Research on the Influence of Rumors on Consumers' Irrational Purchasing Behavior under Public Crisis in the Era of Big Data

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Abstract. Based on COVID-19 and Persuasion Communication Theory, this study constructs a research model to analyze the influence of rumors on consumers' irrational purchasing behavior in the context of public crisis. Using an online questionnaire survey, the empirical results show that information quantity, content features, platform credibility, and source credibility all have a significant positive impact on rumor credibility; rumor credibility has a significant positive impact on negative emotion; Negative emotions have a significant positive impact on irrational purchasing behavior. The platform, source, quantity, and content features of rumors will affect people's trust in rumors. Rumors cause social panic and lead to a surge of negative emotion, making people lose rational judgment and make irrational purchasing behavior. These irrational behaviors are largely due to the panic about some rumors, the urgency, and suddenness of public crisis events, making people more willing to believe in the uncertain information and engage in some irrational consumption behaviors.

Keywords: Rumor, Credibility, Negative Emotion, Irrational Purchasing Behavior

1 Introduction
After the outbreak of the COVID-19, there has been looting of masks, disinfection of alcohol, and food in various parts of China. On January 31, 2020, news that "Shuanghuanglian can inhibit the virus" appeared on major social media. Within a few minutes, the online and offline pharmacies of Shuanghuanglian were out of stock. However, there was no scientific evidence to prove that Shuanghuanglian could inhibit the virus. The harm caused by rumors is far greater than the incident itself. In a crisis, rumors are an important source of social instability. Rumors easily cause economic losses, destroy social order, and aggravate social panic [1]. Under this background, by introducing the theory of Persuasion and Communication, this paper studies how rumor credibility affects consumer emotion and affects consumers' purchasing behavior.

2 Literature Review and Research Hypotheses
Information quantity refers to the amount of information people see repeatedly. Research shows that people have more trust in recurring information [2]. The number of rumors will affect people’s
perception of trust in rumors [3] [4]. In this paper, people have repeatedly seen similar rumors on various social media, making them believe more about the truth of rumors. Thus, this paper hypothesizes that:

H1: Information quantity is positively correlated with rumor credibility.

The features of rumors in this paper include the layout, pictures, videos, data, links, etc. Rumors containing people's names or place names are more likely to be true than those lacking such information [5]. Under the background of COVID-19, the content of rumors affects people's trust in rumors. Rumors with a standardized layout and rich content are more able to convince the rumor receiver. Thus, this paper hypothesizes that:

H2: Content features are positively correlated with rumor credibility.

According to the theory of trust transfer, consumers choose whether to believe the information by evaluating the authority of the information publishing platform and the professionalism of the publisher. The level of trust in social media will affect people's trust in information [6] [7]. In this paper, when people face uncertain information about the COVID-19, they judge the authenticity of the information based on the authority of the published social media and the professionalism of the publisher. The authenticity here refers to the authenticity perceived by the individual, not the truth of the objective thing itself. Thus, this paper hypothesizes that:

H3: Platform credibility is positively correlated with rumor credibility.

H4: Source credibility is positively correlated with rumor credibility.

The credibility of rumors is generally considered to be the quality of the source of information; regardless of whether the content of the message is correct or not, the source makes people believe without hesitation [8]. Rumors weaken the rational consciousness of many people, resulting in a high degree of panic and herd behavior. Trust in rumors will aggravate people's negative emotions, affecting people's normal decision-making [9]. After the outbreak of COVID-19, some unconfirmed information on the Internet was widely disseminated. The exaggeration and expansion of information aggravate people's negative emotions. Thus, this paper hypothesizes that:

H5: Rumor credibility is positively correlated with negative emotions.

Emotion is usually defined as a positive or negative emotional response to a perceived situation. As we all know, emotions can affect people's behavior, and consumers who experience negative emotions try to alleviate negative emotions by seeking solutions or taking defensive actions [10]. When facing emergencies, people will feel that their life and safety are threatened due to insufficient and incomplete knowledge, and then they will have a sense of insecurity and unprecedented panic. Affected by the environment, information, and panic, people cannot make rational judgments and exhibit irrational behavior. Many people queue up all night to buy masks and Shuanghuanglian oral liquid. Thus, this paper hypothesizes that:

H6: Negative emotions are positively correlated with purchasing behavior.

To sum up, this paper constructs the research model, as shown in Figure 1.

![Figure 1. Model](image-url)
3 Variable Measurement and Data Collection

The questionnaire of this research contains two parts. The first part is to investigate the personal information of the respondents, including age, gender, income, etc. The second part is the measurement item of this paper, to measure the influence of rumor credibility on consumers' irrational purchasing behavior under public crisis. The measurement items in this study are all adopted from the existing mature scales, and the Likert 7-level scale was used for measurement.

To ensure the reliability and validity of the questionnaire, a total of 100 questionnaires were distributed in the pre-test. The reliability and validity of the obtained data were analyzed, and the unclear expression or ambiguity was modified to determine the formal questionnaire. In the formal survey of this paper, a total of 345 valid questionnaires were collected. The statistical results show that from the perspective of gender, 36.23% of the respondents are men, and 63.77% are women. In terms of age distribution, the number of samples aged 21-25 was the highest, accounting for 53.33%, followed by 105 people under 20 years old, accounting for 30.43%. In terms of income distribution, income below 2000 CNY accounted for 57.1%. In terms of educational level, 69.86% of respondents are undergraduates.

4 Data Analysis

4.1 Reliability and Validity Analysis

Reliability test. The data is processed by SPSS 21.0. As shown in Table 1, the factor loading is within the suggested threshold, indicating that the latent variables can be well explained by the observed variables. The Cronbach’s Alpha value and CR value of each variable are greater than 0.7, indicating the good reliability of scales used in this article.

Validity test. The validity test includes convergent validity and discriminant validity. As shown in Table 2, the AVE of each factor is above 0.5, the factor load of all items is greater than 0.7, the average root of AVE of each factor is greater than the correlation coefficient between each factor and other factors, indicating that the convergence validity and discrimination validity are good.

Model fit. Using Amos 22.0 for confirmatory factor analysis and maximum likelihood estimation method for estimation. CMIN / DF =1.745, RMSEA=0.047, GFI = 0. 923, AGFI = 0. 900, NFI = 0. 936, RFI = 0. 924, IFI = 0. 972, CFI= 0. 972. All indicators are within the suggested threshold, and it shows a good model fit.

| Variable                               | Factor loading | CR  | Cronbach’s Alpha |
|----------------------------------------|----------------|-----|------------------|
| Information quantity(F1)              | .765- .810     | .835| .835             |
| Content Features(F2)                  | .694-0.834     | .821| .819             |
| Platform Credibility(F3)              | .859-.787      | .903| .903             |
| Source credibility(F4)                | .814-.902      | .881| .880             |
| Rumor credibility(F5)                 | .849-.892      | .909| .909             |
| Negative emotions(F6)                 | .806-.867      | .871| .871             |
| Purchasing Behavior(F7)               | .734-.876      | .854| .852             |
Table 2. Discriminant validity

|     | AVE | F7  | F6  | F5  | F4  | F3  | F2  | F1  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| F7  | .663| .814|     |     |     |     |     |     |
| F6  | .693| .504|     |     |     |     |     |     |
| F5  | .768| .832| .504|     |     |     |     |     |
| F4  | .712| .447| .541| .655|     |     |     |     |
| F3  | .757| .452| .435| .705| .729| .870|     |     |
| F2  | .606| .395| .448| .643| .745| .633| .779|     |
| F1  | .629| .282| .335| .510| .397| .398| .478| .793|

4.2 Hypothetical Test

Amos 22.0 was used to analyze the path of the structural equation model. The statistical test is shown in Table 3. Among the statistical results, information quantity had a positive effect on rumor credibility (t = 4.000, P < 0.001), supporting H1; content features had a positive effect on rumor credibility (t = 5.502, P < 0.001), supporting H2; platform credibility had a positive effect on rumor credibility (t = 2.065, P < 0.001), source credibility had a positive effect on rumor credibility (t = 2.322, P < 0.05), support H4; rumor credibility had a positive effect on the negative emotions (t = 9.859, P < 0.001), supporting H5; negative emotions had a positive effect on purchasing behavior (t = 8.181, P < 0.001), supporting H6.

Table 3. Standardized path coefficient and statistical test

| Hypothesis | Route   | Estimate | S.E.  | C.R.  | P   |
|------------|---------|----------|-------|-------|-----|
| H1         | F5<---F1| .230     | .057  | 4.000 | *** |
| H2         | F5<---F2| .375     | .068  | 5.502 | *** |
| H3         | F5<---F3| .187     | .091  | 2.065 | *   |
| H4         | F5<---F4| .166     | .072  | 2.322 | *   |
| H5         | F5<---F5| .526     | .053  | 9.859 | *** |
| H6         | F5<---F6| .514     | .063  | 8.181 | *** |

Notes: *, **, ***Significance at 0.05, 0.01 and 0.001 levels, respectively

5 Conclusions and Enlightenment

5.1 Main Conclusions

First of all, this paper summarizes previous studies by literature research method, combined with the background of COVID-19, we construct the structural equation model of the influence of rumors on consumers’ irrational purchasing behavior. Secondly, the research hypothesis is tested. Information quantity, content features, source credibility, and platform credibility positively affect rumor credibility, rumor credibility positively affects negative emotions, and negative emotions positively affect irrational purchasing behavior.

5.2 Practical Inspiration

The government should strike hard at Internet rumors. First of all, strengthen the management of network public opinions. Through network tracing, transmission threshold alarm, and other means to strengthen the supervision of Internet public opinions. At the same time, the government should establish and improve the relevant laws and regulations. Based on the severity of the rumor, we should formulate corresponding legal punishment measures, clearly identify the responsibilities of relevant Internet enterprises in dealing with rumors, and curb the generation and spread of rumors from the source. Second, strengthen the scientific and cultural literacy of citizens. By enhancing the public’s
scientific literacy and rational criticism ability, we can effectively increase the public’s resistance to rumors. Finally, strengthen the building of emergency response capabilities. We should establish and improve the perfect, flexible, and individual-oriented emergency plan, management system, operation mechanism, and operation legal system.

For individuals, freedom of speech is one of the most basic constitutional rights given to citizens by the state. However, spreading rumors is not freedom of speech. Everyone should be responsible for his own behavior and should not let himself become a channel for spreading rumors. In the face of uncertain information, we should maintain a rational attitude and cautious dissemination and do not blindly choose to believe. Simultaneously, when obtaining relevant information, the information released by authoritative official media shall prevail.

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