Media and Communication Research (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/mediacr.2024.050328
ISSN 2523-2584 Vol. 5 Num. 3

Comparing AI Media and Traditional Media: A Frame Analysis of NewsGPT and Reuters Coverage of the 2024 Olympic Game

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Keywords: Frame Analysis, NewsGPT, Reuters, Olympic Game

Abstract: The "liquid" nature of journalism has become more pronounced with the impact of artificial intelligence, disrupting traditional news production models. This study employs a three-level frame analysis method to examine the 2024 Olympic coverage of NewsGPT, the world's first news website entirely generated by AI, and Reuters, a traditional media outlet. The findings reveal notable similarities in news topics and structures, while highlighting significant differences in the portrayal of individuals and discourse tendencies. This research further explores the performance of AI and traditional media in terms of journalistic professionalism, aiming to provide insights for the better development of traditional media in the face of AI's impact.

1. Introduction

In liquid journalism, traditional news production demonstrates characteristics of decentralization, deinstitutionalization, and constant change. With the rapid development of artificial intelligence, journalism's traditional norms and authority are further eroding, making its "liquid" nature even more pronounced. In March 2024, NewsGPT, the world's first news website entirely generated by AI, was launched. Utilizing modern machine learning algorithms and natural language processing technologies, it scans global news sources in real-time to generate and present news information, indicating that AI media poses a significant challenge to traditional news production models.

Current research on NewsGPT mainly focuses on the frameworks used for reporting specific events[1], biases and misinformation present in its news[2], and ethical issues in its news practices[3]. However, there is a lack of understanding regarding the differences in news content between AI media and traditional media, as well as how traditional outlets can articulate their advantages and values in light of the new challenges posed by AI. This study aims to conduct a comparative analysis to highlight the characteristics of AI media in terms of news topic selection and content organization, providing insights for traditional media to find a "solid" foundation amidst the "liquid" environment.

2. Literature Review

2.1. Framing Theory

The concept of framing was first introduced by Goffman[4], who defined it as the cognitive structure and psychological processes individuals use to identify and understand events. Subsequently, Tuchman[5] adapted Goffman's framework to explain its role in news production, arguing that framing exists in aspects such as the selection of news events, content editing, and audience cognition. Gamson and Modigliani[6] emphasized that framing involves the production of meaning, describing it as an organized theme or narrative thread that provides significance to a series of events.

Building on this foundation, many researchers have refined the concept of framing into different levels. Tankard[7] proposed a "framing list" of 11 indicators, such as news headlines, images, and sources. Guoren Zang[8] introduced a three-tiered framework theory, classifying frames into high, middle, and low levels. High-level frames appear in titles and leads, defining the thematic focus of events and answering, "What is this about?" Middle-level frames include the main events (key figures, plots, etc.), prior occurrences, historical context, outcomes, impacts, attributions, and evaluations. Low-level frames are composed of rhetorical styles formed by combinations of words and phrases, representing a micro-level linguistic structure and symbolic expression. This study adopts this analytical framework to conduct a three-tiered frame analysis of the reporting samples.

2.2. Frame Analysis of Media Content.

Currently, empirical research utilizing framing theory in media content has yielded extensive findings. From the perspective of research dimensions, those researches can be categorized into longitudinal and cross-sectional comparative studies. A notable example of a longitudinal study is Gamson and Modigliani's[9] analysis of nuclear energy news, in which they identified seven distinct media frames and illustrated the dynamic evolution of their proportions over time. In cross-sectional comparative studies, Hossain[10] examined the news frames employed by The Times the UK and The New York Times from the US in their coverage of the Bangladesh Liberation War.

From the perspective of research subjects, the existing researches cover various media content types, including newspaper articles[11], news images[12], television news reports[13], and short videos[14]. However, a notable lack of frame analysis focused on media content produced by artificial intelligence indicates a research gap.

Many studies focus on specific media content covering particular news events like the Olympics. Current research on Olympic news reporting includes case studies of individual media outlets and cross-country comparisons. Zaharopoulos [15](2007) analyzed the reporting frames of the online version of The New York Times during the 2004 Athens Olympics. Hayashi et al. [16]conducted a qualitative discourse analysis of Olympic television news reports from ten channels across five countries to compare the diverse reporting styles and discourse tendencies. Additionally, gender equality issues in Olympic news reporting have attracted significant attention. Braumüller et al.[17] analyzed 3,394 images from two German newspapers covering the Summer Olympics from 2000 to 2016, revealing a growing marginalization of female athletes.

It is evident that factors such as nationality and gender are considered key variables in Olympic news reporting. With the advancement of artificial intelligence, new variables are introduced into this context. Specifically, it is worth investigating whether differences exist between the Olympic news coverage produced by AI media and that of traditional media.

3. Research Questions

In summary, based on existing research findings and gaps, this study employs framing theory and utilizes a three-level framework analysis (high-level framework: news topics; mid-level framework: reported individuals, news structure; low-level framework: discourse tendency). It selects NewsGPT and Reuters as representative examples of AI media and traditional media, respectively, to analyze their coverage of the 2024 Paris Olympics and explore the following questions:

3.1. High-Level Framework

Q1: Are the news topics focused on by AI media more diverse compared to traditional media?

3.2. Mid-Level Framework

Q2: Is the gender distribution of individuals reported in AI media more balanced than in traditional media?

Q3: Are there significant differences in the news structure between AI media and traditional media?

3.3. Low-Level Framework

Q4: Is the discourse tendency in AI media reporting more objective and neutral compared to traditional media?

3.4. Overall

Q5: Why are there no significant differences in the news reporting frameworks of AI media and traditional media? Or why are there significant differences?

Q6: How can traditional media identify its strengths in the face of new challenges posed by AI media?

4. Materials and Methods

4.1. Sample Selection and Data Cleaning

This study chooses NewsGPT, the world's first AI news website, as a representative example of AI media, while selecting Reuters, a well-established and influential mainstream outlet known for its journalistic professionalism, as a representative of traditional media. The analysis focuses on the coverage of the 2024 Paris Olympics by both media outlets.

Data was collected by searching for the keyword "Olympic" on the official websites of NewsGPT and Reuters, covering the period from July 19 to August 18, 2024 (the week before and after the Olympics). 96 articles were obtained from NewsGPT and 1,430 articles from Reuters. To ensure data quality and relevance to this study, the researcher implemented a filtering process and decided to retain the following criteria for the samples: (1) text-and-image news reports or commentaries (excluding pure audio content, video content, and fact-checking articles); (2) text length exceeding 100 words; (3) content (including the title, lead, body, and image captions) containing the terms "Olympic," "Olympics," or "Olympian" a total of two times or more.

After filtering, all 96 articles from NewsGPT met the analysis criteria. Considering the sample size, a full sample analysis was conducted. From the 1,430 articles obtained from Reuters, 1,354

met the analysis requirements. To maintain equal sample sizes for comparative analysis, 96 samples were randomly selected from these 1,354 articles. The sampling method used was systematic sampling: the samples were sorted and numbered chronologically. A random sample was drawn from the first 14 samples, and then every 14th sample was selected thereafter until a total of 96 samples was obtained.

4.2. Research Method

This study employs framing analysis, a type of content analysis informed by the three-level framework theory proposed by Zang Guoren. The researcher modifies the framework to align with its theoretical implications, categorizing it into three levels: high-level framework (news topics), mid-level framework (reported individuals and news structure), and low-level framework (discourse tendency). The specific coding classifications for each category are initially based on existing research, with further refinement and adjustments occurring during the pilot coding process.

The "news topics" were categorized as follows: 1 = event updates; 2 = environmental safety; 3 = commercial economy/social benefits; 4 = geopolitical issues; 5 = facility support; 6 = event organization; 7 = personal stories; 8 = gender issues/performance-enhancing drugs; 9 = other.

The "reported individuals" were categorized as follows: 1 = female; 2 = male; 3 = both genders; 4 = neutral; 5 = none.

The "news structure" were categorized as follows: 1 = inverted pyramid structure; 2 = storytelling structure[18]; 3 = parallel structure; 4 = others.

The "discourse tendency" were categorized as follows: 1 = positive; 2 = negative; 3 = neutral.

Two coders conducted the coding of the sampled content while ensuring coding reliability. Based on the coding results, this study provides a systematic and objective quantitative description of the reported content.

5. Results and Discussion

5.1. High-Level Framework: High Concentration of News Topics

The samples from NewsGPT and Reuters show a clear concentration on two main news topics: "event updates" and "personal stories." (see table 1) The content predominantly focuses on the progression and outcomes of Olympic events, as well as athletes' personal experiences and viewpoints. In contrast, other topics, such as environmental safety, appear less frequently and are more evenly distributed. This study conducted a cross-tabulation analysis to further analyze whether significant differences exist between NewsGPT and Reuters in terms of news topics. While there are observable differences in the news topics covered by the two media outlets regarding the 2024 Olympics, these differences are insignificant ($X^2 = 8.182$, $p > 0.05$).

Table 1: Media * News Topics Cross tabulation

	News Topics								
Media	event update	environmental safety	commercial economy/social benefits	geopolitical issues	facility support	event organization	personal stories	gender issues/performance-enhancing drugs	other
NewsGPT	33	8	8	4	3	5	26	4	5
Reuters	47	5	2	2	3	3	27	3	4

The data indicates that the AI media NewsGPT exhibits a high concentration of news topics in its coverage of the 2024 Olympics, showing considerable similarity to the traditional media outlet Reuters, rather than presenting a more balanced and diverse array of topics. This phenomenon can be attributed to two main factors: first, the nature of the reported events, where both the competition

and the athletes are core components and focal points of the Olympics; second, the potential for agenda-setting between media outlets, suggesting that the reporting topics and related data from traditional media may have influenced NewsGPT's selection of news topics.

5.2. Mid-Level Framework: Differences in Reported Individuals and Similarities in News Structure

Regarding reported individuals, This can be seen in Table 2, among the 96 samples from NewsGPT, 32 (33.3%) feature only female individuals, while 32 (33.3%) feature only male individuals. Additionally, 12 samples (12.5%) include male and female individuals, indicating a relatively balanced gender distribution with equal attention given to both sexes. In contrast, Reuters' 96 samples include 32 (33.3%) featuring only females and 38 (35%) featuring only males, slightly higher than NewsGPT, with 16 reports (14%) including both genders. Notably, NewsGPT has 18 samples (18.8%) that lack reported individuals, while Reuters has only 3 (3.1%). This suggests that NewsGPT presents more reports without individual sources, focusing more on descriptions of events or phenomena. In contrast, Reuters typically incorporates interviews with relevant individuals, reflecting a more diverse sourcing approach. Both media also include samples classified as gender-neutral, primarily due to ambiguity in gender identification or a lack of precise determination in the text.

Following cross-tabulation analysis and chi-square tests, the study identified significant differences in reported individuals between the two media outlets ($X^2 = 14.578$, $p < 0.05$). While NewsGPT shows a more balanced gender distribution than Reuters, it also has a more significant number of reports lacking individual sources, indicating a deficiency in diverse sourcing within its coverage.

Table 2: Media * Reported Individuals Cross tabulation

	Reported Individuals				
Media	Female	Male	Both	Neutral	None
NewsGPT	32	32	12	2	18
Reuters	32	38	16	7	3

Table 3: Media * News Structure Cross tabulation

	News Structure			
Media	inverted pyramid structure	storytelling structure	parallel structure	others
NewsGPT	76	10	9	1
Reuters	67	21	7	1

Table 3 presents the data of news structure, In terms of news structure, the inverted pyramid format is the most prevalent, with NewsGPT featuring 76 samples (79.2%) and Reuters 67 samples (69.8%), both significantly outpacing those using alternative structures. The nature of the reported Olympic events primarily drives this trend. The inverted pyramid structure organizes news facts by importance, enabling audiences to quickly grasp critical information, which aligns perfectly with the demand for timely updates during the Olympics. The presentation of the samples demonstrates that the AI media NewsGPT has effectively mastered and employed the inverted pyramid structure, accurately capturing and organizing key news facts. NewsGPT features 10 samples (10.4%) using a storytelling structure, while Reuters has 21 samples (15.5%). The storytelling structure does not merely aim for the rapid delivery of news information; instead, it unfolds the news events chronologically or employs a literary narrative approach, such as suspense, to engage the audience's interest more effectively. The parallel structure, typically used to report multiple related event

results or introduce several athletes, is less common, with NewsGPT featuring 9 samples (9.4%) and Reuters 7 samples (7.3%). Cross-tabulation analysis and chi-square tests reveal no significant differences in the news structures employed by NewsGPT and Reuters in their coverage of the 2024 Olympics ($X^2 = 4.720$, $p > 0.05$).

5.3. Low-Level Framework: Significant Differences in Discourse Tendency

The discourse tendency analysis reveals that the AI media outlet NewsGPT frequently employs emotionally charged language in its reporting. According to the data in Table 4, Among its samples, 33 (34.4%) express affirmative sentiment, while 7 (7.3%) convey negative sentiment, and 56 (58.3%) maintain a neutral stance. In contrast, traditional media outlet Reuters displays more restraint in emotional expression, with the vast majority of its reports remaining objective and neutral (N=82, 85.4%). In a few instances, Reuters does exhibit affirmative or negative sentiments, with 12 samples (12.5%) expressing affirmative views and 2 samples (4.5%) expressing negative ones. Affirmative content typically praises athletes' performances, while negative content often expresses regret over competition outcomes or condemns wrongdoing. Cross-tabulation analysis and chi-square tests indicate significant differences in discourse tendency between NewsGPT and Reuters in their coverage of the 2024 Olympics ($X^2 = 17.476$, $p < 0.05$).

Notably, NewsGPT's samples often reflect the reporter's perspective on events, whereas Reuters tends to present ideas and viewpoints of relevant individuals through direct quotes, striving for a balanced representation of differing opinions, especially on controversial topics. This demonstrates traditional media's commitment to journalistic professionalism. Thus, AI media NewsGPT's objectivity still shows a notable gap when compared to traditional media like Reuters.

Table 4: Media * discourse tendency Cross tabulation

	discourse tendency		
Media	Positive	Negative	Neutral
NewsGPT	33	7	56
Reuters	12	2	82

6. Conclusions

This study employs a three-level framework analysis to compare the news coverage of the 2024 Olympics by AI media NewsGPT and traditional media Reuters. The findings indicate no significant differences between the two regarding news topics and structure; both primarily focus on event updates and personal stories while favoring the inverted pyramid format. Regarding reported individuals, NewsGPT emphasizes a balanced gender distribution but has a notable number of reports lacking individual sources, highlighting a deficiency in sourcing. Regarding discourse tendency, NewsGPT features more emotionally charged reporting, reflecting a more explicit stance from its reporters, whereas Reuters tends to maintain a more objective and neutral tone.

From the perspective of journalistic professionalism, AI media NewsGPT shows considerable progress in aligning with traditional media regarding news topics and structure. It demonstrates a commitment to balanced gender representation in its coverage. However, gaps remain in using primary sources and maintaining objectivity, leading to issues such as unclear information sources and overt value judgments, which undermine its journalistic integrity. The study also finds that all images used by NewsGPT are AI-generated, distorting the portrayal of actions and scenes, raising serious challenges to news authenticity. This raises concerns about the ethical standards of AI media and introduces uncertainty into the complex online information environment, blurring the lines of truth. In this context, traditional media should uphold the pursuit of news authenticity,

striving to be trustworthy in the post-truth era. Based on the research findings, it is believed that traditional media has an advantage over AI media in the practical application of journalistic professionalism. Journalists in traditional media should recognize and amplify this advantage to effectively respond to the challenges posed by AI.

Acknowledgment

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

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