

What Influences the Willingness of Chinese WeChat Users to Forward Food-Safety Rumors?

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With the rapid development of social media, the management of online rumors on food safety has become an important issue. The precondition of effectively preventing and treating food safety problems lies in discovering the factors that influence the spreading of rumors. In this exploratory study, we investigate the factors that influence the willingness of Chinese WeChat users to forward food-safety rumors from the perspective of rumor audience. We first construct a theoretical model and put forward certain hypotheses relating variables such as rumor-content credibility, source credibility, and audience's quality of rational criticism that influences the willingness to forward food-safety rumors. The empirical results show that WeChat food-safety rumors are characterized by obvious narrative features, dependence on professional sources, and highly realistic resonance. Stronger altruistic motive, content credibility, and source credibility lead to stronger audience willingness to forward rumors. However, the government and other authorities are generally viewed as ineffectively coping with the spread of such online rumors. This study's findings suggest several ways to improve their counterrumor efforts on social media.

Keywords: WeChat, health communication, food safety, rumors, risk communication

In recent years, with the rising popularity of the Internet and various social media, the management of rumors on food safety has become an urgent task in risk communication. By December 2017, the number of Chinese netizens had reached 772 million. The number of mobile netizens had reached 753 million. The number of real-time telecommunication users had reached 720 million. Thus, social media have become an important channel for information communication (China Internet Network Information Center, 2018). At the same time, the food industry has become the field most overloaded with rumors. Of all Internet rumors, food safety accounts for 45% (Yan, 2017), food safety-related rumors ranked number one (X. Tang, Huang, & Liu, 2017), and half of the information about food safety on social media is rumors (Wang, 2018).

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According to the *Chinese New Media Research Report 2013* (X. Tang, Huang, & Liu, 2013), WeChat has become a major channel for spreading rumors on food safety. The wide dissemination of rumors on food safety through WeChat is closely related to the features of WeChat itself.

There are several features of the WeChat platform. First, WeChat users, characterized by their massive number and close connection, constitute a vast audience for information on food safety. By the first quarter of 2017, the number of active WeChat accounts across the globe had reached 938 million. WeChat covered 90% of smart phones, and 55.2% of WeChat users open the channel more than 10 times daily (Zhu, 2016). The public's close attention to food safety also contributes to rumors on the topic being huge in number. WeChat users are closely connected among themselves, have firm relations with other users in real life, engage in mass communications through acquaintances, and adhere socially as groups and communities. All this clearly leads to deep trust in acquaintances as sources of information (S. Lai, 2014). It also further allays users' possible doubts and hesitancy when forwarding rumors (Guo & Xue, 2015). Audiences' crowd psychology is very likely to be activated at this point, thus creating a butterfly effect.

Second, the regulation of the WeChat platform is not very effective. In recent years, the administrators of the WeChat platform have attempted to deal with the flow of rumors. For example, on October 17, 2014, WeChat released an official rumor refuting account, "rumor filter," aimed at accurately identifying account operation and false content. According to the data of China's 2018 WeChat Rumors Management Report, "WeChat rumors refuting center has recorded 490 million incidents of refuting rumors, involving 140 million users. The total number of forwarding of knowledge and education information of refuting rumors has exceeded 45 million" (2018, p. 68). However, the number of WeChat public accounts has exceeded 10 million, with an increase of 15,000 new users daily. Nearly 30 billion pieces of content are generated every day. Moreover, the threshold for WeChat users' content generation is very low, requiring only simple registration to become an active user who can push messages. Meanwhile, food-safety rumors often imitate the writing style of scientific papers and combine audio, video, and other communication media to arouse readers' interest and involvement by incorporating some touching stories, making it difficult to distinguish the truth from falsehood. The point-to-point information released by WeChat public account lacks professional gatekeepers' review. Moreover, the postings on WeChat allow for public comments, adding more options for adding rumors. In 2016, the big data communication lab of Sun Yat-Sen University released the WeChat "rumors" *Annual Analysis Report*, revealing that from April 2015 to March 2016, the No.1 and No. 4 among the popular rumor articles were related to new drugs and food safety. In terms of reading volume, the average reading volume of food-safety rumors is nearly 1.8 million, which ranks first among all types of rumors. Thus, the regulation and control of food-safety rumors on WeChat public platform is still far from being effective.

Finally, yet importantly, due to the low traceability of anonymously generated information and the closed-loop communication model, authoritative information generally fails to reach the users. A real-name registration system has not yet been established on WeChat platforms, and therefore many texts, pictures, and videos without links fail to be traced to their origin; because the closed-loop communication model has been established and enlarged over time, authorities find it even more difficult to intervene; and because WeChat's autonomous subscription mechanism allows users to selectively follow accounts or platforms with similar opinions, it becomes almost impossible for authoritative information by authoritative organizations to reach a wide audience. Meanwhile, a diversified means of displaying information has enhanced the efficacy

of communication. Pictures, audios, videos, and other multimedia forms can be used to relay the information, which is far more direct, vivid, and interesting than text itself. Thus, the perceived credibility and attractiveness of the information are enhanced.

In 2013, the *Interpretation of the Supreme People's Court and the Supreme Procuratorate of the People's Republic of China on Several Issues Concerning the Application of Laws in the Handling of Information Systems and Criminal Cases* was proclaimed. In it, the number of online rumor forwarding served as a benchmark for conviction of crimes, which also highlighted the importance of an audience's forwarding behavior in rumor communication. Scholars argue that attention should be paid more to public reaction than to the content of the rumor itself (Zhang & Shu, 2016). The audience chooses to forward because of its consent to the rumor's content. From this perspective, examination of the factors influencing the audience's willingness to forward, and the reasons for its acceptance of WeChat food-safety rumors, is a significant step in the study of these rumors' flow.

To explore the factors that influence the willingness of Chinese WeChat users to forward food-safety rumors we provide an extensive review on studies examining the flow of food-safety rumors. Based on this literature, we present the theoretical model and our research hypotheses. A detailed description of variables, questionnaire design, and data collection are included in the Method section, followed by the empirical analysis. Finally, we discuss the findings and their theoretical and practical implications.

Literature Review

The relevant literature in this field can be grouped into three categories: studies of rumors in social media, studies on WeChat rumors, and studies on factors influencing the flow of rumors. Let us present some of the main findings from studies in these three categories.

Rumors in Social Media

The studies of rumors, from their sources to their consequences, highlight the context where the rumors are generated. The essential components to be considered are the importance of an event, the ambiguity of the information (Pedersen & Sigmundsson, 2005), and its potential threat (Difonzo & Bordia, 2007), usually together with some aspects of the social context. As for the rumors' contents, these are messages related to current affairs and usually those that have not been verified by authorities (Zhou, 2009). For participants, these rumors are important topics (Rosnow, 1991). They can be entirely false or partially true. As for the rumors' function, they may lead to negative impacts, including economic losses, social panic, and violent incidents, which are detrimental to government credibility (C. Wang & He, 2009). On the other hand, rumors can also help the public to understand society, to ward off risks, and to resolve problems. Especially when the truth has not been identified, the public tends to take initiatives to find out more and take relevant steps on their own. When the desired information fails to be obtained through formal channels, the audience inclines to informal channels for information, of which rumors are the product. They are important means of resolving internal problems in a group or a community.

The wide dissemination of information on social media greatly depends on the users' forwarding behavior. Information that has been forwarded many times is more likely to attract the attention of a wider audience (Cai, 2011; Chen & Wang, 2015). The act of forwarding rumors means interest, involvement, and activation: On receiving rumors from the platform, the rumors' consumer becomes a "prosumer." He or she

undergoes a cognitive or emotional reaction and holds one-to-one private conversations as well as group conversations with friends, social circles, and more. The process involves voluntarily forwarding to others text, comments, and links relating to the original rumor.

WeChat Rumors

WeChat rumor is one type of Internet rumors communicated through online platforms. Internet rumors and traditional rumors are the same in nature, components, content, and emotions. But Internet rumors have different communication channels, forms, and even impact. They are unverified statements or comments on objects, events, or issues, usually of interest to netizens, and have been widely disseminated. They help the public interpret any current ambiguous but important situation (Cao & Huang, 2004; Zhou, 2012). Food safety is one kind of rumor, categorized according to its content (He, L.N. 2017; X. Hong, Jiang, & Xia, 2014). The WeChat rumors in this study consist of unverified information on food safety and have the following three features: (1) They are widely disseminated through WeChat; (2) their theme is related to food safety; and (3) when the audience receives the information, they have not been informed by the authorities whether the information had been verified as true or false.

Factors Influencing the Flow of Rumors

The study of factors influencing the flow of rumors has attracted much academic attention (X. Hong et al., 2014). Of special interest, due to their potentially dangerous effects, are food-safety rumors. Their content usually combines the following features: First, they relate to hotly debated food-safety issues of common concern, such as GM food (Zhang & Shu, 2016). Second, they concern regular food in everyday life. Dietary risks are closely related to everyday life and can hardly be neglected (Lofstedt, 2006). Third, food-safety rumors tend to appear periodically as they are usually about seasonal produce (X. Tang et al., 2013). Regarding the source of the WeChat rumors, the lack of supervision of registration of WeChat public platforms have turned public accounts into the producer and transmitter of WeChat rumors (Jing & Zhu, 2015). According to data published by Sun Yat-Sen University, a WeChat rumor has the following features: First, it appears to associate itself with experts and scholars or professional organizations. Second, it blurs key and marginal information intentionally. Third, professional and scientific terminologies are used frequently (Zhang & Shu, 2016). At the same time, there is an obvious trend of integration due to the group-based nature of WeChat. That is, the audience is likely influenced by the identity, popularity, and credibility of the disseminator (Niu & Qian, 2016). Compared with that of government authorities, which are usually out of reach, the immediate and accessible online rumor is easier for the audience to relate to and rely on. Qin and Liu (2017) demonstrated that individual trust positively influences the spread of WeChat rumors. Regarding the audience, their knowledge and discernment about food safety, the great attention they devote to food-safety information, the collective memory of food-safety incidents related to the rumors and other factors, influence significantly their participant behavior (W. Hong, Wu, & Wang, 2013; H. Wang & Hong, 2017). The rising number of incidents involving food safety has focused extensive public attention on such issues. People panic and display anxiety over food safety, which has become an inexplicably frightening matter. Therefore, there is more public interest in these issues, and consequently more active communication behavior in terms of search for information, exposure and sharing (Z. Lai & Yang, 2014). The audience's psychological features with regard to food-safety rumors are similar to those associated with other rumors. The major difference is that an altruistic motive is more evident in forwarding food-safety

rumors: The serious consequences of the rumors are more likely to arouse concern for families and friends (Y. Wang, 2016). Studies have analyzed rumors and their influence on communication mainly from the perspectives of communication and psychology (Xinhua & Liqun, 2018). They provide a valuable input and have erected a solid foundation of theory. Yet there is still room for further study. First, only few studies have examined WeChat food-safety rumors; second, existing studies tend to conduct research from communication or psychological perspectives alone, instead of being interdisciplinary (Mengfei & Zhonghua, 2018). More specifically, understanding of the social context of rumors is scarce. True, some scholars have striven to examine rumors from the communication environment and social context perspectives, and have contributed to shifting our traditional understanding of rumors. However, few studies account for the specific social context of food-safety rumors (Hu & Wei, 2017). Third, from the audience's perspective, research on rumor communication is insufficient and lacks a solid quantitative dimension. In the few such studies, the method involved was qualitative, focusing on a single case analysis or the examination of several cases. Empirical quantitative studies are rare.

Theoretical Model

For the audience, acceptance of WeChat food-safety rumors is a process of persuasion. When a rumor has been disseminated, its source, content, and audience are the most important determining factors for the communication effect. Hovland, in the book *Propagation and Persuasion*, proposed the communication persuasion Theory (Hovland & Weiss, 1953). The theory argues that the effect of communication and persuasion is influenced by three factors—"information publishers," "information content," and "information recipients." These factors play a decisive role in the effect of communication and the attitude of the audience, which in turn leads to different behavioral tendencies of the audience. According to the research model, WeChat food-safety rumors are accepted by the audience, leading to changes in the audience's perception, emotion, attitude, and behavioral tendency, which is a process of being persuaded by the rumor.

Value-added theory was proposed by Smelser (1962), with the belief that the emergence and development of all collective behaviors are basically influenced and determined by the following six factors—namely, structural inducement, structural tension, generalized belief, triggering event, effective mobilization, and decline in social control capabilities. The communication process of WeChat food-safety rumors is the combined action of all these factors. To view the dissemination of WeChat food-safety rumors from the perspective of value-added theory is reasonable. More specifically, structural conduciveness is the supporting environment. WeChat, as a channel, enables all participants to join the communication process. The strong relationship based on acquaintances enhances the audience's belief in rumors; structural tension and general beliefs become embodied in concerns, social anxiety, and mistrust of food safety. This is possibly triggered by frequent food-safety incidents, mismatch of information, and other conflicts. A uniform memory is being formed. Audiences wish to express their own anxiety and demands by forwarding rumors. In this process, food-safety incidents and major related events are triggers. Here, active mobilization means supporting the disseminators of WeChat rumors. The decline in the effectiveness of social control suggests that the government's and other authorities' ability and current efficacy have not reached the desired level in terms of food-safety rumor management, and they fail to act against the dissemination of WeChat food-safety rumors.

Based on the literature review, the variables characterizing WeChat food-safety rumors are included in one model (see Figure 1). A specific model suggesting those factors influencing an audience's willingness to forward food-safety rumors is proposed (see Figure 2).

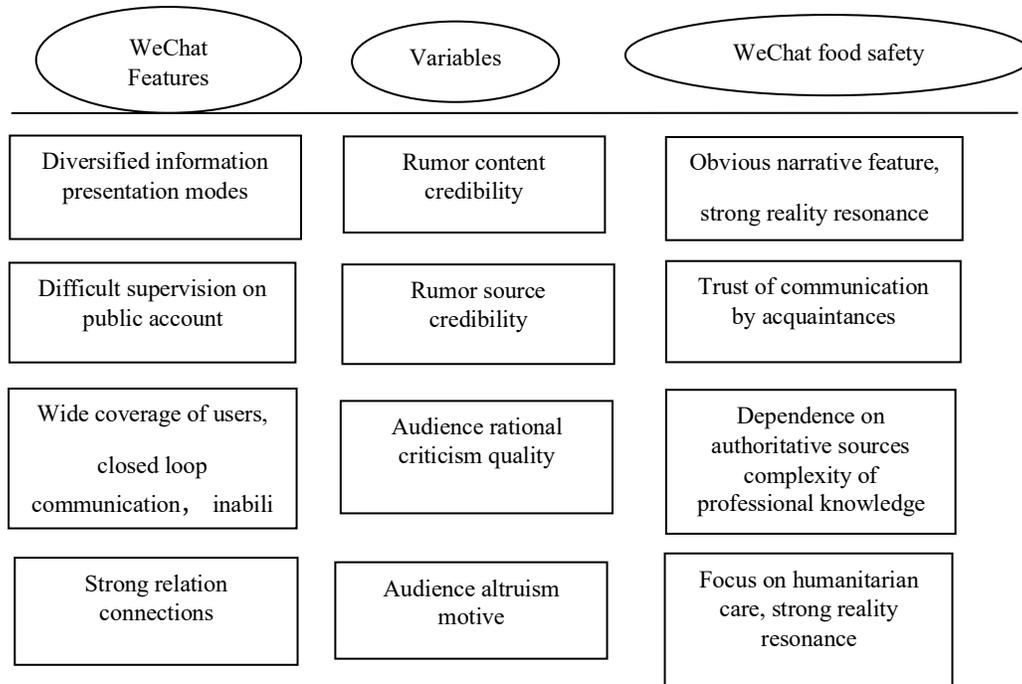


Figure 1. The model measuring the variable construct.

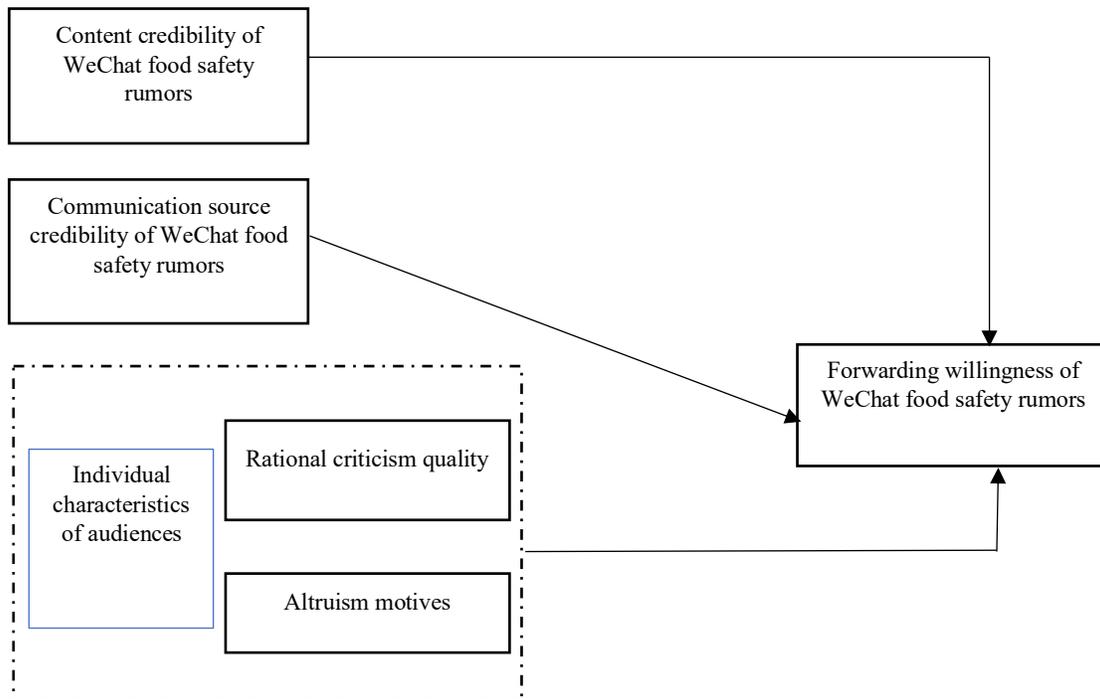


Figure 2. The model measuring factors influencing willingness to forward food-safety rumors on WeChat.

Hypotheses

The content credibility of rumors is an audience's subjective judgment of the measure of reliability of rumor content. Previous studies have suggested that the higher the content credibility, the more likely the rumors will be disseminated. Note that important and ambiguous information tends to attract greater attention. WeChat food-safety rumors are usually about regular food in everyday lives: They describe details such as persons, time, place, and causes in a narrative style. Diverse presentations including experiments and videos have been used to strengthen audience perception of the content credibility:

H1: A rumor's content credibility will positively affect willingness to forward food-safety rumors on WeChat.

Through the audience's attitudes and perception, the information source influences relevant willingness and behavior (Yasmina, Edwin, Van, & Lidia, 2011). The more reliable the source, the more likely is the information to be re-disseminated (Yang, Ge, & Lan, 2013). Scholars have made such measurements from various angles, including professionalism, reliability, and relations among the communicating parties (Berlo, Lemert, & Mertz, 1969; Hovland & Weiss, 1953). This study defines communication-source credibility as the degree of audience's trust in the disseminator who forwarded the

rumor. According to Hovland and Weiss (1953), two factors determine the degree of trust: (1) the degree of the information receiver's psychological trust in the information disseminator, and (2) the audience's judgment of the disseminator's ability and expertise. Based on theory and case studies, this research sees credibility of a WeChat food-safety rumor disseminator in two dimensions: the disseminator's expertise and the audience's view of the disseminator:

H2: The source credibility of rumors will positively affect the receiver's willingness to forward food-safety rumors on WeChat.

Hovland, Janis, and Kelley has studied individual audiences' characteristics, including "intelligence and motive of audience" (1954, p. 136). Based on existing research, an audience's intelligence factors can actually be extended into the quality of rational criticism—namely, an audience's rational assessment ability when receiving rumors. According to previous studies, the stronger the rational criticism quality the audience possesses, the less likely is it to spread rumors (Chorus, 1953). As for food-safety rumors, dependence on professionals, expert knowledge, huge audiences, and great variance among individuals have all made it more difficult for an audience to distinguish truth from falsehood in rumors:

H3: The receiver's rational criticism quality will have a negative impact on the willingness to forward food-safety rumors on WeChat.

Motive is the driving force behind individual behavior; behavior is the direct expression of motive (Isen & Reeve, 2005). Individual need and motive are important components influencing a communication persuasion effect (Hovland et al., 1954). Because of the nature of communication through acquaintances, and a touch of humanistic care, WeChat food-safety rumors are mainly forwarded to benefit others. That is, this study identifies the major motive influencing an audience's willingness to forward as altruism. Much evidence exists of the altruism and altruism sentiment that can be found on the Internet. Audiences may achieve a sense of moral fulfillment through forwarding rumors: This is what is regarded as altruistic motive (Guo & Xue, 2015). Food-safety rumors on WeChat induce altruistic motives in the audience by soliciting the act of forwarding:

H4: The receiver's altruistic motive positively affects his or her willingness to forward food-safety rumors on WeChat.

Method

The Measurement of all Variables

According to our hypotheses, rumor-content credibility, source credibility, the audience's rational criticism quality, and the audience's altruistic motive were selected as independent variables.

Independent Variables

Content Credibility

This study uses the following four test items to measure the credibility of the rumor content. First, the narrative details, which can reflect the reliability of the rumor content; second, diversification of the presentation mode—"pictures and video content have more advantages in forwarding due to stronger contextization" (Hui & Li, 2016, p. 137); and third, the inclusion of professional knowledge.

Source Credibility

The credibility of the source refers to the degree of trust given to the rumor's source by the receiver. Three specific test items are used to measure the users' evaluation of the credibility of the source. One is professionalism (i.e., the ability of rumor sources to provide professional information; Sussman & Siegel, 2003). The second is dependability (i.e., the degree to which the audience depends on the recognition of the rumor spreaders; Hovland et al., 2013). Third is the trust among acquaintances (i.e., the degree of trust given to the friends who spread the rumors; Zhang & Shu, 2016). Generally, people tend to believe rumors transmitted by people they know (Garret, 2011).

Audience's Rational and Critical Quality

Rational and critical quality refers to the audience's ability to rationally evaluate received rumors. Based on the index provided by S. Tang, Wang, and Xu (2008), we use three items to measure the quality of rational criticism: rational criticism knowledge, rational criticism consciousness, and rational criticism ability. They respectively represent the food-safety-related knowledge the audience knows, skeptical consciousness, and the ability to distinguish the true from the false.

Description of Audience's Altruistic Motivation

Altruistic motivation refers to the purpose of benefiting others by forwarding the information. Based on the results of researches on altruistic behaviors, it can be concluded that the behaviors based on altruistic motivation have the following characteristics: beneficial to others, voluntary, conscious, and not expecting return (Trivers, 1971). In this study, based on the studies of Kankanhalli, Tan, and Wei (2005) on altruistic motivation, the audience's altruistic motivation is measured by the following three questions: Are they proud of the altruistic behavior of forwarding? Do they share the needed information with others through forwarding? and Do they help others solve problems through forwarding?

Dependent Variable

The audience's forwarding intention of WeChat food-safety rumors refers to the willingness of the receiver to forward a WeChat food-safety rumor. As for the operationalization of the rumor's forwarding willingness, based on the related theories and referring to the research of Lee and Ma (2011) and Chen and Wang (2015), this study measures the audience's forwarding intention of WeChat food-safety rumors from the following three dimensions: willingness to forward, extent of initiative, and executive force. We specifically use "willing to forward," not just the three items "reading," "want to forward," and "will forward." Specifically, measurement scales of independent and dependent variables are presented in Table 1.

Table 1. Operationalization of the Main Variables.

Variable	Operationalization	References
Willingness to forward food-safety rumors on WeChat	I'm willing to forward this information, not just read it.	Lee & Ma (2011)
	I want to forward this information.	Che & Wang (2015)
	I will forward this information.	
Rumor content credibility	The information clearly details specific food, location, time, and reasons to avoid food.	Rosnow (1991)
	The information uses diversified means of presentation, including pictures, videos, and so on.	Sun & Li (2016)
	The experts, scholars, medical professionals, and scientific knowledge involved in the information convince me.	
	I regularly consume the foods mentioned in the information.	
Reliability of rumor source	I believe that the source of the information is professional. I believe that the friend or public account from which I receive the information is trustworthy.	Garret (2011) Hovland et al. (1954)
	If the information is forwarded by my WeChat friend, I consider it real.	
Audience's rational criticism quality	I understand the food science and life knowledge about the information.	S. Tang et al. (2008)
	I trust the information once I see it. I would never doubt it.	
	I could use my knowledge to judge whether the information is true, or identify loopholes.	
Audience altruistic motive	I'm proud of the fact that I'm sharing this information with a WeChat friend through forwarding.	Wasko & Faraj (2000)
	I'd like to remind my WeChat friend of the food hazard in the information.	
	I hope that by forwarding this information to my WeChat friend, I contribute to my friend's health.	

Control Variables

We introduce variables such as audience's gender, age, education level, marital status, occupation, and other demographic features as control variables.

Questionnaire Design and Data Collection

The questionnaire includes three parts: cover letter, personal information, and subject questionnaire. The cover letter explains the identity of the investigator, the purpose of the investigation, the content of the investigation, the instructions, and guarantee of confidentiality of the results. Personal background information includes gender, age, education, marital status, occupation, the length of time using WeChat, the average number of opening times per day, the frequency of forwarding messages, and the number of received food-safety rumors. The main part of the questionnaire guides the respondents to recall the situation of food-safety rumors once received, and to understand the respondents' perception level of each variable at that time

Five hundred questionnaires were distributed, online and off-line. Of the 473 responses received, 338 were online and 135 off-line. When testing the questionnaire, we first selected 10 WeChat users and, based on their feedback, modified some of the questions that were ambiguous or difficult to understand. Then we selected 50 users who have received food-safety rumors on WeChat as our pretest samples. The result showed that the questionnaire had high reliability and validity, the Cronbach's alpha coefficient of each variable exceeded 0.7, the KMO values were all greater than 0.7, and the factor loading of each item is greater than 0.5. After removing several items specifically designed for content credibility, the off-line questionnaire was finalized. For the sake of typicality and availability, the off-line questionnaire was mainly issued in the Citizens' House in Wuhan City and in several villages in Anhui. Wuhan is the location of the Chinese Optics Valley and a first-tier city in China. Anhui is a less urbanized province with a large rural population. A 7-point Likert-type scale was used to measure the extent of agreement on relevant questions (1 = *strongly disagree*, 7 = *strongly agree*). Although this study defines rumors as information items unverified as true or false by the authority, usually rumors are associated with negative or false contents. Therefore, to prevent respondents from being biased by the term "rumor," "information item" was used instead. Both online (major) and off-line questionnaires were used. Online questionnaires were distributed through wjx.cn. (a Chinese online survey site). Teachers, students, families, and friends as well as their acquaintances who had forwarded WeChat food-safety rumors were invited to participate. Because of feasibility and accessibility, off-line questionnaires were distributed at two locations: Wuhan Citizens' Home in central China, where there are many urban residents, and a rural area in central China with a middle-income-level rural population.

After examining responses, the following responses were deleted: those of respondents who selected "0 times" in answer to the question "How many times have you received food-safety rumors through WeChat?" Those of respondents who spent less than 1 minute answering the questionnaire; and those of respondents who selected "General" for most of the questions in the scale. After screening, the total number of effective questionnaires was 368. Effective questionnaire recovery rate was 73.6%.

Empirical Analysis

Data

Table 2 shows the samples' basic characteristics, with a relatively even distribution between males and females.

Table 2. Statistical Characteristics of Sample.

Statistical items	Categories	<i>N</i>	Proportion (%)
Gender	Male	56	42.4
	Female	12	57.6
Age	<20	0	2.7
	21-29	42	65.7
	30-39	4	14.8
	40-49	9	13.4
	50-59	3	3.4
	>60	0	0
Degree	Junior high school and below	39	10.5
	Senior high school or vocational	35	9.6
	College	33	9.0
	Bachelor's	152	41.3
	Master's and above	109	29.6
Marital status	Unmarried	221	60
	Married	147	40
Occupation	Students	132	35.9
	Civil servants	67	18.3
	Company employees	90	24.5
	Workers	23	6.3
	Farmers	15	4
	Private business owners/freelancers	31	8.5
	Retirees	1	0
	Others	9	2.5

Years of experience using WeChat	Less than half a year	0	0
	Half a year to 1 year	4	1
	1–2 Years	21	6
	2–5 Years	221	60
	5 Years and Above	122	33
Times of opening WeChat daily	0–1 time	0	0
	2–5 times	21	6
	6–10 times	66	18
	>10 times	281	76
Frequency of forwarding WeChat messages	Almost none	63	17
	Occasionally	221	60
	1–3 times daily	43	11.8
	3–10 times daily	16	4.4
	>10 Times daily	25	6.8
Number of times receiving WeChat food-safety rumors	1–3 times	223	60
	>3 times	145	40

The majority of the population are between the ages of 21 and 29 years. No respondent is older than 60. Possible reasons are that older people rarely or never use WeChat. Most respondents are students, employees at enterprises, civil servants, laborers, farmers, or freelancers. Ninety percent of them have used WeChat for more than two years or have gone online with WeChat more than five times daily. The results suggest that these WeChat users are quite active; all have experienced message forwarding, as most of them selected “occasionally” for this activity. Regarding WeChat food-safety rumors, 60% have received them one to three times, and 40% have received them three times or more. This suggests that most of the population constitute the audience for WeChat food-safety rumors.

The questionnaire’s reliability test resulted in Cronbach’s alpha of 0.905, demonstrating sound overall reliability. The reliability and validity analysis of the main variables are shown in Table 3. Concurrently, we conducted tests for any significant differences in audience willingness to forward WeChat food-safety rumors because of control of variables, including gender, age, educational degree, marital status, and occupation. Preanalysis of variables showed that all variances were homogeneous. Details are presented in Table 3 and Table 4.

Table 3. Main Variable Reliability and Validity Test Results.

Variable	Item	Factor load	KMO	Eigenvalues	Cumulative variance interpretation rate (%)	α
Content credibility	1	0.739	0.707	2.488	72.2	0.797
	2	0.791				
	3	0.830				
Source credibility	1	0.856	0.715	2.210	73.6	0.818
	2	0.842				
	3	0.876				
Rational criticism	1	0.713	0.702	1.988	71.3	0.742
	2	0.865				
	3	0.855				
Altruistic motive	1	0.915	0.734	2.561	85.4	0.914
	2	0.948				
	3	0.908				
Willingness to forward rumors	1	0.918	0.725	2.342	78.1	0.859
	2	0.920				
	3	0.809				

Correlation and Regression Analysis

To further clarify the interrelations among the variables, we proceeded to conduct a correlation and regression analysis of the data, using SPSS21.0 for the regression test. The results are shown in Table 4.

Table 4. Pearson Correlation Analysis Table Between Major Variables.

	Content credibility	Source credibility	Rational criticism	Altruistic motive	Forwarding willingness
Content credibility	1				
Source credibility	.384**	1			
Rational criticism	.159**	.028**	1		
Altruistic motive	.421**	.313**	.009*	1	
Forwarding willingness	.515**	.584**	-.116*	.738**	1

Note. * $p < .05$. ** $p < .01$.

Table 4 shows that at the 0.01 significance level there is a significant positive correlation among content credibility, source credibility, altruistic motive, and willingness to forward the rumor. At the 0.05 significance level there is a negative correlation between quality of rational criticism and willingness to forward. In addition, the correlation between the two variables other than the dependent variable is less than 0.5, so it can be concluded that there is no significant multicollinearity among them (Blalock, 1963).

Further, tolerance and variance expansion factors (VIFs) were used to identify collinearity among variables. The results, shown in Table 5, indicate that all tolerances are greater than 0.1, and the VIF values are less than 10. Thus, it can be concluded that there is no significant multicollinearity among the variables.

Table 5. Collinear Analysis Table of Independent and Manipulated Variables.

Variable	Tolerance	VIF
Content credibility	.427	2.342
Source credibility	.462	2.164
Rational criticism	.975	1.025
Altruistic motive	.617	1.620

To test the research hypotheses and verify the model's interpretability, we performed regression analysis on the independent and dependent variables. The results in Table 6 show that all four core independent variables are significantly correlated with the users' willingness to forward. The audience's

altruistic motive, rumor content credibility, and source credibility are positively related to the willingness, and the quality of audience's rational criticism has a negative effect on the willingness to forward. Furthermore, the overall significance level of the model reached $p < .05$, and the adjusted R -square reached 0.625, which means the tested model can explain 62.5% of the variance in forwarding willingness of WeChat food-safety rumors. To be specific, given that all the other variables remain constant, the higher the audience's altruistic motive is, his or her willingness to spread a rumor is stronger. Provided that all the other variables remain constant, the higher the content credibility, the more likely the rumors will be disseminated, and the more reliable the source, the more likely is the information to be re-disseminated. Given that all the other variables remain constant, the stronger the rational criticism quality the individual possesses, the less likely he or she is to spread rumors. Therefore, all the hypotheses, H1, H2, H3, and H4, are supported by our empirical results.

Table 6. Regression Analysis Table of Factors Influencing Receiver's Willingness to Forward Food-Safety Rumors.

Variable name	<i>B</i>	<i>SE</i>	<i>t</i>
Gender	.219**	.099	2.207
Age	.180	.076	1.320
Degree	-.016	.051	-.309
Marital status	.162	.145	1.122
Occupation	-.041	.034	-1.244
Rumor content credibility	.151**	.056	2.685
Source credibility	.111**	.056	1.987
Audience's rational criticism	-.092*	.051	-1.807
Altruistic motive	.650***	.036	17.441

Note. Dependent variable: Rumor-forwarding willingness. * $p < .10$. ** $p < .05$. *** $p < .01$. (two-tailed).

The findings are summarized in the following figure (Figure 3).

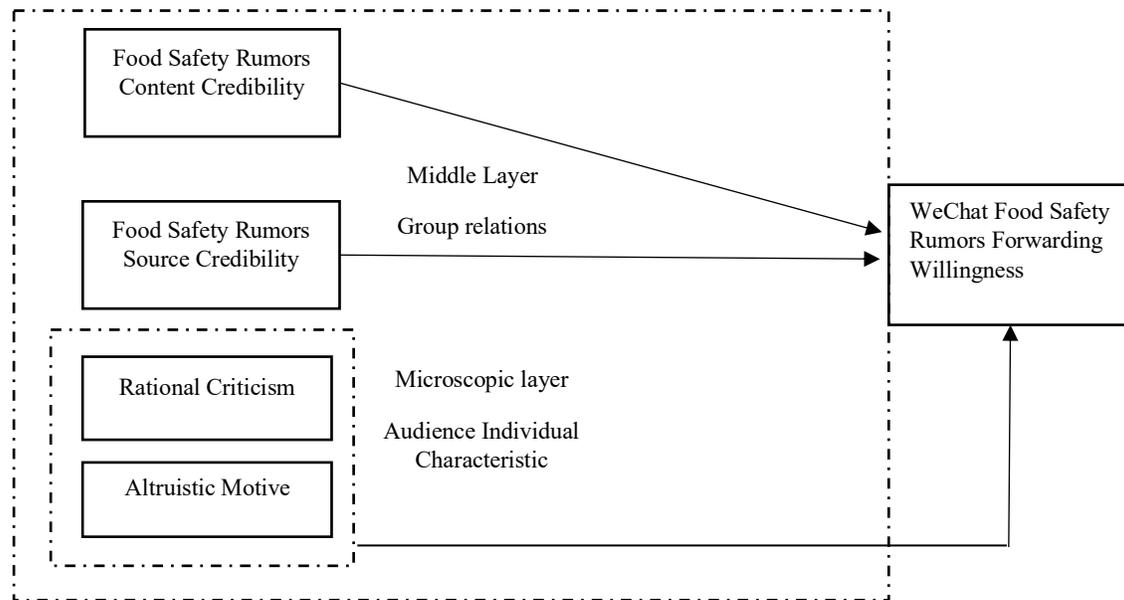


Figure 3. Model of factors influencing WeChat users' willingness to forward food-safety rumors.

Discussion

We can conclude that the higher the perceived credibility of WeChat food-safety rumors, the greater the audience's willingness to forward them. The rumor's details and various presentation methods are important incentives for audience forwarding. To enhance the content's credibility, food-safety rumors usually adopt a narrative approach. Details of specific foods, people, time, place, and cause are usually presented in various ways—such as by pictures and videos—to enhance the appeal and connection of the rumor with people's daily life. The more prominent the above characteristics of food-safety rumors, the more likely the audience is to perceive them as credible, and the more willing are they to forward them.

It is also evident that the higher the WeChat food-safety rumor's communication source credibility, the greater the audience's willingness to forward. The professional level of the communication's source, the degree of psychological trust, and the trust relationship among acquaintances all exert some influence on the audience's judgment of the credibility of WeChat food-safety rumors. First, the receiver will tend to believe friends who are professionals and have self-media public accounts on food safety. Second, WeChat users generally regard their friends as their main source of information and will not doubt the messages they have forwarded. The WeChat friends' circle is based on a robust relationship, an acquaintance circle, and a social relationship. The differential mode of association also proves that it is easy to generate trust and enhance the audience's perception of source credibility.

Another conclusion is that the higher the quality of the receiver's rational criticism, the weaker his or her willingness to forward. On the one hand, if the individual has doubts, engages in critical thinking, and finds ways to identify a rumor's authenticity, the less he or she will readily assume it is true, and willingness to forward the rumor will decrease. On the other hand, as food-safety rumors usually involve professional or scientific knowledge, if the receiver understands this knowledge, he or she could identify the rumor's authenticity, or loopholes, and therefore will not forward it.

Finally, the altruistic motive has a strong and positive influence on an individual's willingness to forward a food-safety rumor. In fact, it has the strongest effect of all the variables. Individual motive has always been an important topic in studies on the rumor-communication mechanism. Food-safety rumors display a strong trait of humanist care, which plays an important part in inducing an audience's altruistic motive. Therefore, the stronger the altruistic motive, the stronger the willingness to forward the rumor. By forwarding food-safety rumors, a receiver wishes to share the content with relatives and friends, to warn them against the severe consequences of eating hazardous foods and to ensure their safety and health.

What about countering the spread of such rumors? The effectiveness of measures to counter rumors is rated relatively low by Chinese WeChat users, although audiences trust these authorities rather strongly, as revealed by our survey. The respondents expect authorities to refute these rumors, but they are not excessively willing to forward the refuting information. When the information released by authorities lags behind, users become disaffected. In particular, there is a general lack of awareness of the need for rumor-refuting by Chinese local government authorities. Accordingly, attention would only be paid when the rumors have already been spread across a large audience. As a result, the promptness of refuting rumors is not ensured. Several rumor-refuting institutions exist, including an official government blog, an official WeChat refuting platform, and other professional institutions. Still, the independent subscription mechanism of the WeChat public account has stymied any large-scale following of authoritative or official WeChat accounts by WeChat users. The refuting information usually fails to reach the expected audience in time, and as a result, most users are not even aware of the existence of a WeChat rumor-refuting platform. Because of the limitations of WeChat's public account comment mechanism, the public cannot discuss or post a comment under the refuting information. Thus, their goal and demand for participation and interaction cannot be properly met, and when they do receive rumor-refuting information, the popularity of a particular topic has already waned. Thus, users are less likely to forward the refuting information, and therefore, there is definitely much room for improvement of refuting processes for WeChat food-safety rumors.

This study has some limitations. First, due to time constraints, the representativeness of the sample has yet to be enhanced. Second, the questionnaire could obtain data based only on the audience's subjective feelings, and the data did not provide explanations for the underlying reasons of the hypotheses. Future research could use a wider range of samples and various text-mining tools to explore the characteristics of food-safety rumors in various social media channels, select a wider range of respondents, and explore food-safety-rumor forwarding behavior based on different individual audience characteristics.

We suggest that further studies consider the influence mechanism and evolution process of each variable on the audience's food-safety rumor-forwarding behaviors, and further quantify and thoroughly investigate emotion perception as a variable. In addition, we propose a predictive index of the spread of a food-safety rumor, based on the results of model testing and the process of rumor evolution. Also, prediction

of the rumors' communication route might be helpful in enhancing the efficacy of food-safety-rumor risk communication.

Conclusion

With the increasing popularity of social media, the management of WeChat food-safety rumors has become a crucial factor in risk communications regarding food safety in China. On this online platform, audience's forwarding behavior is a crucial factor. Taking into account the dual nature of food-safety rumors as news and as social activity, this study constructed a model measuring the factors influencing audience's willingness to forward food-safety rumors. It was concluded that the higher the rumor's content credibility, source credibility, and audience's altruistic motive, the stronger the WeChat users' willingness to forward food-safety rumors; however, the stronger the audience's rational criticism quality, the weaker their willingness to forward food-safety rumors. We propose government strategies including establishing rumor-content surveillance mechanisms, denying fake rumors entry into the communication source, raising the public's rational criticism ability, and enhancing the authorities' efficacy in refuting rumors to target WeChat food-safety rumors.

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