

Analysis of Influencing Factors on Microblog Dissemination of Emergencies

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Keywords: Emergencies, Opinion leaders, Multiple linear regression, Microblog

Abstract: Nowadays microblog has gradually become an important way of network information dissemination, and opinion leaders play an important role in guiding the microblog dissemination of emergencies. Taking opinion leaders of microblog as the research object, this paper uses regression analysis to study the influence of opinion leaders and event relevance on microblog dissemination of emergencies. According to the research results, measures are put forward to promote the spread of emergencies in a benign direction.

1. Introduction

Emergencies refer to natural disasters, public health events and so on that suddenly occur, may cause grievous injury to the society and need to take measures as soon as possible. With the development of the Internet, microblog has gradually become an important way for network information dissemination and diffusion. As an important link, opinion leaders play an important role in the dissemination of emergencies on microblog.

Nowadays, China has stepped into a period of high frequency of emergencies, and the spread on microblog will have a negative impact on social stability and development to some extent. So it is important to study how to deal with the spread of emergencies on microblog. Therefore, this paper takes the COVID-19 event as an example, microblog's opinion leaders as the research object to analyze the factors on microblog dissemination of emergencies, and puts forward measures to provide references for coping with microblog dissemination of other emergencies.

2. Factor Selection and Data Acquisition

2.1 Selection of Research Factors

By searching relevant literature, the number of microblog retweeting is finally selected as the dependent variable. Also, the opinion leader's certification level, number of followers, number of concerns, microblog posts, microblog membership level, city, type of opinion leaders, number of microblog comments and praises. At the same time, the data is divided into two parts, relevant and irrelevant data, for analysis according to the correlation between the category of the blogger and the COVID-19 event.

2.2 Data Acquisition and Processing

The microblog data about COVID-19 event are obtained by Octopus, and then the data with no less than 100 reposts and 50000 followers are selected for use, and 706 data are obtained finally. The data obtained are processed preliminarily by Excel. The opinion leaders' certification level is divided into four parts, which are represented by the number "0-3" respectively. For the city where the blogger is located, the number "1-6" is used to represent the first-line, new first-line, and from second to fifth line cities, the number "7" represents Hong Kong, Macao and Taiwan, "8" represents overseas areas, "0" represents unknown areas. Besides, according to type of opinion leaders, 358 data are finally classified into related events, including government official microblog, traditional media official microblog and so on. Then, there are 348 data that are not related to the researched event.

3. Multiple Linear Regression Analysis

3.1 Regression Analysis of Irrelevant Opinion Leaders

In order to analyze which variable have an impact on the microblog dissemination of emergencies and the degree of impact, the stepwise regression method of R language is used. The dependent variable is the number of microblog retweeting, and the independent variable is the number of microblog comments, praises, certification level, microblog membership level, number of followers, number of concerns, number of posts, type of opinion leaders and city.

Firstly, the regression model of all variables was established to obtain the multiple linear regression equation. However, most variables don't pass the significance test, so the effect of the overall regression equation is bad. Therefore, step function of R is used for stepwise regression, and variables are continuously deleted until AIC value is minimum. The final result is shown as Table 1.

Table 1 the Final Result of Stepwise Regression with Irrelevant Events

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-1.761e+03	9.328e+02	-1.887	0.0600
Number of comments	4.372e+00	3.214e-01	13.601	< 2e-16
Number of praises	-1.516e-01	2.389e-02	-6.345	7.03e-10
Microblog certification level	9.776e+02	4.855e+02	2.014	0.0448
Multiple R-squared: 0.4096, Adjusted R-squared: 0.4044				
F-statistic: 79.55 on 3 and 344 DF, p-value: < 2.2e-16				
Dependent variable: number of retweeting				

As can be seen from Table 1, there are still three variables left: the number of comments, the number of praise and the microblog certification level, and each variable passing the significance test. It also can be seen from the Table 1 that, for opinion leaders of irrelevant events, the number of comments and microblog certification level influence the number of retweeting positively, and the number of praises has negative effects on the number of retweeting. To sum up, the influential variables of opinion leaders with irrelevant events on microblog dissemination mainly include the number of comments, the number of praises and microblog certification level. The specific influence equation is as follows:

$$retweeting = 4.372 \times comments - 0.516 \times praises + 977.6 \times certification\ level - 1761$$

3.2 Regression Analysis of Relevant Opinion Leaders

Firstly, the regression model of all variables was established to obtain the multiple linear regression equation. However, most variables don't pass the significance test, so the effect of the overall regression equation is bad. Therefore, step function of R is used for stepwise regression, and variables are continuously deleted until AIC value is minimum.

When the AIC value reaches the minimum, there are still five variables left: the number of comments, praises, followers and concerns, as well as certification level. The overall significance test has improved, but the significance of the number of followers and concerns is more than 0.05, which failed the significance test. Then continue to use the function drop1 in R to do stepwise regression. From the result of drop1, the variable, the number of followers, should be removed. Finally, the multiple linear regression equation is constructed with the remaining four variables, and the results are shown in Table 2.

Table 2 the Final Result of Stepwise Regression with Relevant Events

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	914.00611	631.01096	1.448	0.1484
Number of comments	0.35972	0.05221	6.890	2.57e-11
Number of praises	0.02349	0.00301	7.805	6.82e-14
Number of concerns	-0.54134	0.27486	-1.970	0.0497
Type of opinion leaders	108.77580	54.16533	2.008	0.0454
Multiple R-squared: 0.9508, Adjusted R-squared: 0.9502				
F-statistic: 1704 on 4 and 353 DF, p-value: < 2.2e-16				
Dependent variable: number of retweeting				

It can be seen from Table 2 that there are four variables left: the number of comments, the number of praises, the number of concerns and the type of opinion leaders, and each variable pass the significance test. At the same time, from the Table 2, we can see that the number of comments, praises and the type of opinion leaders have affect the number of retweeting positively, and the number of concerns has the negative impact on the number of retweeting. To sum up, the variables that affect the microblog dissemination of irrelevant opinion leaders include the number of comments, praises, concerns and the type of opinion leaders. The specific influence equation is as follows:

$$retweeting = 0.3597 \times comments + 0.0235 \times praises - 0.5413 \times concerns + 108.7758 \times type + 914.0061$$

3.3 Result Analysis

3.3.1 The Influencing Factors Are Different

From the results of regression, the impact of relevant and irrelevant microblog opinion leaders on the microblog dissemination of emergencies is different. For relevant microblog opinion leaders, the impact on the microblog communication of emergencies is the number of comments, the number of praises and the certification level; For irrelevant microblog opinion leaders, besides the number of comments and praises, the number of concerns and the type of opinion leaders are also included .

3.3.2 The Influence Direction and Size Are Different

The number of comments and praises both have the impact on the microblog dissemination of emergencies, but the influence direction and size of these two variables are different. The number of comments has a positive impact on the number of retweeting for relevant or irrelevant opinion leaders, but the number of comments of irrelevant opinion leaders has a greater impact on the number of retweeting: for each additional comment, irrelevant opinion leaders' number of retweeting will increase by 4.372, and relevant opinion leaders' number of retweeting will increase by 0.3597. For the variable number of praises, irrelevant opinion leaders' number of praises has a negative impact on the number of retweeting, while relevant opinion leaders' number of praises has a positive impact on the number of retweeting, and the number of praises has a greater impact on irrelevant microblog opinion leaders.

4. Measures

4.1 Strictly Control the Certification of Microblog Opinion Leaders

Microblog opinion leaders have a large number of fans, which have great attention in microblog. Moreover, most of the opinion leaders are officially certified by Sina microblog and have a certain position in their industries. Therefore, the existence of opinion leaders has a certain impact on the microblog dissemination of emergencies. If the certification of opinion leaders is too easy, people who cheat will become opinion leaders easily, which may cause the rapid spread of some false statements, and then affect the development of emergencies in the opposite direction. Therefore, we should strictly control the microblog certification.

4.2 Establish the Management Mechanism for Microblog Opinion Leader

The management mechanism of microblog opinion leaders should include two parts: on the one hand, it is an incentive mechanism to promote microblog opinion leaders to express positive opinions and make full use of their positive guiding role in the dissemination and governance of emergencies; on the other hand, it is a punishment mechanism which punishes some opinion leaders for publishing or forwarding unconfirmed news or extreme remarks. The implementation of microblog opinion leader management mechanism can regulate the opinions of microblog opinion leaders and lay a good public foundation for the dissemination and governance of emergencies.

4.3 Enhance Communication with Microblog Opinion Leaders

Communication with opinion leaders mainly consists of two aspects: the government and the public. Through communication with microblog opinion leaders, the government can provide real and effective information of emergencies and make full use of the dissemination role of opinion leaders to promote the smooth development of emergency governance. The communication between the public and microblog opinion leaders can make microblog opinion leaders reflect on whether their speech is standard and whether it has a benign guiding effect on the microblog dissemination of emergencies. Besides, it can attract more people to participate in the discussion of the emergencies. The implementation of this measure can make the content disseminated by microblog opinion leaders more authentic and reliable, and then promote the benign dissemination of microblog in emergencies.

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