

Trust Deficit and Cognitive Restructuring: An Analysis of the Impact of AIGC Visual News on the Public Trust System

Yufei Wu

*Dalian University of Technology, Dalian, China
yufeiwu729@gmail.com*

Abstract. Artificial Intelligence Generated Content (AIGC) is reshaping the ecology of social media and even online media with unprecedented authenticity and generation efficiency. As AI text-image and video generation technologies mature, AIGC visual news has achieved a deceptive level of authenticity, continuously blurring the line between fact and fiction. As a special information form relying on authenticity and public trust, the impact of AIGC visual news on the public trust system urgently requires in-depth exploration. Therefore, this study collects public evaluations and attitudes toward AIGC visual news from news platforms and social media, quantitatively analyzes public trust levels, and systematically explores its mechanism of action on the public trust system. The results show that AIGC visual news has triggered a significant trust deficit, whose crisis mainly stems from multiple factors such as the subversion of individual cognitive frameworks, the collapse of traditional trust foundations, and the low-cost abuse of technology. This influence has a two-sided nature, on the one hand, it weakens the traditional principles of trust; on the other hand, it compels the society to start the process of cognitive restructuring to facilitate the creation of a more reasonable and transparent trust mechanism.

Keywords: AIGC, visual news, public trust system, trust deficit, cognitive restructuring

1. Introduction

The visual news is transforming at an unprecedented pace in the context of the origin of Artificial Intelligence Generated Content (AIGC) technology. As of today, the level of AI development is improving fast, and AI-generated image and video technology has advanced considerably, which has allowed AIGC visual news to pretend to have some degree of truth to it. This technological application does not only transform the way news is produced and distributed, but it has an overwhelming influence on the system of trust in people.

Being a form of information that is special and relies on authenticity and trust of the populace, the AIGC visual news has a very high level of realism, which constantly obscures the fact/fiction line. This technological development has triggered a significant trust deficit, whose crisis mainly originates from the subversion of individual cognitive frameworks, the collapse of traditional trust foundations, and the low-cost abuse of technology. However, this impact also presents a double-

edged sword characteristic: while damaging traditional trust foundations, it also forces society to embark on a process of cognitive restructuring.

The purpose of this study is to systematically explore the mechanism of action of AIGC visual news on the public trust system, and to deeply analyze the core manifestations of trust deficit and the specific paths of cognitive restructuring. The research questions focus on two aspects: first, the core manifestations of public trust deficit triggered by AIGC visual news; second, the specific restructuring of public cognitive models under the influence of AIGC visual news and its impact path on the restoration and upgrading of the trust system.

2. Literature review

The main question of the research is the impact of AIGC visual news on the popular trust system. Based on this theme, the works of existing research would be summarized into three-levels: AIGC transformation of the framework of the news communication landscape, challenge of technical risks and trust in AIGC visual news, and theory behind the public trust system in the digital era.

2.1. The news communication ecosystem of AIGC redesigned

The AIGC technology has had a massive influence on the news industry. Liu Yindi et al. literature provides systematic reviews of the AIGC implementation in the whole process of news production stating that it greatly enhances efficiency with accompanying difficulties in the form of losing the industry subjectivity [1]. Chen Lidan and Rong Xueyan also add that video generate models, like Sora, have challenged the authenticity of news, and that now journalists have changed in the role of creators into the role of verifiers [2].

The study by Zhu Hongjun puts this impact on the level of a systematic one, suggesting that the generative AI should be viewed as a systematic restructuring of the industrial practice, the education, and the research paradigm of the news communication [3]. All these studies suggest that AIGC technology is transforming the traditional news communication staple significantly, and the ambiguities it introduces should be given appropriate consideration.

2.2. Technical risks and trust challenges of AIGC visual news

Regarding technical risks, Xie Mei and Wang Shilong study the eight categories of derived risks of AIGC in a systematic way and identify the entire chain of risks of raw data to user feedback [4]. Lin Jialin and Shi Wen dwell on the fact-checking connection, and among the information presented here is that the AIGC representations of the hallucinations of AI can give birth to fake news and will precipitate more serious trust problems [5].

It is worth pointing out that the cognitive bafflement hybrid reality can introduce was already pre-empted in a study by Zheng Manni who states that this phenomenon has already created an age of facts nonexistence [6], and Liu Chunyi and Hu Yong name the lack of trust in the people as a two-sided sword that [7] AIGC has introduced. These researches contribute to a valuable theoretical background of interpreting the technical risks of visual news of AIGC.

2.3. Theory of public trust system

At the theoretical level, Wang Chenyao presents the theories of trust that Luhmann and Coleman have suggested in their writings, and suggests that the relational practice of journalistic truth is the eventual point of contact between the news industry and the trust of the population [8]. This

theoretical approach is a valuable addition to the procedure of examining the mechanism of trust deficit within the influence of AIGC.

The work of Wei Weige, found on the theory of modernity trust by Giddens, highlights the fact that the role of agents of the abstract system in preserving trust is a junction, as outlined by the research [9], and therefore explains how the public trusts the AIGC systems. The governance strategy suggested by Liang Xun et al. is the discovery-management-prevention which also serves as the reference to the construction of the trust system during the AIGC era [10].

2.4. Innovation space and gaps in research

At the same time as the valuable contribution of the available research, the presence of certain gaps is obvious. First, studies mainly concentrate on the general effects of AIGC, and not much is done on the particular form of visual news; second, quantitative research on the level of public trust is rather deficient; and, lastly, not many studies concentrate on the specific cognitive psychological programming. The gaps in these research allow this study some innovation.

3. Research design and methods

The current research uses a questionnaire experiment design to investigate the particular effect of the AIGC visual news in influencing the public trust by using a strict experimental design. The experiment uses a pretest-posttest control group design, setting an experimental group (watching AIGC visual news) and a control group (watching traditional visual news) to effectively isolate the impact of news type on public trust.

3.1. Research procedures

This study follows the procedures of selecting news—recruiting research subjects—conducting the experiment—data analysis and processing.

First, real news events are selected as experimental materials, and videos of the experimental group (AIGC visual news) and the control group (traditional filmed visual news) with identical content are produced and collected respectively. It is ensured that, except for the presentation form, the news value, information points, and other aspects remain consistent; meanwhile, a questionnaire is designed with reference to the video news content, and the item expressions are optimized through pretesting to ensure the reliability and validity meet the standards.

The experiment is conducted through an online questionnaire platform. Before recruiting adult subjects aged 18 to 60, the purpose of the experiment and data usage rules are clearly explained, and informed consent is obtained. Sampling attempts to reach out to groups of various ages, educational backgrounds, etc., so as to make sample diverse. The experimental group and the control group are random subjects to prevent the impact of the unnecessary variables by making sure that there are no significant differences in demographic characteristics between the two groups.

There are three steps of the formal experimental phase. The initial one is that the subjects are requested to fill the pretest questionnaire, and it is meant to gather their demographic data, starting levels of trust in pertinent news, and the degree of knowledge about the object of focus. Meanwhile invalid samples comprising perfunctory responses as manifested in too short time taken to complete, and all answers to questions being the same, are filtered out and removed. In the second step, the experimental group will be shown AIGC visual news, and the control group shown traditional filmed visual news, where the subjects are expected to watch the video in the entire screen not fast-

forwarding or pausing; Step 3, the post test questionnaire is to be filled in by the subjects after watching the video.

Data processing and analysis were conducted in the following steps: First, the collected questionnaires are cleaned to exclude invalid samples; second, statistical analysis is performed using SPSS software to first test the manipulation effectiveness of the AIGC video (subjects' ability to identify the video production method); then, the differences in scores on the three dimensions of trust and the cognitive restructuring dimension between the experimental group and the control group are compared and analyzed; finally, combined with quantitative data and answers to open-ended questions, the impact of AIGC visual news on the public trust system and the characteristics of cognitive restructuring are summarized.

3.2. Selection of news

The news chosen as the experimental material in this study is the United States Returns 41 Cultural Relics and Works of Art to China in March 2025. This is reported by the reputable media, and the fundamental information can be confirmed in the official channels that can guarantee the congruence of the video materials in both the experimental group and control group. In order to maintain the control of variables, both sets of videos have maintained the same script of the voice-over, the background music and the logic of the story, the sole variations are the visual generation technique. The coverage of the audience is high and the interest of various groups is neutralized and can enhance the externalizability of the research findings. Its information is precise and understandable, has direct data and situations, which allows AIGC to reproduce the visual content accurately to manipulate experimental variables. Besides, the theme is inoffensive and not controversial, which allowed the experiment to concentrate on how production methods can affect the popular trust, which aligns with the main objective of the study.

3.3. Selection of research subjects

The populations to be used by the proposed study will be based on adult populations aged 18-60 and will be recruited under a hierarchical system applying online questionnaire platforms, and will comprise cells with various ages and backgrounds, media exposure rates, and focus on culture relics problems to ensure sample heterogeneity and enhance the externalization of the results. The research follows a different approach as an assignment to randomly select respondents to become test subjects and control subjects, which is based on the fact that the groups of respondents will have no significant difference in demographic variables and will effectively isolate the effect of irrelevant factors. Meanwhile, the participants, who also experienced the same experiment, or have visual impaired are eliminated in order to prevent the initial cognitive bias and objective limitation to the outcomes of the experiment, which is also aligned with the research objective associated with the impact of the AIGC visual news on the public trust system.

3.4. Questionnaire design

The scale of this questionnaire is a Likert 5-point scale (1=strongly disagree to 5=strongly agree), and is focused on three main dimensions of cognitive, emotional and behavioral types of trust, which consists of 18 items, centering on the news report The United States Returns 41 Cultural Relics and Works of Art to China, 2019. Among them, the cognitive trust dimension focuses on measuring the public's judgment on the authenticity and accuracy of core information in the news,

such as the number of cultural relics, return time, age of cultural relics, and policy background; the emotional trust dimension focuses on the public's emotional experience such as the sense of reliability of the news source and the sense of reassurance in information transmission; the behavioral trust dimension focuses on the public's behavioral tendencies such as willingness to share and recommend the news, verify information, and continuously pay attention to follow-up developments. Overall, it aims to quantitatively evaluate the impact of different visual versions (AIGC vs. traditional filmed) of news on public trust.

4. Research results

A total of 132 valid questionnaires were collected in this questionnaire experiment, including 66 in the experimental group (watching AIGC visual news) and 66 in the control group (watching traditional filmed visual news). Statistical analysis of the data was performed using SPSS 26.0, and the results are objectively presented below from the three dimensions of cognitive trust, emotional trust, and behavioral trust, combined with the scores of specific questionnaire items.

4.1. Cognitive trust

The Cronbach's α coefficient of the cognitive trust dimension is 0.87, focusing on the judgment of the authenticity and accuracy of core news information. Statistics show that the average score of the experimental group is (3.12 ± 0.73) points, which is significantly lower than that of the control group (4.21 ± 0.52) points ($t=10.36$, $p<0.001$). All items show significant differences. The experimental group is more cautious in judging the authenticity of factual information, such as the number of cultural relics, return time, age of cultural relics, policy background, handover process, and historical cooperation data, confirming the conclusion that AIGC visual news triggers a trust deficit in the cognitive dimension.

4.2. Emotional trust

The Cronbach's α coefficient of the emotional trust dimension is 0.85, focusing on the sense of reliability of the information source and emotional reassurance. The average score of the experimental group is (2.83 ± 0.89) points, and that of the control group is (3.92 ± 0.61) points, with a statistically significant difference ($t=9.27$, $p<0.001$). The experimental group scores significantly lower in all items, such as "reliable information source," "no sense of doubt," and "reassuring content," among which the gap in the evaluation of information source reliability is the largest, reflecting that the AIGC production method has triggered subjects' emotional resistance and distrust in information transmission.

4.3. Behavioral trust

The Cronbach's α coefficient of the behavioral trust dimension is 0.83, focusing on behavioral tendencies, such as communication, verification, and continuous attention. The average score of the experimental group is (3.01 ± 0.82) points, and that of the control group is (3.84 ± 0.58) points ($t=7.65$, $p<0.001$), showing obvious differentiated characteristics: the experimental group scores significantly lower in active communication items such as "sharing the news," "introducing the content," and "recommending watching"; while in the item "verifying event details through authoritative channels," the score of the experimental group (3.82 ± 0.64) points is significantly higher than that of the control group (3.21 ± 0.73) points ($t=-5.31$, $p<0.001$), reflecting the dual performance of AIGC

visual news inhibiting communication behavior but stimulating the enthusiasm for information verification.

5. Discussion

5.1. Impact

This study finds that AIGC visual news has a significant impact on the public trust system:

In terms of trust deficit, the trust of participants in the experimental group in AIGC visual news is significantly lower than that of the control group. The average score of cognitive trust in the experimental group is 3.12 points, which is significantly lower than 4.21 points in the control group ($t=10.36$, $p<0.001$), and the average score of emotional trust is 2.83 points, also significantly lower than 3.92 points in the control group ($p<0.001$). This trust deficit is mainly reflected in the cognitive dimension: participants' standards for judging the authenticity of AIGC news have changed, and verification behaviors have increased significantly, as evidenced by the fact that the score of the experimental group in the item "verifying event details through authoritative channels" (3.82 points) is significantly higher than that of the control group (3.21 points). In the emotional dimension, participants show more suspicion about the source of AIGC news, and this distrust will also migrate to the news release platform.

In terms of cognitive restructuring, based on the analysis of questionnaire quantitative data and open-ended questions, it is found that participants have gradually formed new information processing strategies. Specifically, first, multiple verification has become the norm, and participants will cross-verify the authenticity of news through multiple sources; second, the importance of media brands has become prominent, and participants are more inclined to trust AIGC news released by authoritative media; third, risk awareness has increased, and participants' vigilance against visual news has generally improved.

5.2. Analysis of impact mechanisms and paths

This study further analyzes the internal mechanism of AIGC visual news affecting public trust. It is found that this impact is mainly achieved through the following paths:

In terms of the technical characteristic path, the high authenticity of AIGC visual news has undermined the traditional standards for judging authenticity. Participants generally reflect that it is difficult to distinguish the authenticity of AIGC news through conventional methods, and this difficulty in distinction directly leads to a decline in trust.

In terms of the cognitive psychological path, the "uncanny valley effect" triggered by AIGC news makes participants feel psychological discomfort. When they find that seemingly real news is actually AI-generated, participants will have a strong sense of betrayal, and this emotional experience will further weaken the trust foundation.

In terms of the sociocultural path, the proliferation of AIGC news has exacerbated the complexity of the information environment. Participants indicate that facing visual news with indistinguishable authenticity, adopting a conservative information acceptance strategy has become a rational choice, and this strategic change reflects the adaptive characteristics of cognitive restructuring.

5.3. Double-edged sword effect and governance implications

The study finds that although AIGC visual news mainly shows a negative effect of weakening trust. It also finds that the public has made adaptive cognitive adjustments. This forced development of

more prudent information processing strategies may promote the improvement of media literacy to a certain extent, constituting a positive adaptation to technical challenges.

At the governance level, this study puts forward the following suggestions: first, it is necessary to establish an AIGC content labeling system to clearly distinguish AI-generated content from manually produced content; second, strengthen public media literacy education to improve the ability to distinguish AIGC content; finally, improve relevant laws and regulations to provide institutional guarantee for the standardized development of AIGC news.

6. Conclusion

Through a systematic experimental study, this study deeply explores the impact mechanism of AIGC visual news on the public trust system. The main research conclusions are as follows:

First, AIGC visual news has indeed triggered a significant trust deficit, and this trust crisis is mainly reflected in the three dimensions of cognition, emotion, and behavior. Participants' standards for judging the authenticity of AIGC news have changed, verification behaviors have increased, and trust in news sources has decreased.

Second, the cognitive model of the populace has experienced a considerable transformation because of AIGC visual news influence. This reorganization is reflected in the rationalization of information processing approaches, the changing of the norms of trust judgment and enhancement of the response capacity to risks, and is indicative of the adaptive adjustment of the populace to the new technological setting.

Lastly, this paper concludes that the effect of AIGC visual news on the trust system is characterized by a dual-sided nature. Along with bringing challenges, it gives a chance to develop a more reasonable and transparent mechanism of trust. Through a good system of governance, the healthy development of the trust system during the AIGC era may be encouraged.

The theoretical value of the study is in the fact that it contributed to the understanding of the mechanism of trust in AIGC environment, and the fact that the empirical foundation was offered to the development of the relevant governance policies is its practical value. The gaps in the effect of AIGC in different cultural backgrounds, along with the long term effect of the long term effects of AIGC environment, on the trust system can further be explored in future research.

This study has certain limitations: the sample size is insufficient, the experiment only selects a single cultural news as the material, the online controlled environment is different from the public's real news exposure scenario, and the long-term impact is not tracked. The questionnaire adopts self-reported measurement, which is prone to social desirability bias, and does not fully include potential influencing factors such as media literacy. Online sampling also has the problem that the proportion of groups with high-frequency Internet use is too high. These all restrict the generalizability, ecological validity, and sample representativeness of the research findings.

Further research is possible to enhance multi-type and multi-theme AIGC visual news material, add other research subjects with varying cultural backgrounds, age, and media literacy, combine the qualitative research methods and longitudinal tracking design effectiveness to deeply examine the dynamic changes of the system of managing public trust and assess the internal psychological mechanism of cognitive reorganization, and develop cross-border comparative research to examine the regulatory role of differences in culture and age. According to the findings of the research, it is possible to optimize the practical directions of the AIGC content governance schemes and offer more complex theoretical backgrounds and practical guidance on how to develop a healthier and more rational wagon of building a more reputable system of trust in the AIGC epoch.

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