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Tech Powerhouse or Tech Threat? An Attitude Analysis of News Reports on Science and Technology in China by *China Daily* and *The New York Times*

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Abstract

This study investigates how science and technology (S&T) in China is represented through attitudinal resources by *China Daily* (CD) and *The New York Times* (NYT). 215 news articles from CD and 133 from NYT were analyzed according to a revised system of attitude within the appraisal framework. Results show that CD features overwhelmingly positive evaluation, highlighting the value of China's technologies and scientific research as well as China's tech strength. The competence of Chinese scientists in striving for innovation excellence is also foregrounded. By contrast, NYT displays both positive and negative attitudes in its reports. On the one hand, it emphasizes China's prowess and determination in developing high-tech industries as well as the utility of China's tech products. On the other hand, it depicts China's sci-tech endeavors as unethical and worrisome, and underlines the weakness and shortcomings of China's technologies. The significance of this study lies in its focus on the cross-cultural comparison of science news and the media representation of China's science and technology.

Keywords: attitude, science and technology in China, *China Daily*, *The New York Times*

1. Introduction

As the U.S. Treasury Department announced a new round of restrictions on China's technology investment in October 2024[1], the Sino-US technological competition has reached an unprecedented level. This sci-tech rivalry is now spilling over into the ideological realm, aggravating the discourse power competition between the two major countries around science and technology (Xie & Jiang, 2025). As carriers of dominant ideologies, news media, especially mainstream media, is one of the main battlefields of the international discourse power game (Jungherr et al., 2019). In the field of international public opinion, American media have been relentlessly intensifying the construction of "China tech threat" narrative, while Chinese media stress that China's scientific and technological development is to benefit Chinese people and the whole world.[2]

[1] https://home.treasury.gov/news/press-releases/jy2687

[2] https://www.chinadaily.com.cn/a/202305/31/WS64769214a3107584c3ac304a.html

As the backdrop of Sino-US tech competition is shaping media narratives, it is worthwhile to take a closer look at the representation of science and technology in China by mainstream news outlets from the two nations. *China Daily* (CD) and *The New York Times* (NYT), which stand out as two leading English-language newspapers from each side, are chosen as the news source of the study. The representation will be analyzed by examining evaluative language in the news reports, as it functions to "reflect the value system" which is "a component of the ideology" (Thompson & Hunston, 2000: 6). Of all the different approaches to analyzing evaluation in news discourse, the appraisal framework (Martin & White, 2005) has proved to be a powerful and effective tool (Huan, 2017; He & Caple, 2020) and is therefore adopted in this study.

The significance of this study lies in its focus on the cross-cultural comparison of science news and the media representation of China's science and technology. The lack of cross-cultural analyses of science news reporting has been pointed out by Vestergaard and Nielsen (2016). Also, there has not been much scholarly attention to the representation of science and technology in China in spite of its frequent coverage in the news media. In view of this, the present study draws on the attitude system within the appraisal framework to explore how CD and NYT represent China's science and technology through attitudinal resources. The underlying factors that might have influenced their representations will also be discussed.

This article consists of six sections. Section 2 introduces the context in which the study is situated. Section 3 briefly reviews previous literature on science news by focusing on ideology. Section 4 explains the data and methodology. Section 5 presents analysis results and findings. A discussion of the results and a conclusion are given in Section 6.

2. China's S&T Endeavors and the US-China Tech Rivalry

In 2016, China released the Outline of the National Strategy of Innovation-Driven Development[1], which has set goals for the country to become an innovative nation by 2020, be in the front ranks of innovative countries by 2035, and a global scientific power by 2050. With a strong determination to become a world leader in science and technology, China has implemented a series of strategic initiatives such as "Made in China 2025", "Science and Technology Innovation 2030 Major Projects", "Thirteenth Five-Year Development Plan for National Strategic Emerging Industries". These state-led efforts have yielded results in a number of cutting-edge sci-tech areas, including information and communication technologies, artificial intelligence, aerospace engineering, biotechnology and so on[2]. China has also rolled out measures to encourage the cultivation of sci-tech talents, strengthen protection of intellectual property rights, promote the commercialization of scientific achievements and expand international sci-tech cooperation. With these endeavors, China is no longer considered a technological follower but on its way to becoming an innovation powerhouse (Li et al., 2020). According to the Global Innovation Index released annually by the World Intellectual Property Organization, China has seen a steady rise of its ranking in the index, climbing from the 34th in 2012 to the 11th in 2022 (Dutta et al., 2022).

China's search for technology and innovation, however, has been considered worrying from the perspective of the United States which often takes China as a rival. On August 14, 2017, the White House issued the Memorandum for the United States Trade Representative, claiming that China's laws, policies, practices, and actions related to intellectual property, innovation, and technology "would negatively affect American economic interests" and "undermine American manufacturing, services, and innovation"[3]. In a 35-page report released by The White House Office of Trade and Manufacturing Policy in June 2018, China was accused of engaging in forced technology and intellectual property transfer, state-supported technology acquisition, and cyber-enabled theft of technologies and IP[4], which "challenged US strategic interests in national security and international order" (Kennedy & Lim, 2018: 561). Due to its intensifying concern over China's innovation

[1] http://www.china.org.cn/china/2016-05/20/content_38494125.htm

[2] https://english.cas.cn/newsroom/cas_media/202111/t20211104_290989.shtml

[3] https://www.gpo.gov/fdsys/pkg/FR-2017-08-17/pdf/2017-17528.pdf

[4] https://trumpwhitehouse.archives.gov/wp-content/uploads/2018/06/FINAL-China-Technology-Report-6.18.18-PDF.pdf

activities and technology ambitions, the Trump administration launched a tech war against China, with an intention to "diminish and postpone China's challenge to the U.S.' global hegemony by containing the development of China's high-tech industries" (Sun, 2019: 199). The US government has since imposed continuous crackdown on China's tech sector by blacklisting Chinese tech companies such as Huawei and ZTE from US investment and limiting their access to advanced American technology. In response, China took countermeasures against the US sanctions, while at the same time stepped up sci-tech self-reliance to break Washington's scientific blockade.

The US-China tech rivalry is believed to be driven by the two countries' divergence in social values, political/economic systems and ideologies (Mori, 2019; Sun, 2019; Wu, 2020). Holding an ideological bias towards China, the US sees China's efforts to become a sci-tech power as "an existential threat to a presumption of American dominance in all aspects of technology" (Inkster, 2019: 109). US policymakers even put forward the notion of China's tech-enhanced authoritarianism, which Sun (2019) has argued is a new form of politicization of economic and technological issues. As geopolitics and technology are increasingly intertwined, technology is in fact largely politicized and has become a more prominent element of the escalating rivalry between China and the US (Wu, 2020).

3. Ideology and Science News Reporting

It is widely acknowledged that news reports, as specific social and discursive practices, are not unbiased recording of social reality but rather influenced by various sociocultural and political factors (Fowler, 1991; Fairclough, 1992; Van Dijk, 1995). One major factor is ideology, which is a kind of "fundamental, axiomatic beliefs underlying the social representations shared by a group, featuring fundamental norms and values" (Van Dijk, 2009: 193). According to Van Dijk (2009), news discourses are imbued with ideologies and can contribute to the (re)production of ideologies in society.

Some scholars have pointed out that science news, which is usually assumed to be an objective representation of scientific reality, is in fact also influenced by the ideological standings of news producers, just like any other types of news. For instance, Carvalho (2007) argues that different ideological cultures among British quality newspapers largely affect their representations of scientific knowledge on climate change. According to Carvalho (2007), the reporting by *The Times*, a news outlet with an ideological culture of neo-liberal capitalism, is characterized by skepticism about climate change and opposition to the continuation of policies and practices to address climate change. In contrast, influenced by a social democratic ideology, reports by *The Guardian* and *The Independent* tend to highlight the potential risks of climate change to environments and defend mitigating action in relation to climate change. The link between ideology and climate change reporting is also pointed out by Dirikx and Gelders (2010). A more recent study by Yu and Liu (2020) investigates how ideologies affect US news coverage on artificial intelligence (AI), and finds that Conservative-oriented reporting focuses on the shortcomings of AI and the potential threats it poses to society, whereas the Liberal-leaning reports foreground AI's advantages. Such political standings in the media may give rise to politicization in science news reporting, with political topics, actions and actors featured more often than science-related ones in news articles (Chinn et al., 2020; Litvinenko et al., 2022). Other scholars find that non-scientific events such as political affairs or policy-making are likely to be triggers for science news (Elmer et al., 2008; Vestergaard & Nielsen, 2016).

Previous studies on the representation of S&T tend to highlight micro-level factors such as personal preferences of science journalists (Stocking & Holstein, 2009), journalistic norms (Boykoff & Boykoff, 2004), news values (Badenschier & Wormer, 2011), organizational arrangements (Guenther et al., 2019) and so on. The impact of ideological factors on the selection and representation of S&T in general is still under-explored. What's more, prior research has focused on the representation of S&T by newspapers with different ideologies from the same sociocultural background, and comparative cross-cultural studies of science news are rare. For this reason, the present study will investigate the representation of S&T in China by CD and NYT, two mainstream newspapers from China and the US. Given the different socio-political environments in China and the US, which may lead to divergent ideological standpoints of Chinese and

American media, comparison between science news coverage in these two countries is likely to reveal meaningful findings. The representation will be analyzed through the lens of evaluation, as it functions to express a communal value system which in turn reveals the ideology of the society (Thompson & Hunston, 2000).

4. Data and Methodology

4.1 Data

This study collected news reports on science and technology in China published by *China Daily* (CD) and *The New York Times* (NYT) between 1 January 2013 and 31 December 2022. News reports by CD were collected from the 'China-innovation' section on its official website[1]. As the number of news reports by CD is much higher than that of NYT, data sampling was conducted by adopting the constructed week sampling method. Constructed week sampling is a type of stratified random sampling technique popular in media studies in which the final sample represents all seven days of the week to account for cyclic variation of news content (Luke et al., 2011). As is recommended by Song and Chang (2012), one constructed week would allow reliable estimates of news content in a six-month population for daily newspapers in China, even for highly volatile variables. Therefore, we constructed two weeks for each year, obtaining 140 days' reports between 2013 and 2022. After duplication removal, 215 news reports totaling 78,072 words were collected from CD. News reports by NYT were collected from the science and technology sections of its website[2] by using 'China' and 'Chinese' as the search terms. All the retrieved articles were read through carefully to exclude duplicates and irrelevant ones such as reports on S&T in other countries or reports on issues unrelated to S&T. This resulted in 133 news articles with 141,081 words in total. The collected news reports were then constructed into two corpora: the CD corpus and the NYT corpus. The composition of the data is shown in Table 1.

Table 1. Data composition of the study

Corpus	Number of news reports	Total words
CD	215	78,072
NYT	133	141,081

[1]https://www.chinadaily.com.cn

[2]https://www.nytimes.com

4.2 Analytical Framework and Procedures

The collected reports were analyzed according to a revised system of attitude within the appraisal framework in systemic functional linguistics (SFL). Developed by Martin and White (2005), the appraisal framework consists of three systems: attitude, engagement, and graduation. Among them attitude is the kernel and is "concerned with our feelings, including emotional reactions, judgements of behavior and evaluation of things" (ibid: 35). The system of attitude is further divided into affect, judgement and appreciation. Affect construes emotional reactions and can be sub-categorized into un/happiness (e.g. happy/sad), in/security (e.g. confident/anxious), dis/satisfaction (e.g. pleased/angry), dis/inclination (e.g. willing/reluctant). Judgement deals with the evaluation of human behaviors according to social esteem and social sanction. Judgement of social esteem concerns normality (how unusual someone is), capacity (how capable someone is) and tenacity (how resolute someone is), while judgement of social sanction involves veracity (how truthful someone is) and propriety (how ethical someone is). Appreciation is the evaluation about things, which can be further categorized into reaction, composition and valuation. Reaction refers to the degree to which things catch our attention. Composition is about the internal structure of things, such as balance and complexity, and valuation is to do with our assessment of the social significance of the phenomenon. Attitude can be positive or negative, and it can be expressed directly or indirectly. If the attitude is construed directly through attitudinal expressions, it is "inscribed". If it is expressed indirectly through lexical metaphors or ideational tokens, the attitude is "invoked".

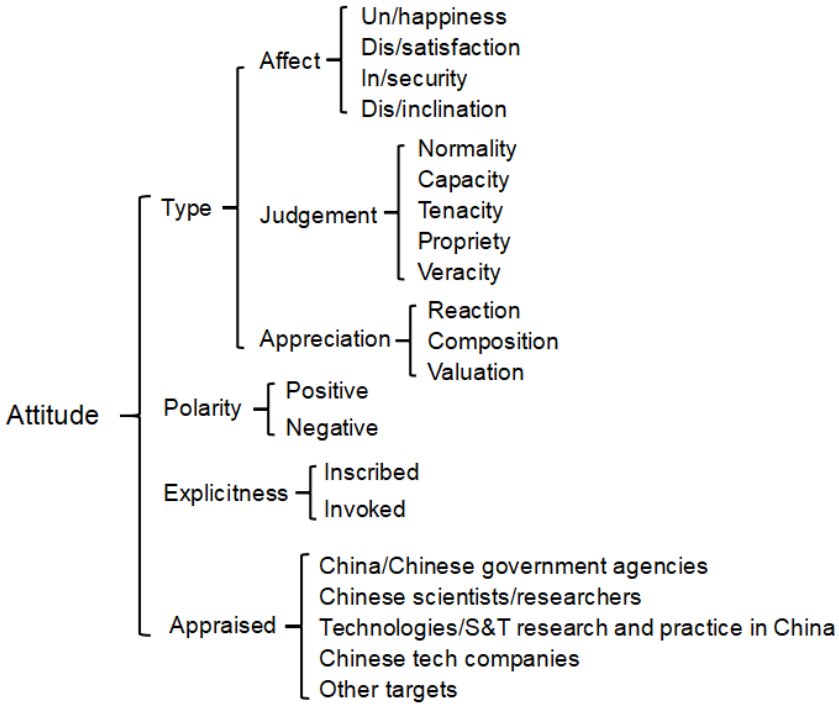

Figure 1. The revised system of attitude applied in this study

Apart from the type, polarity and explicitness of attitude, a new category of "appraised" was added to the framework for further specifying the person, thing or activity that are judged and appreciated, given that we intend to investigate the discursive use of attitudinal resources in representing science and technology in China. As we coded the data, some recurrent targets of evaluation were detected. Based on these targets, we specified "appraised" into five categories: China/Chinese government agencies, technologies/S&T research and practice in China, Chinese scientists/researchers, Chinese tech companies and other targets. As for affect, which deals with people's emotional response and is not a prominent attitude category in science news, we decided to code the type and polarity of affect only. In example (1), positive valuation of China's technology, i.e. the counter-drone system, is directly inscribed through the attitudinal adjective "useful", while the fact stated in example (2) invokes negative judgement of China's capacity in producing home-made optical network technology.

(1) "The system is *useful* in airport, border control, drug and smuggling suppression, and security work in nuclear plants and large public gatherings," Shi added.

(2) And the new Chinese supercomputer *is still based on* American-made optical network technology that is used to connect the thousands of microprocessor chips.

The collected data was imported into the UAM CorpusTool[1] and manually annotated according to the revised framework presented in Figure 1. The data was coded by two assistants familiar with the attitude system separately and inter-coder reliability revealed a Krippendorff's alpha score of 0.899. All cases of disagreement were revisited by the author, and discussions were held until a final decision was made. During this process, *The Language of Evaluation* (Martin & White, 2005) and *Handbook for Analyzing Chinese and English Appraisal Meanings* (Peng, 2015) were frequently consulted for help. After the analysis, UAM can perform automatic summarization and retrieval of the analysis results.

5. Findings

The distribution of attitudes constructed in the CD and NYT corpus in terms of polarity and type is summarized in Table 2. It can be seen that the reports by CD display an unbalanced distribution of positive and negative attitudes: almost all the attitudes are positive (97%), and few negative aspects of the scientific events are

[1]http://www.corpustool.com/index.html

mentioned (3%). Positive capacity and valuation are the most prominent. Among the three types of attitude, appreciation is the most frequently represented (54%), closely followed by judgement (41%), while affect shows very low percentages (5%). In contrast, reports by NYT combine both positive and negative attitudes. A somewhat surprising finding is that more than half of the attitudes expressed in NYT reports are positive (61%), among which positive capacity, tenacity and valuation are highlighted. NYT contains many more negative attitudes than CD does (39% and 3% respectively), with a prime focus on negative propriety, capacity, valuation and insecurity. 72% of the attitudes constructed in NYT reports fall into the category of judgement, far beyond the proportions of appreciation and affect (18% and 10% respectively). The prominent attitude features and their realizations in the reports by CD and NYT are discussed in the following.

Table 2. Distribution of attitudes in the corpus

		CD		NYT	
		Positive	**Negative**	**Positive**	**Negative**
Affect	Happiness	+12	-0	+3	-5
	Satisfaction	+1	-0	+2	-5
	Security	+11	-3	+7	-84
	Inclination	+20	-0	+21	-3
	Sum	**N=47 (+44, -3), 5%**		**N= 130 (+33, -97), 10%**	
Judgement	Normality	+0	-0	+5	-14
	Capacity	+278	-14	+337	-96
	Tenacity	+65	-0	+179	-4
	Propriety	+62	-0	+50	-222
	Veracity	+0	-0	+0	-3
	Sum	**N=419 (+405, -14), 41%**		**N=910 (+571, -339), 72%**	
Appreciation	Reaction	+15	-3	+16	-4
	Composition	+4	-1	+4	-5
	Valuation	+533	-10	+156	-50
	Sum	**N=566 (+552, -14), 54%**		**N=235 (+176, -59), 18%**	
	Total	**+1001 (97%)**	**-31 (3%)**	**+780 (61%)**	**-495 (39%)**
		1,032 (100%)		**1,275 (100%)**	

5.1 CD's Representation of S&T in China

5.1.1 China's Useful Technologies and Valuable Scientific Research: Positive Valuation

In terms of the distribution of attitudes, the most remarkable feature of the CD corpus is its highlighting of positive valuation, which accounts for more than 50% of all the positive attitudes (see Table 2). Positive valuation mainly concerns technologies and scientific research in China, and is frequently realized by emphasizing the performance or function of technological products. This is illustrated through examples (3)-(5) where the robots, the icebreaker and the satellite are presented as capable of performing complicated tasks, thus constructing positive appreciation of the technology. In some other cases, positive valuation is inscribed through positive adjectives such as "advanced", "innovative", "effective", "intelligent", "cutting-edge" and expressions containing superlatives such as "the biggest and best of its kind", "the fastest ground vehicle in the world", "the largest and most sensitive radio telescope".

(3) With the hands, robots *can grasp and place different objects steadily and accurately* after judging the shape and size of the item.

(4) Incorporating state-of-the-art design and

advanced equipment, the icebreaker *is capable of operating in any ocean*.

(5) "Through that mission, we improved the recoverable satellite platform. Currently, our satellite *is able to return 250 kg payloads back to Earth from space*," Zhao said.

Another strategy to realize positive valuation is to emphasize the utility of Chinese technologies by highlighting their application in solving problems and improving people's livelihood. For instance, CD has reported on how temperature screening robots are used to assist the epidemic control in China, AI monitoring platform to protect wildlife, Beidou-backed app to help herdsman track cattle in pastures, meteorological satellites to advance weather forecast, etc. In addition, technologies or scientific research are frequently collocated with the verb "help*" to construct positive valuation. Some concordances with "help*" as the node are presented in Figure 2, where the subjects of "help*" are highlighted in red.

1	thereafter, said Duan. In-orbit 3D printing is effective in	helping	with space station repair and maintenance and is essential
2	to that of Mars. Our space biology research will also	help	us understand possible life forms on Mars," Wang said.
3	China's overseas medical assistance mission, Eyebright's products have	helped	people in many countries, including Cambodia, Sudan and Congo,
4	planet, algae might be our pioneer," Wang said. New technology	helps	researchers decrease emissions at coal plants Researchers at Zhejiang
5	and recovery technologies at sea. The seaborne launch technology will	help	China provide launch services for countries participating in the
6	the whim of the user, he said. The technology can	help	in life-threatening missions as well as in rehabilitation
7	vice chairman of Nuctech. In 2016, a just-upgraded Nuctech equipment	helped	Australian Border Security seize 254 kg of cocaine and 104 kg
8	me to work at a chip company." Smart tech system	helps	communities ward off virus China's tech powerhouses are
9	s Yanchang oilfield, Shaanxi TV reported on Monday. The technology	helped	discover new oil reserves in an oilfield that has
10	contributions to the astronomic research in the world." New technology	helps	find over 800 m tons of oil The deep oil
11	a Shanghai hospital. With the 5G network, the robots can	help	medical staff carry out tasks involving consultations, disinfection, cleaning
12	rely on isolated solar power and hydropower grid. Unique tech	helps	resolve water shortage in Beijing Looking at the Chanping
13	of fireworks a day - one box every 15 seconds. High-tech	helps	spot distracted driving in SW China city An intelligent

Figure 2. Some concordances with "help*" as the node

(6) "The instrument *is a good start* and *can provide experience for* the future development of a larger coronagraph," said CAS academician Fang Cheng.

(7) Other recent scientific and technological breakthroughs include the launch of the Xihe solar observation satellite and..., which *have significantly bolstered* China's quantum computational advantage.

Apart from positive performance and utility, technologies and sci-tech research in China are also evaluated positively in terms of their social significance. As illustrated in examples (6) and (7), technologies and scientific breakthroughs in China are represented as valuable in promoting the future development of scientific research in a certain technical field and in contributing to China's efforts to become a technological powerhouse.

5.1.2 A Powerful China and Capable Chinese Scientists: Positive Capacity

Table 2 shows that the second predominant attitude type in the CD corpus is positive capacity, which mainly concerns China/Chinese government agencies and Chinese scientists/researchers. One way to realize positive capacity is to emphasize China's status as an emerging force in science, technology and innovation, or as a world sci-tech power. This is largely achieved through appositive nominal phrases referring to China as "a scientific superpower in the making", "front-runner", "leader", "an undeniable actor in spearheading global innovation", etc. Another way is to highlight the capability of China in achieving scientific and technological successes. This can be illustrated through the following examples.

(8) The feat proved that China *had acquired "full ocean depth capability"*, meaning that *it can carry out routine manned expeditions and scientific exploration at any depth in any ocean*.

(9) Last year, China *made many influential breakthroughs* in basic research, ranging from creating the world's first synthesized

single-chromosome yeast to the launch of the China Spallation Neutron Source, Wang said.

As can be seen in these examples, China is presented as a powerful and leading tech powerhouse, capable of making its homegrown innovation and mastering cutting-edge technologies. In addition, expressions emphasizing the advancement and firstness of Chinese technologies such as "the world's first meteorological satellite in dawn-dusk orbit" and "the world's largest single-dish radio telescope" are often mentioned in the corpus, which potentially invokes a positive judgement of China as it has accomplished something other countries haven't. In the reports by CD, positive capacity is also represented through Chinese scientists/researchers' faculty and creativity in developing new technologies and achieving breakthroughs in key technical fields. They are depicted as offering new solutions, carrying out scientific tests, and reporting latest research progress in many disciplines such as medicine, physics, astronomy, material science and information technology. Some examples are presented below.

(10) Hong Kong medicine scholars *develop innovative targeted delivery system* for treating bone tumor.

(11) In December, the journal Science reported that Chinese scientists *have created the world's first photonic quantum computer prototype*, called Jiuzhang...

As illustrated in examples (10) and (11), positive capacity of scientists is predominantly expressed through a material process with Chinese scientists as the Actor and scientific discoveries as the Goal, where verbal groups such as "have developed, have created, realized, achieved, innovated" are often used to suggest their competence.

5.2 NYT's Representation of S&T in China

5.2.1 A Competitive Yet Incapable China: Positive & Negative Capacity

As shown in Table 2, positive capacity is foregrounded of the attitudinal resources in the reports by both CD and NYT, taking up 27% and 26% respectively. Similar to the strategies used in the CD corpus, positive capacity of China/Chinese government in the NYT corpus highlights the country's competence and competitiveness in S&T. This is mainly realized by 1) using positive labels to refer to China and 2) representing China as taking the lead and making progress in the sci-tech field. This can be illustrated through examples (12) to (14). It is worth noting that about 40% percent of positive capacity concerns China's success in the field of aerospace, probably because China has achieved many breakthroughs in exploring outer space in recent years.

(12) China Extends Lead as *Most Prolific Supercomputer Maker*

(13) China, Not Silicon Valley, *Is Cutting Edge* in Mobile Tech

(14) In December 2020, it [China] *became the first country in about four decades to bring back lunar rocks and soil*, amassing several pounds of samples, experts said.

There are 72 instances of positive capacity pointing to Chinese tech companies. Most tech companies judged positively are elite tech giants active in the fields of A.I. and information technology, such as Huawei, Baidu, Alibaba, ZTE and IFlyTek. These tech companies are usually mentioned in NYT reports along with descriptions of their importance and high position (see example (15)). In other cases, they are cast as successful and competitive in developing innovative technologies and achieving technological advances (see example (16)).

(15) The company [Huawei], *China's leading maker of telecommunications equipment and smartphones*, has found itself at the center of...

(16) Two years before Microsoft did, Baidu, the Chinese internet search company, *created software capable of matching human skills at understanding speech*.

Different from CD's overwhelming highlighting of positive capacity, NYT also contains negative capacity in its reports. Most negative capacity is realized by depicting China's lagging behind the developed countries in core sci-tech areas and its reliance on advanced foreign technologies. Examples (17)-(19) are three representative instances indicating that the technology gap between China and Western countries remains large.

(17) China *looks to the West for much of its technology*.

(18) China still *lags in important areas.* Its most powerful, high-end servers and

supercomputers often *rely in part on American technology*.

(19) China's technology boom, it turns out, has been largely *built on top of Western technology*.

In addition, NYT often states that China imports chips and semiconductors in huge quantities from other countries, to invoke negative evaluation that China is unable to produce its own high-end chips and semiconductors. In other instances, NYT highlights China's failure in its scientific and technological endeavors (see examples (20)-(22)).

(20) ...it [China] *failed to* turn scientific knowledge into usable technology.

(21) ...most notably, China *cannot make* reliable engines or avionics, he said.

(22) Military analysts say China *has long tried to replicate* foreign drone designs.

Examples like these contribute to constructing a negative image of a failing China unable to realize high-quality tech development and self-dependent innovation.

5.2.2 Useful but Imperfect Chinese Technologies: Positive & Negative Valuation

It can be seen from Table 2 that valuation is the most prominent subtype of appreciation constructed in the reports by NYT. Different from the reports by CD where almost all instances of appreciation are positive, those by NYT contain both positive and negative valuations of technologies and S&T research/practice in China. A close reading of the instances shows that positive valuation, which accounts for about 67% of the instances of appreciation, mainly functions to highlight the value of China's high-tech products, especially those in the fields of information and communication, such as cellphones, supercomputers, drones, AI software. Example (23) represents the usefulness and importance of drones in China for their wide range of applications.

(23) Drones in China *inspect power lines, survey fires and disaster zones, spray crops, and monitor air pollution around factories*. In some remote areas, they *have delivered packages*.

(24) These and other technical limits mean that China's two aircraft carriers *will not be able to* range out to sea for as long as American carriers, *nor will the jets that fly from them be able to* carry as much munitions and fuel as American carrier fighters.

Almost 21% of the instances of appreciation fall into the subcategory of negative valuation. Expressions of negative valuation center upon the worthlessness and limitations of technologies in China. Example (24) evaluates China's aircraft carriers as less capable than American carriers in terms of performance. Apart from describing what China's technological products cannot do through verbal groups (e.g. failed to, will/would not be able to), the negative valuation is also often realized through adjectives (e.g. imperfect, impractical, vulnerable, not powerful enough, ineffective, unable) and nouns (e.g. shortcomings, flaws, limitations).

5.2.3 A Determined China and the Ambitious Chinese Government: Positive Tenacity

Positive tenacity is also a prominent feature in the reports by NYT. Positive markers of tenacity are mainly deployed to represent China/Chinese government agencies as determined to achieve self-reliance and prosperity in key technical fields and aspirant to become a global leader in core sci-tech areas. For example, China is frequently represented as striving to expand its tech capabilities in such instances as "China Seen in Push to Gain Technology Insights", "the country's bid to be at the forefront of quantum research", "China's drive to become a leading exporter of military equipment", etc. The two words "ambition(s)" and "ambitious" appear 68 times altogether in the NYT corpus. Many of these instances refer to China's technology ambitions and its ambitious programs (e.g. Made in China 2025) in areas like space, chip industry and AI, which help to construct positive judgement of China's tenacity. In addition, the reports by NYT provide information on Chinese governmental efforts in promoting high-tech development, especially its heavy investment in cutting-edge tech areas, which indicates China's resolve to rise as a technological powerhouse. This can be seen from example (25).

(25) The government in Beijing *has poured the equivalent of billions of dollars* into new projects in order to catch up with the West in producing original research...

Apart from illustrating China's dedication and determination to become a scientific power, positive tenacity is also achieved by

representing the country as careful and patient, reaching its goal in a step-by-step way and avoiding risky technological leaps.

5.2.4 An Unethical and Irresponsible China: Negative Propriety

The most salient feature of the negative attitudes constructed in NYT reports is negative propriety, which occupies 45% of all the negative attitudes (see Table 2). Most negative propriety serves to negatively judge China and Chinese government agencies, and it is mainly achieved by 1) focusing on China's involvement in unethical S&T activities and misuse of advanced technologies, and 2) representing China as failing to meet responsible standards in sci-tech practice. For instance, China is often accused of "stealing" intellectual property and valuable foreign technological know-how from American firms, "transferring the science and technology of the developed world" via illegal methods and forcing foreign tech companies to hand over their latest technologies so as to support the development of local companies. These criticisms tend to be expressed quite explicitly through negative lexis such as "steal", "copy", "theft', "illicitly", etc. Examples (26) and (27) are two representative cases.

(26) Foreign governments and companies also say that China's technological advances have too often come from *illicitly copying foreign advances* — increasingly through Internet hacking.

(27) China *has sought technologies to block* American surveillance and communications satellites, and its major investments in cybertechnology — and probes and *attacks on American computer networks* — are viewed by American officials as a way to both *steal intellectual property* and prepare for future conflict.

In addition, China's misuse of advanced technologies is also frequently described in the NYT corpus. When reporting on China's surveillance technology, NYT portrays China as "a digital totalitarian state" and the Chinese government as repressive and inhuman in using techno-authoritarian tools to monitor its people, especially the minorities. This can be illustrated in the following two examples.

(28) China is ramping up its ability to *spy on its nearly 1.4 billion people* to new and disturbing levels, giving the world a blueprint for how to build *a digital totalitarian state*.

(29) Now, documents and interviews show that the authorities are also *using a vast, secret system of advanced facial recognition technology to track and control the Uighurs,* a largely Muslim minority.

In some other cases, the negative consequences of China's wrongdoings are emphasized, such as the expanding digital surveillance will "violate privacy", lead to "a future of tech-driven authoritarianism", and usher in "a new era of automated racism", etc. When reporting on China's space exploration, apart from emphasizing the country's capability, NYT also frequently reports on China's irresponsibility in dealing with its space debris, criticizing China of deliberately launching mammoth rockets to orbit and allowing them to fall out of control to Earth where they may.

5.2.5 Concerns over China's Sci-Tech Activities and Plans: Insecurity

While positive attitudes outnumber negative ones in judgement and appreciation, the opposite is true in affect in the NYT corpus. The most prominent feature of affect in NYT reports is insecurity, which takes up 65% of the total. A close examination of all the instances shows that most of the insecurity is triggered by China's scientific and technological endeavors, its tech capabilities and ambitions, Chinese technologies and tech giants. Expressions realizing insecurity that occur 5 times and more in the NYT corpus are listed in Table 3. Table 3 shows that insecurity is largely related to concerns and worries.

Table 3. Expressions realizing insecurity in the NYT corpus

Expressions of insecurity	**No.**
Concern/-s/-ed/-ing	29
Worry/-ies/-ied/-ing/-isome	21
Fear/-s/-ful	10
Wary/-iness	6
Total	66

In such cases, the emoters, i.e., participants who experience the emotion, are largely related to the US and western countries. This is illustrated in the following examples.

(30) *Concern* Grows in US Over China's Drive to

Make Chips

(31) Western companies *fear* that the Made in China policy could be used to justify government demands to hand over their latest technology...

(32) Despite its benign name, China's Jade Rabbit rover could kindle *anxieties* among some American politicians and policy makers...

6. Discussion and Conclusion

In representing S&T in China, reports by CD feature overwhelmingly positive evaluation, highlighting the value of China's technologies and scientific research, and the competence of China/Chinese researchers in achieving sci-tech progress. By contrast, NYT contain both positive and negative attitudes in its reports. On the one hand, it emphasizes China's prowess and determination in developing high-tech industries as well as the utility of China's tech products. On the other hand, it depicts China's sci-tech endeavors as unethical and worrisome, and underlines the weakness and shortcomings of China's technologies. We propose that the different representations of S&T in China by CD and NYT might have been influenced by the newspaper's ideological and political stances and the ongoing tech war between China and the US.

As an official English-language news outlet of the Chinese government, CD is said to be the "mouthpiece for the Party in its efforts to communicate with the wider world" (Chen, 2004: 700). It can be said that CD's reports reflect the ideology and political stance of the Party vis-à-vis China's science and technology. The Communist Party of China and the Chinese government attach great importance to sci-tech innovation and see it as the primary driving force for socio-economic development. Since 2012, China has implemented an innovation-driven development strategy to improve the quality and efficiency of economy. This may be responsible for CD's overwhelming attention to the positive aspects, especially positive valuation, of China's science and technology.

Meanwhile, the Chinese government also puts much emphasis on China's technological progress and achievements, which is a consistently highlighted part in the annual government work report. According to President Xi Jinping's speech at the opening session of the 20th CPC National Congress, China has witnessed successes on multiple sci-tech fronts, made breakthroughs in some core technologies in key fields and joined the ranks of the world's innovators[1]. This is reflected in our findings that CD tends to underline national scientific developments, as can be seen through by the high proportion of positive capacity in its reports. The highly positive representation by CD echoes prior research that there is a tendency for Chinese news media to foreground positivity when reporting on domestic events (Li & Zhu, 2020).

NYT's positive representation of China and China's technologies, however, is contrary to previous findings that US news coverage favors a negative tone when it comes to stories on China (Liss, 2003; Peng, 2004). We argue that such unusual positivity is partly a result of the ideological tradition in the US to construct its rival as a threat (Yuan & Fu, 2020). With a hegemonic and cold-war mentality, the US government has deemed China's advances and ambitions in strategic technologies as a long-term, fundamental challenge to American global tech leadership (Kania, 2018). China's plans to become a leader in high-tech innovation, the "Made in China 2025" initiative in particular, are believed to be substantially threatening to the global hegemony of the US (Wu, 2020). This ideology is reflected in NYT's coverage, evident in the following two examples where the link between China's positive capability and the threat it brings is manifested.

(33) Although a latecomer by decades to space exploration, China *is quickly catching up*, experts say, and *could challenge the United States for supremacy* in artificial intelligence, quantum computing and other fields.

(34) The Chinese *are getting good at* building these computers, and it's *a competitive issue now for U.S. industry and national security*.

Therefore, NYT's emphasis on China's competence and resolve in developing high-tech industries probably serves to reinforce the pre-established stereotypical perceptions of China's technological rise as a threat by the US in an implicit way and hence trigger worries. Yet, it must also be acknowledged that, in the past decade China does have witnessed a dramatic technology boom and become a

[1] https://english.news.cn/20221025/8eb6f5239f984f01a2bc45b5b5db0c51/c.html

pioneer in many key areas like manned spaceflight, artificial intelligence and 5G research, a boom which is so obvious that the American media cannot turn a blind eye to it.

Besides, the US administration also believes that certain S&T practices by China present threats to US national security interests and are inconsistent with American values. In 2021, the US Commerce Department's Bureau of Industry and Security took actions against China's technology entities in supercomputing, biotechnology, quantum computing and other areas, claiming that they are using US technology to support China's destabilizing military modernization efforts or enabling human rights abuses in Xinjiang[1]. This political bias against China's S&T has permeated the coverage by NYT, which contains many expressions of negative propriety and insecurity. Its focus on negative propriety of China is in line with the typical frames of representing China by the US media, such as anti-communism (Wang, 1991), accusations of human rights abuses and stories of political suppression (Lee, 2002), as can be seen in examples (28) and (29) provided above. In addition, previous studies have shown that negative images of China have enabled the justification of an increasingly hard-line approach to China (Ooi & D'Arcangelis, 2017). Therefore, NYT's highlighting of China's negative propriety may serve to rationalize US actions to crack down on China's high-tech industries and grasp global tech hegemony amid the ongoing tech competition with China.

Facing the pressure from the US, China has taken a series of countermeasures and been forced into a tech war. In response to the Western-hyped "China tech threat", China's state actors stress that China's technological development is aimed at making lives better for the Chinese people and has not harmed the interests of other countries. "It does not target anyone, still less pose any threat," according to Mao Ning, the spokesperson for the Chinese Foreign Ministry[2]. Thus, by painting China's S&T as beneficial rather than threatening, reports by CD serve to illustrate China's peaceful rise in the sci-tech domain and thus provide support for China's countermeasures against US sanctions.

Another point worth paying attention is the vacillation between positive and negative attitudes in the reports by NYT. In the NYT corpus, there are 62 cases where positive evaluations are followed by contrastive negative appraisals. For instance, example (35) at first acknowledges China's achievements in developing supercomputers (positive capacity) before turning to its reliance on American chips to support these computers and China's lagging behind the United States in state-of-the-art technologies (negative capacity). In such cases, the force of the former positive attitude seems to be weakened by the negative attitude, thus potentially positioning readers to take the negative stance. This vacillation can be seen as a common narrative structure in journalism (Martin & Rose, 2003), which is also observed by Hu and Huang (2021) in their corpus-based analysis of British news coverage on the Belt and Road Initiative.

(35) Now, China *has 167 systems on the list* compared to 165 from the United States. China also *leads* a more obscure category — total processing power... Despite those achievements, *Intel still provided the chips for 91 percent of the machines on the list*. And China *is still catching up* with the United States in state-of-the-art technologies...

Unfortunately, the interaction between positive and negative attitudes can't be detected by annotating individual expressions horizontally, but requires the coder to look at the text as a whole vertically. This might be an area that calls for further exploration.

Drawing on the appraisal framework, this article has investigated how evaluative resources are employed to represent China's science and technology by CD and NYT. It also explores the underlying factors influencing the representations. Apart from confirming certain trends discovered in previous studies, such as positive representation by CD and negative representation by NYT, the article reveals that there are also positive evaluations in NYT,

[1] https://www.commerce.gov/news/press-releases/2021/04/commerce-adds-seven-chinese-supercomputing-entities-entity-list-their;https://www.commerce.gov/news/press-releases/2021/06/commerce-department-adds-five-chinese-entities-entity-list;https://www.commerce.gov/news/press-releases/2021/07/commerce-department-adds-34-entities-entity-list-target-enablers-chinas;https://www.commerce.gov/news/press-releases/2021/11/commerce-lists-entities-involved-support-prc-military-quantum-computing;https://www.commerce.gov/news/press-releases/2021/12/commerce-acts-deter-misuse-biotechnology-other-us-technologies-peoples

[2] https://www.mfa.gov.cn/eng/xwfw_665399/s2510_665401/2511_665403/202210/t20221011_10780974.html

although they mainly serve to establish China as a threat. The oscillation between positive and negative attitudes is also characteristic of the reports by NYT.

This study contributes to existing cross-cultural literature on media representation of China by focusing on the less-discussed dimension of science and technology. Methodologically, it reveals the analytical challenge of the appraisal framework in detecting the relations between positive and negative attitudes. However, as the data is limited to news articles from two newspapers, our findings may not be generalizable to other media outlets in China and the US. It is recommended that future research utilize corpus-based techniques to investigate a wider range of data for a more comprehensive understanding.

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