**The Imagination of Communication Studies: Development Prospects from the Perspective of Data and Algorithms**

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Abstract: The emergence of the Internet has given rise to the "digital society" with an irreversible trend. While it has brought about earth-shaking changes in human development and social production, it has also brought more possibilities for the development of social sciences. As an emerging discipline that is closely integrated with technology and mutually beneficial with other disciplines, communication studies focuses on the relationship between technology, people and society. This article starts from a perspective that faces reality, looks at the future, and focuses on the world, and presents a picture of the development of communication studies under the background of digital and algorithmic background.

Keywords: big data; “digital society”; communication studies

From the invention of the world's first computer in 1946 to the birth of the Internet in 1969, and the rapid development of information technology since the 21st century, digital technology has become the most efficient, least damaging, and most profitable way of communication that human society can currently master, and the "digital society" has emerged. The so-called "digital society" is a figurative expression of the "network society" and "virtual society", and is also a specific social construction and cultural form that is in line with the times, with the characteristics of digitization, networking, and intelligence.

With the development of science and technology and the acceleration of social and economic development, the entire human society is also moving forward, and digital plays an increasingly important role in it. Current technologies, such as big data, AI, blockchain, the Internet of Things, artificial intelligence, etc., are no longer privileges owned by a few people. Like transportation, post and telecommunications, greening, and commercial construction, they have become essential infrastructure for the operation of society. The value of Internet technology lies in the circulation of information and the distributed network across time and space established through information sharing.

Communication behavior can be seen anywhere and at any time in all aspects of social life. As an interdisciplinary subject, communication is deeply nourished by sociology, anthropology, management, philosophy, and literature, and has a continuous corpus of phenomena. Its future development is also in such an interactive and integrated subject background, reflecting the changes of the times in theory, recording the latest changes of the times, exploring the impact of communication behavior on human society, and crossing the disciplinary gap with the perspective of information technology to seek rational development. At present, big data is widely used to provide samples for quantitative research methods. Whether in the theoretical analysis level or in the actual news communication operation, this research paradigm is widely recognized and deeply applied. The use of computer technology can basically achieve full data and full sample coverage, eliminating the complicated steps of sampling, stratification, questionnaire distribution, collection, statistics, etc. in quantitative research, which is convenient for timely prediction and analysis of social hot spots; the huge database also makes the research results more accurate, allowing a set of data to be used for multiple purposes and obtain multiple sets of causal relationships. By using principal component analysis and keyword exhaustive methods, we can obtain public data from research institutions and commercial media through emerging crawling tools, transform theory-driven into data-driven to seek breakthroughs, analyze specific situations at the macro level, and combine quantitative and qualitative methods to give communication studies new life.

As a popular academic research, the ideal state of big data is to use data to conduct a remote observation of social phenomena, to observe social phenomena in a slice-like manner, and to conduct macroscopic measurement and control of social changes beyond time and space. Transplanting Wright Mills' "sociological imagination" into the field of communication studies, using technology to link data with social experience, so that theories and paradigms can exist in more different ways.

**1. Using big data to reorganize new perspectives derived from history**

The significance of history lies not only in the past, but also in the present and the future. The sorting out of history contains a universal philosophical consciousness - people-oriented. "If an individual wants to understand his own experience and estimate his own destiny, he must locate himself in the era he lives in; if he wants to know his own life opportunities, he must understand the life opportunities of all individuals in the same situation as himself." Because all the derivative processes of history are closely related to people, they are created, written and inspired by people, which is inextricably linked to the dissemination of social information. Therefore, we can even conclude that history is yesterday's news, and news is tomorrow's history. History is a long river of facts composed of a series of news.

The development of big data has given history a new context. The information that was once ignored in the pile of old papers can now be rediscovered for our use, making history visible, measurable and comparable data. I will give an example: semantic analysis is an indicator for judging the effect of communication, and it is also a means of analyzing and improving the quality of propaganda. Therefore, there are precedents in the research of literature, communication, and semiotics, and it is the focus of experts and scholars; the innovation of big data technology has brought extreme convenience to traditional text mining, and also given many inspirations to communication researchers. The Center for East-West Cultural Studies, jointly established by Nanjing University and Johns Hopkins University in the United States, used more than 48,900 poems in the "Complete Tang Poems" as samples, and conducted full-text mining and analysis with big data, artificial intelligence, autonomous learning and other scientific and technological means, mainly including: analyzing common words and high-frequency words in nearly 50,000 Tang poems, discovering typical images in Tang poems, finding the most similar "synonymous poems" and "similar poems" in the whole Tang poems, and comparing the styles of Tang poems, Song poems, and Yuan operas based on data analysis. Finally, the conclusion is that the most common monosyllabic word in Tang poetry is "人", which fully proves the people-oriented characteristics of literature and art; the common emotional expressions are sadness, fear, joy, anger, thought, happiness, and worry, and these emotions are usually expressed through the description of scenery, the change of seasons, the rendering of colors, and the author's direct expression of his feelings, which is consistent with the literary cognition of "using scenery to express emotions" and "scenery in front of the eyes is the emotion in the heart". Finally, through the comparative analysis of the three texts of "Complete Tang Poems", "Complete Song Ci" and "Complete Yuan Opera", it is concluded that the three genres have obvious characteristics. Tang poetry is mainly based on the description of mountains and rivers and iron horses, which well confirms the division of landscape and pastoral poetry and frontier poems in the heyday of the Tang Dynasty; Song Ci is graceful and soft, mostly expressing daily life scenes and love between children; Yuan opera is closer to life, easy to understand, free and easy, and has obvious characteristics of opera.

From this we can see that using advanced digital technology to extract data from history that cannot be collected by human power alone as triggers and clues, and then using professional business knowledge and background knowledge to analyze and discover connections, evolving from superficial data stacking to deep paradigm analysis, will open new doors for communication and sociological research.

**2. New ideas for using big data to support the development of traditional theories**

The emergence of the discipline of communication fully conforms to the development of the times and the needs of society, especially in the two world wars, and the theoretical system has been enriched and completed accordingly. A series of schools and theories came into being to guide media organizations on how to capture the hearts of the audience, obtain better propaganda effects, study the establishment of communication mechanisms and the operation of institutions, make use of technology for our own benefit, and achieve long-term development. McLuhan and the media environment school, who held high the banner of "the medium is the message", jumped out of the traditional critical and management perspective, looked at society and people from the perspective of technological change, broadened the scope of communication research, found new perspectives and paradigms, and pointed out more presciently that the continuous change of technology will bring about theoretical innovation. How to innovate? How to prove the replacement and change of theories in a theoretical way is also a natural part of the research of contemporary journalism scholars.

In 1970, in response to the sudden rise of television media, American scholar Titchener proposed the famous "knowledge gap" theory, that is, the more information mass media transmits, the greater the information gap and knowledge gap between people of different classes tend to widen. As televisions, computers and other technical equipment have gone from "swallows in the halls of the rich and powerful" to "flying into the homes of ordinary people", the academic community believes that the gap will be bridged at a certain stage, but they ignore the important fact that the development of technology is endless. The subsequent birth of Internet digital technology has further widened this gap, and the academic community soon came up with the concept of "digital divide". In the "digital society", expressing oneself in digital form has become a habit. The so-called digital technology is no longer a privilege of a few people who are high above, nor is it a special skill that requires high cost and high education to master. The COVID-19 epidemic is more like a "catfish effect" - driving people to actively rush into the digital torrent and launch a vivid practice of building a "digital society". The Internet and big data have become a new infrastructure, and digital connections, digital literacy, digital gaps, and digital differentiation all show the high complexity of the "digital society".

The benefits of the "digital society" are the high efficiency, sustainability and fairness of social operations. However, what follows is the continuous aggravation of the digital divide, the typical evolution of social stratification and the imbalance of social cognition... Therefore, in media reports, any event may become an extreme public event, and any person can represent and relate to everyone, igniting the fire of polarization. The free expression of opinions has become the original sin of the poor flow of information. In the entire global village structure, the balance is constantly broken, and the order is repeatedly revised, subverted and rebuilt. Digital differentiation has caused society to be continuously differentiated. Differentiation has penetrated from one field to another, and spread from one civilization to another. Digital differentiation has formed resonance and resonance with the differentiation between the rich and the poor, and has extended this differentiation to the field of knowledge and information. The most typical manifestation is that industrially underdeveloped countries are also digitally underdeveloped countries, and digitally underdeveloped countries are also extremely poor countries, without exception. In the field of mastering and disseminating information, "digital refugees", "digital immigrants" and "digital natives" that never appeared before the 20th century have emerged, such as migrant workers who cannot buy tickets because their mobile phones have no internet connection and they cannot use software, the elderly who are restricted from traveling because they cannot operate and obtain health codes, and poor children who cannot take online classes at home due to lack of terminals... In the "digital society", the more people in this group there are, the more scarce their digital literacy is, and the bleaker their future is.

In addition, whether classic communication theories such as the spiral of silence, cultivation theory, knowledge of propaganda techniques and measurement of communication effectiveness have undergone new changes or even subversion in the digital society, and in what direction they will flow in the future, all require scholars to continuously monitor and summarize and draw conclusions that keep pace with the times.

**3. New Models for Predicting Future Development Using Big Data**

Numbers have memories. In today's world where digital technology is becoming increasingly mature, everything that exists must leave traces. The existence of big data can not only sort out history, but more importantly, it can predict and analyze future development trends, behavioral trends, and desires through a large base of various data. Big data provides a new scale for traditional and historical data and a new method paradigm for machine learning. The combination of the two can provide new research methods and research perspectives, and provide insights into the general laws of social operation.

When the COVID-19 outbreak occurred in Wuhan in early 2020, in addition to the determination of the Party and the state, provincial and municipal leaders, and medical experts to make decisions on whether to adopt "city lockdown" measures and how the disease would develop, there were also many experts and authorities in social and technical disciplines who provided advice as think tanks. Among them, there were many predictions and judgments made using big data algorithms, which provided effective help in timely blocking the spread of the epidemic and eliminating it. A group of quantitative research scholars used data from Baidu Migration and Baidu Maps applications to accurately predict the number of COVID-19 infections. They first formed a curve of data such as the daily infection rate in Wuhan and the number and direction of population migration in and out of Hubei since January 10, the daily number of new cases in provinces across the country, medical level comparisons, development level comparisons, and the cumulative risk of the previous epidemic, and formed a change chart with daily or even hourly units. A professional team of medical experts then judged the impact and importance of each indicator, assigned it a proportional index, and formed a judgment framework and a total index. Finally, they used algorithm technology to integrate these data, determine the causal relationship and connection strength between the elements, and obtain authoritative and fair epidemic risk judgments, providing a scientific reference for the central government to make decisions to "isolate" and "support Wuhan", and made great contributions to saving patients, preventing the spread, and timely controlling the epidemic, all of which reflect the characteristics of a digital society and the power of digital technology.

It is particularly worth mentioning that the inclusiveness of technology platforms and the widespread use of big data not only provide effective basis and reference for efficient government governance, but also bring convenience to the news and public opinion industry. In the international public opinion struggle surrounding the COVID-19 epidemic, my country's media fought a beautiful battle with the help of big data. This is a successful attempt to closely connect the central media with local media, traditional media with new media, government media with commercial media, and even self-media. With accurate data, detailed details, scientific judgments, and timely feedback, it has effectively countered the malicious slander and shameless accusations made by Western media represented by the United States, such as "the new coronavirus originated in China", "China's poor epidemic control has led to a global collective infection", "China's malicious spread of the virus is aimed at suppressing the United States", and "China's humanitarian assistance and donations to other countries are a show". It has made China's position clear and powerful, and resolutely refuted and exposed the unreasonable pressure. It is well-founded and neither humble nor overbearing, truly reflecting the responsibility that a major country should have, and effectively promoted the concept of "a community with a shared future for mankind" advocated and emphasized by President Xi, and played a powerful role in guiding public opinion.

In short, the future of communication will undoubtedly shift from the inclusive but essential communication concept to the realistic and pluralistic communication, bringing together all social and cultural aspects to create the crystallization of wisdom. Just as development is an eternal proposition of human society, the integration of technology and communication will also be unstoppable, facing the future and the world, creating the "imagination of communication".

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