



# Corpus-based critical discourse analysis of China's image in news discourse on carbon peak and carbon neutrality in *China Daily*

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## ABSTRACT

Based on the corpus of news reports on carbon peak and carbon neutrality in *China Daily*, this study examines the national image constructed in news reports of the mainstream newspaper on China's "dual carbon" goals by investigating the use of the high-frequency lexical words, the co-occurrence network of words and collocation features from the perspectives of critical discourse analysis. The corpus analysis tool AntConc 3.5.9 is used to conduct concordance analysis, and KH Coder 3 is used to draw the co-occurrence network of words. It is found that, in the context of carbon peak and carbon neutrality, the image of China is characteristic of strong determination to achieve the "dual carbon" goals, high sense of environmental governance responsibility, and active pursuit of technology innovations and international cooperation. The findings of this study can provide insights into the construction of the "dual carbon" discourse with Chinese characteristics and the global dissemination of the positive national image of China in building a community with a shared future for mankind.

## 1. Introduction

As global climate change becomes increasingly prominent, carbon emissions have become a focal point of international concern. Against this backdrop, China, one of the world's most populous countries and the second-largest global economy, attracts attention for its efforts to address climate change. In September 2020, President Xi Jinping announced during the 75th session of the United Nations General Assembly that, in response to climate change, China would enhance its determined contributions, implement stronger policies and measures, strive to peak carbon dioxide emissions before 2030, and achieve carbon neutrality before 2060. In September 2021, the Central Committee of the Communist Party of China and the State Council issued the Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy, outlining the timetable and roadmap for achieving carbon peak and carbon neutrality in China. In October 2021, the State Council issued the Action Plan for Carbon Dioxide Peaking Before 2030, focusing on the roadmap to achieve the carbon peak goal by 2030. This shows China's firm resolve to actively deal with climate change, adopt a green and low-carbon development path, and achieve common development. In recent years, China's efforts in carbon peak and carbon neutrality (dual carbon) have steadily progressed, achieving positive results at the top-level design and

policy implementation levels.

The news media is an important way to spread national image, and the choice and use of language in the news reports affect the construction of national image (Zhou, 2023). As an English-language daily newspaper officially published in China, *China Daily* serves as an important window for the world to understand China by reporting news events, major strategic decisions and various guidelines and policies, aiming to connect the country with the outside world by better introducing China's development philosophy, path and achievements, which makes it an important media to introduce China to the world. *China Daily* therefore plays a crucial role in shaping the national image to the international audiences.

With the continuous development of the economy and society, China has gradually moved from the periphery to the center of the international stage. As the world's second-largest economy, China plays a crucial role in international trade, yet its corresponding influence in international discourse has not been adequately enhanced. A positive national image can help to strengthen the influence of the international discourse (Xing & Zhao, 2021), and the quality of a country's image exerts a substantial influence on its international standing, as it not only shapes its foreign relations but also, to a certain degree, impacts policy making in various fields such as the economy and military (Li, 2005). The proposal of the "dual carbon" goals has created an important

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opportunity for China to enhance its voice and construct its national image in the world since the experience and lessons of climate change governance in China are an important part of global climate governance. In this context, studying how to construct China's national image becomes particularly important. This study examines how the news reports in China's mainstream newspaper construct China's image based on the corpus of news texts on carbon peak and carbon neutrality.

## 2. Literature review

### 2.1. National image

National image, also known as country image, is defined as “the total of all descriptive, inferential and informational beliefs one has about a particular country” (Martin & Eroglu, 1993: 193). A country's image is not only determined by its political factors and economic strength but is also closely related to the perceptions and opinions of people from other countries in the international community, since image refers to “the set of beliefs, ideas, and impressions that a person holds regarding an object” (Kotler, 2001: 260), and is about people's impression and perception of that object.

In the fields of international relations, political science, communication, and even linguistics, the study of national image has consistently been an important and widely discussed topic. The concept of national image was initially introduced by British economist Boulding (1959), who explained the essence of national image from three aspects: geographical space, psychological emotions, and material strength, and argued that the shaping of a national image is often influenced by factors such as ideology, values, and cultural traditions. Subsequently, Scott (1965) further elaborated on the concept of national image, stating that it is the overall cognitive attribute people have when thinking about a particular country, encompassing cognition, emotions, and behavior. A country's image is considered as the collective impression that people have of the country, and can be represented by its diplomatic image, public image, and media image (Li, 2005). This study posits that national image refers to the perceptions and impressions that individuals from another country hold about a particular nation, which is a subjective cognition and emotional construction encompassing various aspects of a country, including its politics, culture, and economy.

From the perspective of semiotics, a country's image is essentially a cultural impression of an external entity (a country, group, or individual). National image is not a direct representation of reality but is rather a symbolic expression created by image-makers based on their understanding and intentions (Li, 2005). It is found that global competitiveness, psychological elements such as national culture and national psychology, and reliable information of a country without hindrance have great influence on the national image of that country, and that media serves as an important means for people to know and understand a country (Li, Wang, Li, & Zhang, 2016). Readers' interpretation of the reported information can be greatly influenced by the journalist or the media (Xin & Gao, 2019; Yamashita, 1998), and the news report serves as a reliable source of information by showing the recently-occurring fact, and thus is always taken as the main source for information acquisition (Li, Zhao, & Lou, 2023). Therefore, people's perceptions and impressions of a country can be influenced by news reports on that country.

In the context of globalization, the national image constitutes a vital resource for sovereign states to participate in international affairs (Xing & Zhao, 2021), and enhancing the national image is almost a prerequisite for boosting the country's soft power and strengthening its international competitiveness (Li, 2005). Chinese scholars have realized the importance of national image in people from other countries and started to turn their attention to the study on building China's image since early 2000s. It is found that the evolution of China's image was mostly influenced by news reports of other major countries, that it is important for China to consciously construct its national image and deconstruct the

image of other countries, and that one of the efficient ways to improve China's image is to improve the communication strategies in news dissemination for international audiences (e.g. Huan & Deng, 2021; Li, 2005; Tang, 2021; Xiang, 2013). Studies show that some western mainstream newspapers tend to report China-related issues with a negative attitude or present a distorted picture of China to the international audience, and thus portray a negative image of China in international communication (He, 2005; Lu, 2021; Wang, Xin, & Cheng, 2022; Xing & Zhao, 2021). Western media often remain skeptical and tend to question the political motivations and the detailed implementation plans of the initiatives, which poses a challenge for China in gaining global trust and recognition for its environmental efforts (Wang, 2003; Xiang et al., 2021). In particular, it is found that China is portrayed as a country pursuing economic growth at the expense of the environment and good at showing resolution of governance but with poor governance capacity in the environmental news of *The New York Times* (Yang & Wang, 2023). China has now become the second-largest economy, and is eager to improve its own national image by introducing to the world what is being done in China in the effort to improve the environment and build a community with a shared future of mankind. This study explores how *China Daily*, as China's international media outlet, shapes the national image regarding the environmental goals in contrast with the generally less favorable perception from foreign media.

### 2.2. Critical discourse analysis

Critical Discourse Analysis (CDA) takes a critical stance toward how language is used and analyzes texts and other discourse types in order to identify the ideology and values underlying them (Richards & Schmidt, 2010). It seeks to reveal the interests and power relations in any institutional and socio-historical context through analyzing the ways language is used. A three-dimensional framework for CDA was put forward by Fairclough (1992), which includes the analysis of discourse as text, as discourse practice (processes of text production, distribution and consumption), and as social practice, and emphasizes that text analysis is not something that should be done in isolation. This framework was further described as analysis of language texts, analysis of discourse practice and analysis of discourse events as instances of sociocultural practice (Fairclough, 2010). In this framework, each language use can be taken as a communication event consisting of text, discourse practice and social and cultural practice, and the link between text and social practice is mediated by discourse practice. Accordingly, the analysis will specify the linguistic features, process of production and consumption from the perspective of audiences and wider social and cultural practice.

CDA is generally regarded as a trans-disciplinary, text-analytical approach to critical social research, and centers on the systematic, text-based exploration of language to reveal its role in the workings of power and ideology in society by investigating the power imbalance in the use of language (Fairclough, 2010). This framework creates links between discourse study and sociology, and politics, and serves as a means of exploring the relationship between language and social-institutional practices, and the close links between language as discourse and broader social and political structures. The feasible steps of CDA can be summarized as: (1) description of the features of lexical items, collocations, and syntactic choices; (2) interpretation of the texts as discourse practice by examining the generation and dissemination of the discourse; and (3) explanation of the interaction between the discourse and ideology, power and culture by taking discourse as specific social practice (Fairclough, 1992). News reports are concerned with information about something that has just happened or will happen soon, which is closely related to social issues, and are thus always the interest of CDA (e.g. Baker & McEnery, 2005; Liu & Leung, 2021; Qian & Wang, 2023; Xin & Gao, 2019).

### 2.3. News reports on carbon neutrality

Climate change has become a public hot topic, and attracted widespread attention from academia throughout the world, and the research on analyzing low-carbon discourse from the perspective of corpora is gradually increasing (Alexander, 2010; Kotevko, 2012; Poole, 2022; Qian & Wang, 2023). The news report can transform special knowledge into common knowledge, and political discourse into popular discourse, and embeds ideological power within the discourses, and by disseminating these discourses, it shapes social consensus, influencing and changing people's ways of thinking and behavior (Qian, 2019). News reports are therefore considered as an important means to portray a country's image (Li, 2000), and are likely to be used as linguistic evidence to analyze national image.

Scholars have come to realize the importance of reporting the implementation of the "dual carbon" strategy to both domestic and international audiences. By analyzing the current situation of international dissemination of China's "dual carbon" strategy, Lu (2021) suggests that, for global audiences, the international dissemination of China's plan should be formed by a joint force of three discourse entities: official, social, and public. The official discourse should play the leading role, the social discourse should play an explanatory role, and the public discourse a supplementary role. News reports can serve as important source for official and social discourses according to the news sources. Qian and Wang (2023) used corpus-based approach to study the discursive construction of "carbon peak and carbon neutrality" in *People's Daily*, the official newspaper in Chinese, and it is found that the "dual carbon" discourse is introduced to domestic audiences from the concept introduction to the construction of China's determination and confidence in news reports. Zhou (2023) conducted a corpus-based positive discourse analysis of China's image constructed by China's mainstream media in the context of carbon peak and carbon neutrality, and reveals that that the image of China is characterized with high sense of environmental governance responsibility, proactive response to crises, pursuit of multi-cooperation, offering help to other countries and regions, advocacy of ecological civilization and exploration of innovative ideas.

Other studies on the "dual carbon" strategy in China are mostly from the perspectives of social governance and environmental protection, being concerned with the opportunities, challenges, and countermeasures faced by China's development in the "dual carbon" context, the implementation path of the "dual carbon" goals, and the transformation of industrial structure and green and low-carbon development (Wang & et al., 2021; Zhuang, 2021). Comparatively speaking, little attention has been paid to the study of the national image built in the global dissemination of the implementation of the "dual carbon" strategy in China. Based on the corpus of news reports on carbon peak and carbon neutrality of China's mainstream newspaper in English, *China Daily*, this study analyzes the image of China constructed in news discourse of "dual carbon" goals targeted at international audiences from the perspective of CDA.

## 3. Methodology and procedure

### 3.1. Corpus-based critical discourse analysis

A corpus is a collection of naturally-occurring language text, chosen to characterize a state or variety of language, the collocates of a word refer to the words occurring in its close proximity in the texts, and collocation analysis studies the lexical co-occurrence of words with a short space of each other in the texts through examining the collocates of the word under investigation (Sinclair, 1991). The corpus-based approach uses a corpus as the source to check researcher intuition or to examine the frequency or probability of the search items in the corpus, and can present word frequencies, and concordance lines and collocates of the search items with the help of a computer software. The

use of the computer software makes it possible to withdraw the search item with its immediate co-text in an exhaustive way and analyze language use with the linguistic context of the item.

The corpus-based CDA, the combination of the corpus-based approach and CDA, has been widely used in the analysis of media discourse, and is proved to be an effective way to analyze news texts (Baker & McEnery, 2005; Kim, 2014; Liu & Leung, 2021; Qian & Wang, 2023; Wang, Zhang, & Han, 2022; Xin & Gao, 2019). On one hand, the corpus-based approach helps researchers provide quantitative evidence in linguistic studies by collecting real data reflecting language use and using computer software to identify language features hidden in fragmented texts, and further corpus analyses can reveal unexpected language features that are difficult to observe with the naked eye. On the other hand, CDA situates discourse within a social context, interpreting the cultural and ideological implications in discourse. The corpus approach and CDA are considered complementary to each other (Kim, 2014; Qian & Wang, 2023). For example, word frequency statistics can rapidly identify high-frequency words in a corpus, and these words are significant to CDA by serving as a starting point for research. The corpus approach compensates for the shortcomings of intuitive inference, providing reliable linguistic examples for CDA, thereby making the research results more reliable.

In this study, the corpus-based CDA is used to examine the national image constructed in the news corpus. Following the steps of CDA proposed by Fairclough (1992), this study analyzes the language features of the news corpus in terms of high-frequency lexical words, the co-occurrence network, and the collocation features of *China* in the news texts, and then discusses how national image is constructed in the dimensions of textual analysis, discourse practice and social practice respectively.

### 3.2. Research questions

This study investigates the linguistic features and the national image constructed in the news discourse of carbon peak and carbon neutrality of China's mainstream newspaper, *China Daily*, from the perspectives of CDA through analyzing the high-frequency lexical words, co-occurrence network of words, and collocation features of *China*. The research questions include: (1) What are the features of the high-frequency lexical words and the co-occurrence network in the news reports on "dual carbon" goals in *China Daily*? (2) What are the typical collocation features of *China* in the news texts? (3) What national image of China is constructed in these news texts?

The design of the research questions is based on the following considerations: (1) Frequency analysis is one of the most direct methods that corpus analysis can provide, high-frequency words serve as the starting point for discourse studies, and high-frequency lexical words often indicate the common themes and focus of attention in the corpus of news texts. Frequently used lexical words are repeatedly presented to the audiences, and often present a certain image in their mind, thereby affecting their attitudes and impressions toward the current issue (Hu & Tian, 2018). The national image can be analyzed based on the semantic analysis of the high-frequency words (Qian, 2019; Zhou, 2023). (2) The co-occurrence network of words shows which words frequently occur together in the same datasets, and the analysis of co-occurrence network of words can reveal the core issues implied in the texts (Higuchi, 2016). The national image can be discussed based on the core issues revealed by analyzing the groups of frequently occurring words that are often used together. (3) Collocational evidence often supports a tendency for words to occur together even though they remain largely independent choices, the analysis of recurrent expressions is crucially important for both linguistic and ideological studies (Stubbs, 1996). The choice of words and syntactic structures in news texts on a subject will shape a specific image of the subject, and the features of national image can be analyzed through examining the typical collocates of the search word *China*.

### 3.3. Corpus building

Corpus-based approach has proved to be effective in analyzing the contents and linguistic features in news discourse (Qian, 2019; Qian & Wang, 2023; Xin & Gao, 2019). The corpus used in this study is *China Daily News Corpus of Carbon Peak and Carbon Neutrality*, composed of news reports from *China Daily*. The news texts are selected from the official website of the newspaper (<http://www.chinadaily.com.cn/>), and the search words in advanced search are “carbon neutrality, peak” with the word “carbon” included in the title. The span of the news chosen is from October 2020, to August 2023, since the “dual carbon” policy was put forward in October 2020. There are all together 147 news texts concerning carbon peak and carbon neutrality. Those texts of less than 120 words are removed, and 70 news texts are included in the corpus, totalling 16,763 words.

### 3.4. Research instruments

The corpus analysis tool AntConc 3.5.9 is a freeware computer software for concordancing and text analysis. It is used in this study to identify the most frequently used lexical words in the “dual carbon” news report corpus, to withdraw the concordance lines of these lexical words in the news corpora, and to conduct collocation analysis of the search word in order to identify its recurrent patterns by providing its linguistic context.

KH Coder is a computer software package for quantitative content analysis or text mining, using Stanford POS Tagger to extract words from English data, and R for statistical analysis, and has been traditionally used in content analysis to statistically express the data (Higuchi, 2016). It is used in this study to produce the co-occurrence network of words in the corpus, and content analysis can then be conducted.

### 3.5. Research procedure

This study examines the construction of China's image from the perspective of CDA, based on the corpus of news reports on “dual carbon” strategy in China. The research procedure involved in this study includes:

(1) Corpus building. The corpus used in this study is a self-built corpus, the *China Daily News Corpus of Carbon Peak and Carbon Neutrality*, composed of 70 news texts from October 2020, to August 2023. In the process of corpora building, the theme (title), the size of each text, and the time span of the news are taken into consideration.

(2) Text analysis. This is to examine the linguistic features of the

news reports, and includes three steps. The first step is to identify the high-frequency lexical words and conduct concordance analysis by using AntConc 3.5.9. The frequency of each word can be obtained by using the wordlist function of the software. High-frequency lexical words in the corpus, reflecting the theme of the news texts, can then be identified.

The second step is to analyze the co-occurrence network of words by using KH Coder to draw a network connecting words that tend to be used together, which can show the core issues of the news texts. The specific substeps are as follows: 1) Preparation of Data. To analyze text data using KH Coder, we prepare the data as an Excel file, in which the text file of the news is entered in the column of the Excel file with each cell filled with one text of the news corpus. 2) Going to [Tools] [Words] [Co-occurrence Network] in the menu, and then setting and determining the Jaccard Coefficient, as is shown in Fig. 1. The Jaccard Coefficient is adopted here to display the co-occurrences network of words to words, representing the ratio of the number of responses in which words A and B occur simultaneously (co-occur) to the total number of responses in which either word A or B occurs. Its value ranges from 0 to 1. The larger this coefficient is, the higher the number of responses in which words A and B were simultaneously used. In the co-occurrence network the higher the Jaccard Coefficient, the stronger the co-occurrence relationship, and the darker the color of the line connecting words (Higuchi, 2016). The options in “Select the unit & words” can be adjusted based on specific purposes (see Fig. 1). In this study, we do not change the options of “Select the unit & words”, in which the selected minimum term frequency 15 and the selected minimum document frequency is 1, which are determined by KH Coder. By default, KH Coder generates the network by connecting 60 pairs of the most strongly co-occurring words by lines. To obtain an ideal diagram that contains necessary information that is easy to read, we need to adjust the Jaccard Coefficient. It is found that the perfect diagram appears when it is adjusted to 0.4, as displayed in Fig. 1. In the process of adjusting the Jaccard Coefficient, the lines between words and words can be blurry. In such cases, we need to make the part with dense lines easier to read by using the “Darker lines for stronger edges” option. As for the “Bubble plot”, in this co-occurrence network, the size of the circle surrounding a word indicates the number of occurrences of that word. The larger the circle, the more often the word appears in the responses. 3) Obtaining the co-occurrence network of words (see Fig. 2 in Section 4.2). Through trial and error, the co-occurrence network can be displayed as a result, in which groups of words strongly connected with one another are displayed in different colors, making it possible to conduct content analysis of the corpus.

The third step is to conduct collocation analysis. Typical immediate

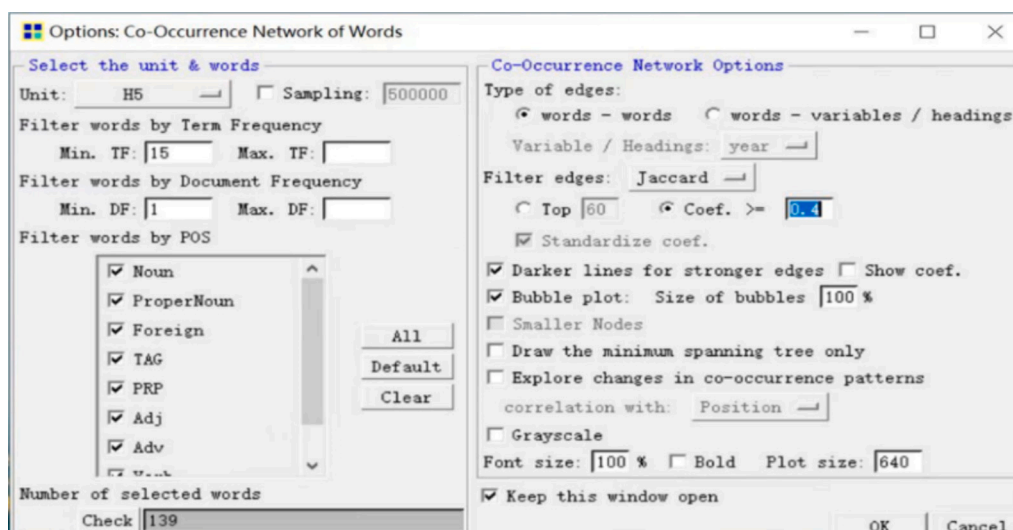


Fig. 1. Options in co-occurrence network of words.



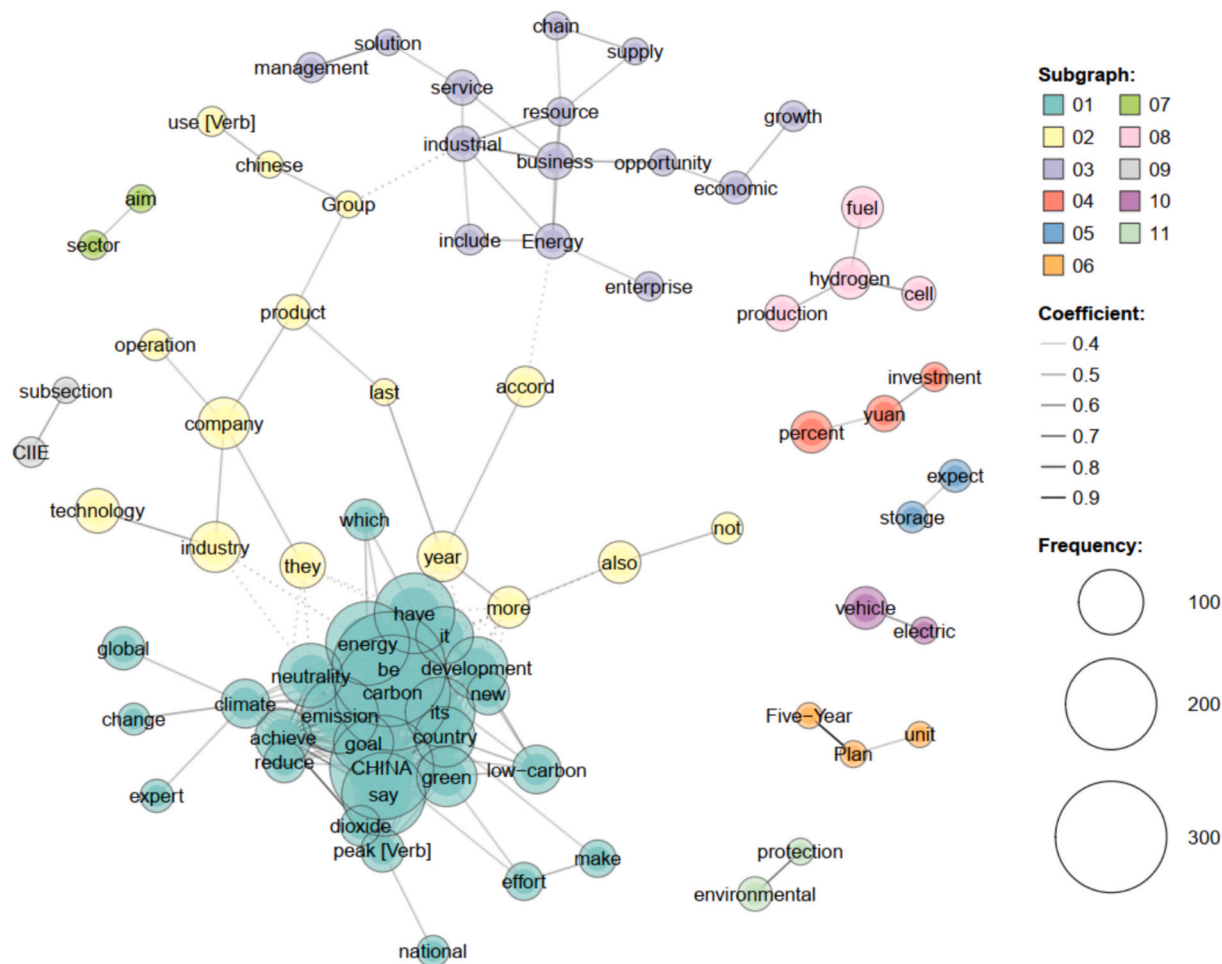


Fig. 2. Co-occurrence network of words in the corpus.

collocates of the word *China* are identified and classified in order to explore the national image constructed in the news reports by using the concordance and collocates functions of AntConc 3.5.9.

(3) Discussions from the perspectives of textual analysis, discourse practice and social practice respectively. Further analysis is conducted on the national image concerning the generation and the dissemination of the news texts, and the related sociocultural factors.

4. Results and discussions

This section includes the analyses of the news discourse in the text dimension, the discourse practice dimension, and the social practice dimension, according to Fairclough's (1992, 2010) three-dimensional framework for CDA. Corpus-based approach allows researchers to analyze the linguistic features of the targeted texts based on the analysis of word frequency, collocation, concordance lines and keywords. The text analysis of the news reports in this study includes analysis of the high-frequency lexical words, co-occurrence network of words, and collocation analysis.

4.1. Analysis of high-frequency lexical words

A corpus can provide reliable quantitative data, and word frequency is the most direct quantitative data a corpus can provide, which helps identify the most basic information in the corpus, including the meaning of the texts (McEnery, Xiao, & Tono, 2006). Frequency information can help identify the basic features in language use. The high-frequency words always serve as the starting point of computer-assisted

discourse studies, and can show the common themes and focus of the texts at the lexical level. AntConc 3.5.9 is used in this study to produce the wordlist, and the top 20 high-frequency lexical words can then be obtained (see Table 1).

Table 1 shows the top 20 high-frequency lexical words. These lexical words include fifteen nouns, three adjectives, and two verbs. The high-frequency nouns include: *carbon*, *China*, *energy*, *emissions*, *neutrality*, *development*, *country*, *year*, *goals*, *climate*, *industry*, *hydrogen*, *coal*, *technology*, and *peak*. These nouns can be classified into 3 semantic categories: (1) nouns of thematic text objects, e.g., *carbon*, *emissions*, *neutrality*, *goals*, *climate*, and *peak*, showing China's adherence to commitments and proactive actions to achieve the "dual carbon" goals, with the emphasis on carbon reduction and environmental protection; (2) nouns describing the solution or development path, e.g. *energy*, *development*, *industry*, *hydrogen*, *coal*, and *technology*, specifying the possible

Table 1  
The top 20 high-frequency lexical words.

Rank	Word	Frequency	Rank	Word	Frequency
1	carbon	405	11	goals	65
2	China	263	12	low	58
3	energy	211	13	climate	56
4	said	159	14	industry	55
5	emissions	125	15	hydrogen	54
6	neutrality	104	16	coal	48
7	development	101	17	technology	48
8	green	91	18	achieve	47
9	country	73	19	peak	47
10	year	71	20	new	46

ways to achieve the goals by means of developing new energy technology and promoting energy conservation; (3) nouns of the subject and time schedule, e.g., *China*, *country*, and *year*, emphasizing the country's determination and responsibility, and specifying the clear timetable of the efforts to achieve the goals.

The high-frequency adjectives include *green*, *low*, and *new*. The adjective *green* tends to co-occur with *development*, *low-carbon*, *transformation*, *transition*, *bond(s)*, *economy/finance*, indicating that China attaches great importance to environmental protection, economic transformation, and sustainable development in the process of economic development; *low* occurs only in the compound word *low-carbon*, which tends to be used to modify *development*, *energy*, *transformation/transition*, showing that the country adheres to low-carbon development and energy transformation through carrying out the policy of energy saving and carbon reduction; *new* is frequently used to modify *energy* and *technology*, indicating the positive attitude and innovative spirit in promoting new energy and technology.

The high-frequency verbs include *said* and *achieve*. As a speech reporting verb, *said* is used to report the speech or opinion of the authority or the spokesman of an organization. The use of this verb shows that the information is objectively reported and that the news reports present the reported speech in a neutral and objective manner, which makes the reporting practice more convincing. The verb *achieve* is mostly used to describe the realization of carbon neutrality, indicating that some achievements have been made in this filed and that China is determined to achieve the “dual carbon” goals as scheduled with full confidence.

The analysis of the high-frequency words shows that the Chinese government is fully aware of the seriousness of climate change, has developed detailed plans to cope with the problem, and has started to take practical measures for green development, e.g., technology innovations, in order to ensure sustainable economic development, and that China hopes to share with the international audiences what has been done in the country.

#### 4.2. Analysis of co-occurrence network of words

Analysis of co-occurrence network of words can show which words commonly occur together in the same datasets, and thus the core issues of the news texts can be observed. The co-occurrence network can visualize the co-occurrence structure in the corpus by drawing a network connecting words that tend to be used together, and in this study, KH Coder is used to obtain the co-occurrence network of words in the news corpus (see Fig. 2).

Fig. 2 indicates that three groups of words strongly connected with one another in the news texts. This shows that the news reports of carbon peak and carbon neutrality focuses on the following three core issues: (1) the carbon peak and carbon neutrality goals of China and corresponding plans (middle-lower part of the network), (2) operation of companies and industries (middle-left part), (3) response of businesses and industries (middle-upper part).

First, the co-occurrence network shows that the word *carbon* is closely connected with *China*, *energy*, *emission*, *neutrality*, *country*, *green*, *development*, *climate*, *reduce*, *achieve*, and *goal* etc., indicating that China is determined to achieve the “dual carbon” goals and implement related policies and plans. The news reports tend to introduce what the government has done or will do to achieve the goals and address the issues of climate change and environmental protection, for example, policies and measures to reduce carbon dioxide emissions, promote green development, develop renewable energy, and improve energy efficiency. For example,

(1) a. International and local carmakers in China are revving up efforts to **cut carbon emissions** to **achieve China's goals of peaking carbon emissions** before 2030 and reaching **carbon neutrality** before 2060.

b. China has made **reducing energy consumption** per unit of GDP

by about 3 % as one of its main targets for 2021.

Sentence (1) a emphasizes China's determination to achieve the “dual carbon” goals and specifies the time schedule, and sentence (1) b presents the details in the plan of reducing energy consumption and carbon dioxide emissions. The precise time schedule in (1) a and detailed figure in the official plan make the reported information more convincing and reliable.

Second, the network structure shows that the words *company*, *industry*, *technology*, *product*, *operation*, and *year* etc. are linked together, demonstrating the operation of companies and industries in the process of achieving the carbon emission reduction target. For example,

(2) a. Liu Wei, secretary-general of the National Alliance of Hydrogen and Fuel Cell, said that the dual carbon goals are a driving force for the development of hydrogen energy **industry**, and China's hydrogen energy **industry** is entering a new chapter.

b. Earlier this year, the **company** developed a system that combines intelligent photovoltaic and digital energy management, which can present the real-time circumstance of the **company's** energy operation.

Sentence (2) a and (2) b show that the dual carbon goals are a driving force for the development of emerging industries such as hydrogen energy industry and that the company has developed a system to present real-time circumstance of its energy operation. This group of words shows that the government has been trying to develop emerging industries focusing on development of green energy and that companies are committed to technology innovation in the process of controlling carbon emissions.

Third, the network structure shows that the words *industrial*, *resource*, *business*, *energy*, *service*, *management*, etc. are linked together, demonstrating the response of businesses and industries in the process of achieving the carbon emission reduction target. For example,

(3) a. The companies' joint statement for the carbon neutrality fund said the fund will direct equity investment into the entire **industrial chain** of vehicle battery swapping **services**. Their objective — to form an all-new mobility **energy service** ecosystem — will be made possible by developing a big data platform for battery charging and swapping.

b. Through digital innovation, the system not only helps learn about the situation of **energy** consumption but also helps predict its trend and contributes to more specific **management of energy**, Hong said.

Sentence (3) a and (3) b show that the enterprises have been making great efforts toward a new energy service ecosystem and green transformation of the country's economic structure by technological innovation in new energy vehicles and energy management. This aspect mainly focuses on the measures taken in the reduction of carbon dioxide in the field of low-carbon transportation and the enhancement of new energy development. Targeted technology improvement tends to be reported here to show the specific and effective measures taken by the authority.

In addition, Fig. 2 shows other groups of words connected with one another. For example, *yuan* is strongly connected with *investment* and *percent* (middle-right part of the network), *plan* is strongly connected with *Five-Year* and *unit* (lower-right part), and *hydrogen* is connected with *fuel*, *cell*, and *production* (upper-right part), and. This shows that the news texts also focus on the production of hydrogen fuel and hydrogen cells, the investment in green energy, and the importance in China's national economic plan (the Five-Year Plan). For example,

(4) a. According to an **investment** plan in 2021, Great Wall Motors will spend 3 billion **yuan** (\$471 million) on hydrogen-related research and development by 2024.

b. China plans to **reduce energy consumption** per **unit** of GDP by 13.5 % and **carbon dioxide emissions** per unit of GDP by 18 % during the 14th **Five-Year Plan** (2021–25) period, Premier Li Keqiang said on Friday in the Government Work Report submitted at the fourth session of the 13th National People's Congress.

c. It has extended the **hydrogen** business from manufacturing **fuel cells** and vehicles to all the links in the whole **hydrogen-energy** industrial chain, namely production, storage, transportation, refueling and

usage.

Sentence (4) a shows that the company is taking measures to promote technology innovation by expanding investment. Sentence 4(b) presents some details of China's 14th Five-Year Plan, indicating that carbon emission reduction is an important task in China's national economic plan. Sentence 4(c) shows that the company is committed to technology innovation in and promotion of new-energy batteries and vehicles, enhancing green transformation of the country's economic structure. The Five-Year Plan in 4(b) is an important part of China's national economic plan, planning for major national construction projects and distribution of productivity, and setting goals and directions for the long-term development of the national economy. It started from 1953, with an interval of three year's national economic adjustment (1963–1965), and now it is the 14th Five-Year Plan (2021–25) period.

The co-occurrence network of words in the corpus shows that the Chinese government is strongly determined to achieve the “dual carbon” goals, and is actively responding to the problems brought about by climate change by drawing up detailed plans for different time periods and taking effective measures, especially in technology innovation and development of new energy vehicles.

#### 4.3. Collocation analysis of China

The main topic in corpus studies is recurrent collocations and repeated co-selection of lexis, which is important to studies of language and ideology (Stubbs, 1996). Collocation is defined as “the occurrence of two or more words within a short space of each other in a text” (Sinclair, 1991: 170), and collocational evidence often supports a tendency for words to occur together even though they remain largely independent choices. The computer software presents us with co-occurrence information in the basic form of a concordance. The choice of words and syntactic structures in news texts on a subject will shape a specific image of the subject. In order to reveal features of China's image, we need to do the concordance analysis of the word *China* and examine its typical immediate collocates in the news texts, which will help analyze the intention and the attitude of the media.

The observation of the concordance lines shows that there are 263 occurrences of the word *China* in the corpus, and that, among the words immediately to the right of *China*, the form ‘s of possessive usage occurs most frequently 101 times (38.4 % of the total hits of the search word). The second and the third most frequently used words immediately to the right are the *has/had* (21 occurrences) and *will* (15 occurrences), i.e., the use of the perfect tense and the future tense respectively.

The use of possessive forms focuses on the government's focus on and commitment to the reduction of carbon emissions and environmental protection. For example,

(5) a. Addressing the Leaders Summit on Climate on Earth Day (April 22), President Xi Jinping reaffirmed **China's** pledge that its carbon dioxide emissions will peak before 2030 and the country will achieve carbon neutrality before 2060.

b. Digital solutions, green electricity, energy efficiency, new carbon management technologies, strengthened innovation, reduced use of water and energy, waste reduction, and even business diversification are among the host of strategies and measures that Chinese and foreign corporates are embracing and employing to bolster **China's** carbon goals.

c. The operation of **China's** first offshore carbon capture and storage demonstration project will further facilitate **China's** carbon peak and neutrality goals, as oil companies step up research and investment to help them become sustainable in the long run, industry experts said.

d. The State-owned enterprise started construction of the country's first 10-MW pumped storage hydropower project in Northeast **China's** Jilin province on Saturday, said its operator State Grid Corp of China.

Sentences 5(a) and 5(b) emphasize the China's firm commitment to the strategic goals of carbon peak and carbon neutrality and international cooperation. Sentences 5(c) and 5(d) indicate that the

government has been taking effective measures to fully promote the implementation of various policies in order to ensure that China can achieve the goals on time.

The choice of perfect tense shows what has been done in the country to cope with the energy crisis. For example,

(6) a. **China has completed** construction of the dam for the Baihetan Hydropower Station, which will be the world's second-largest in terms of installed capacity, after working nonstop for 1510 days and nights.....

b. Yang said that China **has come up with** various supporting policies in recent years to ensure the achievement of carbon peak and carbon neutrality, which has led to the vibrant development of low-carbon industries in the country.

Sentence 6(a) introduces the construction and operation of the hydropower station, and 6(b) reports the introduction of supporting policies and the development of low-carbon industries. Both achievements require long-term and tremendous efforts, indicating China's comparatively strong executive power in implementing the policies and taking related measures.

The choice of future tense shows that China will adhere to existing policies and take further effective measures to achieve the “dual carbon” goals. For example,

(7) a. **China will** also accelerate the optimization of the country's industrial structure and energy mix and promote a peak in coal consumption as soon as possible.

b. **China will** control the aggregate amount and intensity of energy consumption, reduce the use of fossil energy and advance the low-carbon transition of sectors like industry, construction and transportation, according to the draft outline of the 14th Five-Year Plan (2021–25) for national economic and social development and the long-range objectives through the year 2035.

These two sentences above show that the country will take further and specific measures to reduce energy consumption by optimizing industrial structure and controlling the amount and intensity of energy consumption in different lines of work, showing its strong determination and active attitude toward seeking effective ways to achieve the goals.

The collocation analysis of *China* shows that China is firmly committed to the “dual carbons” goals, and has managed to and will take effective measures to achieve the goals through technology innovations and international cooperation, indicating that China is a responsible country with strong executive power.

#### 4.4. Discussion

According to the three-dimensional framework for CDA (Fairclough, 2010), discourse is seen simultaneously as a language text, discourse practice, and social practice. This section will first summarize the result of the analysis in the textual dimension, and then conduct discussions in the dimensions of discourse practice and social practice respectively.

In the textual dimension, the analysis of high-frequency words, co-occurrence network of words, and collocation of *China* in 4.1, 4.2, and 4.3 shows that the image of China is characteristic of high sense of environmental governance responsibility. To be more specific, in the context of carbon peak and carbon neutrality, China is presented as a country with a firm and clear determination, proactively taking responsibility for environmental protection, making and implementing response policies, actively carrying out technological innovations, and pursuing international cooperation. In reporting the “dual carbon” strategy, news texts are of constructive influence in building the China's image in that the way and strategy of language use will to some extent affect the dissemination and acceptance of reported information. This proves the finding of Qian and Wang's study (2023) targeted at domestic audiences, in which China is constructed as a country full of determination and confidence in the “dual carbon” news discourse in China. The features of pursuing technological innovations and international cooperation seem to be specific to news reports to international audiences.

In the dimension of discourse practice, as the most influential daily

newspaper officially published in China for international audiences, *China Daily* is the medium for the government and people to communicate with the outside world. The attitude and stance of the media often conveys the intention of the Chinese government and the wishes of the people. In the “dual carbon” context, the national image of China is the product of the combination of two different institutional discourses, politics and media, which is the result of the joint promotion of government entities at the behavioral level and media discourse at the symbolic level. The “dual carbon” goals are the decision made by the Chinese government based on domestic and international situations, demonstrating the government's high sense of responsibility in addressing climate change and strengthening environmental governance.

*China Daily* serves the will of the state, and introduces the policies and measures implemented by the government to international audiences. It reports the country's efforts and achievements in achieving the “dual carbon” goals, from the macro-level policy formulation and strategic planning to micro-level technological innovations and corporate behavior, enabling the international community to have a clear understanding of China's determination and specific measures in carbon reduction and environmental protection. The news reports not only introduce the implementation of the “dual carbon” goals inside the country, but also cover the promotion for international cooperation in addressing climate change. The goals have been incorporated into the Five-Year Plan of China, the important national economic plan of the nation, reflecting the firm determination of the government in promoting green transformation of economic development. This effectively conveys the voice of the Chinese government to the international audience, actively constructing and maintaining China's image as a responsible country in dealing with environmental issues, and promoting the international community to form a more objective understanding of China.

In the dimension of social practice, the “dual carbon” goals were put forward in the context of global challenges posed by climate change to the human living environment. With the increasing emission of greenhouse gases such as carbon dioxide, global climate change is becoming increasingly serious, posing a threat to life systems. As the biggest developing country in the world, China, while rapidly developing its economy, has been facing increasingly serious environmental problems such as air pollution, water pollution, and land degradation. At the same time, global climate change has also brought enormous challenges to China's economy and environment. The Chinese government responded quickly to this problem, proposed the “dual carbon” goals in 2020, and formulated and implemented supportive policies. This is a systematic and comprehensive work, covering high-energy-consuming and high-emission sectors such as energy, industry, transportation, and construction. China is a country with large power-distance culture characterized by respect for authority and emphasis on collectivism (Hu & Tian, 2018), and the organizations at all levels and their members are more inclined to follow and execute the orders of superiors, which will to some extent accelerate the promotion of government decisions, supportive policies and response measures to mitigate the impact of unexpected problems. Once a policy is made by the central government, the local governments and relevant functional departments will respond quickly usually by establishing a coordination mechanism in order to implement the policy.

China has started to promote economic transformation and upgrading by advancing green development and strengthening technological innovations, aiming to achieve high-quality economic development. This shows that the country is intended to change its image of pursuing economic growth at the expense of the environment constructed in western media, and is committed to winning global trust and recognition for its efforts to achieve carbon neutrality through international communication. As a mainstream media for international audiences, *China Daily* inevitably reports China's policy guidelines and major achievements, and aims to tell China's story well, spread the voice of

China, and present the image of China as a trustworthy and admirable country. The finding in this study appears to be different from Yang and Wang (2023) based on the environmental news in *The New York Times*, indicating that China is country good at showing the government's resolution but with poor governance capacity. The reason behind the difference might be the differences in ideology and social system of the two countries, or *China Daily* fails to cover some seemingly negative information about problems or challenges arising in the process of achieving carbon neutrality, which may serve as an important experience or lesson in global environmental governance.

In summary, the “dual carbon” strategy helps promote the green and low-carbon development, and contributes to the visionary idea of a community with a shared future for mankind, which is now the center of China's global discourse. The implementation of this strategy is not only beneficial to the environmental protection and economic development in China, but also beneficial to global environmental protection and economy. News reports in *China Daily* not only objectively record the social reality, but also participate in or influences the construction of social reality through discourse practice, which will promote the dissemination and acceptance of the will of the state.

## 5. Conclusion

Using the corpus-based CDA, this study examines the construction of China's image in news reports on carbon peak and neutrality in *China Daily*. It is found that the image of China in the “dual-carbon” context is characteristic of strong determination to achieve the “dual carbon” goals, high sense of environmental governance responsibility, and active pursuit of technology innovations and international cooperation in new energy development. Compared with previous studies, this study highlights the image of technology innovations and international cooperation in new energy development. The finding in this study is somewhat different from that of Qian and Wang's (2003) study of discursive construction in the “dual-carbon” discourse targeted at domestic audiences. In the news discourse targeted at domestic audiences, the national image is characteristic of active transformation of special knowledge to common knowledge, and determination and confidence in achieving the goals. In the news discourse targeted at international audiences, knowledge transformation is not typical. Our finding is roughly consistent with Zhou's study (2023), except for the image of active response to crises and advocacy of ecological civilization in Zhou's study, which is possibly caused by the different selection criteria for data collection. The data in the Zhou's study covers a comparatively wider range since the data is obtained by searching the carbon-related words from the full text of the news, rather than from the title of the news.

This study provides insights into the study of national image constructed in news texts. News reports on carbon peak and carbon neutrality in the future need to improve China's image of being good at showing resolution of governance but with poor governance capacity in western media, possibly by increasing the coverage of specific results of the implementation plan, problems encountered during implementation, and the measures taken to address them, making the discourse more convincing. For example, the newspaper can report stories behind the “dual carbon” goals, such as personal low-carbon lifestyle transformation, corporate green development practices and problems encountered, and effective countermeasures taken. The limitation of this study lies mainly in the comparatively small size of the news corpus and the comparative limitedness of linguistic features under examination. Future research on the construction of national image in news reports can use larger news corpora and examine more linguistic features such as the expression of modality and stance.

## CRedit authorship contribution statement

**Zhuoran Li:** Writing – original draft, Software, Resources, Data curation. **Ronghui Zhao:** Writing – review & editing, Methodology,



Conceptualization.

## Declaration of competing interest

None.

## Data availability

Data will be made available on request.

## References

- Alexander, R. (2010). *Framing discourse on the environment: A critical discourse approach*. New York: Routledge. <https://doi.org/10.4324/9780203890615>
- Baker, P., & McNery, T. (2005). A corpus-based approach to discourses of refugees and asylum seekers in UN and newspaper texts. *Journal of Language and Politics*, 4(2), 197–226. <https://doi.org/10.1075/jlp.4.2.04bak>
- Boulding, K. (1959). National Images and international systems. *Journal of Conflict Resolution*, 3(2), 120–131. <https://doi.org/10.1177/002200275900300204>
- Fairclough, N. (1992). *Discourse and social change*. London: Polity Press. ISBN 0-7456-0674-1.
- Fairclough, N. (2010). *Critical discourse analysis: The critical study of language* (2nd ed.). London: Routledge. ISBN 13: 978-1-4058-5822-9 (pbk).
- He, Y. (2005). *American media and China image (1995–2005)*. Guangzhou: Nanfang Daily Press. ISBN 9787806524367.
- Higuchi, K. (2016). A two-step approach to quantitative content analysis: KH coder tutorial using Anne of green gables (part I). *Ritsumeikan Social Sciences Review*, 52(3), 77–91. <https://www.ritsumei.ac.jp/file.jsp?id=325881>.
- Hu, K. B., & Tian, X. J. (2018). A corpus-based study of the image of Chinese diplomacy in the English translations of Chinese discourse on diplomacy. *Foreign Languages in China*, 15(6), 79–88. <https://doi.org/10.13564/j.cnki.issn.1672-9382.2018.06.012>
- Huan, C., & Deng, M. (2021). Partners or predators? A corpus-based study of China's image in south African media. *African Journalism Studies*, 42(3), 34–50. <https://doi.org/10.1080/23743670.2021.1913428>
- Kim, K. H. (2014). Examining US news media discourses about North Korea: A corpus-based critical discourse analysis. *Discourse & Society*, 25(2), 221–244. <https://doi.org/10.1177/0957926513516043>
- Koteyko, N. (2012). Managing carbon emissions: A discursive presentation of 'market-driven sustainability' in the British media. *Language & Communication*, 32(1), 24–35. <https://doi.org/10.1016/j.langcom.2011.11.001>
- Kotler, P. (2001). *A framework for marketing management*. Upper Saddle River: Prentice-Hall. ISBN 7-301-05431-9.
- Li, W. D., Wang, Q. H., Li, J., & Zhang, K. (2016). National image of world major countries in Chinese undergraduates' minds: An evaluation based on components of a nation. *Public Relations Review*, 42(3), 476–478. <https://doi.org/10.1016/j.pubrev.2014.05.001>
- Li, Z., Zhao, R., & Lou, B. (2023). Corpus-based critical discourse analysis of reporting practices in English news reports on public health event in China and United States. *Frontiers in Psychology*, 14, Article 1137382. <https://doi.org/10.3389/fpsyg.2023.1137382>
- Li, Z. G. (2005). *Construction of national image*. Beijing: Communication University of China press. ISBN 7-81085-594-8.
- Liu, E. Y., & Leung, J. H. (2021). Corpus insights into the harmonization of commercial media in China: News coverage of migrant worker issues as a case study. *Discourse, Context & Media*, 41, Article 100482. <https://doi.org/10.1016/j.dcm.2021.100482>
- Lu, J. Y. (2021). International dissemination of Chinese solutions to carbon peak and carbon neutrality. *International Communications*, 10, 67–70. [https://kns.cnki.net/kcms2/article/abstract?v=9g5ITc5ddu3oFXSo5DeMPr3hv1twl88va4zPgKTY1nwHMD4\\_UaxyLY1UQZOrqH8tVhgH95Yc6\\_LUNWgytiN7fVRwHw6dV1le6AKr9bE9JQ2ag4kcveovw\\_Y502WNrCAB83IC9erdx34v\\_Anyqckmh\\_qNVwwnZKniHGWvgkVquQrdW4\\_P1RtApRseE7AAtV8oiUXfgdd5YfzdAhxH1V7LA==&uniplatform=NZKPT](https://kns.cnki.net/kcms2/article/abstract?v=9g5ITc5ddu3oFXSo5DeMPr3hv1twl88va4zPgKTY1nwHMD4_UaxyLY1UQZOrqH8tVhgH95Yc6_LUNWgytiN7fVRwHw6dV1le6AKr9bE9JQ2ag4kcveovw_Y502WNrCAB83IC9erdx34v_Anyqckmh_qNVwwnZKniHGWvgkVquQrdW4_P1RtApRseE7AAtV8oiUXfgdd5YfzdAhxH1V7LA==&uniplatform=NZKPT)
- Martin, I. M., & Eroglu, S. (1993). Measuring a multi-dimensional construct: Country image. *Journal of Business Research*, 28(3), 191–210. [https://doi.org/10.1016/0148-2963\(93\)90047-S](https://doi.org/10.1016/0148-2963(93)90047-S)
- McEnery, T., Xiao, R., & Tono, Y. (2006). *Corpus-based language studies: An advanced resource book*. London: Routledge. ISBN: 978-0415286237.
- Poole, R. (2022). *Corpus-assisted ecolinguistics*. London: Bloomsbury. ISBN: 978-1350320420.
- Qian, Y. F. (2019). Discursive construction of low-carbon economy in the *New York times*. *Journal of Tianjin Foreign Studies University*, 26(2), 30–41. [https://kns.cnki.net/kcms2/article/abstract?v=92B8ThN9lcssfABM3VZQXmpto0T7dH1eMWA3KpPukHLG\\_Zgece6t\\_lISdmwViiN05mWmJn5a1Drie2ZiJ0DbdFk8VoKCOQ0cV1CwvH3k\\_HWzaDw0lyDfSfnrAV1kXygv4Cg8LkoF9Q06sfmhDLz26saF-EicMdB9B-IYBqUv6cZdGZ2dq60g1U9oi3qke&uniplatform=NZKPT&language=CHS](https://kns.cnki.net/kcms2/article/abstract?v=92B8ThN9lcssfABM3VZQXmpto0T7dH1eMWA3KpPukHLG_Zgece6t_lISdmwViiN05mWmJn5a1Drie2ZiJ0DbdFk8VoKCOQ0cV1CwvH3k_HWzaDw0lyDfSfnrAV1kXygv4Cg8LkoF9Q06sfmhDLz26saF-EicMdB9B-IYBqUv6cZdGZ2dq60g1U9oi3qke&uniplatform=NZKPT&language=CHS)
- Qian, Y. F., & Wang, C. H. (2023). Discursive constructions around the dual-carbon goals in the *People's daily*: A Corpus-based critical discourse analysis. *Journal of China University of Petroleum*, 39(4), 69–77. <https://doi.org/10.13216/j.cnki.upcjess.2023.04.0008>
- Richards, J. C., & Schmidt, R. (2010). *Longman dictionary of language teaching and applied linguistics*. London: Pearson Education Limited. ISBN 978-1-4082-0460-3.
- Scott, W. A. (1965). Psychological and social correlates of international images. *International behavior: A social-psychological analysis*, 71–103. ISBN: 978-0829000276.
- Sinclair, J. (1991). *Corpus, concordance, collocation*. Oxford: Oxford University Press. <https://doi.org/10.2307/330144>
- Stubbs, M. (1996). *Text and corpus analysis: Computer-assisted studies of language and culture*. Oxford: Blackwell. Blackwell Publishers Ltd.. ISBN: 9780631195122.
- Tang, L. (2021). Transitive representations of China's image in the US mainstream newspapers: A corpus-based critical discourse analysis. *Journalism*, 22(3), 804–820. <https://doi.org/10.1177/1464884918801116>
- Wang, H. (2003). National image building and Chinese foreign policy. *China: An International Journal*, 1(01), 46–72. <https://doi.org/10.1142/S0219747203000050>
- Wang, H., Xin, B., & Cheng, R. Y. (2022). Research on the social constructive role of metaphors in news coverage of "US withdrawal from TPP" by mainstream US media. *Journal of Beijing International Studies University*, 44(6), 68–89. [https://kns.cnki.net/kcms2/article/abstract?v=f4imrocbXlzoQBtFVRc6FTqQU051ks9GdEL-79S7LUgN5UvRuRkSrEqdFZp0cGV-X8Fhw3Gsn-INVMdbt\\_u\\_8j-u2AvXwk4U6J3oHwFgnbF\\_Nn55L1KZP2xX9fWh010skDp6-\\_dMVZHL\\_bXj8KXNGZAo\\_2HIGFX-Zb4vMDH3bCavTVE5oukRmg0UT&uniplatform=NZKPT&language=CHS](https://kns.cnki.net/kcms2/article/abstract?v=f4imrocbXlzoQBtFVRc6FTqQU051ks9GdEL-79S7LUgN5UvRuRkSrEqdFZp0cGV-X8Fhw3Gsn-INVMdbt_u_8j-u2AvXwk4U6J3oHwFgnbF_Nn55L1KZP2xX9fWh010skDp6-_dMVZHL_bXj8KXNGZAo_2HIGFX-Zb4vMDH3bCavTVE5oukRmg0UT&uniplatform=NZKPT&language=CHS)
- Wang, S., et al. (2021). Multi objective programming model of low-cost path for China's peaking carbon dioxide emissions and carbon neutrality. *Research of Environmental Sciences*, 34(9), 2044–2055. <https://doi.org/10.1016/j.scitotenv.2023.169386>
- Wang, Y., Zhang, R. E., & Han, M. L. (2022). Study on China's national image in the English translations of report on the work of the government: A corpus-based discourse analysis. *Journal of Beijing University of Chemical Technology*, 4, 71–80. <https://doi.org/10.3969/j.issn.1671-6639.2022.04.010>
- Xiang, D. (2013). China's image on international English language social media. *Journal of International Communication*, 19(2), 252–271. <https://doi.org/10.1080/13216597.2013.833535>
- Xiang, N., Wang, L., Zhong, S., Zheng, C., Wang, B., & Qu, Q. (2021). How does the world view China's carbon policy? A sentiment analysis on twitter data. *Energies*, 14(22), 7782. <https://doi.org/10.3390/en14227782>
- Xin, B., & Gao, X. L. (2019). *A comparative study of the textual and pragmatic functions of reported speech in Chinese and American newspapers*. Shanghai: Shanghai Foreign Language Education Press. ISBN: 9787544655330.
- Xing, L. J., & Zhao, J. (2021). Construction of China's national image from the perspective of international discursive power: Challenges and countermeasures. *Northeast Asia Forum*, 30(3), 111–127. [https://kns.cnki.net/kcms2/article/abstract?v=f4imrocbXk6BobicGLiHaQ3bZdxSYfywvsmBR5-9GJ\\_tZ3YBQ8yK4mURKWM0ajzntkrQ\\_sXHkqQnnWttPEzPJi9ASFHncC4uUr1VSpjiuLB8VGPtFNm9YqNtuLSX7jiu2TLh6AMIQRWnsqv0DxVMV2yWhedblR6k6cDYt5p-M8srqBFVfjCgiFJEn85NnZl&uniplatform=NZKPT&language=CHS](https://kns.cnki.net/kcms2/article/abstract?v=f4imrocbXk6BobicGLiHaQ3bZdxSYfywvsmBR5-9GJ_tZ3YBQ8yK4mURKWM0ajzntkrQ_sXHkqQnnWttPEzPJi9ASFHncC4uUr1VSpjiuLB8VGPtFNm9YqNtuLSX7jiu2TLh6AMIQRWnsqv0DxVMV2yWhedblR6k6cDYt5p-M8srqBFVfjCgiFJEn85NnZl&uniplatform=NZKPT&language=CHS)
- Yamashita, T. (1998). Contrastive analysis of discourse representation in Japanese and American newspaper reports. *Intercultural Communication Studies*, 8(2), 177–191. <http://www.s3-live.kent.edu/s3fs-root/s3fs-public/file/12-Toru-Yamashita.pdf>
- Yang, M., & Wang, Z. (2023). A corpus-based discourse analysis of China's national image constructed by environmental news in the *New York times*. *Humanities & Social Sciences Communications*, 10(1), 1–12. <https://doi.org/10.1057/s41599-023-02052-8>
- Zhou, X. C. (2023). A corpus-based positive discourse analysis of China's image constructed by the domestic mainstream media in the context of carbon peak and carbon neutrality. *Journal of Southwest Jiaotong University*, 24(4), 12–25. <https://link.cnki.net/urlid/51.1586.C.20230708.2116.004>
- Zhuang, G. Y. (2021). Challenges and countermeasures faced by China in achieving the "dual carbon" goals. *People's Tribune*, 18, 50–53. [https://kns.cnki.net/kcms2/article/abstract?v=f4imrocbXkhdxa06aR-CtxsmW\\_2pgi3TsC4qG1lvc4-XZieYiCu0h7JSeHeC6k4nUrhGUYbJmI9ILUM6oNYVE\\_PlqZr8T8uXelVpAmiqVUK70mXueTwuYBZ\\_7V8xlp2T3NCsuJ1q4LHjYlK4BqEVjeMEcZE4p9n3t455qQmGX1Y3vQnK1kXLV-9TQgZBE4B&uniplatform=NZKPT&language=CHS](https://kns.cnki.net/kcms2/article/abstract?v=f4imrocbXkhdxa06aR-CtxsmW_2pgi3TsC4qG1lvc4-XZieYiCu0h7JSeHeC6k4nUrhGUYbJmI9ILUM6oNYVE_PlqZr8T8uXelVpAmiqVUK70mXueTwuYBZ_7V8xlp2T3NCsuJ1q4LHjYlK4BqEVjeMEcZE4p9n3t455qQmGX1Y3vQnK1kXLV-9TQgZBE4B&uniplatform=NZKPT&language=CHS)