

More Diversity, Same Framework: A Comparative Analysis of Video Platforms and Aggregated Platforms in China

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Abstract:

With the in-depth development of social networks and the Internet revolution, the diversity of news in the digital age is worthy of attention. Video websites have more independent players, allowing them to publish more alternative news than mainstream media. How much the penetration rate of different institutions affects platform diversity, and whether and to what extent video news sites can break through the mainstream news reporting framework are some concerns. This study selects digital platforms with different penetration rates of Chinese organizations. Taking Tokyo Olympics reports as a sample, an evaluation system for news diversity was built, and Simpson's diversity index was measured from the perspective of content diversity, including national visibility, medal coverage ratio, and athlete visibility. Through PCA dimensionality reduction analysis, news keywords of different platforms are extracted, and news reporting frameworks of different platforms are visualized. Results show that video websites have a lower penetration rate and more diversity and coverage of different actors. However, it is still possible for video platforms and aggregation sites to be under the convergent news framework. Abandoning a certain degree of news diversity and maintaining the convergent news framework may serve as a strategy to assist China's digital age news propaganda.

1. Introduction

Western news media history is replete with examples of processes of differentiation from political parties and organized social groups rooted in religion, class, and other group forms. This historical origin makes news autonomy an important issue for scholars. First, journalism should have some independence from the government and the market. Second, maintaining the diversity of journalism and the diversity of news. If journalism is sufficiently decentralized and diverse in opinion; if journalists come from all walks of life and facilitate the exchange of different opinions; ... if journalism is a pluralistic institution, it will be beneficial to the development of a democratic society [1]. To maintain a democratic society, a plural media landscape is recognized as an important and highly normative prerequisite.

As for the media in China, several studies have shown that the Chinese government controls the news media to a large extent [2] and that China's propaganda system is a huge bureaucracy that

covers almost all media related to information dissemination [3]. In other words, almost all media that communicates information to the Chinese people are under the bureaucratic authority of the Chinese Communist Party [4]. However, with the in-depth development of social networks and the Internet revolution, news reporting has shifted from print media to digital media. The rise of digital media threatened the dominance of traditional media in public opinion [5]. The emergence of online news platforms, known as aggregators of news, characterized by the rise of online news and the integration of user-generated content into the news production process, has led to journalists and newsrooms "moving from the era of single-media reporting to multimedia reporting" [6]. Aggregated news platforms present traditional media with current affairs as the main content, but the sources of news subjects are more diverse and the power of dissemination is lower; hence, news publishers are no longer limited to the authoritative voice of the past. Video news websites are also news aggregators wherein news are presented in the form

of videos. Video websites are regarded as a newer medium, empowering individuals to create and disseminate information, bringing about a decentralized communication model, and involving people of different social backgrounds in the dissemination of information. This represents a direction in the evolution of media. Compared to traditional media such as newspapers and television, digital media is often seen as inherently democratizing and liberating, offering a prospect of freeing us from our long-standing reliance on a small number of powerful information providers and the “mainstream” discourse they provide. As a response, the government encourages traditional media to innovate through media convergence and requires them to perform their propaganda functions more subtly to maintain the party’s leadership in the ideological field [7,8]. In the wave of rapid development of decentralized digital media, questions on whether the Chinese media has adopted a different penetration and media integration strategy for newer media than print media, how much influence the penetration rate of different institutions has on platform diversity, and whether and to what extent we can break out of the mainstream news reporting framework have been raised. By comparing news aggregation platforms and video platforms, we can observe the changes in China's publicity strategy for new media.

2. Literature Review

2.1. News Diversity

Media diversity has been conceptualized and operationalized in several ways. The first fundamental distinction proposed is external and internal diversity [9]. External diversity refers to the diversity of different media channels outside the market, while internal diversity refers to the diversity of content within the same media channel. The manifestation of external diversity is the partisan media phenomenon. The internal model celebrates the diversity of media sources, content, and audiences, making news and information about others accessible to most people [10]. At the conceptual level, a recent structured literature review of journalism and media diversity research points to limited progress in recent years and distinguishes between vertical and horizontal diversity, where the former signifies “a variety of ideas within a single media channel,” the latter denoting “a variety of ideas in different media collections” [11]. This is very consistent with differences between internal and external diversity in early development, also divided into variation within a given publication or media source” and

“degree of change between different media sources [9]. Although there are many ways to the concept of news diversity, it is still based on external and internal diversity, and most of them are distinguished from classification methods. Dennis McGuire proposed the measurement dimension of news diversity in the article “Information Diversity: The Evolution of Media and Public Policy Concepts”, that is, news diversity includes system diversity, source diversity, content diversity, etc. and subcategories include ownership, source, content, and exposure diversity and organization, production, output, and receiving diversity [12,13]. Although more and more indicators are used in the measurement of diversity [14]. Content diversity is always one of the important types of research on news diversity [15,16].

2.2. News Framework

In discussions of diversity, news framing is considered to represent different perspectives in news (i.e. framing, sources, viewpoints) and is a central issue in journalism research as it is an indicator of news quality [17]. summarize the definition of news diversity as “the dispersion of the representation of ideas, opinions, attributes, opinions or framing in the context of a news product and a particular issue.” News framing is a useful multidimensional perspective for studying the nature of news media coverage around a particular issue. Entman (1993) explained that framing is a selection process in which aspects of perceived reality are selected and become more prominent in textual communication [18]. Gofman (1974) sees framing as a means by which people “locate, perceive, identify and label” reality [19]. Gamson, and Modigliani (1989) see the media frame as central organizing idea or story line that provides meaning [20]. Gitlin (1980) developed Goffman's concept with a clearer definition [21]. Framing is about making choices about what exists, what happens, and what makes sense. Emphasis and representation are the metrics used. The news framework is considered to be closely linked to political institutions, media institutions, and ideologies. Gitlin (1980) first applied the concept of framing to media studies and linked this concept to the production of news discourse [21]. Pan and Kosicki (1993) developed this view, arguing that news routines, social institutions, ideologies, etc. constitute the news framework [22].

3. Research questions and methods

Compared with a large number of assessments of different media, digital platforms are introduced in

the comparative study of news diversity. The comparison of platforms in countries or regions with weak external diversity, such as the one-party state of China, is particularly important. In the face of new digital media, the government may adopt different organizational penetration rates for different platforms in the process of media convergence. Recent studies have shown that media type ownership and market structure will affect the diversity of news [23,24]. The role of different types of media ownership and media systems also have been discussed in the on line news diversity [25]. Based on this, we assume that the penetration of different organizations in different news platforms will also have an impact on news diversity.

Institutional penetration rate refers to the proportion of state organs, commercial organizations, etc. on news platforms. The excessive participation of politics and capital will affect the autonomy of the media. The higher the institutional penetration rate, the lower the diversification of news platforms [10]. By selecting the comparison between news aggregation platforms with a strong penetration rate of government organizations and video platforms dominated by self-media, this study examines whether the government differentiates media integration policies for different platforms, and whether this will lead to content diversity being different. Second is the methods. Connecting the diversity measurement and visualization of news frames through digital processing of vectors and dimensionality reduction processing, news headlines are unified into a plane, which outlines the news reports on the entire platform. Based on the above discussion, this study mainly addresses the following questions:

QR1 Do video websites have a lower institutional penetration rate compared to news aggregation platforms?

QR2 Will a low penetration rate increase the platform's content diversity?

QR3 Are video and news aggregation platforms still under the same news framework?

In terms of topic selection, recent research has found that in some special issues such as climate issues, China's market-oriented newspapers are indeed quite different from party-sponsored newspapers [26]. This study follows two conditions in the selection of topics: (1) News with high public attention, and (2) Non-political issues. The 2021 Tokyo Olympics is selected as the research sample, and the platform comparison method of fixed themes is adopted, measured with news coverage during the Olympic Games from July 2021 to August 2021. Three groups of representative data were selected: (1) Group A: traditional media such

as People's Daily, which is China's official mainstream media; (2) Group B: aggregation news platforms such as Toutiao, the most used aggregation news platform; and (3) Group C: video platforms such as Bilibili, the most frequently used video platform by Chinese teenagers.

For research question 1, we calculated the institutional penetration of the selected samples. Institutional penetration rate refers to the proportion of state organs, commercial organizations, etc. on news platforms. The excessive participation of politics and capital will affect the autonomy of the media. The higher the institutional penetration rate, the lower the diversification of news platforms. [10]. Hence, we hypothesized the following:

H1: Video websites have a lower institutional penetration rate compared to news aggregation platforms.

For research question two, we need a measure of news diversity, as this study mainly measures content diversity. A total of six indicators are set to discuss the degree of news diversification, including news type, country visibility, athlete visibility, and medal coverage ratio to conduct a comparative study between video websites and aggregation websites. After normalizing the diversity data, a correlation analysis was performed on the diversity index and the organizational penetration of the two platforms.

To calculate content diversity for both platforms, we use Simpson's Diversity Index (Dz), a measure of diversity that includes overall uniformity of presence and distribution.

To minimize the possible distorting effect of the number of classes in the distribution, we only used the standardized diversity index. In addition, using Simpson's standardized diversity index helps to compare the distribution of the number of different classes.

Simpson's Dz ranges from 0 (no variance, very skewed distribution) to 1 (maximum variance, perfectly uniform distribution), and is calculated as follows, where p_i is the proportion of actors in class i and k is the class in the distribution number:

$$\text{Simpson's Dz} = \frac{1 - \sum_k^n p_i^2}{1 - \frac{1}{k}}$$

We formulated the following hypotheses:

H2: The lower the penetration rate, the greater the news content diversity.

H2a: The lower the penetration rate, the greater the country visibility.

H2b: The lower the penetration rate, the greater the athlete visibility.

H2c: The lower the penetration rate, the greater the news types.

H2d: The lower the penetration rate, the greater the medals diversity. For the third research question, this study measures from three perspectives, vertical, horizontal, and visual analysis. First, in the comparison of the vertical time dimension, by calculating the correlation between the number of news reports on the two platforms over time. Second, in the comparison of horizontal content dimension, visualization of news frames, and exploration of its dependence on mainstream media. Through the word2vec text processing tool in the natural semantic analysis system, each news title is converted into a 512-dimensional vector, and then through PCA dimensionality reduction processing, the 512-dimensional vector is converted into a 2-dimensional vector, and keywords are captured and visualized. Given the influence of the state system, media system, and ideology on the news framework mentioned in the theoretical review section, we assume that regardless of the level of organizational penetration, China's digital news is still within the same news framework. Third, to test the dependence of aggregated news websites and video websites on mainstream media, we first collated and coded the reports of the people's daily during the Olympic Games, coded as a1-a182, with a total of 182 news items. A-B and A-C groups (traditional newspapers vs video platforms and traditional newspapers vs aggregated news platforms) were tested for news homogeneity to explore their dependence on mainstream media. We hypothesized the following:

H3a: The number of news reports on video websites and news aggregation platforms tends to be consistent over time

H3b: The frame visualization outline of news reports on video websites and news aggregation platforms tends to be consistent.

H3c: Video platforms and aggregation platforms still rely heavily on mainstream media.

4. Results

4.1. Organizational penetration rate

H1: Video websites have a lower institutional penetration rate compared to news aggregation platforms.

Different structural penetration rates represent the degree to which different platforms are influenced by institutions. It also reflects the different penetration strategies of the government on different platforms. The excessive participation of politics and capital will affect the autonomy of the media. The higher the institutional penetration rate, the lower the diversification of news platforms [10].

Table 1 gives an overview of the institutional penetration rate of the aggregating news platform Toutiao and video platform Bilibili. Firstly, the news providers are counted by user ID. Make a social category for all organisations involved in Olympic coverage. Reference to Beckers and van Elster's classification (2019) includes four categories of social actors: political and government actors, business actors and experts, civil society actors and citizens [27]. Combined with the actual situation in China, the Chinese news agencies are considered to be controlled by the government [2], the penetration rate of news agencies is specially calculated. Commercial institutions and non-governmental institutions participated in a small number of reports and merged into the same category. So Institutional penetration rate refers to the combined proportion of political organizations, news agencies, and commercial organizations. political organizations include central government organizations and media such as People's Daily and Xinhua News, and local government platforms. News agencies are news media platforms excluding organizations directly under the government. Commercial organizations include social organizations, universities, and other groups.

Table 1 shows that Toutiao, the representative of aggregation news platform, during the monitoring period have a total of 936 news providers. The total number of news providers is significantly lower than that of video websites, which have a total of 4,450 users. However, As Table 1 summarizes, the institutional penetration rate of Toutiao, the representative of aggregation news platforms is 41.3% (n=387), whereas the rate of Bilibili, which represents video platforms is only 3.9% (n=174). H1 are confirmed.

4.2. Diversity index measurement

H2: Lower penetration rate, more news content diversity.

Through the discussion of news diversity indicators in the literature review section, there are many classification methods. Considering China's system, this study does not discuss external diversity. Based on the research content of this paper, we mainly measure content diversity and the four variables to monitor the diversity of news. National visibility, gold medal attention, athlete visibility, and news types, a comparative study of video websites and aggregation websites. In this part, the Simpson diversity index is used for calculation. The calculation shows that the diversity of video websites with low penetration rates is

greater than that of news aggregation platforms with high penetration rates.

Table 2 summarizes the content diversity index of the aggregating news platform Toutiao (GroupB) and video channel Bilibili (GroupC). Table 2 shows that four variables are measured from content diversity to monitor news diversity: national visibility, gold attention, athlete visibility and news type for aggregate and video Sites. First, the Simpson diversity index is used to calculate the content diversity of the four parts to obtain the original diversity index value, and then the weight diversity index is assigned by each part accounting for 25% of the weight, and finally the total diversity index is calculated. Unify to the 0-1 interval for comparison. Table 2 indicates that video sites have the advantage of diversity due to country visibility and news type. In general, the diversity of video websites with lower penetration rate is greater than that of news aggregation platforms with higher penetration rate ($0.77 > 0.60$).

4.3. National visibility

H2a: Lower penetration rate, more country visibility.

Many studies define content diversity as the heterogeneity of news content, i.e., the multiple actors, questions, and points of view (or frame). Since the Olympic Games is a multi-country event, we focus on the presentation of news on different countries, that is, country visibility.

The reports on Bilibili, the video platform covered 48 different countries and regions during the monitoring period, compared with 37 different countries and regions covered by Toutiao, the aggregated news platform. Video platforms have some reports on the countries with very low ranking on the medal table including Uganda, Ireland, Israel, Thailand, Estonia, Latvia, etc., paying more attention to the non-mainstream and non-medal power countries.

4.4. Diversity of news types

H2b: Lower penetration rate, more athlete visibility.

In addition to regional news classification, the news classification of aggregated news platforms is divided into 20 categories by news type, including attention, recommendation, hotspot, finance, technology, entertainment, etc. During the monitoring period, Toutiao mainly focused on the game itself. Sports reports account for 90.4% of the total, and there are fewer reports that focus on other related subjects. On the video platform, Bilibili, 87 different types of news are classified in the back

system. Its news types are richer and more diverse, and the classification is very detailed. We make statistics on the classification of more than 100 reports, among which the top five news types are: competitive sports ($n=3,035$, 31.1%), daily ($n=1,150$, 11.8%), hot spots ($n=854$, 8.8%), sports comprehensive ($n=651$, 6.7%), social ($n=443$, 4.5%) and funny ($n=300$, 3.1%). Although most reports are still focused on sports, it also has an increased number of news reports focused on social and entertainment, history, fitness, film, TV editing, and other related areas.

Figure 1 give a rough indication of the two variables that have a negative relationship with institutional penetration, country visibility and news type. In the previous article, we calculated the aggregation news platform Toutiao (GroupB) and the video site Bilibili (GroupC).) Table1 shows institutional penetration and Table2 shows content diversity index. Figure 1 confirmed assumptions H2a and H2b, that is the national visibility and news type increase as agency penetration decreases. are confirmed.

4.5. Athletes' visibility

H2c: Lower penetration rate, more news types.

In terms of the visibility of athletes, there are 124 different athletes' reports on video websites, including foreign athletes, while only 54 athletes' reports appear on aggregated news websites. Video platforms with lower organizational penetration rates present more reports. More athlete visibility. In terms of quantity, video sites have an advantage, but due to the frequency of video sites' reports on some athletes, such as the report on the first gold athlete Yang Qian ($n=568$, 7.6%), the attention on the youngest Chinese athlete Quan Hongchan ($n=402$, 5.4%), so the difference in the diversity of athletes is not obvious as measured by the Simpson diversity index.

4.6. Gold medal attention

H2d: Lower penetration rate, more medals diversity.

In the news framework of the Olympic Games, reports on gold, silver, and bronze medals are essential, but only paying attention to medal reports is not conducive to the diversified presentation of the theme of the Olympics. Therefore, telling other Olympic-related stories is also important for content diversity. On the aggregated news platform, medals reports accounted to 2795 (65% for gold, 17% for silver, 7% for bronze, and 11% for comprehensive medals), compared with 5784 on the video platform (56% for gold medal, 24% for

silver, 13% for bronze and 7% for others). the difference in the diversity of athletes is not obvious as measured by the Simpson diversity index.

Figure 2 gives an overview of the two variables that show insignificant and positive correlations with institution penetration. Figure 2 shows that as institution penetration decreases, there is no significant change in athlete visibility, while gold medal attention increases. Assumptions H2c and H2d are not confirmed.

5. Convergence of news frameworks

5.1. Sequentially

H3a: The number of news reports on video websites and news aggregation platforms tends to be consistent over time

This study finds the convergence problem in news framing between video news platforms and aggregated news platforms. In terms of news volume and coverage of country visibility, the trends for video-based and aggregator-based platforms are almost completely converging as shown below. Video platforms and aggregated news platforms may be in the same news field and framework.

Figure 3 shows the trend of the number of news reports on video news platforms and aggregated news platforms, from July 1 to August 30, the number of reports during the Olympics. Besides, correlation analysis and simple linear regression were performed on the video platform and aggregated news platform through SPSS, and it was found that the two platforms have strong correlations with the number of daily news reports ($B=1.587$, $SE=0.078$, $R=0.935$).

5.2. Framework visibility

H3b: The frame visualization outline of news reports on video websites and news aggregation platforms tends to be consistent

A news framework is a useful multi-dimensional perspective, which can be used to study the nature of news media reports around a specific issue. Entman (1993) explained that the framework is a selection process in which certain aspects of perceived reality are selected and become more prominent in text communication [18].

Principal component analysis (PCA) is a mathematical dimensionality reduction method. In space, PCA can be understood as projecting the original data into a new coordinate system. The first principal component is the first coordinate axis, that is, the x coordinate in Figure 4 and Figure 5. The meaning represents the change range of the new

variables obtained from a certain transformation of multiple variables in the original data; The second component is the second coordinate axis, that is, the y coordinate in Figure 4 and Figure 5, which represents the change range of the second new variable obtained by some transformation of multiple variables in the original data. In this paper, we transform a multi-dimensional variable into a two-dimensional variable and project it into a plane to get the visual graphics of news frameworks on different digital platforms. Then, by extracting the keywords, that is, the subject of the news, the different color blocks in Figure 4 and Figure 5. Each color block has a keyword representing the main content frame of the news for that color block. In this way, you can see the selection and highlighting in the news frame, and further analyze the similarity of the news frame.

Figure 4 and Figure 5 show the news frame visualization graphs of the aggregated news platform Toutiao (GroupB) and the video channel Bilibili (GroupC), respectively. It can be seen visually from the graph that the news frames of Group B and Group C are similar to fish in shape, but Group C has a higher dispersion from the fishtail to the right, which shows the diversity of some parts. The overall frame shape is similar. From the keyword analysis, Group B is divided into seven categories: gold medal, gold medal, Tokyo, Olympic Games, Olympic Games, men's and women's, which constitute the news reporting framework of the news aggregation platform. Group C is divided into seven categories: gold medal, Tokyo, Olympic Games, Olympic Games, 2021, all red Zen, and Yang Qian. Comparing the two groups of keywords, four keywords are completely consistent. The difference is that in terms of highlighting the reports on athletes, the aggregation platform emphasizes men and women athletes, while the video platform highlights the individual athletes, and the names of two concerned athletes appear. In general, the news frameworks of the two platforms are similar, showing the convergence of news frameworks.

5.3. News homogeneity

H3c: Video platforms and aggregation platforms still rely heavily on mainstream media.

Assessing the homogeneity of news content in news headlines from the same media company is a commonly used research method to measure the impact of increased market concentration on the diversity of news coverage [28]. In this paper, the similarity of news headlines is measured by the Word2vec text processing tool in the natural semantic analysis system, and cosine similarity is

adopted as an algorithm for judging the similarity of the two articles. Based on the vector coordinates, drawing the cosine value of the angle between the two vectors in the space to evaluate their similarity. The closer the cosine value is to 1, the smaller the angle is, that is, the two vectors are similar.

Taking 60% as the threshold, the news dependence (homogeneous) of aggregated news platforms on the official mainstream media, People's Daily, is 35%, while the homogeneous news ratio is 14% for video news platforms. However, it is worth noting that if we set the threshold at 50%, the number of similar news will soar greatly. Like aggregation news platforms, the dependence on mainstream media will reach over 90%.

6. Discussions and Conclusions

Compared with news aggregation platforms, the video platform has a lower penetration rate. China may adopt different penetration methods for different digital platforms. For news aggregation platforms, political institutions and national news organizations have entered in large numbers and adopted a high penetration mode. For video platforms, due to the nature of the video platform, they have only entered the relevant government agencies of the Communist Youth League of China and adopted a low penetration mode. The current number of self-media on the video platform exceeds 90%, bringing a decentralized communication mode, which involves the people from different social backgrounds in the dissemination of information.

The video platform has a lower penetration rate with more news diversity. This study makes a comparative study of video websites and aggregate websites from the aspects of news type, national visibility, medal coverage ratio, and athlete visibility. Through the calculation of the Simpson diversity index, it is found that the total diversity score of video websites is higher than aggregate news websites. In the degree of diversity contribution, there is a positive correlation between news types and national visibility and organizational penetration. However, there is no significant correlation between medal coverage ratio and athlete visibility.

Video platforms and aggregate news platforms may still be in the convergent news framework. This study also found that in China, video websites and aggregation websites are in the same news framework. First, the aggregated news and video news are very similar to the news topics of the mainstream media. Second, the aggregated news and video news are highly convergent in the time series trend of the number of Olympic reports.

Third, through the principal component dimension reduction analysis, the news framework graphics of the aggregated news and video news platforms are similar. This reminds us that both video websites and aggregate news websites belong to the same national public opinion field and cannot escape the same news framework to some extent, even though video websites provide us with more news perspectives and types.

6.1. Additional Findings

There is no apparent difference in the number of news reports between video websites and aggregate news websites. For the report of the same news event, video news websites do not show obvious quantitative advantages over aggregate news websites. Even in this study, the total amount of video news is slightly lower than that of video platforms. However, compared with the single print media, the number of online news is soaring. For video websites to attract more people to join, it does not mean an absolute increase in the number of news reports. And the number of news reports is not the only indicator of news diversity.

In addition, professional reports on video websites are seriously insufficient. 63% of we media users on aggregate news platforms have professional qualifications, while only 1% on video platforms. This reminds us that the number of we media is not equal to the number of independent journalists. To attract more users, video news websites have a relatively loose review of users' personal information and have no requirements on personal professional ability.

6.2. Limitations

This is an exploratory study on the news diversification and independence of video platforms and aggregation platforms, but there are still some limitations in the research. First, selection of samples. This article analyzes a specific topic, namely the news coverage of the Tokyo Olympic Games. We chose this topic due to the wide participation of Olympic news coverage, which could attract news participants as many as possible. However, because the subject matter is relatively neutral, it is not easy to generate polarized views. Therefore, the differential analysis of different viewpoints is limited. Second, lack of audience diversity analysis. The two selected samples (Groups B and C) in this article are from popular online platforms, but their audiences may not be the same. Toutiao has a wider distribution, while Bilibili has a more concentrated youth group. Third is the difficulty of text crawling video news

platforms. The content analysis of this article is relatively macroscopic and lacks the comparison of specific news reports. It is difficult to capture the specific content of the news on a large scale, especially from video news platforms, so only the news headlines were analyzed.

6.3. Conclusions

This research introduces the comparative study of news diversity on digital platforms and outlines the news reports of the platforms through the measurement of diversity and the visualization of the news framework. Thus, it provides new ideas for diversity research for countries or regions with weak external diversity. Video websites with a lower penetration rate provided more options for news diversification, including more types of news and more visibility of actors. However, in terms of the substantive diversity of news, video websites and aggregate websites may still be under the convergent news framework. There is a convergence in the trend of the total amount and content of news reports, and the dependence of online news on mainstream media still deserves our

attention. At present, China's video news platforms do show some advantages in diversity, but there are still many limitations, such as actually promoting the process of news democratization and liberation. Moreover, the results suggest that even if there are differences in the indicators of news content diversity, it is still possible to be in the convergent news framework. In the digital wave, for the new digital platform, transferring the diversity of content but maintaining the consistency of the news framework may be a new strategy for countries or regions with weak external diversity.

Table 1. Institutional penetration rate

Institutional penetration	Group B	Group C
Political organizations' penetration rate	9.8%	0.9%
News agencies' penetration rate	3.6%	0.8%
Commercial organizations penetration rate	27.9%	2.2%
Institutional penetration	41.3%	3.9%
100%=	936	4450

Note: Institutions penetration rate = Political organizations' penetration rate + News agencies' penetration rate + Commercial organizations penetration rate.

Table 2. Simpson's Dz

Simpson's Dz	Original index		Weight index	
	Group B	Group C	Group B	Group C
National visibility	0.4	0.5	0.10	0.12
Gold attention	0.8	0.7	0.20	0.18
Athlete visibility	1.0	1.0	0.25	0.25
News type	0.2	0.9	0.05	0.22
Total Simpson's Dz			0.60	0.77

Note: Total Simpson's Dz= 25%*National visibility+25%* Gold attention+25%* Athlete visibility+25%* News type

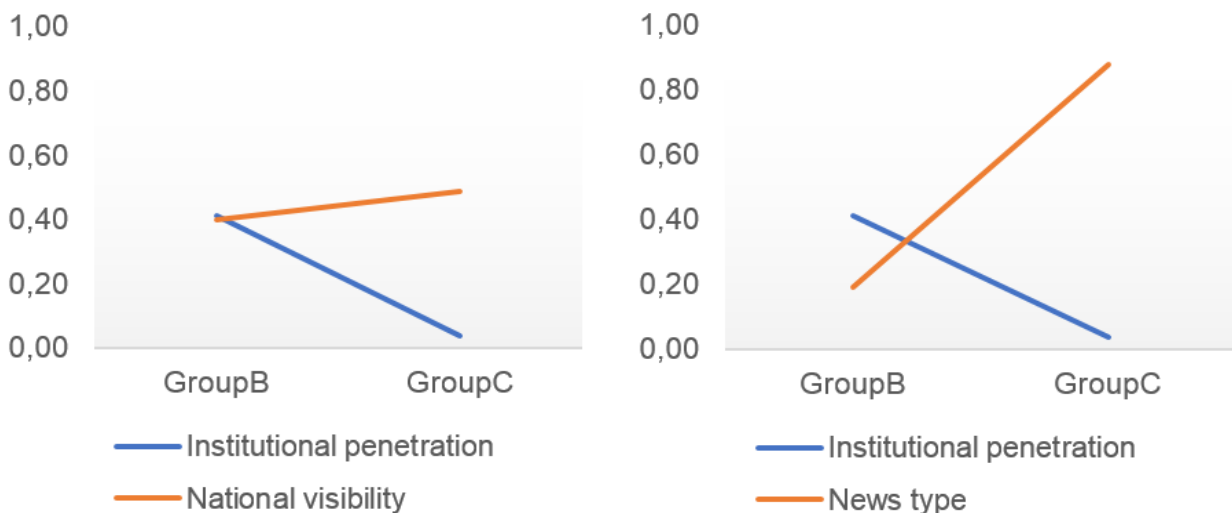


Figure 1. Correlation between organizational penetration rate and diversity I

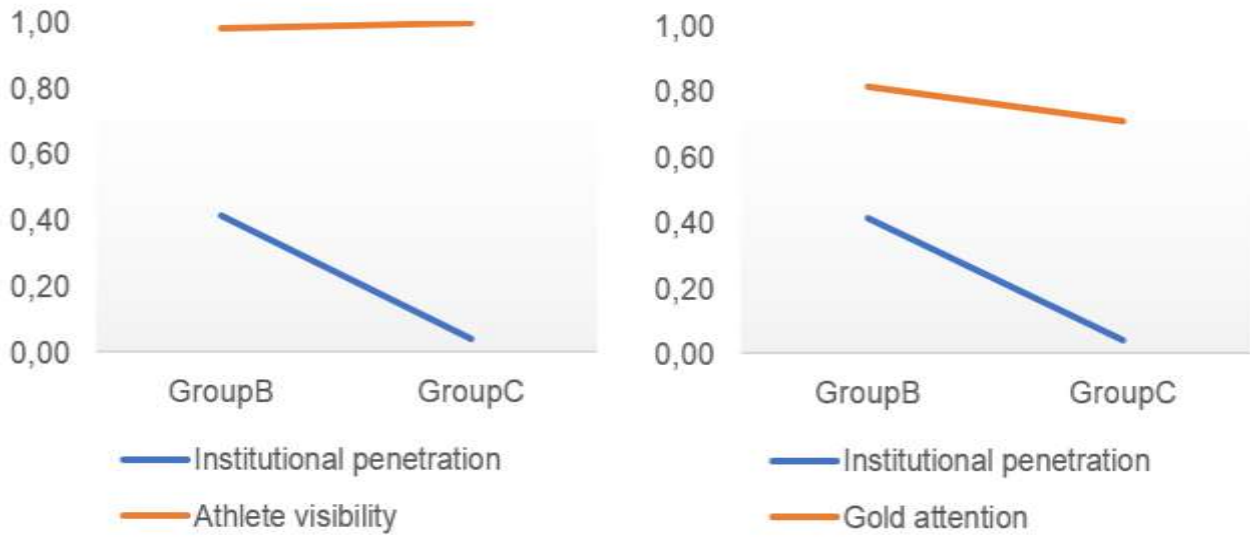


Figure 2. Correlation between organizational penetration rate and diversity II.

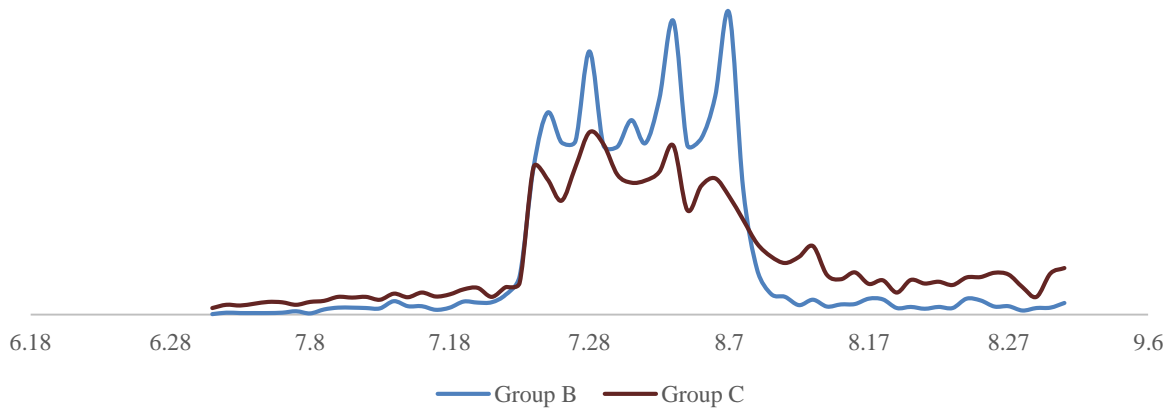


Figure 3. Number of news stories over time (Group B vs C)

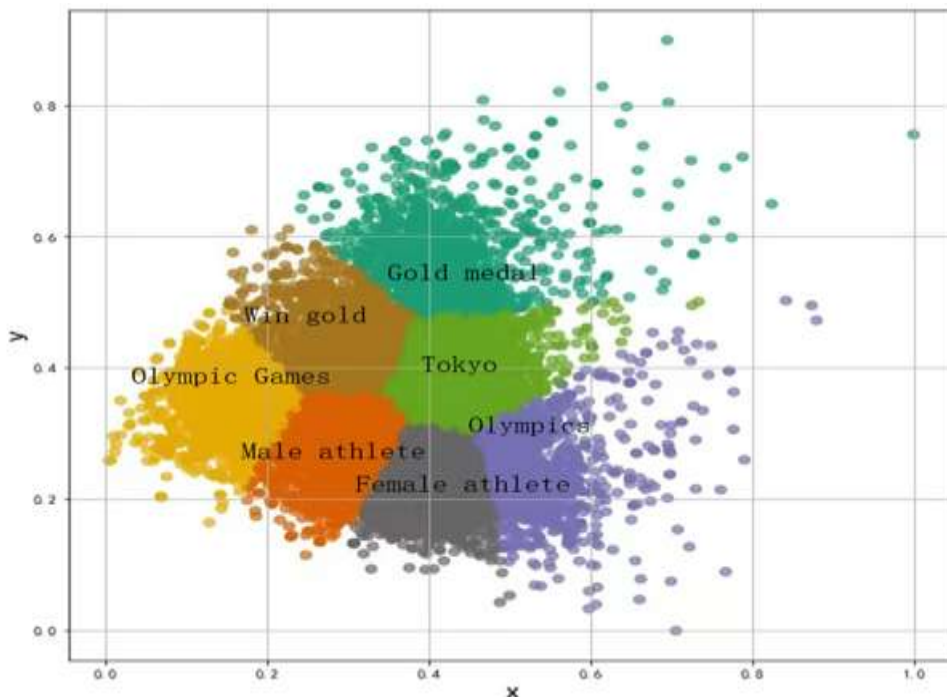


Figure 4. Framework visibility for Group B

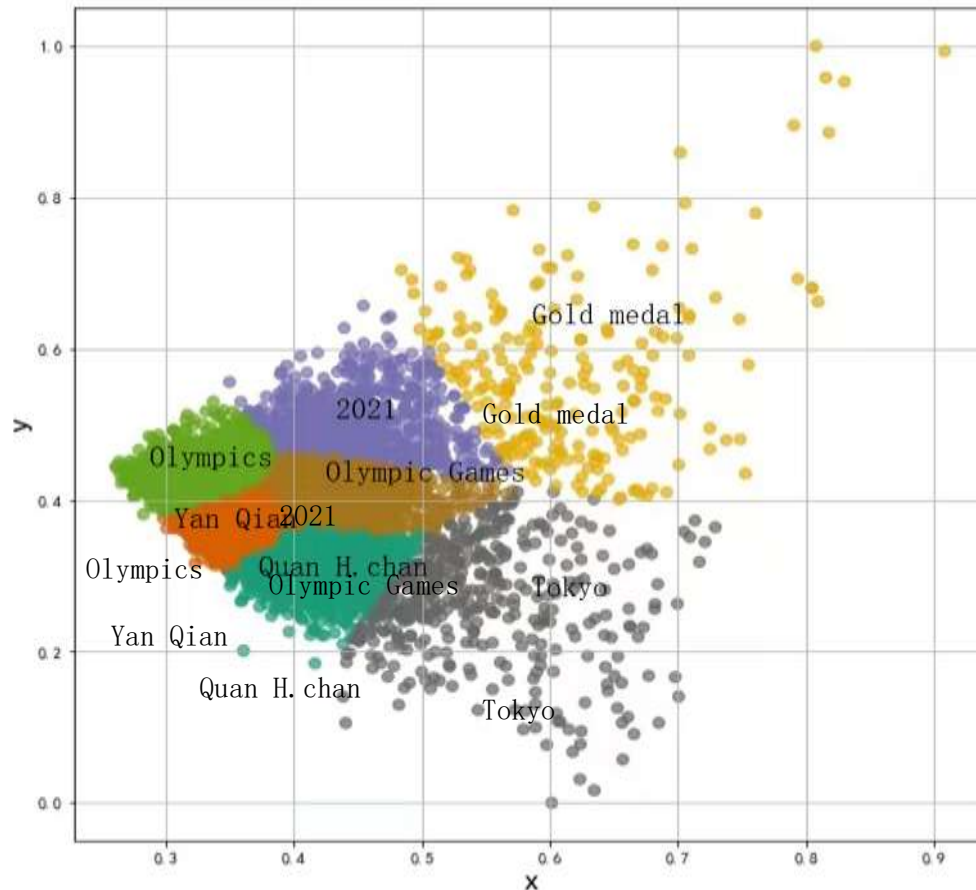


Figure 5. Framework visibility for Group C

Author Statements:

- **Ethical approval:** The conducted research is not related to either human or animal use.
- **Conflict of interest:** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper
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References

- [1]Schuderson, Michael. (2017). Where Does Autonomy Come from, Rodney Benson, Eric Neville7, Bourdieu and the Journalistic Field, Zhejiang University Press. Vol. 229.
- [2]Zhao, Y. (2008). Communication in China: Political Economy, Power, and Conflict. Lanham, MD: Rowman & Littlefield Publishing Group Publishers.
- [3]Tan, Y. (2012). Organizational Ethics of Chinese Mass Media." *Journal of Mass Media Ethics* 27 (4): 277–293. doi:10.1080/08900523.2012.746124.
- [4]Shambaugh, D. (2007). China's Propaganda System: Institutions, Processes and Efficacy In. *China Journal* 57;25–58. doi:10.1086/tcj.57.20066240.
- [5]Lu (2018). Competing for New Media: Game of Macro Policy, or Win-win? On the Relationship Between Social Media Platform and Mainstream News Production in China. *Theory and Criticism of Literature and Art* 3;137–145.
- [6]Saltzis, K., and R. Dickinson. (2008). Inside the Changing Newsroom: Journalists' Responses to Media Convergence. *Aslib Proceedings* 60 (3);216–228. doi:10.1108/00012530810879097.
- [7]Chang, J, and H. Ren. (2018). The Powerful Image and the Imagination of Power: the "New Visual Turn" of the CPC's Propaganda Strategy Since its 18th National Congress in 2012. *Asian Journal of Communication* 28 (1): 1–19."doi:10.1080/01292986.2017.1320682
- [8]Huang, Z.A., and R. Wang. (2019). Building a network to "Tell China Stories Well": Chinese Diplomatic Communication Strategies on Twitter.

- International Journal of Communication* 13;2984–3007.
- [9]McQuail, D., et J. J. Van Cuilenburg. (1983). Diversity as a Media Policy Goal: A Strategy for Evaluative Research and a Netherlands Case Study. *Gazette* 31 (3): 145–162. doi:[10.1177/001654928303100301](https://doi.org/10.1177/001654928303100301).
- [10]Rebillard, F., and M. Loicq (eds.). (2013). *Pluralisme de l'information et media diversity. Un état des lieux international, De Boeck*.
- [11]Entman, R.M., and S. S. Wildman. (1992). Reconciling economic and non-economic perspectives on Media policy: transcending the Marketplace of Ideas. *Journal of Communication* 42 (1): 5–19. doi: [10.1111/j.1460-2466.1992.tb00765.x](https://doi.org/10.1111/j.1460-2466.1992.tb00765.x)
- [12]Napoli, P. M. (1999). Deconstructing the Diversity Principle. *Journal of Communication* 49(4);7–34. doi:[10.1111/j.1460-2466.1999.tb02815.x](https://doi.org/10.1111/j.1460-2466.1999.tb02815.x).
- [13]Sjøvaag, H. (2016). Media diversity and the global superplayers: operationalizing pluralism for a digital media market. *Journal of Media Business Studies* 13(3); 170–186. doi:[10.1080/16522354.2016.1210435](https://doi.org/10.1080/16522354.2016.1210435).
- [14]Joris, G., F. De Grove, K. Van Damme, and L. De Marez. (2020). News Diversity Reconsidered: A Systematic Literature Review Unraveling the Diversity in Conceptualizations. *Journalism Studies* 21 (13); 1893–1912. doi: [10.1080/1461670X.2020.1797527](https://doi.org/10.1080/1461670X.2020.1797527).
- [15]Kapfer, J., D. Kurpius, et al. (1996). Diversity in the News: A Conceptual and Methodological Framework. *Journalism and Mass Communication Quarterly* 73 (3);582–593. doi: [10.1177/107769909607300306](https://doi.org/10.1177/107769909607300306).
- [16]Hendrickx, J., and H. Ranaivoson. (2021). Why and How Higher Media Concentration Equals Lower News Diversity—The Mediahuis Case. *Journalism* 22 (11);2800–2815. doi:[10.1177/1464884919894138](https://doi.org/10.1177/1464884919894138).
- [17]Masini, A., P. Van Aelst, T. Zerback, C. Reinemann, P. Mancini, M. Mazzoni, M. Damiani, and S. Coen. (2018). Measuring and Explaining the Diversity of Voices and Viewpoints in the News: A Comparative Study on the Determinants of Content Diversity of Immigration News. *Journalism Studies* 19(15);2324–2343. doi:[10.1080/1461670X.2017.1343650](https://doi.org/10.1080/1461670X.2017.1343650).
- [18]Entman, R. M. (1993). Framing: Toward Clarification of a Fractured Paradigm. *Journal of Communication* 43(4);51–58 <https://doi.org/10.1111/j.1460-2466.1993.tb01304.x>
- [19]Goffman, E. (1974). *Framing Analysis: An Essay on the Organization of Experience*. New York: Harper & Row, 21.
- [20]Gamson, W. A., & Modigliani, A. (1989). Media discourse and public opinion: A constructionist approach. *American Journal of Sociology*, 95;1–37.
- [21]Gitlin, T. (1980). The Whole World Is Watching: Mass Media in the Making and (Un)Making of the New Left, Berkeley, University of California Press, 6–7.
- [22]Pan, Z., Kosicki, G. M., (1993). Framing analysis: An approach to news discourse. *Political communication*, 10(1);55–75. doi:[10.1080/10584609.1993.9962963](https://doi.org/10.1080/10584609.1993.9962963)
- [23]Buyens, W., and P. Van Aelst. (2022). Alternative Media, Alternative Voices? A Quantitative Analysis of Actor Diversity in Alternative and Mainstream News Outlets. *Digital Journalism* 10 (2);337–359. doi:[10.1080/21670811.2021.1929366](https://doi.org/10.1080/21670811.2021.1929366).
- [24]Hendrickx, J., and A. Van Remoortere. (2021). Assessing News Content Diversity in Flanders: An Empirical Study at DPG Media. *Journalism Studies* 22(16);2139–2154. doi: [10.1080/1461670X.2021.1987299](https://doi.org/10.1080/1461670X.2021.1987299).
- [25]Humprecht, E., and F. Esser. (2018). Diversity in Online News: On the Importance of Ownership Types and Media System Types. *Journalism Studies* 19 (12): 1825–1847. doi: [10.1080/1461670X.2017.1308229](https://doi.org/10.1080/1461670X.2017.1308229).
- [26]Duan, R., and S. Miller. (2021). Climate Change in China: A Study of News Diversity in Party-Sponsored and Market-Oriented Newspapers. *Journalism* 22 (10);2493–2510. doi:[10.1177/1464884919873173](https://doi.org/10.1177/1464884919873173).
- [27]Beckers, K., and P. Van Aelst. (2019). Look Who's Talking: An Analysis of Actors in Television News (2003–2016). *Journalism Studies* 20 (6): 872–890.
- [28]Beckers, K., A. Masini, J. Sevenans, et al (2019). Are newspapers' news stories becoming more alike? Media content diversity in Belgium 1983–2013. *Journalism*, 20(12);1665–1683. doi:[10.1177/1464884917706860](https://doi.org/10.1177/1464884917706860)