The Significance, Operation Logic, and Coping Methods of Cognitive Competition in the Era of Digital Media

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Abstract: Cognitive competition is the artistic process of changing the audience's cognition and behavior through technical tools such as big data algorithms, precise push, and social platforms. Cognitive competition has affected global Internet users in an invisible manner, like air. This paper first analyzes the significance of cognitive competition to communication research and national public opinion security. Second, from the theoretical basis of cognitive science and communication, this paper discusses the operation logic of cognitive competition affecting people's thinking and action. In addition, four realistic approaches are proposed, including cognitive consumption caused by redundant information, cognitive errors caused by false information, cognitive bias caused by one-way information, and irrational cognition caused by emotional information. Finally, from the national and individual levels, it is recommended that different subjects actively respond to the risks of cognitive competition with an evident attitude and comprehensive preparation. We can jointly build a free, rational, healthy, and efficient online discussion space through this.

1. Introduction

In the era of digital media, the way of human communication is undergoing complex and profound changes. New forms such as massive information, intelligent algorithms, and live online appear. The increasingly widespread and coordinated use of social media, digital communications, and other integrated communications tools has made it possible to reach audiences more quickly with carefully planned, personalized, and targeted content.

Human thinking has become a weapon for interest groups to compete and divide in the communication environment. It involves the operation of the cognitive field to change the target's perception, which leads to the change of the target audience's scheduled action and gains the advantage over the competitor. Psychologist Lahey defines 'cognition' as a series of processes, including information acquisition, transformation, storage, and extraction [1]. It includes the psychological process of obtaining, sorting, explaining, and analyzing information, constituting the pre-action mechanism. The cognitive competition represents the competition that acts on the cognitive process. In addition, it is the behavior of competitively seizing the limited cognitive resources of individuals through various ways in the communication environment [2]. The current cognitive competition integrates available information, networking, and psychological elements. The purpose of the cognitive competition is to manipulate the target population's perception; it is necessary to ensure that the target population takes appropriate actions to achieve the desired results so that the entire social environment serves the group's interests and ideology. On various digital media platforms, the focus of cognitive competition among many stakeholders is the control and anti-control, leading and anti-leading of communication content; the competition for network discourse power with information as ammunition has become the main confrontation in today's cognitive competition.

Based on the current situation and the change in the international situation, this paper puts forward the following research topics from the theoretical basis of cognitive science and communication: First, what role and value does cognitive competition play in developing disciplines and society? Second, what kind of communication logic and the realistic path does cognitive competition affect people's thinking and action? Third, how should the state and individuals respond to complete the social space and self-shaping of free rationality for this competitive situation?

This paper investigates the above dimensions to make a preliminary exploration for future research on cognitive competition in communication.

2. The Disciplinary Value and Practical Significance of Cognitive Competition Turn

The actions of shaping popular thought and competing for attention have never stopped. The history of communication studies is also a record of competition. At the very beginning of the establishment of the discipline of communication, Harold Lasswell defined the word "propaganda" in Propaganda Technique in World Wars: "With meaningful symbols, or a little more specifically and not so precisely, is to control the views by descriptions, rumors, reports, pictures, and other means of social communication [3]". A few years later, he shortened the original sentence to "the technique of manipulating expressions to influence people's actions"[4]. Until today, countries compete for the right to speak in the international community. From governments and organizations to individuals, they have frequently spoken in the Internet communities of different countries, trying to influence global public awareness, public opinion, and even action strategies. It has always been the focus of business groups to attract the audience to receive specific information in massive information and to make specific changes in the attitude and behavior of the audience toward things. The mechanism of this process is also the focus of communication. In the era of digital media, where everything can be digitized, the turn of cognitive competition is valuable for both the development of disciplines and specific communication practices in the international community.

2.1 The Response and Development of Traditional Studies

Communication research has evolved from a focus on grand narratives to a focus on the cognitive behavior of individual users. This process reflects a shift in academic thinking and paradigms. At the same time, academic research must follow the reality, actively resolve the dilemma, and provide solutions for the contemporary media environment. Since the beginning of the discipline, communication science has been nourished by psychology, sociology, philosophy, and other contents and studied by generations of people. It has gradually divided into two branches of communication thought in the European continent and the United States. Focusing on issues of cognitive competition and communicative practices reveals modern people's responses to past ideas.

First, European communication science takes cultural research, critical research, and political economy research as the core, focusing on the value of communication, that is, the influence of communication on human life and production. European scholars have always believed that the emphasis of communication is not the function and effect but the overall development and liberation of human beings. To realize the free and comprehensive development of human beings, the focus of communication is not on what kind of information the communicator sends and what effect it achieves; but on the bondage, control, or liberation of mind, brain, and thinking caused by ideology or the content it disseminates. The study of cognitive competition is a response to the European branch. It focuses on individual users, micro-level psychological cognition, and ideological shaping activities.

Second, although cognitive competition has moved from macro to micro, the thinking dominated by communicative effects in the United States remains focused on studying users' information acceptance. In essence, it focused on studying users' information received and how it affects users' cognition and understanding of social events and forms public opinion. The fundamental purpose of the study is the communication effect, which conforms to the fundamental philosophical logic of human beings from consciousness to practice. Individual users have different perceptions of something or a conception, which ultimately affects individuals to make a variety of behaviors and feedback. Therefore, the microscopic cognitive competition is oriented by externalized actions and reactions, essentially a 'propaganda war' and a 'public opinion war.' Cognitive competition has evolved into a new form in the era of digital media.

Finally, in the information war of digital communication, cognitive theory has become a new field of research for communication science. In addition, the research purpose is changed from split military manipulation to cultural exchange negotiation and win-win situation, hoping to explore higher value in the background of digital communication. Dialogue, communication, and negotiation affect users' cognitive field, enhancing mutual understanding and seeking consensus among nation-states. Finally, the goal of building a cultural community and enhancing harmony and happiness is achieved. In this sense, cognitive competition and innovation have developed the study of communication.

2.2 Provide Theoretical Guidance for National Public Opinion Security

The theory of cognitive competition was first proposed for foreign military strategy, which refers to the attempt to manipulate the cognition, thinking, and even behavior of other countries' nationals. For example, when there are hot events involving national security and national interests in the opinion field, the global users' positive perception of the event is conducive to the cohesion of the country's masses; they take concerted action abroad, seize the commanding heights and master the right to speak, and form a good leadership. On the contrary, once the global users form a negative cognition, it may evolve into an action that destroys or divides the world after fermentation. To sum up, this is the Cognitive Warfare of the information age outside the firefight, using network technology to alter users' cognition, manipulate public opinion, and control the evolution of the situation.

Today's human war is more covert and comprehensive. The field of human thinking has become the sixth battlefield in addition to the five battlefields of land, sea, air, sky, and network. The combination of Internet users' global access, algorithm push, and large-scale AI technology makes the war no longer limited to the traditional "hot war" attack. Still, it turns to the social consciousness oppression brought by digital media information dissemination. As the "tug-of-war" between Russia and Ukraine outbreaks, Cognitive Warfare also appears more frequently in public view. Supported by solid intelligence capabilities, combined with the cooperation and guidance of the mainstream media, the relevant countries publish information in cyberspace, including websites, blogs, and social media platforms, to compete for and control the right to disseminate public opinion. Through the interaction and re-creation of global Internet users, the news has snowballed many times. At the same time, the government continues to form high-intensity cognitive oppression of Internet users. It suppresses or incites some opinions, reducing the influence of the enemy regime on the target audience and thus promoting the implementation of policies in the country.

For example, in the cognitive war of the Russia-Ukraine conflict, Russia used the grand narrative of the official media and viciously questioned Ukraine's national legitimacy from a historical perspective. In comparison, Ukraine makes good use of social media to carry out the fragmented expression of different narratives from the perspective of netizens. In addition, the involvement of social media is prominent. Statistics show that less than a week after the Russian-Ukrainian conflict, there have been about 1.31 million false reports on the situation in Ukraine and Donbas. About 100 new false news appears every 20 minutes. These cases reflect that in the Russian-Ukrainian conflict, multiple subjects are engaged in carefully planned information production and distribution, trying to influence the pattern of war by manipulating public perception.

The application of cognitive warfare appears in the Russian-Ukrainian conflict and hides in the global network, evolving into an uninterrupted and normalized struggle. Ideological propaganda, indoctrination, the infiltration of values and culture, and information technology for network attack and defense are all essential parts of cognitive warfare. Whether at home or abroad, the interest in the competition for individual cognition of users has far exceeded the single field of communication or public opinion. Its importance involves macro, meso, and micro levels. Scholars and political leaders from all over the world have been unable to ignore the importance of cognitive competition. The consequences of cognitive competition are beyond computation, and it is not a temporary bias of public opinion. Therefore, it is of great practical significance to be keenly aware of the implicit significance and operational logic of cognitive competition in disseminating pan-data and to provide theoretical guidance for the judgment and action of nations and countries in international public opinion.

3. Operation Logic and Coping Methods of Cognitive Competition

From the attention to communication skills in the discipline's early days to the media industry's suggestion that content is king in the paper media era, Internet communication has spawned user-centric Internet thinking. In the evolutions, people are starting from the user to explore how communication subjects use limited cognitive resources to compete and plunder under the influence of massive information. Cognitive competition is not about manipulating information flow but the subjective cognitive process of individuals. Moreover, the cognitive competition relies on the processing mechanism after individuals receive information. Based on this, a chain from media information contact to communication effect is completed.

3.1 Cognitive Consumption Caused by Redundant Information

In the digital media communication environment with the characteristics of the multi-screen, hyperlink, and massive push, users are increasingly being trained to process information with fragmented, fast-reading, and shallow thinking. In addition, the user's energy is continuously consumed by overload information. Although people feel exhausted in the information world, they have to deal with massive amounts of information due to fear of being separated from the group and lagging behind the times. Therefore, there is a contradiction between information resources' infinity and individual cognitive resources' finiteness. In the long run, individuals may burn out. It isn't easy to stimulate and mobilize their cognitive enthusiasm, and they gradually lose the ability to think independently, thus affecting cognition and thinking. Like computer programs, there is a limit to the ability of the human brain to process information. If the brain needs to handle many tasks, the processing rate will slow, and the brain will even 'crash'. Absorbing and processing excessive information in a unit of time will lead to people's distraction and ineffective cognition and reduce the individual's cognition speed and brain operation speed. Thinking about what really should be a concern becomes a complex problem.

At the same time, the competition of massive entertainment software for consumer cognition has caused individual energy consumption. Cognitive surplus, also called attention surplus, refers to the residual attention caused by time redundancy. In the 1820s, many drunk people were in the streets of London, England. They did nothing after work, drunken by drinking gin, and spent their free time. In the era of digital media, a series of social tools developed around cognitive surplus have entered the historical stage. Taking the globally popular Tik-Tok as an example, users often make such exclamations: "In the Tik-Tok, refreshing over the past few hours, but it seems to have learned nothing." The patterned behavior law constructed by the dopamine brain circuit causes each video update to re-stimulate the brain nerve; The dopamine circuit is constant feedback, giving consumers a sense of pleasure and enjoyment because of instant satisfaction. Positive feedback will drive users to repeat actions unconsciously. Constantly updating content makes users feel busy and full. In fact, they are in the ocean of fragmented information and consuming cognitive surplus, nothing. Such fragmented information brings users into the trap, increases the individual's cognitive load, and destroys their thinking ability.

3.2 Cognitive Errors Caused by False Information

In the vast amounts of information on the network, sometimes information manufacturers confuse the public by processing false information. The cognitive contention is realized by guiding and creating individuals' wrong cognition of an event. Communicators use the network to change the user's cognitive process. The essence is to use their psychological prejudice or reflective thinking to affect decision-making and behavior. Finally, it leads to corresponding actions of individuals and groups.

The platform economy has deepened the participation privilege of content and the integration of production and consumption of media audiences. The cognitive competition based on false information propaganda frequently appears in the party struggle. The US presidential election in 2016 has made false information rise and highlighted its political function. In 2022, the Russia-Ukraine conflict recreated the proliferation of fake news on social media. During this period, a large number of fake pictures and fake videos presented on the Internet by grafting or editing modification appeared, for example, the picture of Ukrainian soldiers and their daughters going to the battlefield in tears, a synthetic video of Russian and Ukrainian military bombing civilian areas. False information generally has little effect on highly professional users in news communication. However, for ordinary users, it can achieve the effect of deceptiveness.

False reports cause widespread controversy, negatively impact, and even deepen contradictions and conflicts. It is difficult to quickly distinguish the authenticity of the information; the cost of dispelling rumors far exceeds the cost of creating false information, and the speed and scale of fact-checking cannot keep up with the speed and scale of creating false information. Therefore, people often choose to accept information rather than be skeptical. In the end, always blindly follow the point of view of false news, putting the public in a passive position. Users mistakenly believe that the first impression is their cognitive schema. With the reinforcement of bombshell false news, the initial misperception will solidify into stereotypes, which are difficult to change. For such false information, it may not be that the user actively clicks to obtain it but passively accepts the information instilled by the source. In addition, accurate push false news is often accompanied by irrational elements such as sensational, and people easily believe them sensibly.

3.3 Cognitive Prejudice Caused by One-way Information

The human brain depends on various temporary buffers to retain information of current interest [5]. To ensure the space capacity of the buffer, we will use the label to abstract the classification, construct the information integration system for recognition and action in the brain, and put the information into the brain in the appropriate place and fix it. The operation of the classification framework inevitably leads to prejudgment and thus falls into bias. Therefore, people tend to prejudice.

The role of media information in the formation of prejudice is significant. Lipman proposed the concept of Pseudo-Environment: Through the selection, processing, and reporting of news and information, the mass media has re-structured the virtual environment suggested to people and inserted a vast Pseudo-Environment built by the mass media between people and the natural environment. Due to mass media's bias, people understand reality through a one-sided pseudo-environment, which is easier to construct stereotypes and prejudice.

The Priming Effect of cognitive psychology shows that people usually do not consider all factors when choosing and judging. Instead, people take shortcuts and analyze information based on the closest nodes in their cognitive networks. The power of priming is that it can activate the nodes in people's cognitive networks. The news media will provide the audience with a priority context superior to the news content to enhance the communication effect. Priority context is information with stereotypes and biases, which may exist in other reports from the same media and in the writing and analysis of news reports. They trigger nodes that make individuals associate content with stereotypes. People then judge the content of reports with such presuppositions, thus reinforcing bias.

Unlike creating false information, another practical method of cognitive competition lies in disseminators' one-way release of information. By intentionally shielding channels, concealing or ignoring the information that individuals should know, the reports strengthen prejudice in the homogeneous information flow, thus guiding individual perception towards a single channel. Individuals develop cognitive biases, and their cognitions are altered.

3.4 Irrational Cognition Caused by Emotional Information

"We always have an illusion that our feelings come from our hearts [6]". However, this is not the case. In his book The Crowd: A Study of the Popular Mind, Gustave Le Bon points out that when people gather together to form a group, their emotions and thoughts will gradually tilt in the same direction, individual consciousness tends to disappear, and collective psychology and emotions will replace it. In many scenes, it is not the will to think that causes us to act but the unconscious impulse in an emotional atmosphere. With the rise of digital technology and the realization of the right to expression, people have constructed a post-truth communication state, and emotion has become a factor that cannot be ignored in communication. The long-established concept of objectivity in journalism regards emotional news as threatening news standards and norms [7]. However, driven by interests, content in media tends to apply emotional narrative to attract public attention. At the same time, the expression of public opinion in social media is increasing, and the network has become a port for public sentiment to vent. Therefore, irrational voices accumulate and mutate, resulting in emotions such as cyber nationalism.

Compared with deliberation, irrationality is a kind of information processing that relies on emotion, experience, and memory. In rapid cognitive processing, thinking results lack a continuous logical chain and complete reasoning structure. People respond and act on their own preferences, intuition, and impulses. In the case of information overload, individuals often rely on mental shortcuts to make rapid judgments to complete information processing. The advantage of cognitive competition is that the communication subject grasps this weakness and tries to intervene in the public's cognition from the early stage of the event, accurately pushing information and opinions from attention and memory to motor control and executive planning [8]. Therefore, the public is caught in the illusion of participation and unconsciously recognizes the information received from facts, values, and emotions.

However, we need to be highly vigilant that some media content is mixed with deception and lies, trying to blur the meaning of the truth in specious language. These so-called truths take emotions as spiritual weapons, act on people's brains and attention, and generate power that affects politics and the economy. In the virtual environment on the Internet, due to the asymmetry of information, the influence of onlookers' psychology, and the indoctrination of public emotion pools, citizens are prone to cognitive and judgment errors when facing news mixed with bias, and lead them to send out discourse expressions that deviate from the ration on the Internet platform. More seriously, some people even take a series of

irrational actions to destroy society.

4. Deal with the Possible Threat of Cognitive Competition

Usually, the battle for user cognition is quietly unfolding between artificial intelligence, big data, and social media interactions. Competition can be seen everywhere in individuals, countries, and transnational organizations. In the era of pan-data, no one can live independently of the network, data, and personal intelligent terminal. Therefore, whether it is for building a national cybersecurity defense line or considering the needs of personal health and the use of networks, we need to make sufficient preparations and efforts to reduce the risks that may arise from the cognitive competition.

4.1 Country: Strengthen Technical Prevention Capabilities and Build an International Image

In the face of the objective reality of war brought about by digital technology and the change of the paradigm of the great powers' game, all countries must realize the infiltration and expansion of Cognitive War and understand that this war without smoke not only appears in the wartime stage of military conflict but also exists in a hidden way in the regular cyberspace competition. Of the vast amount of information and the mixture of participants and circulation channels, countries should actively adopt complementary prevention strategies to prevent countries from maliciously eroding their political foundations through cognitive network warfare.

First, the government should pay attention to the construction of Internet infrastructure and enhance the ability to use new technology tools and big data; with robust technologies as the support, countries grasp and perceive the global public opinion. In addition, the government needs to build a governance system with algorithm and data governance as the core, and improve infrastructure to cope with ongoing or possible future crises.

Second, the network supervision and public opinion monitoring departments are set up to supervise and analyze the network public opinion data in real-time and establish cyberspace's security risk assessment mechanism. After discovering fabricated facts and incendiary statements, managers conduct news verification to prevent the spreading false information. In the face of rumors and instability, government agencies and the mainstream media must proactively respond to potential controversies; track and make statements on hot events. By displaying evidence-based facts to gain public trust, cut off the closed loop of information that manipulates public perception.

Finally, we attach importance to the country's international communication work, promote the internationalization process of the media and the construction of overseas localization, actively speak on the international platform, show the actual style of the country to the world, and strive for a favorable public opinion environment. For intentional false accusations and erosion, we should respond quickly, set up topics, and actively discuss sensitive topics in the form of comics, short videos, and other powerful forms of promotion dissemination. We must persist, dare to struggle, and be good at struggle.

4.2 Individual: Efficient Use of Cognition, Autonomous Control of Cognition

The individual is the terminal of cognitive competition and the subject of multiple forces' interference and competition. Although individuals cannot stop the trend of the times, they can exert their subjective initiative to reduce the negative impact of cognitive competition by adjusting and striving.

First, we need to make efficient use of cognitive ability. Human cognitive bandwidth is exceptionally scarce. The capacity of working memory is limited within a specific range, which means that human beings have a significant disadvantage in dealing with a large amount of information in a short time. Once beyond the limits of cognition, the brain may strike due to overload. Based on this prerequisite, individuals need to make efficient use of cognitive bandwidth, in the case of limited time and resources, actively and consciously shield and abandon external interference and temptation. At the same time, priority should be given to work with a high difficulty coefficient and high correlation, and positive information should be input into the cognitive region of the brain. Priority should be given to understanding, thinking, and recognition, and attention should be focused on valuable affairs, isolating the interference of irrelevant information on thinking and cognition.

Second, we can cultivate our cognitive habits. Individual cognitive control covers almost all forms of human cognition, involving the process from lower to higher levels of control dependence, such as perception, memory retrieval, and action, to reasoning, problem-solving, and language. Individuals can

strengthen their mastery of cognitive control, self-examination, and active control and admonish themselves to receive external views soberly. In addition, it improves the autonomy and selectivity of new ideas, knowledge, and information cognition. By rationally and objectively clarifying the business, people can avoid being blindly and unconsciously involved in the competition of users' cognition.

5. Conclusion and Discussion

In the era of cognitive competition, the purpose of information dissemination has dramatically differed from the traditional. It realizes information transmission and exchange and is committed to completely changing and reversing brain thinking mode and cognitive dimension. Its fundamental purpose is to change how the human brain processes information [9]. Cognitive competition is not just a by-product of information dissemination. It shows that the fundamental goal of communication is to change user behavior in the age of digital media. Cognitive competition is hidden, intangible and profound. The mixed information on digital media is like a catalyst, subtly changing the individual's cognitive and mental structures. The media use individual cognitive biases and errors to manipulate their overall cognition. At the same time, the media distracts and misleads the user's attention, artificially creating pressure. All behaviors directly stimulate individual psychological acuity and weaken people's judgment ability. With the deepening of embodied participation, sensory psychology, network integration, and the trend of global social media, the form and influence of cognitive competition will also become more complex in iterative evolution.

Individual superpowers have raised cognitive competition to the level of cognitive warfare and paid more attention to it. In the world pattern, we must pay attention to cognition status in communication research, understand that the underlying logic of cognitive competition is the change of social information dissemination mechanism and paradigm, and then further study cognitive competition. This paper focuses on the turn of cognitive competition in the era of digital media, analyzes the value of cognitive competition research, and discusses the operation logic and coping methods of cognitive competition. In addition, the possible risks and countermeasures are put forward. Due to the limited depth and length of thinking, this paper does not discuss the communication and human mind, memory, neurons, event domain, and other mechanisms in detail. Moreover, what kind of social practice may be brought about by cognitive competition, for example, whether cognitive competition theory can play a significant role in reaching social consensus and forming a public sphere in an ideal state, is a topic worthy of attention and discussion in the future.

References

[1] Benjamin B. Leahy. Introduction to Psychology[M]. Wu Qinglin et al. Shanghai People's Publishing House, 2017: 338.
[2] Yu Guoming, Guo Jingyi. From 'public opinion war' to 'cognitive war': the theoretical definition and experimental paradigm of cognitive contention. Media observation, 2022: (08), 23-29.
[3] Lasswell H D. Propaganda technique in the World War [M]. The people's University of China Press, 2003: 22.
[4] Rogers. The history of communication - a biographical approach [M]. Translated by Yin Xiaorong. Shanghai Translation Publishing House, 2002: 222.
[5] Franconeri S. L., Alvarez G. A., & Cavanagh P. (2013). Flexible cognitive resources: competitive content maps for attention and memory. Trends in Cognitive Sciences, 17(3), 134-141.
[6] Gustave Le Bon. The Crowd: A Study of the Popular Mind [M]. Dai Guangnian translation. Wuhan Publishing House, 2012: 32.
[7] Pantti M., "The value of emotion: An examination of television journalists'notions on emotionality", European Journal of Communication, vol. 25, no. 2, 2010, pp. 168-181.
[8] Stokes M G, Buschman T J, Miller E K. Dynamic coding for flexible cognitive control[J]. The Wiley handbook of cognitive control, 2017: 221-241.
[9] Stout D. (2021). The cognitive science of technology. Trends in Cognitive Sciences, 25(11), 964-977.