

Study on the Main Factors Affecting the Network Public Opinion Recognition Hotness Evaluation

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Received 19 January 2018; accepted 7 March 2018

Published online 26 April 2018

Abstract

The main factors affecting the heat of public opinion network scientific identification evaluation, and analyze the relationship between various factors, has important significance for the development of understanding of the changes of network public opinion trends. From the perspective of information ecology, and through literature review, questionnaire summarized the 15 factors influence the changes of network public opinion on these factors and heat. Effective relationship was analyzed by DEMATEL method. The results show that the ability of handling crisis, the government should guide satisfaction, opinion leaders, topic types, Navy participation and participation response number can be regarded as the key factors affecting the network public opinion heat evaluation.

Key words: Network public opinion; Hotness evaluation; Influence factor; Distinguish

Qin, Q., & Tang, S. K. (2018). Study on the Main Factors Affecting the Network Public Opinion Recognition Hotness Evaluation. *Canadian Social Science*, 14(4), 17-23. Available from: <http://www.cscanada.net/index.php/css/article/view/10278>
DOI: <http://dx.doi.org/10.3968/10278>

INTRODUCTION

The popularity of online public opinion is defined as the extent to which unconventional emergencies formed on the Internet, after unruly emergencies broke out,

including the coverage of incidents by online media, the discussion of incidents by Internet users and the government's ease of incidents (Zhang, Qi, & Fang, 2011). Jiang (2008) believes that focuses which are widely discussed by people, can reflect the interests and aspirations of netizens, even can be regarded as the hot spot of Internet public opinion. Other scholars also think that the events which can arouse people's great attention can be called the hot spot of network public opinion. On the basis of understanding and summing up the research of many experts and scholars, the heat of network public opinion is defined as the rising degree of the convergence of different opinions, emotions and attitudes of Internet users, network media and so on, after the outbreak of an emergency.

By the end of 2016, the number of netizens in China reached 731 million and the Internet penetration rate reached 53.2% (Qu, 2014). The Internet has become a gathering place for netizens to express their ideas and demands and can expand their social influence in a short period of time. Internet public opinion has increasingly become an important factor affecting social harmony. On one hand, recently, the "intentional injury case" in Liao Cheng City, Shandong Province, and the student death incident in Lu County, Sichuan Province, have aroused strong social concern and formed a certain degree of network public opinion. On the other hand, his public's emotional expression, false information, negative emotions Intertwined in the network, can easily make hot events evolved into offline group action. . Network public opinion ecology is an important part of the information on the ecological system, to a certain extent; it can reflect the public opinion of a country or region. Therefore, this paper attempts to analyze the mutual influence between the indicators in the evaluation of the network public opinion from the perspective of information ecology and DEMATEL method. By analyzing the influence degree of each factor and influencing mechanism to identify

the key factors, for the relevant departments effectively evaluating the network public opinion event situation and dealing with the network public opinion, grasping the development trend of public events to provide theoretical support and practical reference.

1. STUDY HYPOTHESES

On the basis of sorting out the existing research and combining the relevant theories of information ecology, this paper makes corresponding research hypotheses on the influential factors in the network public opinion heat evaluation.

(a) Information source assumptions on the impact of network public opinion.

Wang and Li (2017). pointed out that the theme sensitivity plays an important role in guiding and controlling early warning of public opinion in mobile social networks. Pan and Hu (2017) found that ordinary citizens can find effective public opinions through self-retrieval capabilities after using online platforms. Wang et al. (2013) integrated the main body of public opinion and the public opinion dissemination of two dimensions, the network public opinion is divided into three types: weak network public opinion, strong public opinion network and fluctuating network public opinion.

At the same time, the researches on the evaluation of network public opinion heat at this stage lack the research on the attribute of the topic itself. Most of the thermal evaluation indicators are from the incident and the main body of the object and the role of the three perspectives, namely, Internet users, government and media influence of each of the three factors. But it ignores the features of the topic event itself. In the early stage of the outbreak of the event, the content of the form of the media, the quality of the media coverage, the degree of damage the event itself, and other characteristics are less reflected in the existing literature research. Therefore, on the basis of the original research, this paper increases the influence factors of topic events on the network public opinion heat evaluation.

Based on this, the following hypotheses are proposed.

H1: The impact of event topic sensitivity on the evaluation of network public opinion.

H2: The impact which is explosive degree of Event Topics on the popularity of network public opinion.

H3: The impact of topic type on the evaluation of network public opinion.

(b) The hypothesis that the behavior of information person affects the evaluation of network public opinion.

People's interest demands form people's motivation and become the motivation that drives people's activity. Because of their interest demands, the network information main body joins the network information ecological chain, the interest demands are becoming the important force that promotes the information flow (Lou,

2013). Analyzing the information behavior of the audience can help to reveal the hidden psychological state and the change rule of the information audience for public opinion matters (Guan, 2014). Ma et al. (2014) pointed out that the information production of information producers is the source of information generation. Without abundant and high-quality micro-blog information, it is impossible for the formation of information ecosystem Wang (2014) regards the number of reporting sources as one of the indicators to measure the heat of the topic, with the hot topic is widely discussed, the relevant reports will be a lot of reproduced (Liu, 2012).

Based on this, the following hypotheses are proposed.

H4: The influences of the quantity of information released by the producer on the popularity of network public opinion.

H5: The influences of that number of information distribution authority on the impact of network public opinion on the existence of heat.

H6: The influences of the number of participants responding to the evaluation of network public opinion.

(c) The hypothesis of the influence of information environment on the evaluation of the heat of Internet public opinion.

Through widely participate in the network public opinion information interaction, the network public opinion provides the evolution of the power for network technology environment, social environment and network public opinion rules. To a certain extent, on one hand, it changed the power as the core of the social order and information transfer rule as the core of network public opinion rules (Xie, 2013). On the other hand, the disorderly politics of the internet and its resistance and mobilization campaign have brought great political risks to the society with the participation of rumor, network promoter and explosive information network. Therefore, the establishment of a benign interaction model between the government and the public, connecting individuals and society, and deeply understanding and identifying the internal mechanism of network social movements and the operation of public opinion (Xu, 2011), will effectively reduce the negative harm to society.

In the process of information transmission, the general users are more easily to accept behavior and the degree of information by opinion leaders for a hot topic event attitude and the effect of this has an important guiding role in the development of network public opinion.

Based on this, the following hypotheses are proposed.

H7: The influences of general netizen' emotional tendency on that evaluation of the network public opinion.

H8: The influences of network navy army on network public opinion heat evaluation.

H9: Opinion leaders and mainstream media value orientation have an influence on the popularity of network public opinion.

(d) The hypothesis of the influence of government behavior on the evaluation of the heat of Internet public opinion.

While the media and the public continuously improve their network literacy and political literacy, they should take a rational and positive attitude to participate in social governance and supervise, guide the media and the public in participating in social governance. To improve the government's public opinion guidance ability, grasp the trend of public opinion, and avoid and eliminate the negative impact of false or negative network public opinion information, thereby endangering the social stability.

Based on this, the following hypotheses are proposed.

H10: The intelligence gathering ability of government departments has an influence on the evaluation of online public opinion.

H11: The satisfaction of the government should influence the evaluation of online public opinion.

H12: The influence of government crisis management ability on network public opinion heat evaluation.

(e) Hypotheses of the influence of information technology on network public opinion heat evaluation.

Information technology, network infrastructure, information policies and regulations, information ethics and other things that directly or indirectly affect public opinion subjects can be called network public opinion environment. The sum of all types of information technology and tools is called information technology, which consists of traditional media technology and new media technology, among them traditional Internet technology, web site platform, computer technology's tool side, mail system, and belong to the traditional media technology. New media technology refers to the using of the Internet technology, mobile communication technology, The tools and technology of IPAD tools and mobile phone with large data and so on. It shows the information service function of public opinion media with outstanding technical advantage, makes it possible to be subject of public opinion and convenient real-time interaction, while giving public opinion expression richer form.

Based on this, the following hypotheses are proposed.

H13: The information tool (mobile terminal) access rate has an influence on the network public opinion heat evaluation.

H14: The popularity rate of information tools has an impact on the popularity of network public opinion.

H15: The update speed of information tools has an impact on the popularity of network public opinion.

2. THE MODEL

2.1 DEMATEL Method

Based on the DEMATEL method of influencing factors, the basic steps of the model building are as follows:

Step one: build the initial direct impact matrix $A = [a_{ij}]_{m \times n}$. According to the evaluation system of network public opinion, they are compared to the degree of mutual influence among the indicators in pairs one by one. After the score of all the interviewees is making arithmetic average, the matrix is used to represent the direct impact matrix $A = [a_{ij}]_{m \times n}$.

Step two: establish a direct impact on the standardization of D. Using Equations (1) and (2) to normalize the initial direct impact matrix, a standardized direct impact matrix D can be obtained with a value between 0 and 1.

$$M = A/S, \quad (1)$$

$$S = \max \left[\max_{j=1}^n \sum_{i=1}^n a_{ij}, \max_{i=1}^n \sum_{j=1}^n a_{ij} \right]. \quad (2)$$

Step three: the comprehensive impact of the matrix T calculation: Directly and indirectly influence constitute the comprehensive influence of constituent indicators together, among them $M, M^1, M^2 \dots M^h$, A series of decreasing matrix numbers represent the indirect influence matrix, and $\lim_{h \rightarrow \infty} M^h = [0]_{n \times n}$. It can be known from the definition that the sum of the indirect influence matrix and the initial direct influence matrix is the comprehensive influence matrix. It is calculated by Formula (3).

$$T = M + M^2 + M^3 + \dots + M^h = M(1 - M)^{-1}. \quad (3)$$

Step four: Calculate the center and the degree of reasons. The formula is as follows:

$$r_i = \sum_{j=1}^n t_{ij}, \quad (4)$$

$$c_i = \sum_{i=1}^n t_{ij}. \quad (5)$$

2.2 Data Calculation

In order to ensure the scientificity and comprehensiveness of experts scoring as far as possible, this paper invites 9 experts from Sichuan Information Management and Service Research Center in the fields of network public opinion, information theory, emergency management, information science theory research and so on. Each expert is asked to judge the logical relationships among the 15 possible factors listed in Table 1 based on their respective knowledge and experience. Scoring was conducted using the Likert Scale 5 (0 for no impact, 1 for low impact, 2 for moderate impact, 3 for high impact, and 4 for high impact), and the nine scored tables were collected after arithmetic averaging, the standardized influence matrix is obtained according to the Formulas (1)-(3).

Table 1
Heat Evaluation Index and Explanation Based on Information Ecology Network Public Opinion

Class indexes	Secondary indexes	Definition of indicator
Information source	H1: Eventtopic sensitivity	The degree of social concern by event topics causing
	H2: Explosive degree of event topic	The degree of Spreading in the network easily by event topic
	H3: Event Type belonging to	Topic type of the event belonging to
Information person	H4: Number of information released by producers	Number of information published by the person who occurred the event
	H5: Number of information release agencies	The number of information publishing agencies
	H6: Number of participants responding	Number of users participating in comments and forwarding information related to events
Information environment	H7: The emotional tendency of ordinary Internet users	The emotional attitude of ordinary netizens to the incident
	H8: Participation of navy army	Involvement of navy army in the incident
	H9: Value orientation of Opinion Leader, mainstream media	The concept of transmission by the representative mainstream media, the network big V and so on
Government Attitude	H10: Intelligence gathering capacity of government departments	The ability of government departments to collect information on public opinion events
	H11: Satisfaction of the government	Internet users' satisfaction with government departments' response to public opinion incidents
	H12: Government crisis management capacity	Government departments' to handling public opinion events
Information Technology	H13: Information tool (mobile end) access rate	Speed of information tools accessing to the Internet for uploading and downloading
	H14: Information manpower popularization rate	Number of people with information tools as a percentage of total population
	H15: Update speed of information tools	Iteration cycle of new and old versions of information tools

We use Formulas (3)-(5) to standardize the influencing factors that expert groups have assessed and finally get the comprehensive influence matrix of 15 indicators for network public opinion heat evaluation. See Table 2.

Table 2
Comprehensive Impact Matrix of Network Public Opinion Thermal Evaluation Index Based on Information Ecology

	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15
H1	0.2027	0.2940	0.2559	0.2482	0.2482	0.2540	0.2540	0.2585	0.3052	0.3016	0.3107	0.3107	0.2514	0.2010	0.1724
H2	0.2530	0.2311	0.2806	0.2526	0.2526	0.2585	0.2585	0.2635	0.3091	0.2633	0.3147	0.3147	0.2568	0.2267	0.2201
H3	0.3022	0.3309	0.2432	0.2811	0.2811	0.2877	0.2877	0.3150	0.3426	0.3156	0.3489	0.3489	0.3277	0.2514	0.2431
H4	0.2516	0.2755	0.2580	0.2063	0.2517	0.2576	0.2576	0.3077	0.2623	0.3132	0.3132	0.2766	0.2259	0.2194	0.2194
H5	0.2392	0.2615	0.2453	0.2393	0.1939	0.2449	0.2449	0.2497	0.2723	0.2494	0.2989	0.2989	0.2428	0.2152	0.2090
H6	0.2636	0.2892	0.2703	0.2642	0.2642	0.2254	0.2921	0.2973	0.3223	0.2748	0.3282	0.3282	0.2888	0.2367	0.2293
H7	0.2582	0.2828	0.2647	0.2588	0.2588	0.2866	0.2199	0.2912	0.3126	0.2867	0.3219	0.3219	0.2621	0.2318	0.2246
H8	0.2698	0.3166	0.2770	0.2916	0.2916	0.2984	0.2984	0.2366	0.3303	0.2808	0.3367	0.3367	0.2743	0.2422	0.2134
H9	0.3022	0.3289	0.3093	0.3018	0.3018	0.3089	0.3089	0.2937	0.2763	0.2934	0.3497	0.3497	0.2826	0.2513	0.2435
H10	0.2587	0.3045	0.2869	0.2583	0.2583	0.2643	0.2643	0.2695	0.3162	0.2238	0.3219	0.3219	0.2626	0.2318	0.2251
H11	0.3139	0.3427	0.3219	0.3141	0.3141	0.3214	0.3214	0.3272	0.3574	0.3269	0.2977	0.3643	0.2981	0.2619	0.2533
H12	0.3294	0.3602	0.3377	0.3296	0.3296	0.3372	0.3372	0.3439	0.3750	0.3435	0.3823	0.3157	0.2010	0.2185	0.2117
H13	0.2424	0.2877	0.2495	0.2429	0.2429	0.2486	0.2486	0.2747	0.2747	0.2744	0.2828	0.2828	0.2010	0.2185	0.2117
H14	0.2297	0.2511	0.2355	0.2298	0.2298	0.2352	0.2352	0.2398	0.2615	0.2395	0.2666	0.2666	0.2336	0.1617	0.229
H15	0.2246	0.2456	0.2303	0.2247	0.2247	0.2299	0.2299	0.2344	0.2557	0.2342	0.2607	0.2607	0.2284	0.2025	0.1513

2.3 Reliability and Validity Test

For internal consistency test, Cronbach's alpha reliability coefficient method is commonly used. According to Guleford, the reliability coefficient is usually above 0.90 with the best agreement; if it is above 0.80, the reliability

is very good; hovering around 0.70, indicating that the reliability is moderate; and the minimum acceptable range reliability of the coefficient is defined at 0.50. If the reliability coefficient is less than 0.50, the reliability test is unacceptable and cannot be passed.

Table 3
Cronbach's α Reliability Coefficient Calculation Results

Affect the popularity of the network public opinion evaluation of the main factors	Cronbach's α
Information source	.817
Information person	.827
Information environment	.905
Government attitude	.874
information Technology	.802

Using SPSS to analyze the data, as shown in Table 3 above, the Cronbach's alpha coefficients of the five first-level indicators are all above 0.8, and the questionnaire has high credibility.

The test of validity of the scale in this article was conducted using the KMO and Bartlett tests. By factor analysis, the more suitable the original variable is for factor analysis, the more its statistical value tends to be 1., indicating that the stronger the correlation between variables; On the contrary, the weaker the correlation between variables, the more the statistics tend to be 0, the more the original variable is less suitable for factor analysis, and generally, the range is between 0 and 1.

The KMO metric defines the statistic values as follows: In the case of very factorial analysis, the statistic value should be above 0.9; the value around 0.8 indicates that it is suitable for the KMO measure; for each 0.1 value reduction, the fitness level decreases in descending order; Suitable for KMO measurement, the value of 0.7 in the vicinity; if the vicinity of 0.6, then the scale is not suitable for KMO measurement; numerical less than 0.5, it is not suitable. Bartlett test was used to test the correlation between variables. The test results are shown in the following table.

Through the above analysis, it can be concluded that the KMO test coefficient of information source, information person, information environment, government attitudes and information technology questionnaire is in the range of 0.7-0.9 and meets the KMO standard; Bartlett test is 0.000, indicating that the data is more suitable for factor analysis and the relationship between data is not independent of each other. After the test of reliability and validity, the questionnaire was confirmed to have good reliability and validity.

3. RESULTS ANALYSIS

3.1 Calculation Results

Table 4
Impacts, Degree of Influence, Degree, Reason Ranking

	<i>D</i> influence degree	Ranking	<i>R</i> reinfluence degree	Ranking	<i>D+R</i> centrality	Ranking	<i>D-R</i> reason degree	Ranking
H1	0.8685	11	3.9412	12	7.8097	11	-0.0727	10
H2	3.9558	9	4.4023	4	8.3581	6	-0.4465	15
H3	4.5071	3	4.0661	7	8.5732	4	0.4410	1
H4	3.9392	10	3.9433	10	7.8825	10	-0.0041	9
H5	3.7052	13	3.9433	10	7.6485	13	-0.2381	14
H6	4.1746	6	4.0586	8	8.2332	7	0.1160	4
H7	4.0682	7	4.0586	8	8.1268	9	0.0096	7
H8	4.2944	5	4.1576	5	8.4520	5	0.1368	3
H9	4.5056	4	4.6252	3	9.1308	3	-0.1196	13
H10	4.0681	8	4.1522	6	8.2203	8	-0.0841	11
H11	4.7363	2	4.7349	1	9.4712	2	0.0014	8
H12	4.9079	1	4.7349	1	9.6428	1	0.1730	2
H13	3.7859	12	3.8914	13	7.6773	12	-0.1055	12
H14	3.5385	14	3.4557	14	6.9942	14	0.0828	6
H15	3.4376	15	3.3276	15	6.7652	15	0.1100	5

According to the center of each index rankings, in accordance with the order of their size: (H12) government crisis handling capacity, H11 government response satisfaction, H9 leader opinion orientation, H3 topic type, H8 navy participation, H2 topic explosive degree, H6 Participation Response, H10 Gathering of Government Intelligence, H7 Netizens' Emotional Inclination, H4 Quantity of Information Released, H1 Topic Sensitivity, H13 Information Tools Access Rate, H5 Information Issuing Institutions, H14 Information Tools Popularity, H15 Information Tools Update speed. Comparing the importance of various factors on the network public opinion heat rating, you can compare the value of the center value, the greater the degree of importance of this factor to the network public opinion heat evaluation, the greater the center value, and vice versa.

According to the degree of each indicator rankings, in order of their size : H3 topic type, H12 government crisis handling capacity, H8 naval participation, H6 participation in response, H15 information tools update rate, H14 information tools penetration rate, H7 Internet users feelings Tendency, H11 government response satisfaction, indicating that other indicators are more likely to be affected by these indicators, either positive or negative, and have a direct impact on the evaluation of online public opinion, which is the main factor in promoting the changes in network public opinion.

The results of the factors in order of their size are: H4 the number of Quantity of Information Released, H1 topic sensitivity, H10 government intelligence gathering ability, H13 information tool access rate, H9 leaders opinion orientation, H5 number of information distribution bodies, H2 topics explosive degree. It shows that other factors are more likely to affect these factors, and then affect the development and trend of network public opinion heat. By reversing the influence factors of such factors, we can find out the important factors that affect the change and development of network public opinion heat.

3.2 Identification of Key Factors

H12 Government Crisis Management Capability can be regarded as the first factor influencing the evaluation of Internet public opinion heat, ranked first in the center of public opinion, indicating that it has the strongest overall impact on the network public opinion heat evaluation and ranked second in the cause. There is an active influence on other indicators, it can be confirmed as the key factor. H11 government response satisfaction ranked second in the rankings of influence, rankings of influence and center are in the first and second and other indicators are closely related. It is obviously to be the key variable in the network public opinion evaluation and is also obviously the key One of the factors. H9 leaders' opinion orientation is the third one in the center and the fifth in the result factor, which indicates that it is more likely to be disturbed by other indicators and thus adversely affect the trend of network public opinion heat, which can be regarded as the key factor. H3 topics type and H8 navy participation in the middle of the rankings, but in the cause of the positive performance, directly other factors promoting the evaluation of network public opinion to change is the main reason changing in network public opinion hot trend, and it can be seen as the key factor. The H6 participant response number is at the 7th place in the center. Although the score is not high but is the 4th place in the cause degree, the H6 participant responds with more initiative can influence other factors, so it can also be regarded as the key factor.

H13 Information Tools Access Rate, H14 Information Tools Popularity, H15 Information Tools Centrality, ranked 12, 13, and 15 of the influence factors. H10 influence degree of government information gathering ability ranked No. 8 and No. 6, the degree of the reasons is ranked No. 11, so it is not the key factor. The degree of impact of the H2 topic was at 4, which showed obvious passiveness, and the influence was 9th among the 15 indicators, so it cannot be regarded as the key factor. H4 number of information released, H5 number of information agencies, H1 topic sensitivity and H7 netizens emotional orientation, these four indicators, whether from the impact degree or the central degree value, ranking are in the lower position? Therefore, it cannot be used as a key factor.

CONCLUSION

The main conclusions of this paper are as follows:

(a) The various influencing factors do not exist alone and independently play an important role in the assessment of network public opinion heat, but are intertwined with each other to form a complex system.

(b) It is different for the various factors on the network of public opinion evaluation of the mechanism to militate. The type of topics, the ability of the government to deal

with the crisis, the participation of the navy, the number of respondents, the update speed of information tools, the popularity of information tools, the sentiments of Internet users, and the degree of government response to satisfaction, eight factors, are the reason factors which actively influence other factors in the system. The outcome factors are the number of posts, the sensitivity of topics, the ability of government intelligence to gather information, Changes in other factors are more likely to affect these outcome factors.

(c) Among the 15 influential factors, the government crisis handling capacity, government response satisfaction, guidance degree of leader's opinion, topic type, naval participation and participation responses are the six most critical factors affecting the evaluation of network public opinion.

The conclusions of this study have the following policy implications: i) Government crisis management ability is the most crucial factor that affects the evaluation of network public opinion. Strengthening the government's ability to handle emergencies and improving people's satisfaction with government work is the main way to ease the tension of network public opinion, and effectively guide the behavior of Internet users. ii) The governance of network public opinions should be flexible, in the middle of the online community, the content Audit system should be established and perfected. Opinion leaders and celebrities with social reputation should be widely called to safeguard the healthy environment and good order in cyberspace and to resist the spread of false information. iii) To a large extent, the network of the navy influences the change and development of the heat of network public opinion. Therefore, it is important for relevant parties and authorities to release relevant information timely and effectively, and to clear up inconsistent rumors.

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