

The Fuzzy Trend of Network Media Science Communication Boundary in the Post-Epidemic Era

——Content Analysis Based on the Short Video of Myocarditis in Bilibili

Lingxin Su^{1,a,*}

¹Northeast Normal University (Jingyue Campus) No. 2555, Jingyue Street, China

a. Sulx969@163.com

*corresponding author

Abstract: In the post-epidemic era, experts and ordinary people with medical knowledge have participated in science communication through digital media platforms to jointly deal with the risk of the epidemic. However, the subject dilemma of the science communication boundary and the blurred communication boundary brought about by the dislocation of information misreading and trust has attracted public attention. This paper focuses on the short video of scientific communication related to “myocarditis” in the Bilibili and adopts the content analysis method to conduct individual analysis and cross-analysis on the relevant communication subjects, communication content, and communication forms respectively, and analyze the data results. It is found that the boundary of science communication is constantly dissolved and blurred, but the influence of authorities in the science communication industry can not be underestimated; the popularization and democratization of science communication are the important reasons for the ambiguity of science communication, we also find that the technology available in network media is becoming an effective catalyst for the blur of science communication boundary.

Keywords: science communication, communication boundary, content analysis, technology availability, science popularization

1. Introduction

Since the emergence of COVID-19 (COVID-19) cases, “accidental”, “sudden” and “information uncertainty” have caused public panic, and the scientific dissemination of information about the epidemic has become one of the topics of high concern worldwide [1]. Around December 2022, the “New Ten” epidemic prevention and control measures “issued by the joint prevention and control mechanism of The State Council attracted the attention of the news and communication community. After the epidemic, the short video science communication of “Yang Nankang” also involved the boundary issue of science communication. The boundaries of scientific communication have been repeatedly mentioned, and the relationship between scientists and the public has become more complicated in such a digital age.

According to the latest statistics of China’s Internet Audio-visual Development Research Report (2023), the number of short video users will continue to grow in 2022. Compared with 2021, the

utilization rate of short videos by all kinds of user groups has increased, and short videos have further “penetrated” into all kinds of Internet users, and nearly a quarter of new Internet users will touch the Internet due to short videos. Short videos last more than 2.5 hours per day. In the current digital media era, the public’s demand for scientific information is increasing, especially in public health emergencies such as COVID-19, the public’s demand for scientific information has been pushed to an unprecedented height. On the one hand, due to the timeliness of various related diseases in the post-epidemic era, more and more experts and the public participate in information dissemination, especially in the field of science communication. It is an important task for epidemic prevention and control the public to reduce the public misunderstanding of the sequelae of the “new crown” and promote the rational understanding and scientific treatment of the symptoms after Kangkang. On the other hand, the technology of the major video broadcasting platforms shines brilliantly, different from the communication mode of traditional media, such as multiple subjects and short video content narrative also brings many discussions to the boundary of the communication of short video science.

The factors of the ambiguity of the boundary of public information production territory, the erosion of the boundary of professionalism and authority, and the progress of digital technology have caused the disappearance of the current communication boundary. Thus, the iteration of technology and new media has blurred the boundary between the production and dissemination of knowledge information, while the boundary of scientific knowledge, despite the professional requirements of knowledge, is inevitably challenged by this general trend. Therefore, by analyzing the content of short videos of science communication in network media, this paper tries to answer the following questions: What are the changes in the boundary of science communication from the perspective of technology availability? Why did these changes happen?

2. Manuscript Preparation

In the post-epidemic era, a large number of topical events such as “Yanghu” and “Yang Guo sequelae” have poured out, and the related research on science communication has entered a new stage of rise, but the research contents are different. Professor Jia Hpeng pointed out that domestic science communication has a highly organized nature. [2] Zeng Jingping and Wei Ding studied the situation of science communication based on the short video platform and pointed out that science communication work should make full use of the rapidly developing science and technology, innovate the ways and means of science communication, and do a good job in the all-media communication [3] of “short video + science communication” scientifically, orderly and efficiently. Chu Yajie and Jiang Fangyuan from the perspective of science communication audience dialogue participation, Note that “ although the ‘dialogue’ and ‘engagement’ perspectives provide a useful thinking framework for understanding science communication in the age of social media, However, limited by the integration of the communication situation and the ambiguity of the concept itself, There are clear limitations to the ‘dialogue’ and ‘engagement’ perspectives, May underestimate the communication effectiveness of scientific institutions.” [4] Li Shumin discussed the problems of Chinese scientists participating in science communication, “One is that the community of scientists pays little attention to uncertain science communication, Not strong ability; Second, there are great constraints in the time and energy of scientists’ participation in science communication; Third, the lack of incentive mechanism for scientists to participate in science communication; Fourth, we need to strengthen the training and guidance for scientists’ participation in science communication.” [5]. Which also discusses science communication boundary, liu, YanDingYou through during disease resistance in Wuhan “double Huang Lian event” thinking, that the boundary of science communication is a limit science internal information exchange internal boundary and science and media, the public, government, professional institutions for the external boundary of scientific information dissemination of [6]. As early as the end of the 20th century, the American sociologist of science

Gieryn [7] put forward the famous theory of scientific boundary setting theory in his related discourse. He pointed out that the boundaries of science are flexible, historically changing, contextual, internally inconsistent, and sometimes somewhat controversial. Yang Zheng, [8] a scholar of China, has adopted a series of discourse means, intentionally or unintentionally, to construct the discourse boundary between science and non-science, scientists and the public. However, it is also found that under the combined action of other factors such as the rapid development of new media and other factors, the absolute discourse authority status of scientists in the process of science communication has been challenged and eliminated to a certain extent [8]. Jia also pointed out that the theoretical development of mainstream science communication provides a theoretical basis for the public and scientists to carry out “equal” dialogue. Researchers not only deeply discussed the social structure of science communication, especially the power composition in it, but also tried to eliminate the absolute authority [9] of the scientific community in the process of science communication.

There are many reasons for the elimination of the absolute discourse power of this expert group. On the one hand, some scholars believe that science communication should avoid falling into the Tacitus trap and consciously safeguard the public interest. On the other hand, from the perspective of science communication research, the emergence of new modes of public participation such as digital media and “citizen science” is considered an opportunity for the identity boundary between traditional scientists and citizens in the science communication system [10]. The reconstruction of the science communication process brought about by the booming digital media, the decentralization and generalization of participatory science communication, and the science communication subject may all become an important power to break the boundary between science, scientists, and the public. Scholars Liu Bing and Hou Qiang said, “Whether traditional or modern science popularization, its essence is the practice of popular science, but the content has changed.” [11]. Wang Dapeng put forward different views that the paradigm of popularization of science has occurred and is changing, from making up for public scientific knowledge through science education to realizing two-way interaction and equal communication between scientists and the public [12]. However, there are still problems such as the lack of public understanding of science and the lack of trust in science communication. As the main force of UGC, citizens promote the generation of multiple communication subjects. On the one hand, the public’s internal demand for scientific information is diversified, and the awareness of independent participation is gradually enhanced; on the other hand, the production content form of short videos has changed from long to short concise, and the shooting and convenient production. These civilian and low-threshold technical characteristics provide the external possibility for the popularization of science, and many studies ignore the promoting effect of technological development on the popularization of science.

At present, the development of digital technology not only promotes the change in the global science communication environment but also reshaped the relationship between the subjects, institutions, and media under the new video platform. Supply is increasingly used to explain the application practice of technology. Technology availability can be considered as a “multi-dimensional relationship structure between the technical object and the actor”, or “the connection between the actor and the environment”. [13][14] In the field of communication, “technology availability” and “media availability” are often used to explain the changes and influences brought by new technologies on video media platforms. The new intelligent digital technology will also bring new availability to people’s scientific communication. Chen Changfeng [15] discusses technology convergence is to break the division between printing media, audio, and video media to form a digital media form, text, video, audio, interactive graphics, and other fusion on a platform to present the “narrative flow”. Scholar Peng Lan [16] believes that the availability of new media technology not only depends on the technology itself, which has an impact on the production and dissemination of public content but also leads to the increasing dilution of the boundaries between mass

communication, interpersonal communication, and group communication. The development of technology has always been an important driving force for the evolution of forms of communication, and media technology is reshaping the relationship between technology and people. Lu Ting [17] and others believe that the internal logic of technology-driven media development needs to be organically combined with humanism and pay attention to playing the main role of human beings. The transformation from passive and passive “audience” to active and active “user” is behind the redistribution of the communication discourse power and the reconstruction of the communication pattern.

3. Research Method

3.1. Data Collection

Compared with Weibo, WeChat, TikTok, video, and many other new media video platform is given priority to graphic, short video service mode, Bilibili website video duration unlimited and encourage long video advantages and the characteristics of science video more match, on science video more advantages, all kinds of scholars and official media and knowledge learning, the development of science and technology area makes B station content more technical and persuasive, in evaluation, empirical, based on professional interpretation and knowledge sharing, so this research chooses Bilibili as a data acquisition platform.

This paper adopts the content analysis method, takes the B station platform as the research object, captures “Kangkang myocarditis”, “novel coronavirus myocarditis” and “Novel coronavirus myocarditis” as the search terms, and finally extracts 466 valid videos as the research samples.

3.2. Research Frame

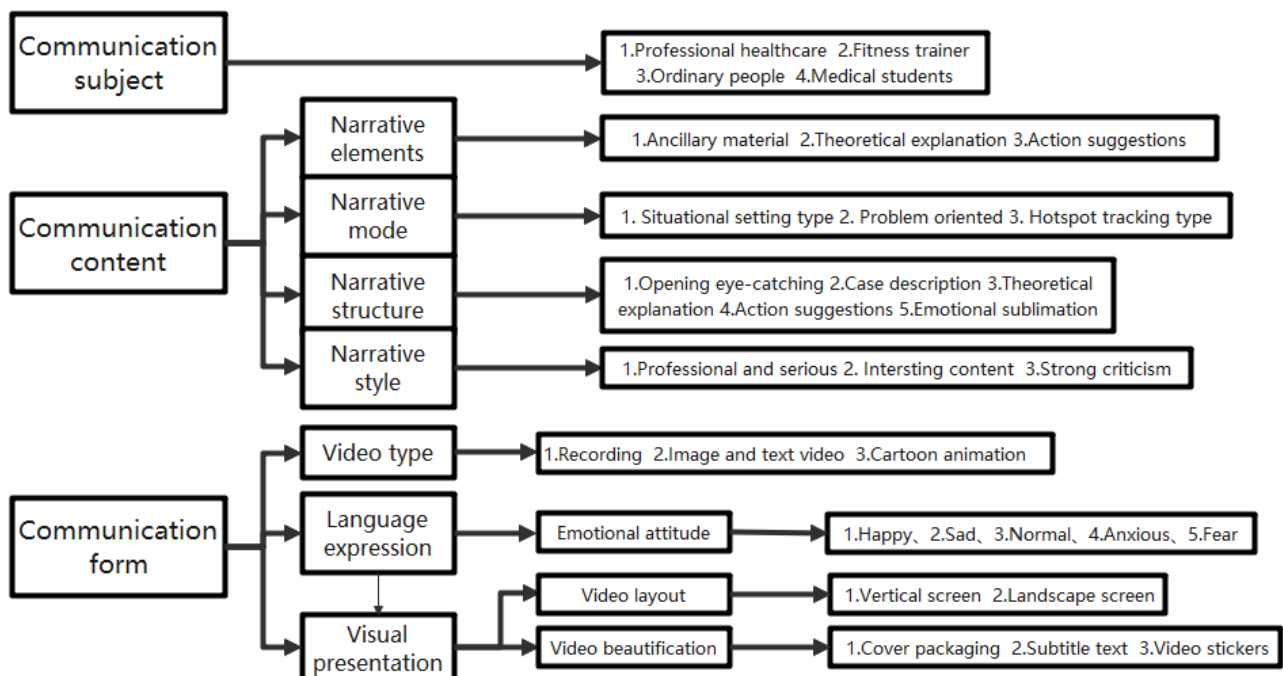


Figure 1: Research frame.

3.3. Index Selection

3.3.1. Preliminary Selection of Indicators

The author has extensively read the existing research on the dissemination of short video accounts in the academic circle, and carefully combed and analyzed the views and views put forward by the researchers. Through the research, it is found that at the macro level, the short video accounts are mainly manifested in three aspects: communication subject, communication content, and communication form, so the above three accounts are taken as the first-level indicators of the research framework. In the selection of micro-level indicators, the short video news products should have the content and form of perspective, to the above two aspects of indicators more detailed separation, put forward the “narrative elements”, “narrative mode” five secondary indicators, and based on historical documents as reference put forward the transmission form of “emotional attitude” “narrative style” and so on four level 3 indicators.

3.3.2. Explanation of the Evaluation Indicators

3.3.2.1. First-level Indicators

Communication subject: The short video platform of the B station organically combines the information breadth of UGC with the professional level of PGC, and adopts the information content released by users as the reporting material. Professional medical teams’ information acquisition ability has been unable to meet the requirements of short video-era report speed, the emergence of fitness coaches for “myocarditis” related science videos provides rich material, and ordinary people and medical students can replace professional journalists to capture the first reaction, “PGC + UGC” production mode can greatly improve the spread of scientific video efficiency and work output ability, also can improve the short video platform and the link between the audience.

Communication content: refers to the narrative performance of the video itself, including narrative elements, narrative mode, and narrative structure.

Communication style: The form of communication includes not only the production means used by the media in the process of the creation of video news and the presentation form of content products, but also its language expression.

3.3.2.2. Level-2 Indicators

Narrative elements: From the perspective of narrative elements, common narrative elements in short book recommendation videos include auxiliary materials, theoretical elaboration, action suggestions, etc. Most short videos tend to use 1-2 narrative elements to help the presentation and expression of short video content. Therefore, the author adopts the index coding method of multiple selected enumeration types.

Narrative mode: Research shows that short videos now mostly adopt the mode of “explosive point front + question/scene resonance/poke pain point + illustration/experience/story + knowledge point/opinion extraction” to attract attention. Popular science short videos are no exception, so there are three types of situation setting, problem guiding, and hot spot tracking.

Narrative structure: there are five categories: eye-catching beginning, case elaboration, theoretical elaboration, action suggestion, and emotional sublimation. The narrative structure of the “inverted pyramid” is likely to obtain a higher number of comments. Most short videos adopt three or above narrative structures, so they also adopt multiple selections of enumeration indicators.

Language expression: including emotional attitude and narrative style.

Visual presentation: including external video layout and internal video beautification.

3.3.2.3.Three-level Indicators

Emotional attitude: At present, it is very common for mainstream media to use emotional expression to spread value. Short popular science videos often contain rich emotional connotations, which can effectively regulate the audience’s emotions and stimulate the resonance of users. Mainstream media reasonably use the emotional regulation strategy of “happiness, anger, sorrow and joy” to create warm news content, which can condense social empathy, effectively meet the emotional needs of the audience, and play a role in motivating, comforting, and guiding them. Enkman (Ekman) divides emotions into six basic emotions: happiness, sadness, anger, fear, disgust, and surprise. According to the experience of precoding, “disgust” is adjusted to “normal”, deleted the less frequent “surprise” emotion, and finally the comment emotion tendency is divided into praise, sympathy, question, disgust, and anger; therefore, the five categories are happy, sad, anxious, fear, and normal.

Narrative style: The research shows that in popular science short videos, serious language style has a better communication effect than the emotional expression and friendly language style, so the narrative style is divided into three categories: professional, interesting content, and critical.

Video format: In terms of video communication, there are also great differences in horizontal and vertical screens. Horizontal screen, which has the most efficient use of screen space on PC, tablet and other devices, is unprecedentedly inefficient for screen space content on vertical mobile phones.

Video beautification: the video cover attracts the eye, the news picture is smooth, and the subtitle style is beautiful and generous. Short video news is mainly presented through pictures, and whether the video cover is attractive directly determines the user’s viewing choice. The short content time makes the audience not have too high requirements for the precision of the video picture, but the fluency of the video picture and whether the subtitles are eye-catching, clear, and beautiful directly affect the user’s viewing experience. The copywriting and subtitles of short video news can effectively help the audience to read and understand the news content. Compared with traditional video news, the text (subtitles, copywriting) in short video news plays a more important role. Popular science short videos generally do not add narration to interpret the content, but interpret the news content with subtitles and copywriting, which requires the copywriting of short video news to briefly summarize the news theme, and the subtitles should play an explanatory role in the video content.

Table 1: Summary of the assignments of related variables in this study.

Level 1 indicators	Secondary indicators	Level 3 indicators	Encoding category	encoder mode
Communication subject			Professional medical care =1 Fitness Trainer =2 Ordinary people =3 Medical student =4	The assignment type
Communication content	Narrative elements		Auxiliary material Theoretical elaboration Action advice	List type
	Narrative mode		Situation setting type =1 Problem guide type =2 Hotspot tracking type =3	The assignment type

Table 1: (continued).

Communication style	Narrative structure		The beginning of the eye Case elaboration Theoretical elaboration Action advice sublimate emotion	List type
	Narrative style		Professional serious =1 Content interesting =2 Critically strong =3	The assignment type
	Video type		Recording Graphic video Cartoon animation	List type
	language performance	Emotional attitude	Happy=1 Sad=2 Anxious=3 Fear=4 Normal=0	The assignment type
	Visual presentation	Video format	portrait screen=1 Landscape screen=2	The assignment type
		Video beautification	Cover packaging Subtitle text Video stickers	List type

4. Data Analysis

4.1. Descriptive Analysis of the Samples

4.1.1. Communication Subject

Table 2: Sample descriptive statistics.

Level 1 indicators	Secondary indicators	Level 3 indicators	Alternating quantity	The number of cases	Percentage
Communication subject			Professional medical care	255	54.72%
			Fitness Trainer	40	8.50%
			Ordinary people	143	30.68%
			Medical student	28	6.00%

The occupation type of the communication subject is reflected in the account operation of B station, especially the gap between the professional official accounts and the amateur we-media accounts. The reason why experts are “professional” is because it is their professional field, and because of the outstanding nature of medical experts and the high trust of the public. Therefore, the dissemination

subject of the short video of myocarditis popular science in Station B is mainly composed of professional medical care, fitness coaches, medical students and ordinary people. Myocarditis-related conditions and solutions were often explained by professional medical care (54.72%) and medical students (6.0%) were more convincing, with 255 professional medical care participants, accounting for more than half. At the same time, ordinary people (30.68%) generated videos and shared their opinions according to their own personal experience of myocarditis disease, and the number of participants was 143, accounting for a relatively high proportion. In addition, based on the impact of novel coronavirus on the heart and the load of exercise on the heart, 40 fitness coaches (8.5%) participated, and they were less cautious about when ordinary people should return to exercise.

4.1.2. Communication Content

The content of short video communication related to myocarditis is mostly related to the harm, clinical symptoms, coping methods and their own experience of “myocarditis” after Yangyang Kang, which is narrated from a variety of aspects. In terms of narrative elements, auxiliary materials, theoretical elaboration and action suggestions are the main elements of popular science short videos. Using auxiliary material video has 199, auxiliary material (42.70%) for the authenticity of the popular science video services, including real patient case “16-year-old girl sudden myocarditis need heart transplant, the doctor to rescue, or unsatisfactory” “friend myocarditis died yesterday, only 34 years old” and experts related arguments, netizens weibo comments screenshots such as document material. Moreover, the public’s fear of myocarditis comes from knowing little about myocarditis itself. Therefore, 336 short videos made suggestions on how to prevent and deal with myocarditis after Kangkang (72.10%). In addition, in order to convince the audience, 323 videos (69.31%) were elaborated to make the public understand the pathology of myocarditis. In terms of narrative mode, due to the mostly professional medical treatment to myocarditis related cases, the problem guidance type (50.64%) occupied the highest proportion, followed by the hot spot tracking type (29.18%) than the situation setting type (20.17%).

Table 3: Sample descriptive statistics.

Level 1 indicators	Secondary indicators	Level 3 indicators	Alternating quantity	The number of cases	Percentage
Communication content	Narrative elements		Auxiliary material	199	42.70%
			Theoretical elaboration	323	69.31%
			Action advice	336	72.10%
			Situational Settings	94	20.17%
	Narrative mode		Problem-oriented	236	50.64%
			Hot tracking type	136	29.18%
	Narrative structure		The beginning of the eye	186	39.91%

Table 3: (continued).

narrative style	Case elaboration	242	51.93%
	Theoretical elaboration	336	72.10%
	Action advice	348	74.67%
	sublimate emotion	12	2.57%
	Professional and serious	344	73.81%
	Interesting content	110	23.60%
	Critical	12	2.60%

Short videos of medical popular science are limited by the time, and will not develop a large amount of content. They are more based on the symptoms of myocarditis after Yangxin itself, and focus on the narrative within a specific single narrator. According to the table, The narrative structure of myocarditis popular science video is mainly based on case elaboration, theoretical elaboration and action suggestions, The beginning and the end of the video are supplemented; The purpose of popular science narrative itself is to popularize the coping strategy of myocarditis symptoms to the public, Case presentation (21.53%) and action recommendations (30.96%) focused more directly on the symptoms of mass myocarditis and response methods, To solve the urgent needs of the audience, It is the embodiment of the practical value of popular science short video; Theoretical elaboration (29.89%) has academic value compared to the case interpretation itself, More has the characteristics of “popular science”; besides, In order to catch the eye of the audience within 30 seconds, Get the audience as much about the video as possible through the beginning (16.54%), Attract an audience to watch, Get as much clicks and stay as possible; The first perspective approach makes the audience easy to have emotional resonance, Narrators often use emotional sublimation (1.0%) to comfort the audience’s fear and persuade the “desperate cure” behavior, In myocarditis popular science short video proportion is relatively small.

In addition, the narrative structure of the short video is also reflected in the combination structure of various elements. According to each index coding, the logical combination structure and the total score total structure are in the majority

Logical structure: analyze the problem (why) —— solve the problem (what to do). “Theoretical elaboration” + “action suggestion”, using this structure, most of the communication subjects are professional medical care, the causes of myocarditis are theoretically elaborated, and give the solutions to the related diseases after the analysis of the problems. For example, netease Finance official “Zeng Guang interpretation: How to judge whether you have myocarditis” did not begin, but directly completed the whole video through the theoretical explanation and related suggestions of Zeng Guang, an epidemiologist.

Total score Total structure: “beginning” —— “elaborate” —— “end”. Deliberately creating an attractive beginning, compared with the recent hot spots of myocarditis, empathy pain points, controversial views and so on. The middle part assists with case elaboration and theoretical elaboration, and extends the questions raised at the beginning to explain clearly. Finally, put forward action suggestions or emotional sublimation at the end, which is long, but can well meet the audience’s information expectations. For example, Dr Yuan, medical doctor “Brother Yuan” of

Shanghai Jiao Tong University, showed the hot topic in the form of pictures and pictures, leading to “Yangkang strenuous exercise after sudden death of viral myocarditis, is there this thing?” The topic, the middle to fill some cases to confirm the theory, and finally published personal action advice. The broadcast volume reached 118,000, and the spread effect was obvious.

In terms of narrative style, because this is a disease related to the sequelae of COVID-19, it is more scientific and professional, most professional medical care for popular science, professional serious style (73.18%) accounts for a high proportion, some ordinary people and some fitness coaches have interesting content style (23.60%), and only a few critical style (2.6%).

4.1.3. Form of Communication

Table 4: Sample descriptive statistics.

Level 1 indicators				Communication subject			
Level 1 indicators	Secondary indicators	Level 3 indicators	Alternating quantity	Professional medical care	Fitness Trainer	Ordinary people	Medical student
Communication style	Video type		Recording	232	28	87	20
			Graphic video	91	17	81	10
			Cartoon animation	37	10	23	11
			Happy	0	3	7	2
			Sad	8	7	9	1
			Anxious	7	6	28	3
	language performance	Emotional attitude	Fear	0	6	17	2
			Normal	240	18	82	20
			portrait screen	50	12	73	2
			Landscape screen	205	28	70	26
			Cover packaging	219	30	128	20
			Subtitle text	254	29	101	20
	Visual presentation	Video beautification	Video stickers	49	16	40	15

In terms of video types, recording type (56.72%) and graphic video (30.75%) adopted higher frequency, while cartoon animation (12.52%) adopted low frequency. In terms of emotional attitudes expressed by language, most of them have no emotional color, and normal emotional attitudes (77.3%) accounted for the highest proportion, while others (happy 2.6%, sad 5.4%, anxious 9.4%, afraid 5.4%) accounted for less. In terms of video format, because most of the original materials come from the

TV news screen and the characteristics of the main horizontal screen of B station, so the horizontal video (70.6%) is more than the vertical video (29.4%). In addition, in terms of video beautification, 397 videos used cover packaging (42.6%), 404 videos used subtitle text (44.4%), and 130 videos used video stickers (14.0%).

4.2. Cross-sectional Analysis of the Important Indicators

4.2.1. Cross-sectional Analysis of Communication Subject * Communication Content

Table 5: Communication subject * communication content crosstab.

Level 1 indicators			Communication subject			
Level 1 indicators	Secondary indicators	Alternating quantity	Professional medical care	Fitness Trainer	Ordinary people	Medical student
Communication content	Narrative elements	Auxiliary material	81	30	82	6
		Theoretical elaboration	251	15	33	24
		Action advice	242	37	48	9
		Situational Settings	23	9	59	3
	Narrative mode	Problem-oriented	167	19	39	11
		Hot tracking type	71	12	48	5
		The beginning of the eye	68	36	78	4
		Case elaboration	113	29	89	11
	Narrative structure	Theoretical elaboration	251	15	46	24
		Action advice	254	37	48	9
		Sublimate emotion	9	0	3	0
		Professional and serious	236	22	65	21
	Narrative style	Interesting content	16	15	73	6
		Critical	3	3	5	1

According to the cross analysis results, professional medical in content “theory” (251), “advice” (242) and style “professional serious” (236) data is much higher than other, fully embodies the professional and authority as medical staff, to play the specific transmission subject in the popular science video transmission value function. High heat news topic often arise from the social public common concern of news events, and have the characteristics of news events generally have strong realistic significance and news value, the audience for this kind of news events learned desire will become more intense

(experience, no theoretical essence), eager to in the first time to understand the latest progress of the news situation. When users face some information that they pay close attention to but cannot determine its authenticity, they need to rely on the entry of authoritative information to prove the authenticity of the news content. Compared with other communication subjects, professional medical care subjects rarely use online text and text as the source of news reports, and the reporting perspective is often dominated by professional and serious medical experts. It is helpful to ensure the authenticity of the communication content of professional communication subjects, and the authenticity and accuracy of the video communication content is the source of the credibility of scientific communication video.

At the same time, the performance of ordinary people in different communication content indicators is also different. In the narrative mode, the situation setting type (41.25%) and the interesting communication content (51.04%), it can be seen that the method of ordinary people substituting themselves into the situation is more affinity. Through observation, we can find that the narrative style of popular science video in the network media environment has also changed. At present, many short video accounts of ordinary people have changed the rigid and serious communication image of popular science short videos in the past, and are close to the interest and preferences of the network audience from the content and form. They use a down-to-earth, warm and vivid discourse style for news reporting and content dissemination.

4.2.2. Cross-analysis of the Transmission Subject * Transmission Forms

Table 6: Communication subject * communication forms crosstab.

Level 1 indicators			Communication subject				
Level 1 indicators	Secondary indicators	Level 3 indicators	Alternating quantity	Professional medical care	Fitness Trainers	Ordinary people	Medical people
Communication style	Video type	Emotional attitude	Recording	232	28	87	20
			Graphic video	91	17	81	10
			Cartoon animation	37	10	23	11
	Happy		0	3	7	2	
	Sad		8	7	9	1	
	Anxious		7	6	28	3	
	Fear		0	6	17	2	
	Normal		240	18	82	20	

Table 6: (continued).

Visual presentation	Video form	Vertical screen	50	12	73	2
		Landscape screen	205	28	70	26
	Video beautification	Cover packaging	219	30	128	20
		Subtitle text	254	29	101	20
		Video stickers	49	16	40	15

According to the results of cross-analysis, among the three video types, “recording” video is far ahead in professional care, including a few professional medical video and cartoon animation to promote the dissemination of information; recording, graphic and animation have a significant proportion in other subjects except professional care, reflecting the trend of diversified scientific communication of short video for the public. In addition, in addition to the traditional animation, H5 graphic animation has also become a new carrier of scientific communication content presentation. “Beijing time” account released H5 animation during the epidemic “How long can Kangkang exercise?”, The prevention of myocarditis for scientific guidance, has played a very good popular science effect.

In terms of emotional attitude, “professional medical care”, “fitness coaches” and “medical students” were generally treated normally (77.2%), and the ordinary people accounted for nearly half (42.66%) in terms of happiness, sadness, urgency and fear. Popular science articles and short videos are mainly to introduce scientific knowledge, promoting science and technology and spreading scientific ideas. Professionals often do not have any emotional color, objective public to myocarditis related diseases reasonable explanation. Myocarditis such a small case, ordinary people do not have myocarditis related pathological knowledge, to their own infection of myocarditis disease anxious, or in the face of unknown diseases revealed fear, the state of mind is more sad. In terms of video form, the horizontal and vertical video ratio of ordinary people is close to 1:1. In the Internet era, ordinary people has always held a mobile phone (landscape users are often placed on the table), and the operation cost of recording video is low; portrait content is often shorter, and it is easier for ordinary people to spare time to share myocarditis related science.

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In terms of video beautification, “cover packaging” and “subtitle text” account for a relatively high proportion in each communication subject. “Video stickers” accounted for a relatively few. In order to let the audience follow up the speed of the communication subject and master more knowledge and focus, subtitle text is an indispensable part of popular science short videos. The boring and boring

short video of popular science itself leads to the audience rarely volunteer to point into the video to watch, exquisite and proper cover packaging helps to attract the audience to click, and then watch the video content. “Video stickers” are mostly stickers brought by professional cutting software such as “must cut” or “cut screen”, and most of the types of stickers belong to cartoon types, which does not conform to the simple and rigorous style of popular science short videos, so most videos do not use video stickers.

5. Conclusion

5.1. Changes in the Boundaries of Science Communication

5.1.1. The Boundary of Science Communication Is Gradually Blurred, but the Status of Professionals Is Still Difficult to Shake

Throughout the above analysis, the rapid development of short video platform in the scenario of technology can supply has blurred the boundary of science communication to some extent, and promoted the popularization and democratization of science communication. On the one hand, the authoritative discourse of science communication gradually faces the mode transformation of civilian narration of science popularization and mass communication; on the other hand, the generalization of participating subjects of science communication, except for experts and scholars, it is not difficult to see the public enthusiasm for science communication, and some ordinary people without professional scientific background also actively participate in science communication activities. The public has a dual identity, which is not only the audience of science communication, eager to learn relevant knowledge in the field of science, but also the subject of science communication and an enthusiastic distributor. Moreover, the transformation of these two roles can also be recognized by other members of the public. All kinds of communication subjects popularize the knowledge of myocarditis to the public from different narrative dimensions, and the communication content is more rich, from narrative elements, narrative structure, narrative mode to narrative style. The Internet has never given the public more autonomy of information production and video creation than today.

In recent years, such as UGC, MGC a large number of new content production main body, after the outbreak era people pay more attention to physical health, science communication video volume explosive growth, the current spread of science creators mostly for non-professionals, its scientific content production is difficult to guarantee, professionals still be regarded as the authority of science communication transmission body, the boundary between professional and non-professional still exists. Technology availability emphasizes that “the essence of online public space is shaped by the technical architecture and installation of social media platforms, but at the same time, it is also deeply influenced by the social background, social identity and social practice of social media users”. On the one hand, the rapid development of technology weakens the role of gatekeeper in the short video platform, and the ordinary people begin to become the producer and disseminator of scientific information; On the other hand, from the perspective of science itself, short video science communication, which follows the basic laws of science, remains the most convincing group, which cannot be replaced by the professional public. Professionalism is manifested in many aspects, including the authenticity and certainty of scientific knowledge, and the fairness of scientific evaluation. Experts and scholars are an important part of ensuring the scientific and objective nature of science short video communication while stimulating people’s enthusiasm for communication with the public participation in science communication.

5.2. Reasons for the Blurred Boundaries of Science Communication

5.2.1. Popularization of Science Communication

As early as 2000, the House of Lords published the Science and Technology Report, which proposed the concept of “science dialogue” to replace the public understanding of science. The report states that “in the context of risk-based society, the discussion and governance of scientific affairs requires public participation, and ultimately establishes an equal model of dialogue among scientists, policymakers and the public,” and further states that the dialogue model is an ideal way to rebuild public trust in science. The Science and Technology Report is considered to have initiated a “review turn” in the field of science communication, with the public understanding of science gradually beginning to evolve into public participation in science. In the post-epidemic era, with the development of domestic media technology and the rise of public discourse, more and more science enthusiasts and science media become the main subjects of science communication, and the subjects of science communication become more diversified. The simple, fast and user-friendly online video editing technology provided by various major platforms has unprecedentedly lowered the threshold for the public to participate in the production and expression of the desire of popular science short videos, and everyone can express their own scientific views and ideas. The popularization of short video communication of science content makes the platform attach importance to human perspective, human emotion and human experience in science communication, so as to realize a form of communication close to scientific democratization and popularization. Although the boundary of science communication between experts and the public still exists due to the gap in knowledge level, the gradual blur of the boundary of science communication essentially reflects the essence of science popularization —— It makes it possible that “everyone is a science disseminator”.

5.2.2. Diversification of Science Communication Subjects

Based on the content analysis method of scientific communication short video, it can be seen that other subjects except professional medical care account for as much as 45.28%. The trend of diversification of communication subjects is obvious, and more and more public and science lovers are devoting themselves to science communication. The traditional understanding of science communication is mostly based on the scientists as communicators and the government science communication to the public that can provide authoritative proof. In today’s era, the public can not only be the audience, but also play the role of communicators in the process of science communication in the digital media environment. From the cross-analysis data of the communication content and the subject, on the one hand, the traditional scientific objectivity is partially preserved. The science of science communication and the authority of experts and scholars, The professional rigor of the communication content of the official media and professionals reflects the objectivity of the scientific truth; on the other hand, In order to attract the public, In terms of narrative structure, the audience of “catching” and “at the beginning” and “case analysis”, Analyze your emotional state and personal experience in the communication content, And often use logical combination and total score and total combination to enrich the communication structure, Relative to the single preaching mode of professional health care, On the contrary, ordinary people can better meet the needs of science communication videos from different backgrounds and different ages. Both the “logical structure” and the short video narrative structure of “total score structure” reflect the trend of scientific communication short video narrative. The short video theme adopted by the public are relatively extensive, the expression logic is simple, the language expression is more direct, not limited by the standardization of language expression, and the narrative is more flexible. A healthy scientific communication environment allows the existence of multiple voices and various forms of

communication narrative. The voice of experts and scholars and the presentation of narrative subjects from the folk jointly form a scientific communication situation in the integration of PGC and UGC.

5.2.3. The Forms of Short Video Communication Are Myriad

Research also found that the language of communication form of emotional attitude, professional care to objective reason, problem without emotional color, and it is difficult to do this for ordinary people, spread the subject of emotional attitude will further change into emotional perception, in the spread of scientific content at the same time also can give a short video deep spiritual connotation and humanistic feelings. From the cross-analysis of communication subjects and forms, different subjects have different preferences for using different video types. Graphic video and cartoon animation have become popular ways for ordinary people. Professional medical care has gradually begun to create graphic video types and other short video types such as cartoon animation other than the traditional “single recording” type with the help of video platform, and work hard on video cover, subtitle text and video stickers. In video beautification, cover, subtitles and stickers have almost become the three essential elements of scientific communication of short videos. Especially when popularizing important scientific knowledge and theories, the existence of subtitles can effectively help readers to quickly obtain effective information in massive content. Science communication subject common meet platform on the basis of functionality and ease of use to attract user attention pleasing visual design and style, in addition, in addition to professional medical students, ordinary people and fitness coaches also pay attention to video stickers layout, copywriting and music collocation, etc., strive to rich novel interaction form in reducing the public to understand difficult both good visual experience.

5.2.4. Technology Availability Is the Catalyst for Blurred Propagation Boundaries

Although short video platforms do not produce content, they are not only passive content aggregators, but also active content catalyzers. The unique feature of short video platform in science communication lies in that it includes the general public blocked by the professional knowledge and digital divide in the past traditional media era into the ranks of content producers, so the application scope of availability elements has been expanded from professional content production personnel to all video platform users. In the digital media environment dominated by “technology”, digital technology has endowed with the new creative characteristics of short video. The information increment, multiple narrative and empathy experience brought by technology transform the operation logic of traditional science communication video. In the era of the development and explosion of digital intelligence, the communication mode of science communication is changing rapidly. In the future, the short science videos should integrate the characteristics of the platform with the scientific content, grasp the “intelligent” characteristics of the platform, fully give the general public a voice, and attract them to participate in the link of science communication. At the same time, the main body of scientific communication also needs to firmly grasp the traffic advantages brought by short video, seize the tuyere, and the benign interaction with users, which is the key to its development and survival in the digital era.

5.3. Reflection

What needs to be reflected is that Chinese experts and scholars are rarely trained in science communication, and they cannot well convey the scientific research results, scientific methods and ideas to the public and the media. Secondly, professional medical staff are not actively using the media technology of emerging platforms, so it is difficult for short video creation to not only truly adapt to the communication methods of different media platforms, but also meet the basic requirements of scientific and understandable and vivid communication works. At the same time, due

to the lack of “gatekeeper” in short video platforms, some short videos are apparently telling scientific content and teaching scientific knowledge, but they use the shell of science to serve personal and commercial interests, and conduct pan-entertainment communication in the name of science. The homogenization, kitsch and utilitarianism of these short videos of science communication are obviously the bad effects brought by the blurred boundary of science communication and the excessive popularization of science communication. Therefore, continuously optimizing the scientific communication content of short video, utilizing the communication technology of media platform, grasping the communication trend, meeting the needs of mass communication, and realizing the mutual borrowing of communication technology and scientific content will be our effective way to eliminate the boundary of scientific communication and scientific democratization, popularization and even generalization in the future.

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