , the independent variable of the questionnaire is X , and there are n independent variables. Dimension, partial regression coefficient is b , b_0 is regression intercept, also known as constant, when $m \geq n+1$, it can be expressed as:

$$\begin{cases} Y_1 = b_0 + b_1X_{11} + b_2X_{12} + \dots + b_nX_{1n} \\ Y_2 = b_0 + b_1X_{21} + b_2X_{22} + \dots + b_nX_{2n} \\ \dots \dots \\ Y_m = b_0 + b_1X_{m1} + b_2X_{m2} + \dots + b_nX_{mn} \end{cases} \quad (11)$$

In equation (11), b_n is the unstandardized regression coefficient. In order to eliminate the influence of the units taken by the dependent and independent variables, the standardized regression coefficient β is usually used:

$$\beta = b_n \left(\frac{\sigma_{x_n}}{\sigma_y} \right) \quad (12)$$

In equation (12), b_n is the unstandardized regression coefficient σ_x is the standard deviation of the independent variable, σ_y is the standard deviation of the dependent variable, and n represents the dimension of the independent variable x .

The decision coefficient R^2 is used in multiple linear regression to explain the proportion of independent variable

variation in dependent variable variation in the regression model, which is defined as follows:

$$R^2 = \frac{ESS}{TSS} = 1 - \frac{RSS}{TSS} \quad (13)$$

In equation (13), TSS is the sum of squared total deviations, ESS is the sum of squared regressions, and RSS is the sum of squared residuals, defined as follows:

$$TSS = \sum (X_i - \bar{X})^2 \quad (14)$$

$$ESS = \sum (\hat{X}_i - \bar{X})^2 \quad (15)$$

$$RSS = \sum (X_i - \hat{X}_i)^2 \quad (16)$$

In equations (14), (15), and (16), X_i is the i -th sample value, \hat{X}_i is the i -th regression estimate, and \bar{X} is the average number of samples. $X_i - \bar{X}$, $\hat{X}_i - \bar{X}$ and $X_i - \hat{X}_i$ are total dispersion, regression dispersion and residual dispersion, respectively.

However, the value of the judgment coefficient will increase with the increasing number of independent variables or the total sample n entering the regression equation. In order to eliminate the influence of the number of independent variables and the size of the total sample on the judgment coefficient, the judgment coefficient called adjusted R^2 adopted, and the calculation formula of \bar{R}^2 is:

$$\bar{R}^2 = 1 - \frac{\frac{RSS}{n-k-1}}{\frac{TSS}{n-1}} \quad (17)$$

In equation (17), n is the number of samples, k is the number of restricted conditions or variables, $n-k-1$ is the degree of freedom of the sum of squared residuals, and $n-1$ is the degree of freedom of the sum of squares of the population. The range of R^2 and \bar{R}^2 is between 0-1, the closer to 1, the better the regression model fit. In general, \bar{R}^2 is slightly smaller than R^2 .

In regression analysis, the t test can be used to determine whether the difference between a sample average and a known population average is significant. When the population distribution is normal, the dispersion statistic between the sample average and the population average is t -distributed. As with the validity test, the hypothesis to be tested is called the null hypothesis and is denoted as H_0 ; the hypothesis corresponding to H_0 (the opposite) is called the alternative hypothesis, denoted as H_1 , and $\beta \neq 0$, the test of t The calculation formula is:

$$t = \frac{b}{\sigma_b} \quad (18)$$

In equation (18), σ_b represents the standard error of the regression coefficient. Under the condition that the invalid hypothesis is established, it follows the t -test distribution with degrees of freedom $df = n - 2$. The calculation formula of σ_b is:

$$\sigma_b = \sqrt{\frac{RSS/(n-2)}{TSS}} \quad (19)$$

In the regression analysis, whether there is a linear relationship between the two variables- X and Y can be tested

by using the F test method. Under the condition that the null hypothesis holds, the ratio of the sum of the squared regression to the sum of the remaining squares follows the F distribution with degrees of freedom $df_1=1$ and $df_2 =n-2$, and can be used to test the significance of the regression equation. The calculation formula is:

$$F = \frac{ESS}{RSS/(n-2)} \quad (20)$$

In equation (20), n is the number of samples.

The t -test and F -test can reflect the significance level P value together. In multiple linear regression with multiple independent variables, it is necessary to determine whether the multiple independent variables and the dependent variable have multiple collinearity, which is used to assess whether there is an exact correlation or a high correlation between the independent variables, which results in the estimated distortion of the model or difficulty in estimating accurately. In general, the situation of complete collinearity is rare, and it appears to some extent to approximate collinearity. The multicollinearity test has two main analysis methods. One is the Klein discriminant method, which calculates the coefficient R^2 and the correlation coefficient r_{x_i}, r_{x_j} between the explanatory variables. If there is $|r_{x_i}, r_{x_j}| > R^2$, then there is a certain degree of linear correlation between X_i and X_j ; the other is the preliminary observation method. When the goodness of fit (R^2) of the model is high, F value is very high, and when the variance of each regression parameter estimate $Var(\beta_j)$ is very large (that is, the t value is very low), it indicates that there may be multiple collinearity between explanatory variables, using tolerance and variance expansion factor (VIF), The two are reciprocal. This method is used in the research of this thesis. The VIF calculation formula is:

$$VIF = \frac{1}{1 - R^2} \quad (21)$$

In equation (21), when $0 < VIF < 10$, there is no multi-collinearity; when $10 < VIF < 100$, there is strong multi-collinearity; when $VIF \geq 100$, there is severe multi-collinearity [38].

IV. EMPIRICAL RESEARCH DESIGN

According to Hull's motivational driving force theoretical formula, the potential of individual behavior is caused by the combined action of driving force, habit strength, and incentives, and the three are decomposed into intrinsic motivation and extrinsic motivation. For the creator's behavior, the three aspects of creative scale, creative time and creative intention are inspired by the potential of behavior. We design and subdivide according to intrinsic motivation and extrinsic motivation, analyze the survey data, explore the causal relationship between motivation and behavior, study the impact of creative motivation on creative behavior, and then analyze whether the internal and external motivation in the short video's creator's behavior motivation analysis model have significant influence on the three aspects of variable and

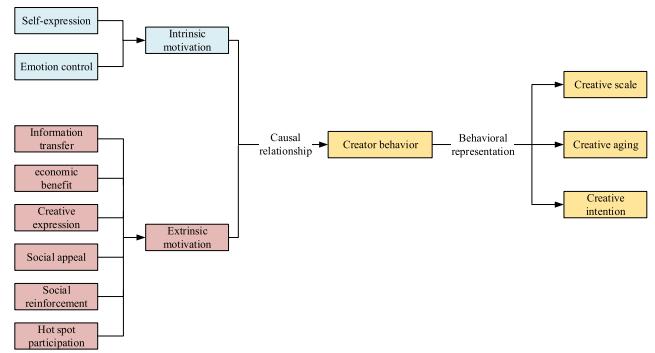


FIGURE 2. Analysis Model of Motivation of short video's creator's Behavior.

creative behavior. Figure 2 is an analysis model of behavior motivation of short video's creators.

Short video's creators are divided into individual creators and group creators according to the size of the personnel. Individual creator mainly refers to individuals or small teams; group creator mainly refers to organizations or companies. From the perspective of social media user's participation, the study of user's participation behavior is a study of the specific performance of participation, measured from two aspects: participation ability and participation level. The author's behavior studied in this article is essentially a study of the representation and motivational orientation of creative behavior, a study that analyzes which creative motivation can have a significant impact on the creative scale, creative timeliness, creative intention and the extent of its impact.

A. VARIABLE SELECTION AND SCALE DESIGN

1) SELECTION OF CREATIVE BEHAVIOR VARIABLES AND SCALE DESIGN

The scale of creation is a sign of the current development period of the creator. It can be described by three variables: team size, number of creations and number of fans. The team size is the number of members of the creative team. The creative number is the number of short videos that the creator publishes within a certain period of practice. The number of fans is the total number of fans that the creator has in multiple short video media. The scale of all variables is divided into 5 levels from strong to weak, and the scores are assigned one by one from 5 to 1.

Creation time is a characteristic variable indicating the degree of participation of creators, which can be used to measure the role or status of creators, and to divide short video's creators into professional creators and ordinary creators. If professional creators is found in the survey, it will be used as the research content that is discussed separately. This article uses the time of creator's creation and the average daily creation time as the variables of creation time. The time of creation refers to the time from the first work creation to the completion of this questionnaire; the average daily creation time is to stay on the short video's creation every day. Time or the average time refers to the period of creating

short videos at a certain stage. The scale scores of all creative variables are still divided into 5 levels from strong to weak.

Creative intention indicates the purpose of the creator to create short video, and can be used to measure the creator level. The creator level is divided into purposeless creation, purposeful creation and directional creation. Unintentional creation can be understood as "taking pictures" unintentionally; purposeful creation is to design and plan the creative content, and complete the shooting and creation according to the design route, but there is no reminder or topical targeting; directional creation emphasizes that release is especially directed to some users or topics. The purposeless creation, the purposeful creation and the directional creation are set according to the "Likert scale [39]", and the scale score of the variable is divided into 5 levels from strong to weak.

2) CREATOR MOTIVATION VARIABLE SELECTION AND SCALE DESIGN

According to the behavioral motivation analysis model of short video's creators in Figure 2, intrinsic motivation includes self-expression and emotional control. Self-expression is a way for creators to achieve their inner needs by publishing short video works. It has a high degree of autonomy and self-coordination, and it can be completed without being driven by other factors; emotional control is the creator's self-reduction through the creation and release of short videos. It is a way to share emotions, relieve sorrow, or embody joy and happiness. Both methods are generated under the influence of intrinsic motivation, and some methods have become the habit of creators, inducing creators to change their behavior.

External motives include information communication, economic benefits, creative expression, social appeal, social reinforcement and hotspot participation. Information communication is the creator's perception of the wide range of content transmitted and the application of auxiliary communication functions through creation and release; economic benefits are the creator's willingness to use short video creation to obtain economic benefits; creative expression refers to the creator comprehensively using creative methods to innovate the presentation of content and expressions to achieve the goal of increasing attention; social appeal is the situation where creators use short videos to communicate with others; social reinforcement is the real world in which creators achieve status and value improvement in the real society; hotspot participation refers to the situation in which the creator participates in the creation and release of social hotspots. The creative motivation is set according to the "Likert scale", and the scale of the variable is divided into 5 levels from strong to weak.

According to this, the short video's creator questionnaire operation method is designed, as shown in Table 1. The sampling frame and sampling scale are designed with reference to the relevant requirements of the modern social survey, and

TABLE 1. Short video's creator questionnaire operation method.

Variable name	Operation method	Scale type
Control variable	Gender, age, occupation, education level, monthly income from creation, account type, form of expression, city of permanent residence, media used	Non-likert scale
	Number of existing team members, number of creations and fans	
Dependent variable	Creation scale	Likert scale
	Creation time	
Independent variable	Creation intention	1.Frequently set the operation of "@user" or "#topic". 2.Frequently design the shooting content and production content for purposeful creation. 3.Frequently aimless "shots".
	Self-expression	1.The information published can make you feel important to others. 2.Often publish original content to show their ideas and opinions. 3.Always comment in short videos created by yourself to express your thoughts and opinions again.
	Emotion control	1.Frequently release short videos to relieve boredom. 2.Often create interesting content. 3.Feel very happy after publishing the work. 4.Publish short videos to eagerly get the attention of the audience. 5.The short video account is a channel for emotional expression.
	Information transfer	1.The spread of the published content is very wide and the audience is huge. 2.Frequently set recommendations or recommend the use of third-party applications (such as Taobao, Jingdong, etc.). 3.In addition to publishing short videos, live webcasts are often performed. 4.Republish the short video that has been released on the same medium without modification. 5.Publish the same short video or produce works with the same theme content in multiple media (such as WeChat, Weibo) or using different methods (such as H5, live broadcast). 6.Make frequent effect evaluation or analysis on the short video released by yourself, and adjust the creative ideas and content in time.
	Economic benefit	1.Hope to achieve corresponding commercial monetization through creation and bring commercial value. 2.Often carry out business cooperation with government agencies, media agencies, enterprises, etc.
	Creation expression	1.Creative titles and text introductions will be set when publishing. 2.Often use creative props, special effects and other content. 3.Often design imitation functions (such as shooting the same paragraph, the same screen imitation, etc.). 4.The background music or sound effects used are carefully planned. 5.Frequently create and publish vertical short videos. 6.The shooting tools and editing tools used are mobile smart terminal devices.
	Social appeal	1.Publish original short videos and interact with other users through comments and reposting functions. 2.Frequently browse, follow, like, repost, and comment on other people's short video works, meet more friends through exchanges, and learn more excellent creative experience.
	Social reinforcement	1.Frequently publish information to make others impress you. 2.Publishing short videos showing oneself, things, and people around to feel different and unique. 3.Hope the audience to pay attention to their account and solve the problems encountered by the audience through comments and forwarding.
Hotspot participation	1.Create content that is closely related to social hot spots or real life 2.Publish original content through short video, hoping more people can see and pay attention to hot issues or public events. 3.Publish original content through short video, hoping to attract the attention of relevant departments or public opinion, and promote the solution of the problem.	

TABLE 2. The main characteristics of the basic characteristics of the sample of the short video's creator survey.

Control variable name	Statistical category	Sample size	Percent age (%)
Gender	Male	1406	54.45
	Female	1176	45.55
Age	19-39	2021	78.27
Education level	College and undergraduate	1595	61.77
Occupation	Student	697	26.99
	Staff of Party and government organs/institutions	225	8.71
	Individual business/freelancers	222	8.60
Creative monthly	Income of 5000 yuan and below	1962	76.15
Account type	Non-authentication account	1729	66.96
Type of operation	Individual or small team operations	1930	74.75
Way of creation	Mixed expression of pictures and videos	829	32.11
Post content	Life Vlog	1183	45.82
Permanent cities	Second- and third-tier cities	1216	47.10
Use medium	Douyin + quick hands	1617	62.62

mutually exclusive questions and co-directed questions are set as the basis for considering the validity of the questionnaire.

B. QUESTIONNAIRE DISTRIBUTION AND SAMPLE INFORMATION COLLECTION

The survey will take place in August 2019, and will be delivered by WeChat groups, designated creators, and commissioned third-party questionnaire survey agencies. The respondent filled in 2614 questionnaires. After the questionnaire survey system and manual double-layer screening, a total of 2582 valid questionnaires are obtained, with a questionnaire validity rate of 98.78%. The creators of this survey include 13 professional groups including school students, individual business households/freelancers, general employees and managers of enterprises/companies, staff of party and government organs/institutions, farmers, unemployed/laid-off/unemployed, etc., which meet the basic requirements of sampling frame, research design, and statistical analysis.

V. RESULTS ANALYSIS AND DISCUSSION

A. SAMPLE BASIC CHARACTERISTICS

In 2582 effective samples, the main characteristics of basic characteristics are shown in Table 2.

This article defines professional creators as a group that uses short video media for a long time to earn high profits with high-volume creation, high popularity, high-value works. In the specific analysis, the creators with more than 100 works published, more than 10,000 fans, more than 1 year of creation time, average daily creation time of more than 5 hours, and monthly creative income of more than 5,000 yuan are classified as professional creators. According to this standard, 61 professional creators are screened out of 2582 effective samples, accounting for 2.36% of the

TABLE 3. The main characteristics of the survey sample of short film professional creators.

Control variable name	Statistical category	Sample size	Percent age (%)
Gender	Male	41	54.45
	Female	20	45.55
Age	19-39	55	78.27
Education level	College and undergraduate	50	81.97
Occupation	Student	15	24.59
	Staff of Party and government organs/institutions	14	22.95
	Individual business/freelancers	12	19.67
Account type	Non-authentication account	60	98.36
Type of operation	Individual or small team operations	37	60.66
Way of creation	Text or picture-based auxiliary expression	24	39.34
	Mixed expression of pictures and videos	24	39.34
Post content	Life Vlog	31	50.82
Permanent cities	Tier 1 and new Tier 1 cities	51	83.61
Use medium	Douyin + quick hands	59	96.72

total sample size, and the main characteristics of professional creators are obtained, as shown in Table 3.

Among the creative intentions, the average value of professional creators for unintentional creation is 3.7; the average value of intentional creation is 4.02; the average value of directional creation is 4.13. It can be seen that professional creators are more inclined to carry out purposeful creation or directional creation.

B. SCALE VALIDITY AND RELIABILITY TESTING

The validity test of the scale adopts the factor analysis method commonly used in sociology and statistics. Use the KMO value of the KMO and Bartlett sphericity test in the correlation matrix analysis method, the approximate chi-square (χ^2) value of the Bartlett sphere test and the significance level to determine by the formula (2), (3) The calculation results are shown in Table 4. Among the variables, there are only two items for creative time limit and social appeal. According to the statistical principle, the test result of any two variables KMO is 0.500, which is not suitable for factor analysis. The KMO value of each factor in the result variable is greater than 0.65, the significance level is less than 0.000, the validity test is good, and further analysis and research can be carried out.

The reliability test of the scale is determined by the reliability analysis Cronbach coefficient in statistical analysis. All items in each scale are the test objects. The *F* test and the Hotelling *T*² test are used to select the significance, and the standardized Alpha is used (α) coefficient as the result observation data. The calculation results of formulas (4), (5), (6), and (7) show that the α value of each scale is greater than 0.7, and the significance level is less than 0.05. Refer to the practical application principle of statistical research: for exploratory research, when $\alpha > 0.6$ and $P < 0.05$, the reliability test is effective. Therefore, the data reliability of each

TABLE 4. Validity test results of some variables of short video's creators.

Variable type level	Variable name	KMO value	Bartlett spherical test approximate χ^2 value	Significance
Dependent variable	Creation scale	0.687	1846.380	0.000
	Creation intention	0.699	3004.484	0.000
Independent variable	Self-expression	0.737	4578.895	0.000
	Emotion control	0.900	9539.246	0.000
	Information transfer	0.931	13891.821	0.000
	Economic benefit	0.723	6137.415	0.000
	Creation expression	0.936	14401.033	0.000
	Social reinforcement	0.759	5467.959	0.000
	Hotspot participation	0.764	5989.416	0.000

Note: Total sample $N=2582$

TABLE 5. Short video's creator variable reliability test results.

Variable type level	Variable name	Normalized alpha value	T^2 value in Hotelling	F	Significance
Dependent variable	Creation scale	0.665	202.466	101.193	0.000
	Creation time	0.707	18.500	18.500	0.000
	Creation intention	0.826	36.035	18.010	0.000
Independent variable	Self-expression	0.892	21.159	10.575	0.000
	Emotion control	0.926	107.274	26.787	0.000
	Information transfer	0.946	80.882	16.151	0.000
	Economic benefit	0.840	75.231	75.231	0.000
	Creation expression	0.950	22.129	4.419	0.001
	Social appeal	0.879	61.920	61.920	0.009
	Social reinforcement	0.915	7.482	3.739	0.024
	Hotspot participation	0.926	31.211	15.609	0.021

Note: Total sample $N=2582$

variable in the creator questionnaire is good. The reliability of the scale is better, as shown in Table 5.

C. EMPIRICAL ANALYSIS OF THE RELATIONSHIP BETWEEN CREATOR MOTIVATION AND BEHAVIOR

Multiple linear regression method is employed to conduct an empirical analysis of the total sample, and the relationship between the dependent variable and the independent variable is studied and calculated by formula (11). The basic characteristics of age and education level are converted from the 6th or 7th scale to the 5th scale, and are analyzed together with gender (female assignment 0, male assignment 1) as control variables. Since professional creators account for only 2.36% of the total sample, this part of the data sample has little effect

on the total sample, and the sample of professional creator groups is not cut off during the empirical analysis of the total sample.

Regression analysis is performed on the dependent variable and the respective variables with creation scale, creation time and creation intention respectively. Table 6 shows the analysis results of the dependence of creators' creation scale on creative motivation. The change in data R^2 in the table indicates the explanatory power of the independent variable to the dependent variable, and the unstandardized coefficient β indicates the positive and negative influence of the independent variable on the dependent variable. The data shows that the two motivations of independent variable information communication and economic benefits have a significant positive impact on the scale of creation, with explanatory powers of 26.7% and 0.5% respectively. Specifically, as creators hope to deliver information more quickly, their creative scale will gradually expand. The more creators hope to gain income from short video creation, the scale of their creation will also expand. This is in line with the commercial operation model, that is, the initial stage is mainly based on a small team, driven by interests towards large-scale operations. The data also shows that the unstandardized coefficient β of emotion control is negative, indicating that the motivation has a negative impact on the creative scale. Emotional control reflects the creator's attitude and desire to express. The negative impact of emotional control shows that the desire to express grows stronger and the scale of creation is smaller with the emotional attitude becoming more prominent. This is due to the dispersion of personal emotional factors in team creation. The non-standardized coefficient β of the creator's education level and age is also negative, which shows that these two motivations have a negative impact on the creative scale, reflecting that creative scale becomes narrow with the increase of the age of the creator, which is more in line with the characteristics of the age structure in the survey, that is, the creation team or individuals tend to be younger, also shows that the number of creators with high education is low, and the low threshold allows more and more low-medium users to join the short video's creator team. In the analysis, the self-expression, creation expression, social appeal, social reinforcement, hotspot participation and other independent variable significance levels (P) are greater than 0.05 or their R^2 changes are extremely small, indicating that these variables have no significant impact on the scale of creation, whose analysis results are not listed in detail in the table.

Table 7 is the analysis result of the dependence of creator's creation time on creation motivation. The data shows that information transfer and economic benefits have a significant positive impact on the timeliness of creation, with explanatory powers of 2.4% and 0.1% respectively. Specifically, if creators want to deliver information faster, their creation time will increase. When creators are pursuing economic interests, the time they spend on creation and the average daily creation time will increase accordingly. The data

TABLE 6. The analysis results of the dependence of creators' creation scale on creation motivation.

ARGUMENT NAME	UNSTANDARDIZED COEFFICIENT		NORMALIZATION COEFFICIENT B	R ² THE AMOUNT OF CHANGE	T	SIGNIFICANCE LEVEL	COLLINEAR STATISTICS	
	B	STANDARD ERROR					TOLERANCE	VIF
CONSTANT	3.104	0.79	-	-	39.474	0.000	-	-
INFORMATION	0.222	0.28	0.324	0.267	8.059	0.000	0.428	2.336
TRANSFER EMOTIONAL CONTROL	-0.092	0.30	-0.124	0.160	-3.088	0.002	0.871	1.148
ECONOMIC BENEFIT	0.065	0.018	0.067	0.005	3.613	0.000	0.968	1.033
EDUCATION LEVEL	-0.167	0.012	-0.264	0.067	-14.457	0.000	0.988	1.012
AGE	-0.056	0.015	-0.070	0.005	-3.738	0.000	0.943	1.061

Note: The total number of samples $N=2582$. The dependent variable is the scale of creation. The F value of the multiple regression model is 113.143, ($P=0.002 < 0.05$), the multiple correlation coefficient is 0.690, the adjusted R^2 is 0.475, and the VIF value of each variable is less than 10. The variables with $P>0.05$ are not listed in the table.

TABLE 7. The analysis results of the dependence of creator motivation on creation motivation.

ARGUMENT NAME	UNSTANDARDIZED COEFFICIENT		NORMALIZATION COEFFICIENT B	R ² THE AMOUNT OF CHANGE	T	SIGNIFICANCE LEVEL	COLLINEAR STATISTICS	
	B	STANDARD ERROR					TOLERANCE	VIF
CONSTANT	2.196	0.139	-	-	15.827	0.000	-	-
INFORMATION	0.199	0.057	0.172	0.024	3.471	0.001	0.126	7.947
TRANSFER EMOTIONAL CONTROL	-0.134	0.049	-0.108	0.002	-2.738	0.006	0.197	5.065
ECONOMIC BENEFIT	0.102	0.045	0.090	0.001	2.252	0.024	0.191	5.234
EDUCATION LEVEL	-0.218	0.023	-0.166	0.032	-9.345	0.000	0.979	1.021
AGE	-0.063	0.030	-0.038	0.001	-2.076	0.038	0.943	1.061

Note: The total number of samples $N=2582$. The dependent variable is the scale of creation. The F value of the multiple regression model is 118.262 ($P=0.04 < 0.05$), the multiple correlation coefficient is 0.468, and the adjusted R^2 is 0.217. The VIF value of each variable is less than 10. The variables with $P>0.05$ are not listed in the table.

also reflects that the independent variable emotional control, the control variable's education level and age have a negative impact on the creation time, that is, the creator wishes to express emotional attitudes, and his creation time decreases; the creation time decreases with the increase of the education level, which is consistent with education background of the creator; creation time will decrease with the increasing number of age, which highlights the younger group positioning of short videos. In the statistical results, independent variables such as self-expression, creation expression, social appeal, social reinforcement, and hotspot participation have no significant effect on the timeliness of creation.

Table 8 is the analysis result of the dependence of creator's creation intention on creation motivation. After data analysis, it is found that the four motivations of self-expression, emotional control, information communication, and economic benefits can positively and significantly affect creative intentions. Their explanatory powers of creation intentions are 70.9%, 4.0%, 0.8%, and 0.1% respectively. Specifically, when creators express their views or surrounding events and areas through short videos, the enthusiasm for creation and the enthusiasm for the creative will increase. The creator will have a clear purpose and actively create by using "@" reminder, "#" topics and other functions, and even initiate

TABLE 8. The Analysis of the dependence of creators' creation intention on creation motivation.

ARGUMENT NAME	UNSTANDARDIZED COEFFICIENT		NORMALIZATION COEFFICIENT B	R ² THE AMOUNT OF CHANGE	T	SIGNIFICANCE LEVEL	COLLINEAR STATISTICS	
	B	STANDARD ERROR					TOLERANCE	VIF
CONSTANT	0.421	0.055	-	-	7.637	0.000	-	-
SELF-EXPRESSION	0.422	0.022	0.415	0.709	19.203	0.000	0.203	4.918
EMOTIONAL CONTROL	0.299	0.027	0.289	0.040	11.264	0.000	0.144	6.949
INFORMATION	0.131	0.027	0.135	0.008	4.920	0.000	0.126	7.965
TRANSFER EMOTIONAL CONTROL	-0.048	0.011	-0.044	0.002	-4.438	0.000	0.986	1.014
EDUCATION LEVEL	0.069	0.021	0.073	0.001	3.287	0.001	0.190	5.263
ECONOMIC BENEFIT								

Note: The total number of samples $N=2582$. The dependent variable is the scale of creation. The F value of the multiple regression model is 1603.329 ($P=0.001 < 0.05$), the multiple correlation coefficient is 0.872, and the adjusted R^2 is 0.759. The VIF value of each variable is less than 10. The variables with $P>0.05$ are not listed in the table.

activities in the media to feel whether your status, ideas, opinions, etc. are respected and valued, which reflects the desire of self-creation. When creators need to express their emotions and attitudes, their creation intentions will be significantly stimulated by the invention. When creators are eager to transfer some information quickly, the intention of creation is more clear and the purpose is obvious; when the creation content is used to obtain economic benefits, the intention of creation will be more clear, but the information communication and economic benefits can hardly explain the creation intention, which means that the degree of influence is weak. In addition, the educational level can negatively affect the creator's creative intentions, with an explanatory power of 0.2%. The higher the creator's educational level is, the simpler the creative intentions are, such as "snapshot" and life records Vlog, etc. The short video can be reflected in the highly-educated creation group. In the statistical results, independent variables such as creation expression, social appeal, social reinforcement, and hotspot participation have no significant effect on the creator's creation time.

D. EMPIRICAL ANALYSIS RESULTS

Based on the analysis of the above data results, information communication is the most important motivation affecting the behavior of short video's creators. Creators spend a lot of time creating content and disseminating it to the audience. This phenomenon is similar to the motives of creators in the traditional film and television industry, that is, creation is to spread. This is consistent with the user motivation of foreign virtual social media discovered by Boyd *et al.* [40]; it is also consistent with the motivation of Weibo users discovered by domestic scholar Meng and Qi [41]. However, there is a difference among creators in the traditional film and television industry: the degree of control variable education has a negative impact on creation behavior, which just confirms the actual situation of short thresholds found by Si Ruo and other studies [42]. The traditional film and television industry is more common with highly educated people, and the creation of works is also based on the depth and meaning of the basic

requirements. The creation of a short video can be a purposeless “shot” or a group of pictures that only show a specific scene or time, and the content can not be complete and coherent, which shows that short film’s aesthetic characteristics are not distinct. At the same time, with the advancement of technology, a smartphone can complete all operations. Intelligent application software can achieve high-quality content input and output for creators of different scenes and levels, and a large number of low-education groups flood into short video creation, which lowers educational level of the short video’s creators.

Another major motivation affecting short video’s creators is economic interest. The respondents had two main reasons for this result: One is related to the media product of short video. Short video is a product of the rapid development of the mobile Internet, which can bring economic benefits for both the creator or media agency. Short video media agencies also provide creators with trading space by building an independent e-commerce platform, and the transaction methods are more flexible and the trading products are more diversified. However, research has found that short video media distinguishes e-commerce marketing in social media. Most of them make profits in the form of “traffic economy”, that is, through advertising sharing generated by user traffic and targeted drainage generated by algorithm recommendation, users and short video media form a mutually beneficial and cooperative win-win situation. Traffic can be converted into income, which has caused some creators to change from ordinary netizens to “net celebrities” who “get rich overnight”. “Net celebrities” exchange status for traffic, earning economic benefits, and achieving higher achievements, which forms a complementary value between status and income. Driven by the herd effect, one creator after another is eager to become a “net celebrity”, hoping to turn high traffic into high returns, which is also one of the driving forces for most creators’ behavior. The second is that it has a certain relationship with the group put in this questionnaire. A part of the short video’s creator’s questionnaire is put into some creator’s communication groups, including groups established by media agencies, online training groups, etc. Among them, there are many creators with high output and high fan volume, and their continuity of creative behavior is also influenced by the important motive of economic interests.

The influence of emotional control on the behavior of creators is quite different. Emotional control has a negative effect on the creation scale and creation time, but a positive effect on the creation intention. In other words, when the creator desires to express emotions and attitudes, the scale of creation is small, the timeliness of creation is low, and the intention of creation is clear. This just explains the phenomenon that individual creators can express emotions and attitudes freely. There are a large number of independent creators among the respondents, who have absolute control over their subjective initiative, more personal characteristics for expressing and venting emotions, and can easily publish personalized content. After the large-scale production or

operation, the emotions and attitudes of the members of the operation team are different. It is impossible to express multiple emotions or attitudes or the integration of multiple emotions and attitudes through the same short video’s creator account. It is difficult to integrate and unite emotions and attitude. At the same time, this result also explains the relationship between creation timeliness and emotional control: creators who have just entered the initial stage will have a short rise in the amount of content published, and each work will be “finely crafted”. The emotions that need to be expressed in the author’s heart are reflected in the content creation as much as possible; after a period of time, the amount of publishing gradually decreases, and the degree of emotional explicitness decreases accordingly. The creator may express emotions through other methods or channels, or even ignore the way in which short video creation can vent emotions, which leads to a negative impact on the timeliness of creation. Emotional control of creators of short videos has a significant positive effect on creation intentions, indicating that the emotional expression of creators needs to clarify the objects and demands. Blind emotional expression cannot attract high attention and may have a negative impact on the creators themselves.

Self-expression has a significant influence on creation intentions. The explanatory power of self-expression for creation intention is as high as 70.9%, which means that the more creators want to express their views and opinions, the more obvious the creative intention is. Among the respondents, there are many well-known media workers and creators in different fields, who express their personal views and opinions through short video channels, and form a group of creator opinion leaders, which is still popular today. In Weibo, well-known users function as an opinion leader through “celebrity effect”, which has similar effect [43]. Short video’s creators may become the initial information focus during the process of self-expression.

Independent variables such as social appeal, social reinforcement, creation expression, and hotspot participation have no significant effect on creation behavior. Specifically, the social appeal has no significant effect, indicating that the connections and communication channels established between creators do not rely on short videos, nor rely on short video creation to maintain social connections with others. This is different from WeChat or other online community based on large-scale groups. It can be seen that the short video shows a weak relationship in the communication between the creators. Social strengthening did not have a significant impact on creators’ behavior, which indicates that there are fewer creators in the survey who simply use short video creation as the main method to achieve real social status. This shows that the number of virtual social media who are eager to become online celebrities is rising. But there are fewer individuals who really achieve the status of Internet celebrity through the Internet [44]. The creation expression has no significant effect, indicating that there is a homogenization phenomenon in the current short video creation content,

which seriously damages healthy development of the short video. The fact that hotspot participation has no significant effect indicates that the creators generally do not pay much attention to hotspot events or problems, and are more inclined to self-immersion or self-expression creation. The content and dissemination "habits" have not yet penetrated deeply into the news, social events, public affairs management and other actions and attitudes, which are different from Hu Lei's discovery that Weibo as an important channel for the public to express opinions and express emotions [45]. However, from the analysis of the creation phenomenon, more than 66% of the creators of short videos will hope that more people, departments or public opinion can see and pay attention to these hot issues or public events, which shows that the creation content may become a hot issue or event. In other words, the phenomenon or problem exposed by short video content will become a social hotspot in the future, and the audience may generate hotspot participation around this content, generate public opinion events, and even guide social development.

VI. RESEARCH CONCLUSION AND FUTURE WORK

With the continuous updating of short-video media functions and increasing support for creation, creators have shown a more rapid development trend, and their impact on social life has gradually increased. Together with the public, they have become a promoter of media development, social management, livelihood dynamic, emergency disposal and other important fields.

A. ANALYSIS CONCLUSION

Based on the analysis results above, the following conclusions can be obtained:

1. There is a phenomenon of professional development for short video's creators. Among short video's creators, there are professional creator groups defined in the research of this thesis as "long-term use of short video media, high yield creation with high yield, high popularity gathering, and ability to create high-value works". Short video creation occupies a certain proportion of time and energy in the life and work of such groups, and even affects their normal work, or they themselves use short video creation as a profession. For example, someone called "Xiao Ye in the office" release a short video about cooking hotpot in the water fountain, and then becomes a "net celebrity", and then he create short video as his professional career. At present, the team's monthly foreign earnings from short video creation exceeds RMB 4.5 million[46]. Professional creators account for a small sample in this survey and account for a relatively low percentage of the entire short video's users. Therefore, professional creation should be a niche, high-output creation group. However, with the rapid development and functional iteration of short video, the creation time and experience of creators may increase, and it may be transformed into a professional development direction.

2. The three variables of the short video creation scale are in the same direction. The number of short video's creator fans, the number of members of the creation team and the number of works released are directly proportional to each other. Any changes in the amount will cause changes in the other two.

3. The main motivations of short video's creators to influence creation behavior are information communication, economic benefits, emotional control and self-expression. There is a difference in the importance and influence of creator's creation motivation on creation behavior.

B. FUTURE WORK

Based on the conclusions above, future research on short video's creator's behavior can be conducted from the following aspects:

1. Verify the universal applicability of conclusions through more short video's creator behavioral representations. Short video's creators with different short video media environments and different national conditions may contain different characteristics. Seek more data sets, including behavior and motivation characteristics of domestic and foreign short video's creators to further verify the applicability of this conclusion.

2. Improve behavior and motivation variables, and establish a more comprehensive questionnaire for creators of short videos. Use data to describe the credibility of the short video's creator's behavior, using behavioral characterization analysis methods to establish a short video's creator's behavior evaluation index system, and constantly offer feedback of the dependence relationship between the short video's creator's behavior and motivation.

3. Further explore the methods of short video's creator's behavior research. Seek ways to improve the acquisition and analysis of feature data of short video's creators, such as behavior feature mining algorithms in computational communication, the establishment of behavioral integration models, and the optimization of questionnaire items. The research method of behavior feature mining has been applied in the field of communication and information science by academic circles, and has achieved good prediction results. In the future, the innovation of research methods can further improve the accuracy and robustness of short-video creator behavior research.

4. Expand the application scenarios of short video's creator's behavior research conclusions. Rely on the characteristics of short video's creator's behavior and motivation to study the role of short video's creators in real issues such as hot events and social governance; enable short video media to function as an operating agency, and apply the conclusions of short video's creator's behavior research to enhance media communication and creator stickiness. It is foreseeable that the research based on the behavior motivation of short video's creators will be widely used in the future to accelerate the integration of creators' production content and the

construction of multiple communication relationships of short video media.

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REFERENCES

- [1] (Feb. 28, 2019). *The 43rd Statistical Report on Internet Development in China (Full Text)*. Accessed: Aug. 27, 2019. [Online]. Available: http://www.cac.gov.cn/2019-02/28/c_1124175677.htm
- [2] (Jan. 25, 2019). *Knowledge Feast of Short Video's Creators: Tencent Short Video Creation Alliance Conference is Here!*. Accessed: Aug. 27, 2019. [Online]. Available: <https://www.chinaz.com/news/mt/2019/0125/986818.shtml>
- [3] (Jul. 30, 2019). *Quick-Hand Short Video's Creator Conference Held in Chang*. Accessed: Aug. 27, 2019. [Online]. Available: <https://baijiahao.baidu.com/s?id=1640491650582587367&wfr=spider&for=pc>
- [4] (Aug. 24, 2019). *President of Douyin: China's Short Video Daily Live Users Will Reach 1 Billion Next Year*. Accessed: Aug. 27, 2019. [Online]. Available: <https://tech.sina.com.cn/i/2019-08-24/doc-ihytcern3267196.shtml>
- [5] K. Ye, "Try to analyze the law of mainstream media short video creation under the background of media fusion," *TV Res.*, vol. 9, pp. 24–26, Sep. 2019.
- [6] L. Shuang, "Innovative path for the creation and dissemination of Shizheng short video analysis based on the 2017 top ten news short video award-winning works," *TV Res.*, vol. 3, pp. 55–57, Mar. 2018.
- [7] G. Chong and Y. Boxu, "Analysis of the content production mode of micro video—Research based on Sina Weibo official short video application, second shot," *Journalism*, vol. 23, pp. 60–65, Nov. 2016.
- [8] R. Harris, "Instagram vs. Vine: Cut through the hype and make short form video Work for you," *KISSmetrics*, vol. 32, no. z1, pp. 211–225, Jun. 2013.
- [9] M. Nour, J. Chen, and M. Allman-Farinelli, "Young Adults' engagement with a self-monitoring app for vegetable intake and the impact of social media and gamification: Feasibility study," *JMIR Formative Res.*, vol. 3, no. 2, May 2019, Art. no. e13324.
- [10] B. Tziperman, T. Lerman-Sagie, M. Hazan, L. Zehavi, and N. Watemberg, "Usefulness of short-term video-EEG in the differential diagnosis of paroxysmal events in children," in *Proc. 33rd Annu. Meeting Child-Neurology-Soc.*, Hoboken, NJ, USA: Wiley, 2004, p. S116.
- [11] A. Painold, M. D. Feichtinger, R. Schmidt, F. Fazekas, B. Melisch, E. Koerner, and E. Ott, "Fatal familial insomnia-video presentation of an Austrian patient with a very short clinical course," in *Proc. 18th Congr. Eur. Sleep-Res.-Soc.*, Oxford, U.K.: Blackwell Publishing, 2006, p. 222.
- [12] N. Abbas and U. Ojha, "Not just a medical student: Delivering medical education through a short video series on social media," *JMIR Med. Edu.*, vol. 5, no. 1, May 2019, Art. no. e11971.
- [13] C. Pan, *WeChat User Adoption Based on Mobile Internet*. Wuhan, China: Huazhong Univ. Science and Technology, 2012.
- [14] W. Rushuang, *Research on Influencing Factors of WeChat User Attitude*. Shanghai, China: Shanghai Jiaotong Univ., 2013.
- [15] W. Xiaoyu, *Discussion on the Usage Behavior and Intention of WeChat Users*. Lanzhou, China: Lanzhou Univ., 2013.
- [16] W. Peng, *Research on the Influencing Factors of Social Media Users' Usage*. Wuhan, China: Wuhan Univ., 2014.
- [17] E. S. A. Mardikyan, "Analyzing factors affecting user behavior intention to use social media: Twitter case," *Int. J. Bus. Social Sci.*, vol. 5, no. 11, pp. 1–12, 2014.
- [18] L. Zongfu, *Research on Government WeChat Information Service Model and Service Quality Evaluation From the Perspective of Information Ecology*. Changchun, China: Jilin Univ., 2017.
- [19] B. Xueying, Z. Yuxiang, and Z. Qingzhong, "On the deconstruction of information life cycle and information literacy under social media environment," *Inf. Document. Work*, vol. 3, pp. 95–99, Jun. 2016.
- [20] H. Li, H. Yue, and H. Yeqing, "Microblog user feature analysis and core user mining," *Inf. Theory Pract.*, vol. 34, no. 11, pp. 121–125, 2011.
- [21] W. Xiaoguang, "Empirical analysis of microblog users' behavioral characteristics and relationship characteristics—Taking 'Sina Weibo' as an example," *Library Inf. Service*, vol. 54, no. 14, pp. 66–70, 2010.
- [22] B. Suh, L. Hong, P. Pirolli, and E. H. Chi, "Want to be retweeted? Large scale analytics on factors impacting retweet in Twitter network," in *Proc. IEEE 2nd Int. Conf. Social Comput.*, Aug. 2010, pp. 177–184.
- [23] Zaman TR, Herbrich R, Van Garl J, et al, "Predicting information spreading in twitter," in *Proc. Workshop Comput. Social Sci. Wisdom Crowds, Nips*, vol. 104, no. 45, 2010, pp. 599–601.
- [24] G. Y. Song, Y. Cheon, K. Lee, K. M. Park, and H. C. Rim, "Inter-categool map: Building cognition network of general customers through big date mining," *K. SH Trans. Internet Inf. Syst.*, vol. 8, no. 2, pp. 1–18, Feb. 2014.
- [25] I. Erkan and C. Evans, "The influence of eWOM in social media on consumers' purchase intentions: An extended approach to information adoption," *Comput. Hum. Behav.*, vol. 61, pp. 47–55, Aug. 2016.
- [26] H. Kwak, C. Lee, H. Park, and S. Moon, "What is Twitter, a social network or a news media," in *Proc. 19th Int. Conf. World Wide Web*, 2010, pp. 591–600.
- [27] Z. Ling and Z. Jing, "Analysis of user behavior characteristics of Weibo based on complex network," *Modern Inf.*, vol. 33, no. 9, pp. 35–43, 2013.
- [28] L. Linhong and L. Rongrong, "Research on self-organizing Behavior of Sina Weibo social network," *Statist. Inf. Forum*, vol. 28, no. 1, pp. 88–94, 2013.
- [29] A. Java, X. Song, T. Finin, and B. Tseng, "Why we Twitter: Understanding microblogging usage and communities," in *Proc. 9th WebKDD 1st SNA-KDD Workshop Web mining social Netw. Anal. WebKDD/SNA-KDD*, 2007, pp. 56–65.
- [30] A. R. M. Teutle, "Twitter: Network properties analysis," in *Proc. 20th Int. Conf. Electron. Commun. Comput. (CONIELECOMP)*, Feb. 2010, pp. 180–186.
- [31] M. Cha, H. Haddadi, F. Benevenuto, and P. K. Gummadi, "Measuring user influence in Twitter: The million follower fallacy," in *Proc. ICWSM*, 2010, p. 30.
- [32] B. Hao, "Make a short video with a refreshing screen. Title copywriting article," *China Optical Technol. Mag.*, vol. 9, pp. 35–37, Jun. 2020.
- [33] Z. Yan, Y. Yan, and W. Xinyi, "An empirical study on the influencing factors of the popularity of 'people's daily' Tik Tok short video," *J. Commun. Univ. China, Natural Sci. Ed.*, vol. 27, no. 3, pp. 6–17, 2020.
- [34] W. Jiaqi, *Research on Li Ziqi's Weibo Short Video User Demand*. Hohhot, China: Inner Mongolia Univ., 2020.
- [35] Z. Dan, *Research on the Spread of Weibo Public Opinion in a Mobile Environment Based on the Theory of Information Ecology*. Changchun, China: Jilin Univ., 2017.
- [36] W. Minglong, *Questionnaire Statistical Analysis Practice—SPSS Operation and Application*. Chongqing, China: Chongqing Univ. Press, 2010.
- [37] Z. Wentong, *Basic Course of SPSS Statistical Analysis*. Beijing, China: Higher Education Press, 2018.
- [38] G. Zhigang, *Social Statistical Analysis Method*. Beijing, China: Renmin Univ. China Press, 2015.
- [39] Q. Laibin, "Statistical analysis and fuzzy comprehensive evaluation of Likert scale," *Shandong Sci.*, vol. 2, pp. 18–23, Apr. 2006.
- [40] D. Boyd, S. Golder, and G. Lotan, "Tweet, tweet, retweet: Conversational aspects of retweeting on Twitter," in *Proc. 43rd Hawaii Int. Conf. Syst. Sci.*, Jan. 2010, pp. 1–10.
- [41] Y. Meng and L. Qi, "Research on willingness to participate in Weibo topics based on herd effect and motivation theory," *Inf. Sci.*, vol. 35, no. 4, pp. 150–155, 2017.
- [42] S. Ruo, X. Wanyu, and L. Hongyan, *Research on Short Video Industry*, 1st ed. Beijing, China: Communication Univ. of China Press, 2018.
- [43] L. Weidong, H. Tao, and Z. Zhenyu, "Empirical research on the formation and interaction mechanism of Weibo public opinion," in *China New Media Development Report*. Beijing, China: Social Science Literature Press, 2012.
- [44] T. Xujun, W. Xinxun, and H. Chuxin, *China New Media Development Report*. Beijing, China: Social Sciences Literature Press, 2019.

- [45] H. Lei, *Theoretical and Empirical Research on the Participation of Weibo Community Members*. Beijing, China: Machinery Industry Press, 2018.
- [46] Phoenix Technology. (Aug. 20, 2019). *The Office Ono Has 12 Million Overseas Fans, as Well as Hand-Made Geng, Li Ziqi*. Chinese Celebrities are Going to the World. Accessed: Aug. 22, 2019. [Online]. Available: <http://tech.ifeng.com/c/7pIOWIOSMik>



XIANG BI was born in Xuzhou, Jiangsu, China, in 1987. He received the master's degree in software engineering and the Ph.D. degree in digital media from Wuhan University, in 2012 and 2020, respectively. He is currently a Lecturer and an Experimenter with the Hubei University of Arts and Sciences, where he is teaching courses for master's and undergraduates. He presides over one project of Hubei Provincial Humanities and Social Sciences Key Research Base, one research project of the Chinese Journalism History Society, and one provincial and one school-level graduate teaching project.



CUNCHEN TANG was born in Wuhan, Hubei, China, in 1960. He received the Ph.D. degree from Wuhan University, in 1987.

He is currently the Director, a Professor, and the Ph.D. Supervisor of the Public Opinion Research Center, Wuhan University, and the Chief Scientist of the Joint Laboratory of Wuhan University and Dublin City University. Since 1987, he has been engaged in teaching and research in electronic information, computer science, software engineering, digital media, and other fields, and has undertaken many major projects, such as the Ministry of Science and Technology of China and the Ministry of Education. He has published more than 50 articles and multiple invention patents.

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