Journal of Linguistics & Cultural Studies

Article

Research on the Image of China's Science and Technology in Asahi Shimbun (2021-2025)

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Abstract: This study examines how Asahi Shimbun constructed the image of China's science and technology between 2021 and 2025. Content analysis was applied to 524 China-related science and technology reports, which were coded at three levels: reporting topics and news frames, genres and information sources, and high-frequency words and reporting tendency. The results show that the coverage concentrated on the internet, new energy vehicles, semiconductors and military defense; that competition and fact frames dominated; that straight news and feature reports made up over 95% of the sample; that governments, especially the US government, and the reporters' own newsgathering were the main information sources; and that high-frequency word analysis revealed that national and political entities accounted for 35.0% of occurrences. Furthermore, 64% of the reports were neutral and 36% negative, with no clearly positive report. Asahi Shimbun portrays China as a rapidly rising technological innovator, an important participant in international technological competition, and a technological power carrying potential risks.

Keywords: asahi shimbun; image of china's science and technology; content analysis; international communication

1. Introduction

In the era of globalization and informatization, the construction of national image has become an increasingly important issue in international relations. Asahi Shimbun is one of the most influential national general-interest newspapers in Japan, and the stance and perspective of its China-related coverage guide the Japanese public in understanding China and its scientific and technological development. In recent years, scholars have carried out a great deal of research on the construction of national image. Some studies have examined the strategic discourse frames of the modern newspaper Ta Kung Pao [1], while others have analyzed the macro-, meso- and micro-level frames through which a contemporary external publicity medium, China Daily, constructs the image of China under the rule of law [2]. Particularly from the perspective of guiding international public opinion, how to build a "credible, lovable and respectable" image of China has become a core concern [3]. However, media in Western and some other developed countries often portray China as an "imitator" or a "security threat" in their narratives of modernization [4], and this tendency toward "over-politicization" is especially pronounced in German-language media and mainstream Western opinion. Although existing studies have addressed the image communication of Silk Road cities [5] and of specific documentaries [6], specialized research on Japanese newspapers, and on Asahi Shimbun in particular, in the key field of science and technology remains insufficient.

In view of this, this study takes Asahi Shimbun as its object and analyzes its China-related science and technology coverage from 2021 to 2025. It reveals the characteristics of that coverage in terms of reporting topics, news frames, genres, information sources, high-frequency words and reporting tendency, and then explores how Asahi Shimbun constructs the image of China's science and technology, together with the influencing factors and problems behind it.

Received: 22 September 2026
Revised: 28 October 2026
Accepted: 11 November 2026
Published: 16 November 2026

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This study adopts content analysis to conduct quantitative and qualitative analyses of Asahi Shimbun's China-related science and technology reports within a specific period (2021-2025). It focuses on the following core questions:

1. What are the main topics of Asahi Shimbun's China-related science and technology coverage?
2. Which news frames does Asahi Shimbun mainly use when reporting on China's science and technology?
3. What are the characteristics of the genre distribution and the composition of information sources in this coverage?
4. How do the high-frequency words and the reporting tendency reflect Asahi Shimbun's attitude toward China's science and technology?

By addressing these questions, this study aims to provide empirical evidence for understanding how mainstream Japanese newspapers perceive China's science and technology, and to offer theoretical references and practical implications for China in enhancing its international communication capacity and effectively shaping its national image in science and technology.

2. Research Design

2.1. Sample Selection

The sample of this study consists of the China-related science and technology reports published by Asahi Shimbun [7] from January 1, 2021 to December 31, 2025, from which 524 valid reports were screened. These reports cover the main areas of attention in Asahi Shimbun's coverage of China's scientific and technological development.

2.2. Category Construction and Coding

To ensure that the analysis is systematic and objective, this study constructs a three-level analytical framework: a high-level framework (reporting topics and news frames), a middle-level framework (report genres and information sources), and a low-level framework (high-frequency words and reporting tendency).

2.2.1. Reporting Topics

According to the content of the news, the reporting topics are divided into 14 categories: the internet, new energy vehicles, semiconductors, military and defense, artificial intelligence, aerospace, communications, high-tech raw material management, biotechnology, science and technology policy, data security, high-speed rail, robotics, and others. The topic of each report is coded, and reports involving several topics are coded multiple times.

2.2.2. News Frames

Drawing on framing theory and the core narrative mode of each news item, the reporting frames are divided into six types: competition frame, fact frame, problem frame, vigilance frame, cooperation frame and threat frame. The main frame reflected in each report is coded.

2.2.3. Report Genres

The report genres are divided into four types: straight news, feature reports, commentaries and interviews, in order to analyze the preferred forms of communication in Asahi Shimbun's China-related science and technology coverage.

2.2.4. Information Sources

The information sources cited in the reports are counted, including governments (the US government, the Chinese government, etc.), reporters' own newsgathering, enterprises (Chinese, Japanese and US enterprises, etc.), media (Chinese media, US media, etc.) and other sources, so as to reveal the bias in its information acquisition.

2.2.5. High-Frequency Words

The high-frequency words in the body texts of the reports are counted and semantically classified, in order to identify the core issues Asahi Shimbun attends to and its potential value orientation.

2.2.6. Reporting Tendency

The reporting tendency is divided into three types: positive, neutral and negative. By judging the overall tone of each report, the attitude of Asahi Shimbun toward China's scientific and technological development is assessed.

3. Results and Discussion

3.1. Topic Analysis of Asahi Shimbun's China-Related Science and Technology Coverage

This study coded the topics of the 524 China-related science and technology reports published by Asahi Shimbun from 2021 to 2025, and identified 570 topic occurrences in total (some reports involve more than one topic). The results are shown in Table 1.

Table 1. Frequency Distribution of Topics in Asahi Shimbun's China-related Science and Technology Coverage (2021-2025)

No.	Topic category	Frequency	Percentage
1	Internet	106	18.6%
2	New energy vehicles	94	16.5%
3	Semiconductors	69	12.1%
3	Military and defense	69	12.1%
5	Artificial intelligence	46	8.1%
6	Aerospace	45	7.9%
7	Communications	27	4.7%
8	High-tech raw material management	20	3.5%
9	Biotechnology	15	2.6%
9	Science and technology policy	15	2.6%
11	Data security	10	1.8%
11	High-speed rail	10	1.8%
13	Robotics	9	1.6%
14	Others	35	6.1%

Overall, the topics of Asahi Shimbun's China-related science and technology coverage show a markedly concentrated pattern. The internet (18.6%), new energy vehicles (16.5%), semiconductors (12.1%) and military and defense (12.1%) are the four core fields of attention, accounting for as much as 59.3% in total. This indicates that Asahi Shimbun's attention to China's scientific and technological development mainly revolves around digital technology, strategic emerging industries and national science and technology security.

3.2. Frame Analysis of Asahi Shimbun's China-Related Science and Technology Coverage

On the basis of the topic analysis, this study further coded Asahi Shimbun's China-related science and technology reports according to framing theory. Combined with the core narrative mode of each news item, the reports were finally divided into six frames: competition, fact, problem, vigilance, cooperation and threat.

Overall, Asahi Shimbun's China-related science and technology coverage is dominated by the competition frame and the fact frame, with multiple frames coexisting. The competition frame appears 157 times, accounting for 30.0% of all frames and making it the most frequently used news frame; the fact frame appears 150 times, accounting for 28.6% and ranking second. Together they account for nearly 60% and jointly constitute the main characteristic of its China-related science and technology coverage.

3.3. Genre Analysis of Asahi Shimbun's China-Related Science and Technology Coverage

This study analyzed the genres of Asahi Shimbun's China-related science and technology coverage and divided the 524 valid samples into four types: straight news,

feature reports, commentaries and interviews. The statistics show that the coverage is dominated by two genres, straight news (62.8%) and feature reports (33.2%), which together account for more than 95%. This indicates that Asahi Shimbun's reporting on China's scientific and technological development centers on the dissemination of news facts, while commentaries with distinct opinions and in-depth interviews account for a relatively limited proportion.

3.4. Information Source Analysis of Asahi Shimbun's China-Related Science and Technology Coverage

This study counted the information sources in the 524 China-related science and technology reports of Asahi Shimbun, with 558 valid source citations in total (some reports cite several sources at the same time).

Overall, governments are the most important information source, accounting for 44.4% of all sources, which shows that Asahi Shimbun attaches great importance to official public statements when reporting on China's science and technology. Among them, the US government is the most frequently cited official source, more often than the Chinese government, which indicates that Asahi Shimbun also pays close attention to the statements of the US government when reporting on China's scientific and technological development.

Reporters' own newsgathering is the second largest source, with 134 citations, accounting for 24.0% of all sources. This indicates that Asahi Shimbun has a strong capacity for independent newsgathering in its China-related science and technology coverage and relies more on its own reporters for news collection, rather than depending entirely on official releases or reprints from other media.

Enterprise sources also account for a certain proportion. Chinese enterprises are cited 60 times, clearly more than Japanese enterprises (14 times) and US enterprises (12 times). This shows that Asahi Shimbun presents the development of China's science and technology industry through the information released by Chinese enterprises, their business data and statements of their management.

As for media sources, Chinese media are cited 41 times, accounting for 7.3%, and US media 13 times, accounting for 2.3%. Moderate citation of information released by Chinese media helps improve the completeness of the reports. Overall, however, the frequency of media sources is clearly lower than that of reporters' own newsgathering, governments and enterprises, which indicates that Asahi Shimbun tends to use first-hand information sources rather than rely on secondary dissemination by other media.

3.5. High-Frequency Word Analysis of Asahi Shimbun's China-Related Science and Technology Coverage

This study semantically classified the high-frequency words in the body texts of the 524 China-related science and technology reports of Asahi Shimbun, with 20,497 occurrences counted in total. The results are shown in Table 2. The original words are Japanese and are given here in English translation.

Table 2. Semantic Distribution of High-Frequency Words in the Body Texts of Asahi Shimbun's China-related Science and Technology Coverage (2021-2025)

Category	Number of words	Total frequency	Share	Representative words and frequency
A. National and political entities	15	7169	35.0%	China 3211, United States 857, Japan 712, world 586, government 319, Beijing 230, nation 230, Europe 210, Chinese government 192, international 189, people 89, president 88, Shanghai 86, central 85, chairman 85
B. Control and restriction	12	1993	9.7%	regulation 395, export 359, tariff 171, strengthening 150, authorities 147, measures 120, subsidy 120,

				guideline 118, ban 117, policy 107, suspension 102, management 87
C. Security and vigilance	12	1652	8.1%	security 227, intelligence 204, Taiwan 171, concern 168, safeguarding 160, pointing out 160, military 105, weapons 99, vigilance 94, aircraft carrier 92, criticism 87, emphasis 85
D. Science, technology and industry	21	3578	17.5 %	technology 516, semiconductor 482, space 314, automobile 216, research 204, factory 168, communications 158, cutting-edge 154, science 121, video 118, artificial 114, equipment 113, automatic 112, battery 110, posting 107, capability 107, construction 105, parts 100, 10,000 units 92
E. Economy, trade and markets	18	2703	13.2 %	enterprise 552, market 272, company 235, investment 145, competition 142, plan 137, the company 136, cooperation 122, provision 108, finance 106, agreement 105, Mr. Xi 99, trade 98, business 97, support 97, major firm 88, supply 82, Japan-US 82
F. General narrative and evaluative words	22	3402	16.6 %	domestic 246, meanwhile 242, use 240, last year 236, possibility 197, field 191, largest 186, problem 179, this year 176, necessary 169, above 167, this time 155, influence 136, important 129, highest 111, previous year 106, center 96, region 92, report 89, time 89, related 89, schedule 81
Total	100	20497	100. 0%	

Words related to national and political entities account for as much as 35.0%, making this the most central semantic category in the body texts. In particular, the frequent co-occurrence of words related to China, the United States and Japan further shows that China-US technological competition and Japan's own science and technology strategy form an important international background of the reports. This corroborates the earlier finding that the competition frame accounts for the highest proportion, and reflects the markedly international political context of the China-related science and technology coverage.

Words related to science, technology and industry occur 3,578 times, accounting for 17.5%, which directly reflects Asahi Shimbun's sustained attention to China's innovation capacity and the development of strategic emerging industries, such as semiconductors, artificial intelligence, new energy vehicles and aerospace.

General narrative and evaluative words occur 3,402 times, accounting for 16.6%. Most of them are neutral expressions, and words with obvious emotional color or value judgment are relatively rare. This indicates that Asahi Shimbun generally maintains strong journalistic professionalism in science and technology news writing, and that its views are expressed more through issue selection and frame setting than through direct evaluative language.

Words related to economy, trade and markets occur 2,703 times, accounting for 13.2%, which reflects the distinct economic attributes of the science and technology coverage and shows that China's science and technology is regarded more as an important part of the global economic system.

Together, words related to control and restriction (9.7%) and to security and vigilance (8.1%) show that, when reporting on China's scientific and technological development, Asahi Shimbun constantly links technological innovation with international competition and national security.

Taken together, the findings show that Asahi Shimbun's reporting on China's science and technology pays attention not only to the technology itself but also strongly emphasizes macro backgrounds such as international relations and global industrial competition. Through narratives of nations, industries, markets and security, it shapes China's science and technology into a comprehensive entity with innovation capacity, international competitiveness and economic influence.

3.6. Reporting Tendency Analysis of Asahi Shimbun's China-Related Science and Technology Coverage

The reporting tendency reflects the overall attitude of a medium toward its reporting object. According to the statistics, among the 524 China-related science and technology reports, 333 are neutral, accounting for 64%, and 191 are negative, accounting for 36%; no clearly positive report appears.

Neutral reports account for more than 60% and mainly concern China's science and technology policies, enterprise developments, scientific and technological achievements and industrial development. They are dominated by event narration and information delivery and rarely use evaluative language with obvious emotional color. The negative reports show that Asahi Shimbun still maintains a rather cautious or even critical attitude toward some science and technology issues. They concentrate on topics such as information leakage, cybersecurity, military and defense, and China-US technological competition, linking China's scientific and technological development with international competition, technological risks and national security, and stressing the competitive pressure that China's technological rise may bring to Japan.

4. The Image of China's Science and Technology in Asahi Shimbun

Based on the foregoing analysis of the topics, frames, genres, information sources, high-frequency words and reporting tendency of Asahi Shimbun's China-related science and technology coverage, it can be found that the image of China's science and technology constructed by Asahi Shimbun is mainly manifested in three aspects: a rapidly rising technological innovator, an important participant in international technological competition, and a technological power with potential risks.

4.1. A Rapidly Rising Technological Innovator

In its reports, Asahi Shimbun portrays China as a country whose scientific and technological innovation capacity keeps growing. In terms of news frames, the fact frame accounts for 28.6% of all reports, second only to the competition frame, indicating that Asahi Shimbun attaches considerable importance to presenting the reality of China's scientific and technological development objectively. In terms of information sources, Asahi Shimbun cites a large amount of information from the Chinese government, Chinese enterprises and Chinese media, which shows that the reports do not avoid the positive achievements of China's science and technology but demonstrate its steadily improving innovation capacity through rich information sources. China is therefore portrayed as an important force in the global innovation system, and its scientific and technological strength has become an object of continuing international attention, especially in fields such as the internet, new energy vehicles, artificial intelligence and aerospace, where it shows remarkable innovation vitality and development potential.

4.2. An Important Participant in International Technological Competition

Asahi Shimbun places greater emphasis on China's image as an important participant in international technological competition. The competition frame is the most frequent of the six frames, accounting for 30.0%. In terms of information sources, the US government and the Chinese government are cited second only to reporters' own newsgathering, which also reflects that the China-related science and technology coverage consistently revolves around international politics and global technological competition. It can thus be seen that Asahi Shimbun does not report on China's science and technology in isolation but stresses the important influence of China's scientific and technological development

on the international competitive landscape and on Japan's industrial security. China is not only a subject of technological innovation but also an important participant in global technological competition, and its competitive position in key fields such as semiconductors, new energy vehicles and artificial intelligence is closely watched by Asahi Shimbun.

4.3. A Technological Power with Potential Risks

At the same time, Asahi Shimbun also constructs the image of China as a technological power with potential risks. Although the vigilance frame (8.8%) and the threat frame (4.6%) account for relatively small proportions, the continuous appearance of related words such as security, vigilance, concern and intelligence shows that, while reporting on China's scientific and technological development, Asahi Shimbun also pays close attention to its own industrial security and national security, and interprets some technological issues within the framework of international security and risk governance. The negative reports concentrate on information leakage, cybersecurity, military and defense, and China-US technological competition, stressing the competitive pressure that China's technological rise may bring to Japan. This reporting tendency indicates that, while acknowledging China's technological progress, Asahi Shimbun remains vigilant about its possible geopolitical and security implications.

On the whole, Asahi Shimbun fully affirms China's achievements in fields such as new energy vehicles, artificial intelligence and aerospace, and portrays China as an important force in global technological innovation. At the same time, it constantly interprets China's science and technology against the background of international competition, so that China is not only a technological innovator but also an important participant in international technological competition and a potential source of risk.

5. Conclusion

Based on 524 China-related science and technology reports published by Asahi Shimbun from 2021 to 2025, this study analyzed the newspaper's coverage in terms of topics, news frames, genres, information sources, high-frequency words and reporting tendency. The coverage is concentrated on the internet, new energy vehicles, semiconductors and military and defense; it is dominated by the competition and fact frames; it relies mainly on straight news and feature reports and on government and reporter-gathered sources; high-frequency word analysis revealed that national and political entities accounted for 35.0% of occurrences; and it is largely neutral (64%) with a substantial negative share (36%) and no clearly positive reports. On this basis, Asahi Shimbun constructs three images of China's science and technology: a rapidly rising technological innovator, an important participant in international technological competition, and a technological power with potential risks.

Theoretically, the study applies a three-level analytical framework to a Japanese newspaper in the field of science and technology, which complements existing research on national image construction that has focused mainly on other media and other topics. It shows that Asahi Shimbun expresses its attitude less through direct evaluative language than through issue selection, frame setting and the choice of information sources. Practically, the findings provide an empirical reference for China to enhance its international communication capacity and to shape its national science and technology image: in the Japanese media context, China's scientific and technological achievements are readily read against the background of international competition and security, so communication that presents China's innovation in an open and cooperative context deserves attention. The study is limited to a single newspaper and to a five-year period, and future research may compare several Japanese newspapers or other countries' media to examine the influencing factors behind these images more fully.

Funding: This paper was supported by the Key Project of the Graduate Innovation Fund of Xidian University, "Research on China's National Image Based on Japanese Newspaper Reports on DeepSeek" (No. 25SFLY001).

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