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Research on the Evolution Structure of Fragment Disordering Public Opinion in College Students' Network Circle Group

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Abstract

Clarifying the evolution structure of public opinion induced and spread by fragmentation in college students' network circle group is the key to understanding college students' online social psychological demands, grasping the development trend of public opinion, and designing targeted public opinion governance strategies. On the basis of identifying the key variables in the process of public opinion communication, DEMATEL-ISM model is used to explore the attribute positioning, relative importance level and hierarchical association mechanism of ante-variable and result variable, and then the governance strategies for fragment disordering public opinion in network circle groups of college students is designed. According to the study, exogenous stimuli, the uniqueness of discourse system, the number of spectacular texts and micro-narrative mode constituted the deep-rooted causes of fragment disordering public opinion. The unique situational and information attributes of network circle groups often become an important "booster" of disordered public opinion. The topic deviation is often accompanied with the formation of negative emotions. The corresponding public opinion governance strategies are sought from the aspects of shaping the network environment, adjusting the operation mechanism of the network circle group, improving the efficiency of using fragmented information, and optimizing the human resources of colleges.

Keywords

College Students' Network Circle Group, Fragment Disordering, Public Opinion Governance, DEMATEL, ISM

1. Introduction

In the age of digital intelligence, fragmented narration, short-time reading and high-intensity interaction have become the main features of college students' online socializing, which also provides a new environment for the dissemination of online public opinion [1]. College students have become important participants and promoters of Internet public opinion [2]. The increase in communication cost caused by information explosion and the decrease in trust caused by long-distance social communication have promoted the emergence and development of network circle group [3] [4]. A network circle group is a network aggregation space formed by users for some specific reasons [5]. For Chinese college students, common network circle groups exist in WeChat friend groups, QQ groups, Baidu post bar, BBS forums, Bilibili and other social networking or information publishing platforms. With its natural advantages in privacy and identity, network circle group has become an important information collection and dissemination platform for college students [6]. The unique language system, high topic cohesion, natural sense of trust and relatively independent information dissemination mechanism, on the one hand, provide an effective way to enrich the spiritual life of college students. On the other hand, it is easy to lead to the disordering dissemination of fragmented information in the network circle group and generate negative public opinions [7] [8]. Fragmented disordering public opinion refers to the sudden, random and impulsive dissemination of fragmented information with refined content, quick release and simple semantics in network circle group channels, which stimulates irrational communication among audiences and even generates group polarization [9] [10]. College students are characterized by active thinking, high sensitivity, weak information screening ability, and easy to be incited [11]. When the complicated fragment information spreads in network circle group in a disorderly manner, college students are more likely to be affected by negative emotions, thus accelerating the spread of negative public opinions and ultimately affecting other areas of study and life [12]. For network circle group operators and higher education administrators, a healthy and diversified network social environment is an important factor to ensure sustainable profits of enterprises and high-quality training of students [13]. There is reason to believe that clarifying the inducing and transmitting mechanism of fragmented disordering public opinion in college students' network circle group has great significance for understanding the psychological demands of college students, providing effective emotional value, grasping the trend of public opinion, and disseminating the positive energy of the network. At the theoretical research level, the discussion on the fragmentation disordering public opinion of network circle group and its governance is still in its infancy. Aiming at network circle groups of college students, this paper extracts the antecedents and result variables of fragmented disordering public opinion, and calculates the relative importance level and hierarchical correlation structure among influencing factors with the help of DEMATEL-ISM model. On the basis of the above work, the dissemination mechanism and governance

strategy of fragmented disordering public opinion will be proposed.

2. Literature Review

2.1. Communication and Management of College Students' Online Public Opinion

College students' online public opinion is the sum of college students' emotions, attitudes, opinions and suggestions on various focal issues in social environment and campus life in online media [14]. Although the concept of "public opinion" is a neutral phenomenon expression, relevant research works pay more attention to the negative impact of public opinion dissemination. Especially for college students, when the information dissemination environment is more convenient and the network social environment is flooded with big data, the network information presents the characteristics of diversification, it is easy to cause the dissemination of provocative, irrational and difficult to identify negative public opinions [15]. Existing research suggests that the emergence and dissemination of college students' negative online public opinion is the result of the comprehensive effect of internal and external factors. Diversified information stimuli, changes in intermediary matters, and soft constraints of the network environment are defined as common external causes [8] [16] [17]. The personal characteristics of college students, such as high acceptance of new things, immature values, lack of social experience, impulsive emotions, obvious blindly following psychology, etc., as internal causes, lead to an increase in the triggering probability of the polarization and alienation trend of online public opinion [10] [18]. In addition, according to the degree of influence or evolution process, the common hazards of negative public opinion include cognitive bias, language anomie, violent onlookers and group polarization [15] [19]. Considering the important impact of public opinion on college students' online social environment and behavior, many scholars have put forward public opinion analysis and governance methods. For example, the public opinion analysis model is designed based on sentiment analysis and machine learning [20], and algorithms for public opinion information mining and analysis are constantly optimized to build the multi-level and all-round public opinion early warning and governance system [11] [21].

2.2. Information Exchange Characteristics of College Students' Network Circle Group

The popularity of online social networking and the strengthening of users' self-protection awareness are the preconditions for the emergence and gradual prosperity of network circle groups [22]. Network circle group is a special way to cluster users in social networks [12]. The emergence of network circle group helps network users avoid excessive information disclosure, emotional regret, awkward communication and other network social problems [23]. As the most active users in cyberspace, college students have enough interest and knowledge to use network circle group to expand their social scope, and they also hope to identify and

connect with similar companions through network circle group [17]. Common interests, values, ways of thinking, life scenes, and learning tasks can all be the basis for college netizens to gather into network circle groups [3] [24]. Network circle group can give college students the opportunity to independently match interests and hobbies, control communication topics, and choose information sharing audiences [25]. Professionalism, exclusivity and closure are considered to be the basic information exchange attributes of network circle group [26]. It has become a common operating rule of college students' network circle group to build communication channels through professional topics, select communication objects with the help of unique language systems, and maintain communication boundaries with the help of qualification access mechanisms [27]. On this basis, the information dissemination of college students' network circle groups shows distinct situational characteristics, including diversified scenes, information cocoon effect, silent spiral effect, etc. [28]-[30].

2.3. The Disordering Information Dissemination in Network Circle Group

The main influencing factors of disordering information in a network circle group come from two dimensions: one is the particularity of the situational attributes, the other is the particularity of the information characteristic. In terms of situational attributes, network circle groups have high internal information transmission efficiency, strong concealment, and out-group aversion [31]. However, when certain information has a strong influence within a network circle group, users with the identity of multiple groups will stimulate the cross-group dissemination of bad opinions, further strengthening the harm of public opinion [32]. In terms of information characteristic, fragmentation has become an explicit feature of college students' online social content. Scattered and trivial information fragments not only speed up the dissemination of public opinion and expand the dissemination scope, but also easily generate derivative topics and increase the risk of chaos in the internal communication order of the network circle groups [8]. Fragmentation increases the triggering frequency of information encounter and provides more possibilities for group social topic deviation [9]. A negative result of fragmented information forms is the phenomenon of disordering [33]. In general, disordering refers to the fact that Internet users deviate from traditional social norms and expectations, and produce opinions and behaviors that are not perfect, deviate from normal, and adulterate with false or irrational [34]. For college students, the intuitive manifestation of disordering is the irregular evolution of communication themes [35]. At a deeper level, disordering of values, disordering of discourse rules, and disordering of dissemination processes are common disordering forms in network circle groups [10] [16] [20] [36].

To sum up, the current research results provide an important reference for this paper, but there are still potentials for improvement. The relevant works are scattered and independent, and lack systematic description of the influencing factors, propagation paths and effects of fragment disordering public opinion. The

propagation of online public opinion is the result of comprehensive interaction between macro network environment and micro individual behavior [37]. As a special channel for network social communication, public opinion dissemination in network circle groups is inevitably influenced by the public network environment [38]. The relative independence of a network circle group enables the dissemination and evolution of fragment information within it, which has its own distinct channel and user characteristics [39]. As receivers and disseminators of communication information, college students' individual preferences interact with information stimuli in communication channels to form the final information adoption and dissemination behaviors [40]. For the college students' network circle group, this paper identifies the antecedent variables of fragment disordering public opinion from four dimensions, including exogenous stimuli, situational attributes, fragmented information characteristics, and college students' information adoption preferences, and extracts the result variables based on the "subject-attitudinal behavior" analysis framework. With the help of the subsequent quantitative analysis results, the dissemination process of fragment disordering public opinion is explored, and the governance strategy is finally proposed.

The main contributions of this paper are as follows:

1) Focusing on the fragmented characteristics of information release, analyzing the dissemination process of disordering public opinion in the network circle group, and putting forward a novel perspective for related research.

2) Comprehensive use of DEMATEL and ISM to conduct correlation and relative importance analysis of antecedents and result variables based on expert research data.

3) The proposed public opinion governance strategy fully considers the differentiated division of labor among network regulators, network group operators and student administrators of colleges.

3. Research Method

3.1. Research Scheme Design

As members of the network circle group, the college students cannot and do not need to understand the overall dissemination process of fragment disordering public opinion. In addition, due to the high sense of trust among members, users are difficult to rationally analyze the negative behaviors of their partners [41]. Therefore, selecting expert respondents based on practical experience or research expertise to collect data is easier to grasp the generation and dissemination process of fragment disordering public opinion. At the same time, faced with a large number of variables involved in the network circle group public opinion dissemination process, compared with conventional multivariate statistical analysis tools, such as regression analysis, structural equation model, qualitative comparative analysis, etc., DEMATEL and ISM have more advantages in terms of the number of variables and the level of correlation structure. Considering that the variables have multi-pair multi-level correlations and weight differences of relative importance,

DEMATEL-ISM model based on graph theory and matrix tools can effectively match research objectives. The technical route of related work is shown in Figure 1.

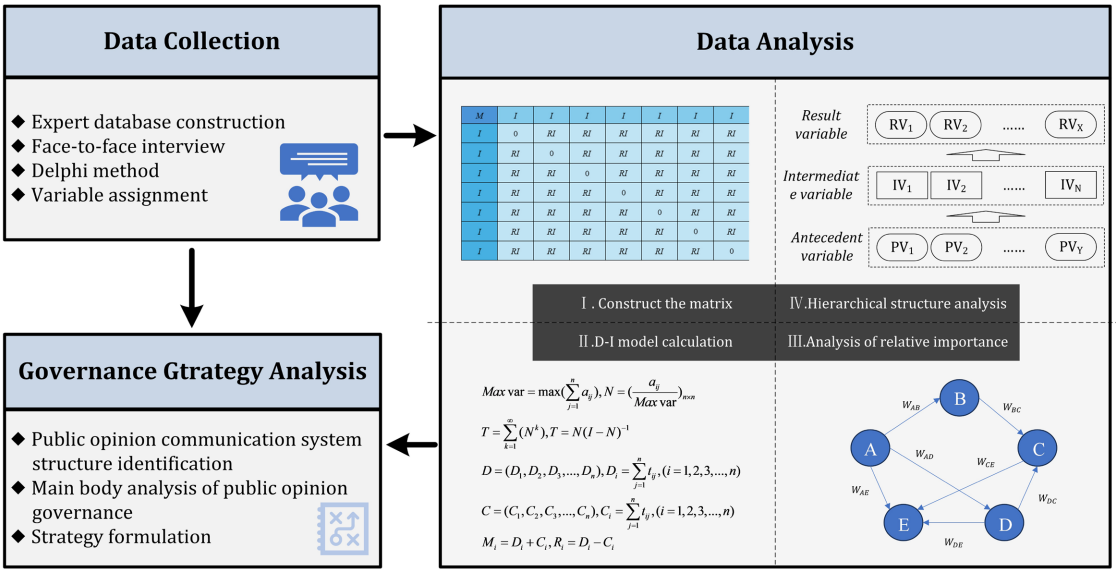

Figure 1. Technical route.

Decision making trial and evaluation laboratory (DEMATEL) is an analytical approach to multi-dimensional complex factor decision making. DEMATEL's core logic is to design the complex correlation structure among elements into a directed graph with weights based on graph theory, so as to realize the collaborative analysis of correlation and relative importance among elements [42]. Interpretive structural modeling (ISM) is suitable for mining the hierarchical structure among influencing factors and expressing the correlation path with directed graphs [43]. Comparatively speaking, DEMATEL's total impact matrix contains more information than ISM's reachable matrix, and the two can be converted by simpler matrix calculation. Therefore, the integration of the two methods is helpful to reveal the hierarchical weights structure between the antecedent variables and the result variables in the dissemination process of the fragment disordering public opinion.

The foundation for exploring the structure of systematic associations between variables using DEMATEL-ISM is to build a team of experts with specialized knowledge and practical experience. For the number of experts, based on empirical judgment, when using the DEMATEL-ISM model for analysis, the number of experts is often between 4 and 15 [44]. Explore the public opinion dissemination mechanism of college students' network circle group, involving the theory and practice of network circle group operation, network public opinion dissemination among college students, ideological and political management of college students and other fields. Therefore, the expert team constructed in this paper consists of 12 members, including network new media operation and management personnel who carry out business for college students, public opinion management experts

of college students, network circle group administrators, senior users of college students, and student administrators of colleges. On the basis of theoretical combing, through face-to-face interviews with experts, variable dimensions, antecedent variables and result variables are determined. Using Delphi method, several rounds of expert opinions are coordinated and communicated. The direct impact matrix would be constructed as the basic data for subsequent quantitative analysis. As a quantitative tool, the DAMETEL is used to calculate the relative importance of variables and to identify variable types. By setting a reasonable threshold, the comprehensive influence matrix could transform into a reachable matrix. On above basis, the hierarchical association logic among variables could be measured using the ISM, and the association structure chart would be drawn. Finally, considering the evolutionary system structure of fragment disordering public opinion, this paper can identify key control variables and formulate targeted governance strategies.

3.2. Variables Identification

Based on theoretical research results or practical experience, this paper constructs a variable database for college students' fragment disordering public opinion, as shown in Table 1. In the selection of variables, three principles are mainly followed. First, the selected variables need to have obvious causal effect in the fragmentation disordering process of network circle group. In short, for the antecedent variable, it is necessary to have a positive correlation semantic judgment with the fragmentation disordering phenomenon. For the result variable, it needs to be able to represent a certain type or degree of disordering phenomenon. Second, the selected variables can be quantified by the assignment method of rank determination. Third, the comparative importance of the selected variables can be compared based on empirical judgment.

Table 1. Variable database.

Fundamental dimension	Variables	Variable implication	Variable source	Prior type
Exogenous stimulation of network circle group	Information pollution intensity (ES1)	The probability of false, false or malicious information in the network environment	References [34]	Antecedent
	Opinion leaders tend to be extreme (ES2)	The preference of opinion leaders for deliberately channeling polarizing sentiments or views	Reference [45]	Antecedent
	Network environment openness (ES3)	The extent to which Internet regulators are tolerant of irrational views	Reference [17]	Antecedent
Situation attribute of network circle group	Information cocoon strength (SA1)	The level of exclusivity of topics within a network circle group	Reference [30]	Antecedent
	Silent spiral strength (SA2)	The percentage of users in a network circle group who are silent because they are afraid of criticism	Reference [28]	Antecedent
	Discourse system has exclusivity (SA3)	The level of exclusivity of discourse systems among members of a network circle group	Reference [23]	Antecedent

Continued

Fragmented information characteristics of network circle group	Information diversification level (IC1)	The degree of differentiation of the topic or style of information within the network circle group	Reference [8]	Antecedent
	Intensity of information fragmentation (IC2)	The proportion of public opinion information with less content, scattered semantics and short time	Reference [7]	Antecedent
	Heterogeneity propagation probability (IC3)	The possibility of public opinion information reaching users from different backgrounds (such as gender, age, education and socio-cultural differences)	Reference [46]	Antecedent
	Number of strange texts (IC4)	The amount of fragmented information intended to attract attention	Reference [34]	Antecedent
College student user's information adoption preference	Adopt preferences for similar topics (UP1)	User interest in topics related to public opinion	Reference [47]	Antecedent
	Irrational empathy preference (UP2)	The degree to which users irrationally identify with public opinion information	Reference [31]	Antecedent
	Shallow reading preference (UP3)	User acceptance of fragmented information	Reference [8]	Antecedent
The form of disordering public opinion	Partial truth (PO1)	Public opinion information that is incomplete and mixed with truth and falsehoods	Reference [34]	Result
	Ideological polarization (PO2)	Individual users have extreme emotions or behaviors	Reference [9]	Result
	Violent onlookers (PO3)	A large number of users are aggressive when evaluating certain public opinion information	Reference [9]	Result
	Language anomie (PO4)	Users use emotional language to express their views	Reference [9]	Result
	Group polarization (PO5)	A large number of users within the network circle group accept and spread extreme views	Reference [18]	Result

3.3. Data Collection and Processing

By setting 5 file grading criteria (0 - 4 represents "no impact", "little impact", "average impact", "great impact", "very large impact"), the Delphi method is used to coordinate and communicate the expert evaluation results for several rounds, and finally the consistency judgment of variable association is formed.

The subsequent data processing is completed in seven steps. Step 1, the direct impact matrix is constructed by using the expert scores after multiple rounds of coordination. Step 2, after taking the maximum value of the row sum as the normalized base, the direct impact is converted into a normalized impact matrix. Step 3, the normalized impact matrix is calculated with the identity matrix to obtain the total impact matrix, as shown in Table 2.

Step 4, calculate the relative importance and influence of variables. Step 5, set a threshold to convert the total impact matrix into a reachable matrix, where the common value of the threshold is the sum of the mean value and standard

deviation of the elements in the total impact matrix [48]. By adding the total impact matrix calculated in this paper and the identity matrix, the set values of the autocorrelation between variables were adjusted. According to the calculation results of the previous DEMATEL model, 0.1293 were selected as the threshold value, and the "0" value or "1" value of the matrix elements were determined to form a reachable matrix. The reachable matrix calculated in this paper is shown in Table 3.

Table 2. The total impact matrix.

Variables	ES1	ES2	ES3	SA1	SA2	SA3	IC1	IC2	IC3	IC4	UP1	UP2	UP3	PO1	PO2	PO3	PO4	PO5
ES1	0.00	0.06	0.00	0.00	0.05	0.00	0.01	0.00	0.07	0.07	0.02	0.08	0.01	0.02	0.15	0.28	0.23	0.16
ES2	0.00	0.00	0.00	0.00	0.11	0.01	0.01	0.00	0.07	0.06	0.02	0.14	0.01	0.08	0.34	0.28	0.28	0.32
ES3	0.12	0.07	0.00	0.01	0.04	0.00	0.26	0.09	0.23	0.10	0.14	0.19	0.12	0.05	0.11	0.12	0.14	0.10
SA1	0.00	0.00	0.00	0.01	0.04	0.06	0.01	0.01	0.01	0.06	0.02	0.20	0.00	0.26	0.16	0.12	0.12	0.16
SA2	0.00	0.00	0.00	0.01	0.01	0.06	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.13	0.15	0.06	0.06	0.11
SA3	0.00	0.00	0.00	0.19	0.04	0.01	0.02	0.12	0.03	0.07	0.03	0.17	0.03	0.20	0.17	0.12	0.18	0.22
IC1	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.12	0.09	0.07	0.10	0.04	0.15	0.04	0.05	0.04	0.11	0.04
IC2	0.00	0.00	0.00	0.06	0.01	0.00	0.12	0.02	0.14	0.02	0.11	0.06	0.26	0.17	0.07	0.05	0.07	0.06
IC3	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.06	0.14	0.09	0.06	0.01	0.04	0.04	0.05	0.03
IC4	0.00	0.00	0.00	0.00	0.04	0.00	0.12	0.02	0.13	0.02	0.16	0.20	0.03	0.02	0.20	0.17	0.19	0.16
UP1	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.02	0.03	0.08	0.02
UP2	0.00	0.00	0.00	0.00	0.15	0.01	0.00	0.00	0.00	0.00	0.06	0.01	0.00	0.08	0.26	0.29	0.30	0.23
UP3	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.00	0.07	0.13	0.00	0.13	0.12	0.08	0.14	0.12
PO1	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.11	0.11	0.10
PO2	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.24	0.23
PO3	0.00	0.00	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.07	0.22	0.17
PO4	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.16	0.06	0.11
PO5	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.09	0.03

Table 3. The reachable matrix.

Variables	ES1	ES2	ES3	SA1	SA2	SA3	IC1	IC2	IC3	IC4	UP1	UP2	UP3	PO1	PO2	PO3	PO4	PO5
ES1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
ES2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1
ES3	0	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0
SA1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1
SA2	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0
SA3	0	0	0	1	0	1	0	0	0	0	0	1	0	1	1	0	1	1
IC1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
IC2	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0
IC3	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0

Continued

IC4	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	1	1
UP1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
UP2	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1	1
UP3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
PO1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
PO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
PO3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
PO4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
PO5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

Step 6, determine the reachable set, antecedent set and common set of variables. Step 7, draw the multilevel correlation path diagram of variables.

4. Results and Discussion

4.1. Relative Importance of Variables

The calculation results of variable categories and relative importance based on DEMATEL model are shown in Table 4. The category division of most variables is consistent with the prior judgment, especially three variables, such as "silent spiral strength" (SA2), "heterogeneity propagation probability" (IC3) and "adopt preferences for similar topics" (UP1), whose affected degree is larger than the influence degree, are judged as the result variables. The calculation results show that in terms of network circle group channels, the blind obedience caused by the internal pressure of network circle group and the sense of trust among its members, it is not a congenital situational feature of college students' network circle group, but a group behavior influenced by other factors in the process of public opinion dissemination. In addition, when fragmented information spreads in network circle groups, it does not necessarily lead to high-intensity divergence evolution, and other negative stimuli are needed to promote the disordering phenomenon of public opinion. In terms of user information adoption preference, college students' interest in topics related to public opinion belongs to stress behavior. Although college students have the desire to receive information and are easy to express their opinions impulsively, the above-mentioned attitudes and behaviors do not necessarily lead to negative results, but need certain triggering conditions. Compared with the five result variables predicted in the early stage, the absolute reason degrees of the above three variables are relatively low, and their specific roles in the dissemination process of fragment disordering public opinion need to be clarified by the hierarchical dismantling of the relationship between subsequent variables.

With the help of causality data and centrality data, a two-dimensional coordinate analysis framework was constructed to comprehensively define variable attributes and core degree. The results are shown in Figure 2. Among them, the zero value of causality is selected as the classification standard to intuitively distinguish

variable types, while the mean value of centrality is adopted as the classification standard to conveniently reflect the relative importance of variables and their role in the process of public opinion dissemination.

Table 4. Relative importance indicators of variables.

Variables	Influence degree	Affected degree	Centrality	Causality
ES1	1.192	0.118	1.310	1.074
ES2	1.721	0.125	1.845	1.596
ES3	1.869	0.000	1.869	1.869
SA1	1.245	0.289	1.534	0.955
SA2	0.613	0.741	1.354	−0.128
SA3	1.599	0.178	1.778	1.421
IC1	0.877	0.579	1.456	0.298
IC2	1.223	0.383	1.606	0.840
IC3	0.539	0.844	1.382	−0.305
IC4	1.441	0.537	1.978	0.904
UP1	0.228	0.869	1.096	−0.641
UP2	1.381	1.369	2.750	0.012
UP3	0.885	0.678	1.563	0.207
PO1	0.475	1.213	1.687	−0.738
PO2	0.792	2.265	3.056	−1.473
PO3	0.709	2.369	3.078	−1.659
PO4	0.488	2.642	3.130	−2.154
PO5	0.289	2.366	2.654	−2.077

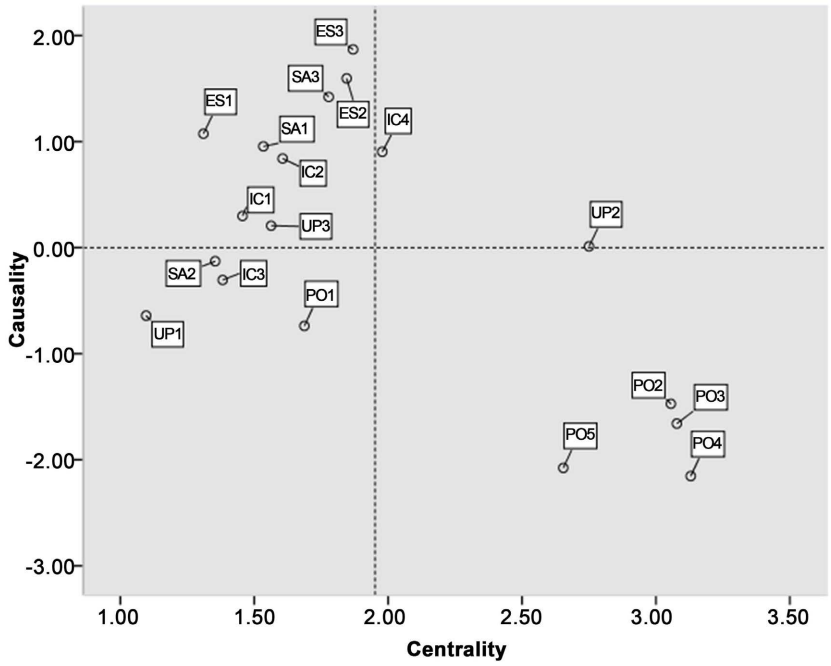

Figure 2. Distribution of causality-centrality.

According to the distribution of variables, exogenous stimulus variables are all in the "high causality-low centrality" quadrant, and most of the network circle group situational attribute variables and fragmented information characteristic variables also belong to this quadrant, indicating that such variables have a certain effect on inducing disordering public opinion but their influence is limited. The distribution of college students' information adoption preference variables is relatively loose, "adopt preferences for similar topics" (UP1) is in the "low causality-low centrality" quadrant, "irrational empathy preference" (UP2) is in the "high causality-high centrality" quadrant, and "shallow reading preference" (UP3) is in the "high causality-low centrality" quadrant. The above results show that in a network circle group dominated by fragment information, college students' sensitive information adoption style and fragmented reading habit accelerate the process of public opinion disordering. In addition to "partial truth" (PO1), most of the typical expression of fragment disordering public opinion are in the quadrant of "low causality-high centrality", which proves that the attributes of the result variables are relatively clear and the influence between them is relatively strong. In addition, the "number of strange texts" (IC4) is in the "high causality-high centrality" quadrant. According to this, it can be concluded that when public opinion information for the purpose of attracting attention occupies a relatively high proportion in a network circle group, it is easy to cause the fragmentation trend of network public opinion, and its harm degree is significantly higher than other characteristics of fragmented information in a network circle group.

4.2. Variable Hierarchical Association Structure of Variables

Using the ISM model for calculation, the reachable set, antecedent set and common set of each variable are shown in Table 5.

Table 5. Correlation indicators of variables.

Variables	Reachable set	Antecedent set	Common set
ES1	[ES1, PO2, PO3, PO4, PO5]	[ES1]	[ES1]
ES2	[ES2, UP2, PO2, PO3, PO4, PO5]	[ES2]	[ES2]
ES3	[ES3, IC1, IC3, UP1, UP2, PO4]	[ES3]	[ES3]
SA1	[SA1, UP2, PO1, PO2, PO5]	[SA1, SA3]	[SA1]
SA2	[SA2, PO1, PO2]	[SA2, UP2]	[SA2]
SA3	[SA1, SA3, UP2, PO1, PO2, PO4, PO5]	[SA3]	[SA3]
IC1	[IC1, UP3]	[ES3, IC1]	[IC1]
IC2	[IC2, IC3, UP3, PO1]	[IC2]	[IC2]
IC3	[IC3, UP1]	[ES3, IC2, IC3, IC4]	[IC3]
IC4	[IC3, IC4, UP1, UP2, PO2, PO3, PO4, PO5]	[IC4]	[IC4]
UP1	[UP1]	[ES3, IC3, IC4, UP1]	[UP1]
UP2	[SA2, UP2, PO2, PO3, PO4, PO5]	[ES2, ES3, SA1, SA3, IC4, UP2]	[UP2]
UP3	[UP3, PO4]	[IC1, IC2, UP3]	[UP3]

Continued

PO1	[PO1, PO2]	[SA1, 5, SA3, IC2, PO1]	[PO1]
PO2	[PO2, PO3, PO4, PO5]	[ES1, ES2, SA1, SA2, SA3, IC4, UP2, PO1, PO2, PO4]	[PO2, PO4]
PO3	[PO3, PO4, PO5]	[ES1, ES2, IC4, UP2, PO2, PO3, PO4, PO5]	[PO3, PO4, PO5]
PO4	[PO2, PO3, PO4]	[ES1, ES2, ES3, SA3, IC4, UP2, UP3, PO2, PO3, PO4]	[PO2, PO3, PO4]
PO5	[PO3, PO5]	[ES1, ES2, SA1, SA3, IC4, UP2, PO2, PO3, PO5]	[PO3, PO5]

According to the hierarchy division criteria of ISM model, variables with the same common set and reachable set are extracted successively as the same level variables, and the derivative path of fragment disordering public opinion in college students' network circle group containing seven levels is constructed, as shown in Figure 3. After comprehensive consideration of the hierarchical affiliation and logical correlation between variables, six fundamental antecedent variables can be identified, including "information pollution intensity" (ES1), "opinion leaders tend to be extreme" (ES2), "network environment openness" (ES3), "intensity of information fragmentation" (IC2), "number of strange texts" (IC4) and "discourse system has exclusivity" (SA3). Among the fundamental factors leading to the disordering public opinion in network circle groups, exogenous stimulus variables account for half, indicating that the regulatory failure of network environment provides more possibilities for the disordering dissemination and evolution of information in network circle groups. In the network circle group, the fragmented information form with less content, scattered semantics and short time accelerates the conversion of public opinion topics and restricts the ability of users to make rational judgments. The information release orientation of "traffic first" exacerbates the spread probability of extreme ideas. The unique discourse system within the network circle group builds an exclusive information dissemination channel, making it possible to secretly spread public opinions out of order.

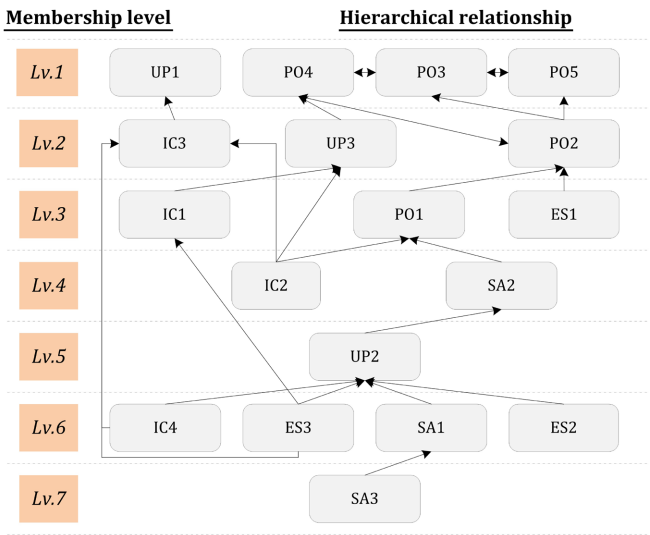

Figure 3. Hierarchical association structure of variables.

There are eight mediating variables. According to DEMATEL model's judgment of variable attributes, it can be found that "information cocoon strength" (SA1), "information diversification level" (IC1), "irrational empathy preference" (UP2) and "shallow reading preference" (UP3) belong to mediating antecedent variables. And, "silent spiral strength" (SA2), "heterogeneity propagation probability" (IC3), "partial truth" (PO1), and "ideological polarization" (PO2) are mediating result variables. It can be seen that in the context of information dissemination, the exclusivity of network circle group provides environmental convenience for the generation and evolution of disordering public opinion. In terms of information form, the diversified communication topics within the network circle group may, on the one hand, lead to the conversion of positive information into negative information. On the other hand, it will also strengthen the harmful effect of negative public opinion. In terms of user information adoption behavior, the shallow reading habit and unstable emotional state developed by college students for a long time easily lead to irrational thinking and expression of public opinion information.

The result variables at the surface include "adopt preferences for similar topics" (UP1), "violent onlookers" (PO3), "language anomie" (PO4), and "group polarization" (PO5). There is reason to believe that fragment disordering public opinion will eventually lead to emotional communication among college students within the community and the wide spread of extreme views. At the same time, if timely intervention cannot be carried out, the offensive language and extreme emotions will have a cyclic influence and will continue to strengthen. Relatively speaking, the mechanism of UP1 is special. The influence paths between the variables suggest that a more relaxed Internet regulatory environment, fragment information, and attention-grabbing topic presentation have two types of potential outcomes. One is only to stimulate the divergent thinking of college students and make them pay attention to other topics related to public opinion. The other is to cause irrational interaction among college students and accelerate the disordering process of internal public opinion information in network circle group with the help of fragment information sending and receiving mode.

4.3. Fragment Disordering Public Opinion Governance Strategy

Effective management of public opinion in network circle group of college students requires close cooperation between government supervision departments, network circle group operators and college administrators, and the multi-agent collaborative model should become an important basis for strategic analysis. Based on the above considerations, this paper holds that the governance of fragmented public opinion in network circle groups of college students should be carried out from four aspects.

First of all, strengthen legal awareness and build a rational and interactive Internet information dissemination environment. The quantitative analysis results show that exogenous stimuli have a fundamental impact on the orientation of public

opinion communication in the college students' network circle group. In other words, the overall health of the network environment is directly related to the order orientation of the information inside the network circle group. After the fragment information from the public network enters the network circle group, there are two potential derivation paths. Under normal circumstances, fragmented wonder texts enter the network circle group channel in a relatively loose environment, stimulating the discussion interest of college students and generating random topic change direction, but the result only increases the absorption strength of network circle groups for public opinion related information. Under special circumstances, when malicious comments and extreme opinions of opinion leaders in the network environment are mixed into the network circle group, college students often lack the conditions for rational judgment, and fragment disordering public opinion would be generated. Therefore, the basic awareness that the Internet is not a place outside the law, the regulation of the expression of Internet information, and the creation of a rational and interactive network environment are the macro institutional basis for reducing the triggering probability of fragment disordering public opinion.

Secondly, set exclusivity rules reasonably to increase the transparency of network circle group information. The analysis results of situational variables show that the unique discourse system forms the natural communication barrier of network circle group, the clear subject restriction brings the high trust among like-minded members, and the large number of blind obedience accelerates the efficiency of information dissemination. In network circle group channels, the covert and rapid dissemination of public opinion information makes it difficult to effectively implement conventional early warning and emergency handling mechanisms. Reshaping the boundaries of the network circle group and increasing the transparency of the information dissemination process of the network circle group are the key to controlling the fragmentation disordering public opinion. On the one hand, the establishment of a reasonable information complaint mechanism to break the monopoly of some group members on the right to speak in information communication is conducive to timely control of the fragmentation disordering phenomenon after it appears. On the other hand, improving the entry and exit mechanism of the members of the network circle group, clarifying the bottom line of the information exchange of the network circle group, and constructing benign social rules are conducive to the reshaping of the communication boundary of the network circle group. The promotion of the above measures needs to rely on the active cooperation of network circle group operators, which is the operational basis for the governance of fragment disordering public opinion.

Thirdly, attention should be paid to the fragmented form of information expression to improve the efficiency of public opinion early warning and response. The characteristics of fragmented information, such as low production difficulty, fast speed and convenient dissemination, provide convenience for the theme transformation, content reshaping and multi-dimensional dissemination of public

opinion. The key to effectively carry out public opinion early warning and emergency management in network circle group is to grasp and use fragmented information forms. The trend of user value judgment implied by fragmented information is suitable as the key basis for public opinion early warning. Short and clear interactive information often accurately reflects the interests of college students. A careful comparison of the derivative path of fragment disordering public opinion shows that introducing the reality truth and positive emotions to the network circle group in a fragmented form can implement positive intervention in the process of public opinion dissemination and shift the focus of interest of college students to rational information interpretation and topic change. The dissemination of positive information to the inner circle in a high-frequency fragmented way requires the collaborative work of multiple agents, which is the organizational basis of public opinion governance in network circle group.

Finally, to promote the college student management team younger, stimulate the resonance public opinion governance model. From the perspective of user information adoption preference, the shallow reading habits and impulsive online communication methods developed by college students for a long time often become the catalyst for the generation and dissemination of fragment disordering public opinion. College student administrators, who undertake the daily management and psychological counseling tasks of college students, are limited by the uniqueness of the discourse system of the network circle group and are often powerless in the face of public opinion dissemination. Relatively speaking, the age difference between young teachers and students is smaller, their interests are closer, they are easier to understand the common words of students, and they are more accustomed to fragmented reading and communication methods. Therefore, it is necessary to continuously promote the youth of college student work team, facilitate teachers and students to resonate in the communication process, help to provide students with good emotional value, and eliminate the negative impact of public opinion. The construction and implementation of the above employment mechanism is the micro-human resources foundation of public opinion governance in colleges.

5. Conclusions

Based on literature analysis and the operation practice of network circle group, this paper extracts key variables in the dissemination process of public opinion. With the help of DEMATEL-ISM model, the results of expert evaluation are quantitatively calculated, so as to realize the systematic structural exploration of the evolution path of fragment disordering public opinion.

The results of quantitative analysis found that the exogenous stimulation from the public network, the unique discourse system of the college students' network circle group and the micro-narrative mode constitute the deep root of the fragment disordering public opinion. The unique situational attributes and fragmented information expression of network circle groups often become the main "booster"

of disordering public opinion. In terms of the results of public opinion dissemination, the boundaries between topic disordering, attitude disordering and behavior disordering are not clear, and topic deviation is often accompanied by the formation of negative emotions. The final result of the propagation of individual negative emotions in the group is that a large number of users accept and spread extreme views. In addition, through the analysis of the key nodes of the public opinion dissemination mechanism, it can be found that a relatively loose network environment and fragmented information manifestation do not necessarily lead to negative public opinion. The communication barrier built by the situational attributes and user characteristics of network circle group is the key to the emergence of disordered public opinion and its covert spread. In view of this, combined with the multi-agent nature of college students' network circle group public opinion governance, this paper puts forward four suggestions. Specifically, strengthening legal awareness and building a rational and interactive Internet information dissemination environment are the macro-institutional basis for reducing the trigger probability of fragment disordering public opinion. Increasing the information transparency of network circle group, is the operation basis of public opinion governance. Paying attention to fragmented information expression forms and improving the efficiency of public opinion early warning and response are the organizational basis of multi-subject collaborative public opinion governance. The micro human resources foundation of public opinion governance in colleges is to promote the young working team of college and stimulate the resonance public opinion governance model.

Despite the contribution of these findings, there are limitations to this study, which stem from the process of data processing in the DEMATEL-ISM model. On the one hand, considering the data source, although expert respondents can have a deeper understanding of the law of public opinion dissemination in the network circle group, it is inevitable that there will be errors in judging the complex relationship between variables based on experience. On the other hand, matrix analysis technology can only measure a single multi-level correlation scheme between variables, but cannot form a differentiated variable configuration with the same effect.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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