



Research on the Guiding Strategy of Network Public Opinion on Sudden Natural Disaster Events on Weibo Platform

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Abstract.

In order to deeply study the evolution law of network public opinion of sudden natural disasters, this study takes Weibo as the data platform and selects the "July 20 Zhengzhou rainstorm" event as the case study. Crawler software is used to obtain the whole life cycle data of the event after the event occurs. Based on the fishbone diagram, this paper identifies the factors that affect the popularity of network public opinion from five aspects: netizens, media, government and network public opinion events, analyzes the influencing factors among multi-agent behaviors, establishes the network public opinion index system of sudden natural disasters, and establishes the network public opinion system dynamics model with the help of Vensim PLE software, which proves that the model is accurate and feasible. In the process of the governance of network public opinion, we need to make use of information technology tools such as big data and data mining technology, combined with the characteristics of the life cycle of network public opinion, to realize the collaborative management of netizens, media, government and other participants, and to build a strong and soft public opinion governance system.

Keywords: *Safety management engineering; Emergency; Internet public opinion; Guidance strategy*

1. Introduction

The scale of user groups of online news and timely social networking is increasing year by year, and online public opinion shows a trend of high occurrence frequency and fast transmission speed^[1]. The evolution of network public opinion of sudden natural disasters shows the characteristics of long life cycle and multiple burst points. Taking the evolution of the public opinion trend of the rainstorm in Zhengzhou as an example, combined with the relevant research of scholars, when the incident has not been properly resolved, the network public opinion tends to break out on a large scale, and with the recurrence of unexpected events, the network public opinion has a strong growth. Specifically, there is no obvious fermentation period for the network public opinion of sudden natural disasters. As the natural climate, geological disasters and other forecasting methods have been gradually improved, the spread of network public opinion may even be earlier than the occurrence of emergencies. The harm after emergencies can be minimized under the perfect emergency management and rescue system. The main content of

network public opinion is the report on the impact on the lives of some netizens, as well as the mutual concern of netizens who are not affected by emergencies. At the same time, it should be noted that sudden natural disasters are often accompanied by two or more disasters, such as torrential rain for several days and aftershocks after earthquakes, which may make online public opinion hot for a long time. In terms of public opinion guidance, it needs not only the administrative role of government departments, but also the coordination and cooperation of enterprises and institutions and the media. For example, Qi Jiayin (2020) and others think that the guidance of public opinion should be changed from "taking information as the starting point" to "taking the people as the starting point"^[2]; Xu Xinran (2019) and others based on balance theory show that people are more likely to be influenced by the views expressed by their favorite media^[3]. In the aspect of public opinion communication, it is considered that the related topics related to specific public emergencies play an important role in the network public opinion communication. If the subject expresses his opinions and voices in the whirlpool of public

opinion, the development trend of public opinion will be dominated by the strong Party and gradually form a consistent point of view from the point to the surface^[4].

To sum up, academia has conducted research on the network public opinion of sudden natural disasters in many directions, which provides sufficient prerequisites for this study. However, there are also some shortcomings, such as the research is mainly based on the relevant theoretical basis, and the lack of an overall review of the life cycle of public opinion. This paper uses the method of system dynamics to simulate the actual case, discusses the internal evolution mechanism, simulates the results of the corresponding strategy, and puts forward some suggestions for the combination of theory and reality.

2. Research design

2.1. Research ideas and research methods

In the specific research process, firstly, online crawler technology is used to collect the whole life cycle of Zhengzhou rainstorm event on Weibo platform. The starting point of the event is July 20, 2021, and the end of the selected time is July 31, 2021. On that day, there were only two related Weibo accounts on the entire Weibo platform, so it can be considered that the incident has subsided.

Then, combined with the relevant research contents of previous researchers, draw the causal circuit diagram of system dynamics, further optimize the causal circuit diagram, and establish the system dynamics simulation model according to the event information. Finally, according to the actual situation of the selected events, the table function of system dynamics is constructed, the weights of subsystems and factors in subsystems are constructed by analytic hierarchy process, and the relevant constants and indexes are constructed through expert interviews and questionnaires.

2.2. Study subjects and data acquisition

In the process of research, it is found that the evolution law of public opinion in the emergency network is relatively complex, and the public opinion has significant stage characteristics and outbreak time point. The information released by traditional media and "Self-media", the heated discussion by Internet users, and the official interpretation of the events by government departments are particularly important to the evolution of online public opinion. Therefore, this study divides the research subjects into media users,

Internet users and government users. Each subject has a suitable impact on the emergencies taken as objects, and shows them through the form of public opinion heat.

This study selected the "July 20 rainstorm event" in Zhengzhou City, Henan Province, which occurred on July 20, 2021 and dissipated on July 31, 2021, and used reptiles to obtain 10260 Weibo data on Weibo platform.

3. Research process

3.1. Participant analysis

The active degree of media users is relatively high, mainly live reporting, case tracking, behavior guidance, etc. The reporting of traditional media is more objective and fair, and some "Self-media" have a certain emotional tendency in the process of news reporting. Selected events are reported by "Self-media". In subsequent posts, traditional media tend to follow case tracking and behavior guidance, while "Self-media" tend to track and forward official reports.

The netizens are the most active, on the one hand because of the huge base of Internet users, on the other hand because of the emotional attitude of some netizens. In the selected events, the first report of "Self-media" selected the perspective that is easy to cause the polarization of public opinion, and divided the Internet users into opposing parties by initiating voting, intensifying the conflict and rapidly increasing the popularity of public opinion. After the official notice of government users was released, the focus of netizens gradually returned to the event itself, and the public opinion gradually subsided.

Government users are less active in various topics of activity, mainly for the purpose of official publicity, law publicity, public opinion guidance and behavior oriented. Government users have a clear division of responsibilities in the publication. In the selection of events, the central and local government departments did not post or forward them, and the public security bureau, procuratorate and court departments are the main ones for case notification, public opinion guidance and behavior guidance.

3.2. Analysis of the influencing factors

During the life cycle of media users in the emergency online public opinion, the effectiveness of their behavior is affected by the amount of articles, influence, emotional tendency and other factors, as shown in figure 1.

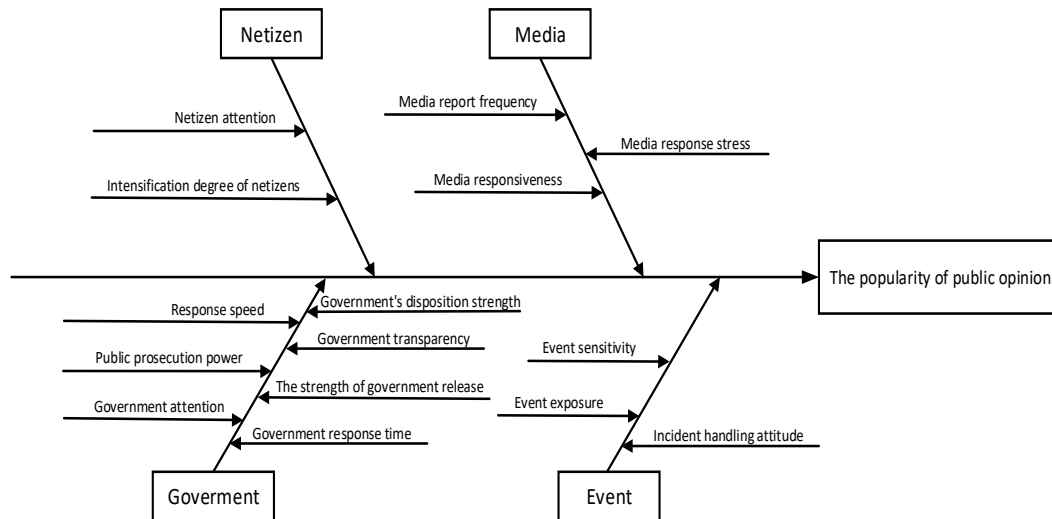


Figure 1. Fishbone diagram of factors influencing public opinion hotness

During the life cycle of emergency online public opinion, the effectiveness of their behavior is affected by the degree of attention, degree of discussion, degree of topic diffusion, degree of opinion opposition and degree of doubt. During the life cycle of government users' emergency online public opinion, the effectiveness of their behavior is affected by the response speed, public credibility, response ability, transparency and other factors. During the life cycle of online public opinion, the degree of attention is affected by event sensitivity, exposure time and other factors.

3.3. Build a system hierarchy Construction of the main evaluation index system

The formation and evolution of the emergency online public opinion is a relatively complex process, which is due to the joint role of the government, the media and the Internet users. The first layer is the heat status of the emergency network public opinion; the second layer is the subsystem layer, including the government subsystem, the media subsystem and the netizen subsystem; the third layer is the variable layer of each subsystem, with the main variables of each subsystem.

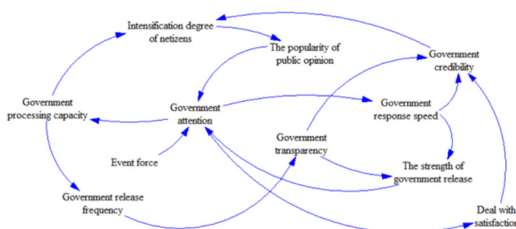


Figure 2. Causality diagram of government subsystem

3.4. Build a model

The model of system dynamics requires the researchers to explore the influencing factors as

comprehensively as possible and explore the potential relationship between the influencing factors. Through in-depth analysis of selected cases, it is found that the media subsystem of media users, netizen subsystem of Internet users and government subsystem of government users are the core content of the whole model. The whole lifetime of the three subsystems is inseparable from the dynamic connection of the selected event. Among them, the netizen subsystem is the main factor in the growth of public opinion heat, through attention, discussion and diffusion. The media subsystem includes the traditional media and the different reporting focus and emotional tendency, and its influence is the main driving force of public opinion popularity, adopting the corresponding event treatment and public opinion guidance.

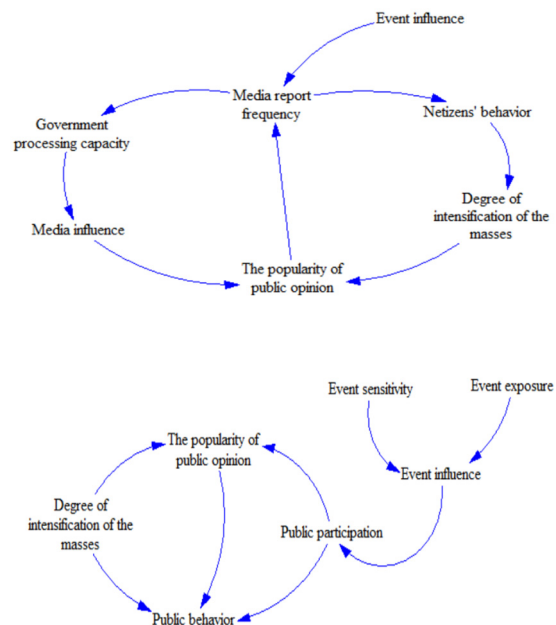


Figure 3. Causality diagram of media and netizen subsystem

In the process of the evolution of emergency network public opinion, Internet users, media users and government users not only interact with each other, but also have a common impact on the popularity of public opinion, forming a relatively complex dynamic system. At the same time, the role of the activity itself will also affect the popularity of public opinion to a certain extent. For example, the choice of a case is an accident and disaster event, which is also a social news that can easily attract attention. These characteristics make the event have a wider audience and can easily arouse discussion and attention from people from various industries.

To sum up, this study establishes a system dynamics model according to event influence, media user subsystem, Internet user subsystem and government user subsystem. By selecting the actual data of the case, through the analytic hierarchy process to distribute the weights of the factors in the subsystem and the subsystem, through expert interviews and questionnaires to assign relevant constants and indexes, and to simulate, the table function is constructed.

4. Results and discussion

In this study, the system dynamic model is further combined with the actual situation, analyzes the evolution mechanism of the network public opinion for emergencies, and analyzes the shortcomings of the current subjects in responding to the network public opinion of emergencies.

4.1. The evolution mechanism of network public opinion

The process of the formation and dynamic evolution of the event network public opinion has gone through four stages: public opinion latency period, event outbreak period, public opinion stability period and public opinion dissipation period^[5]. There are obvious differences in intrinsic factors and mechanisms in the four stages.

Incubation period. The first report of the incident to media users was the incubation period for the online public's opinion on the emergency. At this stage, the scope and impact of the incident are very limited, and the degree of social participation is low. However, due to the particularity of the event and its potential for

discussion, it still attracted the attention of my Internet users in a small range.

The outbreak period. After media users reported for the first time, the online public's views on the emergency exploded on a large scale. For a time, many netizens and users turned their attention to this event, and the popularity of public opinion skyrocketed. The main characteristics of the outbreak period of sudden natural disasters are that the attention and participation of Internet users increases sharply in a short period of time, the attention of media users is highly concentrated, and government users begin to intervene in the event and guide public opinion.

A period of stability. The events that choose to enter a stable period after the outbreak of public opinion can be regarded as the continuation of the node of the outbreak of public opinion. The timely intervention of government users has slowed down the growth of public opinion. Combined with the silence helix theory, the views of most netizens are gradually assimilated, while netizens with different views choose to disappear. Until the second day of the outbreak of public opinion, the government department of the incident issued a document detailing the incident, forming the second peak of public opinion and representing the gradual dissipation of online public opinion.

Dissipation period. In the choice of events, the dissipation of network public opinion is mainly reflected in the proper handling of emergencies and the transfer of the focus of public opinion. On the one hand, the government gave a reasonable and fair explanation to the cause, process and handling of the incident. On the other hand, government users of the Weibo platform, mainly the official accounts of public inspection and legal departments, should publicize the law to the public in a timely manner. On the basis of the correct handling of the incident, released the public mood, received legal education, the public heat of public opinion on the incident gradually dissipated.

4.2. Life cycle analysis

According to the whole life cycle analysis of selected events, there are insufficient discrimination ability and a long time delay, and combined with the modeling and analysis of selected events, it can further improve government behavior, improve media behavior and improve Internet users' behavior.

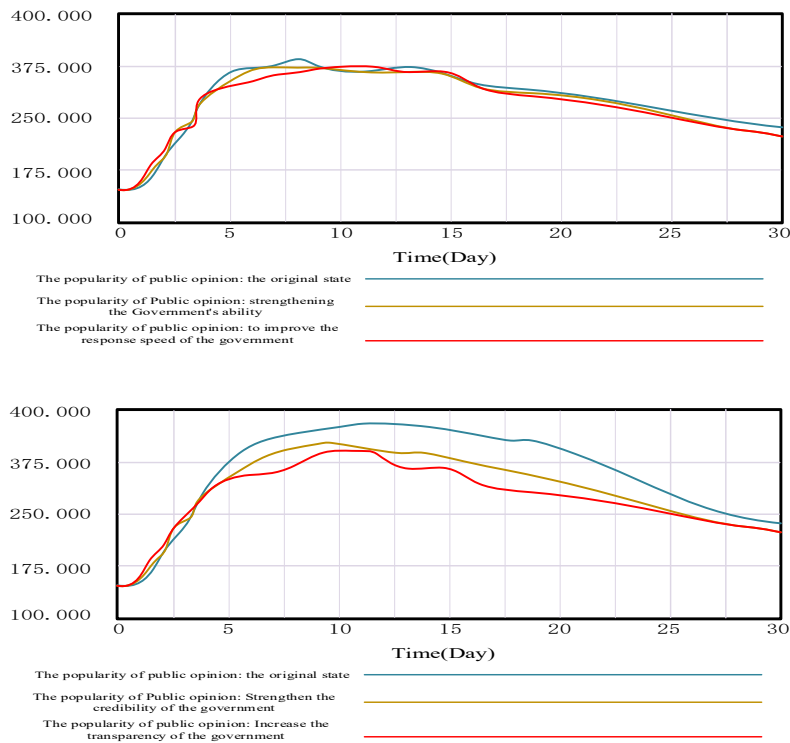


Figure 4. Optimization of the simulation results of the public opinion guidance work

5. Conclusions

In the information and data-intensive society, the governance of network public opinion needs to make use of big data, data mining technology and other information technology tools to coordinate the management of netizens, media, government and other participants to build a public opinion governance system with the combination of technology and theory. First of all, we should strengthen the supervision of the media communication platform in the network public opinion, establish the correct network public opinion guidance and social atmosphere, and achieve the purpose of controlling public opinion. In addition, through education and training to improve individual behavior, scientific literacy, judgment and cognitive ability of netizens, carry out regular education for netizens, and strengthen the control of the source of public opinion. On the one hand, the government should speed up the speed of emergency response, the ability to identify public opinion, the degree of attention to public opinion, and improve the construction of the emergency network public opinion system. On the other hand, it should also take measures according to the characteristics of the "4-4 stage" evolution stage of network public opinion. The regular 24-hour monitoring system for the introduction of public opinion makes the risk control and prevention of network public opinion achieve cross-regional and cross-regional joint work. To form a collaborative governance system of multi-level linkage between superiors and subordinates.

Acknowledgments

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