

Analysis of the "Nipkow Disk" Phenomenon in Public Opinion Dissemination

Dun Hou*

Liaoning Communication University, Shenyang, 110000, China

* Corresponding Author Email: 944319074@qq.com

Abstract. The "Nipkow Disk," invented by Paul Nipkow, scans and transmits images through the combination of apertures and coils. When applied as a model in communication theory, it provides a new perspective on the complexity of information dissemination. This paper explores the relationship between the "Nipkow Disk" phenomenon and public opinion dissemination, proposing that public opinion spreads not linearly but through a series of virtual nodes, such as individuals, media, or organizations, which play a crucial role in the process. These nodes form a complex network structure, where public opinion spreads in a line-by-line scanning process, fermenting rapidly and gradually revealing the full picture.

Keywords: Nipkow Disk, Public opinion dissemination, Shadowless lamp.

1. Mapping of the "Nipkow Disk" Phenomenon in Public Opinion Dissemination

In 1884, German inventor Paul Nipkow designed a perforated "scanning disk." He drilled 12 small holes, each about 2 millimeters in diameter, evenly spaced along a spiral near the disk's edge. Though the disk may seem unremarkable at first, when mounted on a rotating shaft with a small window in front and a picture behind it, a fascinating effect occurs: as the disk spins rapidly, the image behind it becomes clearly visible through the window. When the disk slows, the image blurs and eventually disappears, leaving only a small visible portion through the hole.

This is the famous "Nipkow Disk." As the image passes through the small holes on the disk, it is scanned and transformed into individual points of light, which are then received by a photocell. The image is thus converted into a series of electronic pulses. Since the speed of electricity is 300,000 kilometers per second, and it only takes 1/10th of a second for humans to perceive an image, people do not notice that the image is being decomposed and reassembled.

With the full coverage of mobile internet, the "Nipkow disk" phenomenon has introduced the concept of line-by-line scanning, which originally appeared only in the field of optoelectronics, into the realm of public opinion in a new form. We can simply understand it as a method of communication that involves a detailed and in-depth analysis of information. Specifically, the subject of line-by-line scanning can be media organizations, news reporters, or even the general public. When facing a public opinion event, this process involves receiving or observing and analyzing it. The receiver conducts a line-by-line, frame-by-frame detailed interpretation of the news event or topic to gain a more comprehensive and thorough understanding of the entire event.

Assuming that the image behind the disk represents a news event, then the disk itself represents the entire public opinion arena, and the orderly distributed small holes act as the nodes of information released during the communication process, or serve as key figures, influential individuals, and media. If the disk (i.e., the public opinion arena) does not rotate, then what the public sees is only the "partial truth" behind a single piece of information. Although there are many holes and they are dispersed, they still do not provide a complete view of the entire event.

Conversely, when the disk begins to rotate, the connections between the holes start to jump, and the underlying news event appears in front of the public in a line-by-line scanning manner. Moreover,

the faster the rotation speed, or in other words, when the speed of news propagation exceeds the rhythm of public attention, the full picture of the event naturally comes into view for everyone.

In other words, the early stages of public opinion dissemination might only provide basic information about the event, but through the rotation of the “Nipkow disk,” a line-by-line scanning process could lead the public to explore the deeper causes and impacts of the event, potentially including relevant social backgrounds, historical factors, and more. This approach to attention and communication can help the public better understand the complexity and significance of the event.

The key to the “Nipkow disk” phenomenon is the “propagation speed” and “spread range”. Propagation speed refers to the speed at which information is transmitted from one node to another, and the spread range indicates the extent of information transmission in the network. Therefore, it can be deduced from the “Nipkow disk” phenomenon that the transmission speed and scope of information are characterized by exponential growth, that is, the information will quickly spread to more nodes, forming an exponential communication network.

It is important to note that the “Nipkow disk” phenomenon in public opinion dissemination remains a theoretical model. While it offers some reference and application value in studying public opinion, information dissemination, and social networks, and provides guidance on the general patterns of online communication, it still requires analysis and research tailored to specific contexts in practical applications.

2. The “Nipkow Disk” Phenomenon and the “Shadowless Lamp” Effect

The widespread adoption of internet applications has led to revolutionary changes in the formation of social opinion and human communication methods. Everyone can now voice their opinions through mobile internet at any time and from anywhere, but this convenience has also brought about new issues, such as the spread of false information and rumors.

Many scholars have proposed theories about the internet's ability to restore the truth of events. Professor Yu Guoming from Beijing Normal University, through observations of truth restoration in the dissemination of information on Weibo, introduced the concept of the “shadowless lamp effect.” He argues that in Weibo discussions, individual viewpoints may have shortcomings, much like the “darkness under the lamp” that old-fashioned desk lamps couldn't avoid. However, when all informed viewpoints converge, they create a structural relationship of mutual supplementation, correction, validation, and extension, through which the truth emerges within this information structure.

It is akin to a shadowless lamp used in medical surgery, where multiple high-intensity light sources are arranged on a large lamp plate according to specific rules. The light shines from different angles and directions, creating a large, uniformly lit area. The shadows cast by each point light source disappear, eliminating dark spots in the surgical field.

Some scholars have even suggested that as long as an event has more than one eyewitness and the information dissemination mechanism is sufficiently open, the final conveyed truth will often be more comprehensive, restoring the factual truth and creating a restoration effect.

Turning on the “shadowless lamp” brings one closer to the facts, reflects the truth, and reveals the truth. Once an eye-catching event appears online, internet users will pay attention, spread, and comment on it, offering their views and opinions on the same event and related events, and providing text, audio, images, and video related to the event, forming a holographic puzzle of the event. In this process, internet users act as countless point light sources, providing additional illumination to the information sources for other users, creating a “shadowless lamp” effect.

Clearly, the “shadowless lamp” effect is an ideal state achieved by continuously “punching holes” to make the holes in the public opinion arena more numerous, thereby directly restoring the news event. However, it is important to note that with each “punch” in the “shadowless lamp” effect, there is a risk of creating a “look at a leopard through a tube” effect, where the public may make irrational

judgments similar to “blind men touching an elephant” and arrive at imagined conclusions. This could delay the progress toward a final result or generate suspicion and rumors.

In contrast, the “Nipkow disk” phenomenon is relatively scientific and practical. By systematically “punching holes,” that is, revealing parts of the event, and accelerating the dissemination speed (i.e., guiding public opinion), the public forms a picture in their minds rather than obtaining it directly. This approach not only leaves considerable space but also ensures that when the main plan suspends dissemination, by simply slowing down the dissemination speed, the goal of making things “unclear” can be achieved.

Indeed, bridging public opinion requires leveraging various forces, but it is also essential to recognize that relying solely on internet users’ self-correction ability is far from sufficient. Official organizations and media must guide the process, using multiple channels and methods to explain, scientifically guide the rotation of the wheel, and balance and counteract negative information. Only by forming a coordinated effort among government authoritative information supply, timely media follow-up, and self-purification by internet users can the combined effect of the “Nipkow disk” phenomenon and the “shadowless lamp” effect be maximized.

In addition, the phenomenon of "Nipkov disk" is also upgrading iteratively, and it is being given an innovative means of communication. For example, the mainstream media is gradually adopting new expressions to attract the audience. If the previous mode was only drilling, then now more links begin to pay attention to "Is this hole round and accurate?" Even different shapes of holes will be used with different public opinion events. These vivid expressions more effectively improve the dissemination and guidance of information. Influence and credibility.

3. Implications of the "Nipkow Disk" Phenomenon in Public Opinion Dissemination

The “Nipkow disk” phenomenon in public opinion dissemination exhibits a non-interleaved scanning effect. This means it is an imaging encoding method, not a simple sequential process from 1 to 2 to 3, but rather a process where each line or pixel is scanned to "re-draw" the event image in the public opinion arena.

Therefore, in the “Nipkow disk” phenomenon, public opinion dissemination does not transfer directly from one hole to another. Instead, it is transmitted through multiple jumps, making the process more complex and unpredictable. Public opinion transmission often goes through several stages, each of which might filter, modify, and interpret the information, leading to differences between the final information and the original.

In addition to the nonlinear characteristics, the "Nipkov disk" phenomenon is also reflected in the diversity of public opinion communication, that is, because there are multiple middle holes in the process of public opinion dissemination, the transmission path of public opinion has also become diversified. Different information may be transmitted through different paths, resulting in diversity in the formation and development of communication. In the dissemination of public opinion, different views and opinions can be transmitted to different audience groups through different channels and methods, thus forming a diversified pattern of public opinion.

And due to the leapfrog transmission, the public opinion transmission path in the "Nipkov disk" phenomenon also shows a circularity. This means that public opinion may continue to return to the original hole in the process of dissemination, forming a closed loop. This cyclicity makes transmission more stable and lasting. In the dissemination of public opinion, some important views and opinions may appear repeatedly at different times and places, thus attracting more people's attention and discussion.

In the "Nipkov disk" phenomenon, the influence of different holes is different. Some holes with high influence (such as authoritative media, opinion leaders, etc.) play a key role in the dissemination of information, while some holes with low influence mainly play a role in transmission and diffusion. In the dissemination of public opinion, the remarks of some important media and opinion leaders can

often attract wider attention and discussion, while the voices of some ordinary users may be ignored or overwhelmed.

Therefore, when studying the dissemination of public opinion, we should pay more attention to the circular dissemination process of important views and opinions to better grasp the law of the dissemination of public opinion. Therefore, when studying the dissemination of public opinion, we should pay attention to the impact of highly influential nodes on the formation and development of public opinion, and also pay attention to the voice and participation of ordinary users.

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