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Full Research Paper

What Motivates People to Share Online Rumors? Deconstructing the Ambiguity of Rumors from a Perspective of Digital Storytelling

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Abstract: With the proliferation of social networks and the development of digital technology, the content structure and propagation mode of rumors have become more complicated with ambiguity, which has greatly influenced people's behaviors when facing digitalized rumors. Based on the digital storytelling theory, this study takes an early initiative by deconstructing and identifying the basic components of online rumors and revealing the conditions under which people's sharing behaviors in a social environment. A data set of health-related rumors related to Covid-19 was used to test the research hypotheses. The results indicated that causality explicitness, element integrality and source explicitness have different influences on rumor sharing behavior. And rumor vividness plays a negative moderating effect during the sharing process. This research offers insight to viewers and website authorities on ways to monitor and debunk online rumors.

Keywords: Online rumors, Digital storytelling theory, Sharing behavior, Covid-19

1. Introduction

With the dramatic change in the media landscape in recent years, rumors, mixed with other real information, can be easily and quickly disseminated on social platforms. People might receive and notice rumors when they use the mobile phone and browse certain-scene information on social networks. The emergence of convenient interaction channels also transformed people from information recipients to spreaders of information. Especially in a health crisis, people with anxiety are more likely to share rumors ^[1], which causes unnecessary panic and confusion. For example, in the period of COVID-19, the rumor "taking Isatis Root Granules, a kind of medicine for clearing heat, would play a role in reducing and eliminating the virus" caused a big amount of discussion on the internet, and then caused people to hoard related medicine for speculation.

Compared with the traditional media, such as newspapers and television, rumors on the internet, which are digitalized, have a more complex content structure and communication modality. Specifically, online rumors are often disseminated with a characteristic of *ambiguity*, by concealing the actual information sources and the total news clue ^[2]. It is one of the core essences of distinguishing rumors from true news. However, this distinction might be unobserved in social networks in that internet users have been used to fragmented online content ^[3]. And then it comes to an opportunity for "rumors" to hide and tamper with part of real information through digital media, which is not easily detected by internet users.

On the other hand, digital technology can reshape and sensationalize the original information by the combination of text, picture and short video. And prior research has indicated that content that uses drama-supporting elements, taking digital media as a carrier, may positively affect engagement and the arousal of emotions, and then create viewers' sharing behavior ^[4]. Thus, rumors, with pictures and videos, may increase the perceived importance and validity of viewers when they face such a package of content. For instance, a video of people snapping up in supermarkets on promotion day was uploaded and shared on social networks during the period of COVID-19, which makes people misunderstand that there may be a food shortage. Obviously, under the

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help of video, rumors may get more powerful impetus than that with pure text.

Thus, when rumors meet digital technology, the possible results not only show that the speed of rumor spreading will become faster, but also the embedding of digital technology may easily make people lose focus of information by creating stronger ambiguity and concealing the real content.

Previous studies on rumor have argued that the main factors of rumor sharing include the type of rumors, and the personal perception, such as dread or wish rumors, perceived uncertainty, and trust^[5]. Even with the emergence of social media, the research on online rumors just regarded digital technology as an external environment of rumor transmission to check the role of the above factors on online behaviors, such as verification on searching websites, sharing on social platform, and debunking rumors. Meanwhile, much scholarly attention from the information system field has been proved that digital technology, with the label of modularity and combination, reshape the traditional information and content^[6]. The lack of understanding the nature of rumor-digitized makes it difficult to clarify how digital technology can influence the spread of rumors. Obviously, the prior research on the relationship between rumors and sharing behavior will not enough explain this new complex context of digitalized rumors in digital platforms. Hence, this paper seeks to deconstruct the digital rumor to identify different patterns of creating ambiguity by digital technology, and then to explore how they interactively influence the sharing behavior.

To address the above research question, the target is divided into the two-fold objective: the identification of online rumors' structure and the empirical analysis of such components' effect on sharing behavior. Theoretically, the digital storytelling theory (DST) holds that the creation of a new method of weaving story and narrative processing through digital technology could influence the way people think and their decision-making^[7]. This theory identified the three key components of digital content: foundational component (such as thematic characteristics), structural component (such as antecedents and consequences), and presentational component (combined use of video, pictures, and text)^[8]. This study argues that the spread of rumors, in essence, is to cause confusion by reducing the integrity of foundational and structural components of information and combining vivid digital media. Thus, by applying this theory to the rumor context, we identify three types of features of digital rumors: (1) element integrality and source explicitness, (2) causality explicitness, and (3) vividness of digital media as the key influential variables of viewers' sharing behaviors. Further empirically, to test how the factors interactively operate, we collected and analyzed the rumor data sets in Chinese social platforms during the period of COVID-19.

This study extends prior research in several key ways. First, we expand the rumor research, by deconstructing and identifying the basic components of digital rumors, which uncover their interrelated relationship. Secondly, we specially explored the characteristics of the content ambiguity and digital media in comparison with prior research on textual rumor, to reflect effectively the changing principle by the embedded digital tools, revealing the conditions under which people's sharing behaviors in a social environment. Third, our study is the first study to apply digital storytelling theory in the context of rumor research. It also contributes to the research on other digital contents such as live chat, by dissecting the microscopic and potential structure behind the contents. Finally, we provide practical insights and algorithm ideas related to AI-enabled rumor recognition for social platform managers to reduce the possibility of sharing unverified information.

2. Literature Review and Theoretical Development

2.1 Online rumors

The rumor was defined as a widely spread proposition for the belief of topical reference disseminated without official verifications. Compared with traditional rumors, in addition to the same essence, the dissemination medium of online rumors has converted from the oral and printed transmission into the digital media of social

networks. The anonymity and openness of the internet provide viewers with opportunities to share in an unrestricted way, which leads to the faster and wider spread of rumors and more multiple forms of presentation. Especially when encountering social crisis, inevitably accompanied by collective anxiety, improvisational group behavior and adaptive collaboration among the public, online rumors are characterized by high importance and ambiguity^[9]. In this case, people often share rumors on social media to dispel fear, seek confirmation or make up for vague information, which aggravates the harm of rumors.

Prior research has explored the key factors inducing sharing rumors from the perspective of rumor source, content and viewer's characteristics. First, previous studies have pointed out that the credibility of rumor disseminators will influence the sharing behavior^[10], and information with professional news labels is more likely to be shared by others than information with ambiguous labels or without a label. Secondly, in terms of the content of rumors, the importance of rumors, as well as rumor types such as whether rumors are dread-based or wish-based^[2], will also have an impact on viewer's behavior. For example, Chua and Banerjee explored the influence of personal involvement, the rumor type, text length, overhead information and the presence of counter-rumors on rumor sharing decisions^[5]. Lastly, the personality characteristics, such as gender, personality traits, educational background and individual cognitive beliefs, have been proved to be related to rumors sharing and viewers with different cognitive characteristics may show differences in their behaviors of dealing with rumors.

The pervasiveness of digital technologies in almost every industry has led to new forms of social interaction, control and change^[5]. In recent years, rumors have been endowed with new forms of communication, content carriers and features by digital technology. Through various forms of information exchange, rumors can be spread with high traffic on social media websites^[11]. The packaging of digital technologies which affects viewers' perception as never before combined with the influence of the internet complicates the spread and impact of rumors. How online rumors influence viewers' behavior in such situations has converted in an unknown and comprehensive direction.

2.2 Digital storytelling theory

Digital storytelling, through the positive combination of storytelling and digital technology, has become a more creative way of story editing and narrative processing, and a propaganda tool that influences the way people think and behave. The concept of digital storytelling theory can be summarized as expressing traditional stories as digital works by music, videos and animation, which is used extensively in pedagogy, marketing, art, software development and other areas. Based on the digital storytelling theory, social media covers combinations of text, images and videos, and users communicate their actions and ideas through storytelling and generate self-representation^[11]. As an emerging narrative form, digital storytelling can induce people's emotional emergence, prompting them to make a series of corresponding behavioral responses. Researchers believe that in the case of limited personal cognition, storytelling plays a key role in people's decision-making^[12].

Pavlik (2017) identified the three key features of digital narration in the digital media environment: foundational components (such as thematic characteristics, emotional characteristics), structural components (first-person narratives or segmented, or number quotes) and presentational components (combined use of video, pictures, and text)^[13]. Among them, the foundational components is the basic structure of the content, that is, the basic information and main idea that the content conveys to viewers, which can help viewers quickly and comprehensively understand the text content. Structural components demonstrate the narrative structure of content, that is "How content is laid out", which is especially important to assess the trust-building potential of text arguments^[14]. The presentational components focus on "how content is conveyed to consumers". With the gradual development of digital multimedia technology, content creators can use emerging technologies to enhance the display effect of content and convey information to consumers in a more intuitive way.

In social networks, people can participate through like, comment, share, etc., which makes rumors rife.

Sharing has become an essential component to measure rumor propagation. In a broad sense, rumor sharing doesn't mean that people are sharing the rumor on social networking sites, it simply represents the intention of viewers to share news which might lead to rumor propagation. Previous researches failed to deal with the complex situation under the influence of the internet and digital technology to systematically study the narrative characteristics of digital rumors and deconstruct them. Packaging in digital technology, online rumors possess digital storytelling features and take social media as a storytelling space, which gives the digital storytelling theory the ability to make up the gap. In this study, the spread of online rumors is regarded as a process of digital storytelling, the foundational components of online rumors such as story content, story structure and digital presentation form are directly or indirectly narrated through digital stories. We deconstruct the content features of the rumors into three levels: foundational components, structural components, and presentational components based on the perspective of digital storytelling theory.

This study suggests that the ambiguity of online rumors results from the partial absence of the three components under the embedding of digital technology. And it may also influence the perception and next response to the rumors. Thus in the next section, we develop the hypotheses to explore the relationship between the content features of online rumors and rumor sharing behavior.

The foundational components are represented by an underlying message that the content is delivering to the information receiver^[13]. Since one of the foundational characteristics of rumors is that they provide people with information that describes the event, we include element integrality as part of the foundational components. Besides, considering the source of the news conveys to people the credibility of the information, source explicitness is introduced as the other one of the foundational components. Rumor can be considered as a piece of news; it inspires us that we can use the five elements of journalism to model the element carried in the rumor. More precisely, to conclude the overall characteristics of rumors, element integrality is defined as whether there is time, place, character, event, and cause of the rumor. Five elements of rumors can sketch the contours of the object it describes and influence people's relevant sharing behaviors by influencing people's thinking. Rumor is usually modified or omitted for journalism element ambiguity, on the one hand, a rumor which contained fewer journalism elements will be better able to hide the content of falsity, on the other hand, this kind of rumor is more concise in appearance, and its emotional transmission is stronger, viewers in social networks are also more accustomed to this fragmented way of information transmission and more willing to go to share this kind of rumor. Thus, we propose that:

H1. The element integrality of online rumors has a negative impact on rumor sharing behavior.

The source explicitness of rumors is defined as whether the source is explicitly mentioned in the content of the rumor, ignoring whether the source is true or not. Rumor itself is a kind of persuasive information, so the source explicitness of online rumors to a large extent determines the spread effect of the rumor. Information with credible sources contributes to rumor control and high information quality^[15], the source of news is closely related to its credibility, some rumors increase the credibility of their content by making up and showing the source of the news, it helps eliminate the viewer's doubt and uncertainty. When a social crisis occurs, viewers have very limited information to accept and will make decisions based on the behavior of others. When a rumor has an explicit source mark, viewers will have the illusion that it is a piece of real news verified by others viewers are more willing to believe and have the intention to share rumors with explicit sources^[16]. More recent studies have shown that whether the source is in the title will influence the sharing of rumors^[17]. Hence, we propose that:

H2. The source explicitness of online rumors has a positive impact on rumor sharing behavior.

Structural components refer to the narrative approach of the content to trigger consumer feedback^[13]. Rumors convey the causal logic described by the whole rumor information through the narrative mode of its content, which is closely related to the persuasiveness of information. The causality explicitness of rumors is defined as whether

the causal claim has been clarified clearly in rumors. The previous study has shown that the causality explicitness of news affects people's decisions to some extent^[18]. Most health-related news stories make a prominent causal claim include in either the headline or first two sentences. It is these headlines and main claims that are most eye-catching, most shared and that also frame the rest of a story. Due to the ambiguity and arbitrariness of the fabrication of online rumors, the causality of their content often cannot stand scrutiny. Rumors without clearly causal logic could be easily denied by information viewers^[19], and thus not shared. Those well-designed rumors have better causal logic and are more likely to be believed and spread by the viewers. Hence, we propose that:

H3. The causality explicitness of online rumors has a positive impact on rumor sharing behavior.

2.3 Media Richness theory

Media richness theory is proposed by Richard L. Daft and Robert H. Lengel, two organization theorists, to explain how media choice affects the interaction and decision-making between organizations and individuals. With the development of digital technology, information media has shown a trend of diversification. Therefore, media richness theory is also widely used in various new scenes in information system fields, such as virtual teams, online learning, digital deception, and so on. According to the existing literature, in the digital environment, the carriers with different media richness (such as plain text, pictures and videos) will cause the difference in users' perception of information in the process of disseminating knowledge and information. The core idea is that different media divide the richness according to their information-carrying capacity, and the interaction degree between media richness and information content determines the behavior results of viewers.

In this study, the media richness of digital rumor refers to the potential information-carrying capacity of rumor media. The media that can overcome different knowledge backgrounds and make it easier for the information receiver to understand the information are considered to be rich, such as picture and text, while the media that need a long time to understand or provide less information, such as plain text, are considered to be low richness media. High richness media is conducive to the dissemination of complex and ambiguous information, while low richness media is suitable for conventional and easy to understand information. After the deconstruction of digital rumor, the flexible combination of its components will present different content complexity. Under the media interaction of different richness, the effect of each component on user sharing behavior may present different results.

Combined with the vivid description of digital story theory, the media with high richness represents stands for a kind of concept of “telepresence”. In contrast to an unmediated environment, a person in a mediated environment cannot directly feel, touch, taste, or smell an object. Instead, they rely on the medium to create telepresence that represents a direct experience. Vividness refers to the extent to which a mediated environment can simulate a direct sensory experience. content publishers can convey more vivid and real information to consumers utilizing text, pictures, and videos. This diversified media can create a more vivid information dissemination environment, which can help consumers understand the information conveyed by the content more conveniently in the context of media^[14]. Thus, the vividness of rumors is defined as the diversity of presentation forms of in-process propagations that might stimulate the perception of viewers. Vivid information may produce an effect on judgments of a message's general persuasiveness, suggesting that people might infer persuasion based on interest and attention. Moreover, previous research has proved that the vividness of information presentation can interact with variables such as interactivity to influence the decision-making and behavior of viewers^[20].

Previous studies generally believe that high richness media is conducive to complex and high ambiguity information dissemination, while low richness media is suitable for conventional and easy to understand information. However, some studies have found that the influence of media richness on deception behavior and social network information presentation shows an inhibitory mechanism. On the one hand, the media with high media richness may contain redundant information, to distract users from focusing on the core information; on

the other hand, studies have shown that people tend to be overconfident in the expectation of information authenticity in the context of digital deception, and the richer and more diverse the information carried by media will increase the pressure of users' trust, thus inhibiting users' sharing behavior. Therefore, from this perspective, media richness may have an antagonistic moderating effect on users' behavior of sharing digital rumors, and we hypothesize:

H4a. The vividness of online rumors weakens the effect of element integrity on rumor sharing behavior.

H4b. The vividness of online rumors weakens the effect of source explicitness on rumor sharing behavior.

H4c. The vividness of online rumors weakens the effect of causality explicitness on rumor sharing behavior.

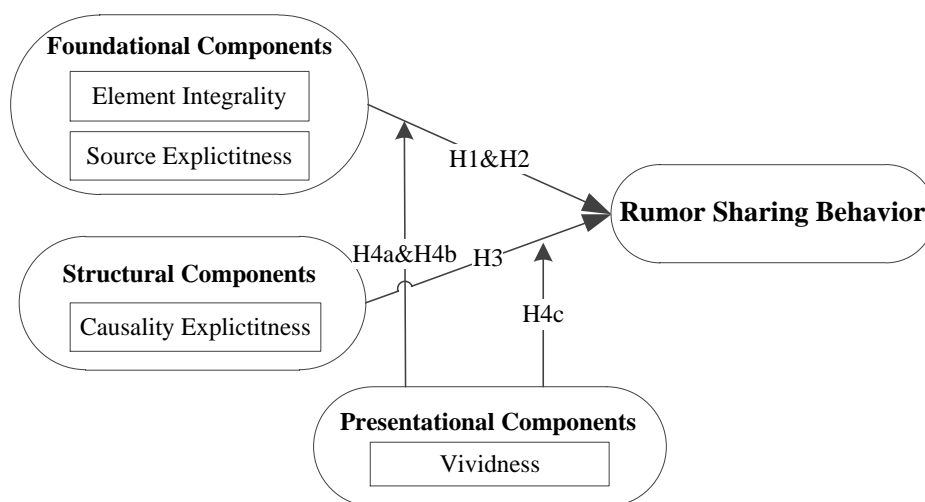


Figure 1. Research model

Based on the above hypotheses, we proposed the research model (see Figure 1), to describe the effects of foundational components and structural components on rumor sharing with the moderation of presentational components.

3. Methodology

3.1 Data collection

Including the title and the refutation date, rumor refutation message about COVID-19 posted on fact.qq.com (a leading news verification website in China) between January 18 and March 15 in the year 2020 were collected. To excavate the characteristics of the rumor, the original text of the rumor is searched with the title of rumors on Weibo, in which users can access various mobile terminals to realize instant information sharing, dissemination, and interaction in the form of multimedia such as text, pictures, and videos.

Information index launched by Baidu refers to the weighted sum of netizens' behaviors such as reading, commenting, forwarding, like and dislike, concerning words. Based on the definition of rumor sharing, the information index of keywords of rumor can reflect the intensity of rumor sharing. Therefore, the information index is taken as the quantitative index to measure the intensity of rumor sharing. The principle of selecting keywords is the keyword that can best represent the event, which means that the information index of the keyword can reflect the intensity of rumor sharing to the greatest extent. The work of keyword extraction was mainly completed by 5 undergraduates, with each of whom independently selected several keywords for each rumor. Moreover, only when all undergraduates choose it, can the selected word be used as the keywords of rumors to ensure the accuracy of keyword extraction.

3.2 Content encoding

Content analysis is a popular technique in feedback research by transforming the meaning of text comments

into objective data using systematic procedures to ensure the objectivity, reproducibility, and reliability of the data analysis. We set up a five-person coding team to encode variables, the encoding process takes the following steps. Firstly, the coding group made judgments according to the encoding rules, and each person was responsible for the coding part of the rumor data. After the preliminary coding was completed, each person checked the codes of other groups and coded for the second time. Finally, the research team further verified the rumor that the verification result was inconsistent with the first encoding result, and the team members voted to decide the result. The encoding rules for each variable are as follows:

Element integrality. We define the elements of rumor as to whether the news includes time, place, character, event, and cause of the rumor. Whether five elements are in the rumor context which we collected from the Weibo platform is checked, encoding result is the count of the elements that appear in the context. For example, if the time, place, and person are stated in the text, the encoding result is 3.

Source explicitness. To encode the rumor source, the original context in the rumor propagation is found in the social platform. If a clear source can be found in the context, it is coded 1, otherwise, it is 0.

Causality explicitness. Causality explicitness of rumor refers to the clarity of the causal logic conveyed by rumors. Common ways to blur causality explicitness in online rumors include the deliberate vagueness of the details of the said object, or reversal of causality. We encode the causality of rumors, with rumors with causal logic coded as 1, and rumors without causal logic coded as 0.

Vividness. The vividness of rumors is used as a moderating variable to influence the sharing of rumors. At present, there are three main forms of news presentation on the Internet, namely text, picture, and video. The vividness in the process of rumor propagation is mainly reflected in these three ways. Thus, the vividness of rumors is measured by the count of the presentation forms used in the rumor propagation.

3.3 Data analysis and results

To understand the influence mechanism of rumors' characteristics on internet viewers' behaviors of sharing rumors, linear regressions were used to estimate the study variables, independent variables and moderating variables in the model are centralized during the regression of moderating effects.

Table 1. Descriptive statistics and Correlation matrix

Variable	V1	V2	V3	V4	V5	SD	Mean
V1 Causality explicitness	1.0000					0.4821	0.3618
V2 Element integrality	0.3312	1.0000				1.5155	2.6447
V3 Source explicitness	0.1673	0.5102	1.0000			0.4781	0.3487
V4 Vividness	0.0071	0.3966	0.3689	1.0000		0.5224	1.3224
V5 Sharing behavior	0.2497	-0.0331	0.1508	-0.0988	1.0000	1.4725	0.2916

152 rumor samples were used for regression analysis, descriptive statistics for variables used in linear regression and their correlation coefficient matrices are shown in Table 1. As shown in Table 1, when rumors were published, many netizens chose to spread rumors, the information index of keywords related to rumors increased by an average of 29.16% month-on-month. In terms of the characteristics of rumors, the causality and source of COVID-19 rumors are generally ambiguous, with average values of 0.3618(SD=0.4821) and 0.3487(SD=0.4781), respectively. Interestingly, the forms of presentation of rumors are not as extensive as expected to spread simpler and more straightforward content, with an average of 1.3224(SD=0.5224) for the vividness of rumors. It can be seen from the table that the rumor sharing behaviors of netizens are correlated to all independent variables to a certain extent, and the correlation coefficients of independent variables are all less than 0.6, so the multicollinearity

problem will not be caused during regression. In order to test whether there is heteroskedasticity in each model, BP test results reject the null hypothesis of homoscedasticity and consider that there is heteroscedasticity ($P < 0.01$). Therefore, OLS with robust standard errors is used to test the model in this paper.

An overview of linear regression results is shown in Table 2, summarizing the main findings of the three models tested, Model 1 only considers the main effect, Model 2 add the moderator to Model 1, Model 3 add the interaction term between the moderator and the independent variable to Model 2. To guarantee the statistical correctness of each model, variance inflation factor (VIF) test is carried out for each model, multicollinearity problems is not a problem, as the maximum VIF index calculated was 1.71 for the research variables, it is far less than the standard value of 10.

Tabel 2. Results of linear regression

Variables	Model 1	Model 2	Model 3
Causality explicitness	0.8956(2.76)**	0.8486 (2.78)**	0.8448(2.84)**
Element integrality	-0.2392(-2.68)**	-0.2040(-2.60)*	-0.1967(-2.68)**
Source explicitness	0.7003(2.14)*	0.7768(2.17)*	0.8627(2.31)*
Vividness		-0.3115(-1.51)	-0.4202(-2.33)*
Causality explicitness × Vividness			-1.101(-2.69)**
Element integrality × Vividness			0.2485(2.25)*
Source explicitness × Vividness			-0.7841(-1.65)
_cons	0.3561(1.88)	0.3099(2.15)*	0.2879(2.49)*
R ²	0.1157	0.1253	0.1737
Mean VIF	1.32	1.45	1.45

Notes: t-statistics in parentheses. ** $p < 0.01$; * $p < 0.05$

The explanatory power (R^2) of Model 1 is 0.1157. In terms of the results of the estimated coefficients in Model 1, as far as foundational component ambiguity is concerned, the number of journalism elements of rumor has a significant negative impact on rumor propagation ($\beta = -0.2392$, $P < 0.01$). Our results prove that the absence of journalism elements will instead promote the spread of rumors, supporting hypothesis H1. On the other hand of foundational component ambiguity, the presence or absence of news sources in rumor content has a significant impact on rumor propagation, and rumors with news sources in rumor content are more likely to be shared ($\beta = 0.7003$, $P < 0.05$). Thus, hypothesis H2 is also accepted. As far as the structural component is concerned, the Causality of rumors has a statistically significant positive impact on rumor sharing behavior and the influence effect is the most obvious ($\beta = 0.8956$, $P < 0.01$), which means that rumors with clearer causality will encourage viewers to carry out rumor sharing, and the hypothesis H3 is supported.

We then examined the moderating effect of vividness through model 3. And Model 3 with moderating effect has a stronger explanatory power and better model fitting effect than Model 1 ($R^2 = 0.1737$). The results demonstrate that rumor vividness exerts a significant moderating impact on the influence of causality explicitness ($\beta = -1.101$, $P < 0.01$) and element integrality ($\beta = 0.2485$, $P < 0.05$) on rumor sharing, while the moderating impact of rumor vividness is stronger for element explicitness. As depicted in Figure 2 and Figure 3, at low levels of rumor vividness, online rumors sharing behavior decreases rapidly when element integrality increases, online rumors sharing behavior rises more rapidly as causality explicitness rises. This means that the vividness of online rumors can weaken the influence of element integrality and causality explicitness on online rumors sharing behavior, H4a and H4c are supported. And the moderating effect of online rumors' vividness on the influence of source explicitness is not significant ($\beta = -0.7841$, $P > 0.05$), H4b is not supported.

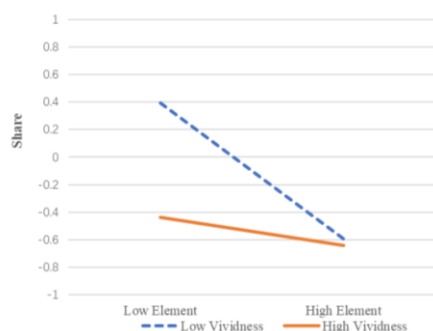


Figure 2. The moderation effect of Vividness on Element

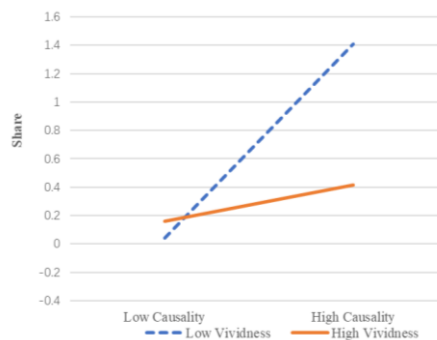


Figure 3. The moderation effect of Vividness on

Causality

4. Discussion and Implications

4.1 Discussion

Drawing on the integration of digital storytelling theory and media richness theory, this study identified the basic components of digital rumors and empirically analyze their interactive relationship on sharing behavior. The results support most of the hypotheses proposed.

First, the results demonstrate that causality explicitness, element integrity and source explicitness exerts great influence on rumor sharing behavior. Among which causality explicitness and source explicitness have positive effects on rumor sharing behavior, while element integrity has negative effects on rumor sharing behavior. Rumors tend to blur the message at different levels, the degree of ambiguity of rumors can influence the sharing behavior of rumors. Mindful individuals are often likely to evaluate the effectiveness of social media content before sharing it. When people are exposed to information that may be a rumor, they tend to assess the information's credibility by assessing its causality ambiguity and source ambiguity. If the causality and source of the rumor are explicit, people are more willing to share the rumor. However, when the element integrity of rumor is high, people are reluctant to spread rumors. There is often a phenomenon that rumor journalism elements are unconsciously transformed and gradually decrease with the propagation. Rumors with complete news elements do not have stronger propagation power. In the information fragmentation era, people prefer a concise message, rumors with concrete and easy to understand are the easiest to become popular, while complex opinions are unlikely to be widely spread.

Secondly, this study sheds light on the moderating effect of rumor vividness in online rumor sharing behavior. Rumor vividness was tested and validated as a negative moderator between element, causality and online rumor sharing behavior. As technology evolves, rumors "recreate facts" in the form of videos or pictures. The iterative updating of media technology means is very rapid, news production and communication channels have been very different from the traditional media era. Simple, inexpensive techniques can make spliced fake videos and images more realistic; facts are "reshaped" so that the audience cannot tell the difference between true and false information, and rumors are no longer just words, but more lurid, frightening, and believable videos or images.

In the digital context, the rich media affect the viewer's perception of the causal logic and element integrity of the content of rumors, weakening the traditional influence path from content ambiguity to communication behavior. Compared with rumors lacking vividness, rumors with high vividness greatly change people's attitude towards rumors^[20]. The vividness of rumor greatly attracts the attention of information seekers and reduces people's thinking about the authenticity of information. The diverse forms of presentation of rumors weaken the influence of the characteristics of rumor content on the rumor sharing behavior.

4.2 Theoretical Implication

With the development of social networks and digital technology, rumors are spreading more rapidly and in more diverse forms. However, previous studies have not considered the interaction between digital technologies and rumors in social networks, which is insufficient to explain the new complex situation of digital rumors in social networks. Our job offers several theoretical implications to the literature.

First, this study provides a new theoretical perspective to investigate the antecedents of online rumors sharing in the digital world. Previous studies on rumors have discussed the propagation of rumors in terms of the types, ambiguities and personality characteristics of the receivers, etc. This study contributes to the literature by further identifying the intrinsic component of online rumors and unfolding how these components affect sharing online rumors. Specifically, the composition of the digital rumor is deconstructed into three parts based on the digital storytelling theory, namely, the foundational components, the structural components, and presentational components, and we found the effects of these attributes on rumor sharing. Our work can be conducive to find the essential fragments of digital rumors which cause the sharing behaviors. Researchers who are interested in detecting the clues of online rumors may refer to this study to assess the specific attributes in the spread of information.

Second, our work extends the application sector of digitalization research by uncovering the traces of digitization in rumor spreading. Yoo et al. (2010) proposed the layered modular architecture to describe one of the critical attributes of a digital system. However, the progression of rumors' digitalization is not precisely reflected in the existing research on online rumors. Related research usually regards digital technology or digital platform as an environment to explore the process of rumor spreading in the digital context^[5]. This study focused on the most three typical changes of rumors' design after rumors are digitalized and shown on the social network. Based on the digital storytelling theory, this study further remodels the relationship between components of digital rumors and rumors sharing. Thus, our empirical findings contribute to alleviating the gap between the practice of rumor digitalization and the existing rumor research.

Third, our findings contribute new insights to the literature by applying the media richness theory into the context of digital rumors. Previous research has indicated that media richness may play different roles in different situations, as most of them argued the positive effects of media richness on performance. Interestingly, the empirical results showed that media richness of rumor spreading could negatively moderate the effects of the element integrality and causality explicitness on online rumor sharing. In other words, the variety of rumors' presentation may restrain the intention of sharing rumors, to a certain extent. In fact, the explanation for the findings in this study has some support in related research, which indicated that media richness may show the opposite effect in the context of digital deception. This study attempts to supplement the research of media richness with new findings and insights by discussing media richness's impact on sharing digital rumors.

4.3 Practical Implications

In the information fragmentation era, the content of social media is more scattered and the process of information deduction is greatly simplified. At the same time, rumor makers are also increasingly good at confusing viewers' judgment through diversified rumor carriers such as pictures and videos. This paper has two practical implications for website administrators, information seekers, and governmental agencies.

First, our empirical findings suggest that short and fragmented news may create ambiguity due to the lack of causality. To make clear the whole story, information seekers need to be vigilant when facing fragmented news and ensure to independently verify sensitive and radical information before sharing. In fact, the openness of the internet makes it easy to trace the source of rumor information. In contact with complex and sensitive social information and communication, the source of information should be actively traced to verify whether the source is fabricated and whether the content is true or false with a rational attitude.

Second, this study provides new ideas for designing the method of rumor detection. Currently, the algorithms for rumor monitoring are based on the evaluation methods such as message content or its sentiment score. Our findings can instruct practitioners of social networking sites to consider adding the new attributes discussed in this study (e.g. length of content, information integrity, media richness) in detection design. Managers should pay attention to verifying the source and authenticity of information and timely release rumor refutation message. Besides, often when the public has a demand for information and the official channels do not release it in time, the rumor will spread quickly. We suggest that government agencies should make information open and transparent, release information of public concern promptly, and squeeze the space of rumor propagation with real information to the greatest extent.

5. Limitation and Further Research

This study has also several limitations. First, all data used in this study are collected in Chinese social networks. However, internet users with different cultural backgrounds or in different stages of COVID-19 may take a different attitude toward rumors. Thus, future research could consider expanding the samples to cover more regions.

Second, considering the interference of rumors' types, most data in this study, which were collected during the COVID-19, are health-related. The influence mechanism of online rumors' characteristics on netizens' sharing behaviors may not be applicable to other types of public security emergencies. In future studies, the sample types and sources could be expanded to further test the universality of this study.

Finally, our study does not explore the intrinsic psychological mechanism of internet users' willingness to share rumors on social network. In future studies, more psychological variables will be introduced to deconstruct the black box of motivation in online rumors sharing.

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