A Diachronic Study on China's News Discourse of Space Science

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Abstract: Space science serves as core strategic underpinning for national technological innovation frameworks, and relevant journal news coverage concerning this field has gone through a visible evolutionary shift in narrative construction. While prior academic works mostly revolve around aerospace anecdotes and technical descriptions, comprehensive research sorting out the evolving rules and developmental paths of such news narration is still insufficiently explored. From the 2000–2025 records of CNKI's China Core Newspaper Database, the research establishes a medium-scale corpus and launches empirical investigation via the combination of quantitative keyword measurement and qualitative case analysis of source texts. Empirical findings illustrate how domestic space science media coverage departs from early narration focused solely on project accomplishments, evolving into a compound framework that ties technical feats to everyday public welfare; livelihood-oriented storytelling gains steady visibility and matures into a fixed expressive format. The study expands available analytical outlooks in the fields of space science narration and science communication, which can guide real-world inclusive and populace-oriented science communication activities amid the current social backdrop.

Keywords: News Discourse; Space Science; Corpus; Keyword Measurement; Empirical Investigation

1. Introduction

As one indispensable strategic sector within national innovation systems for science and technology, space science exerts unique value in media reporting and the shaping of narrative frameworks. Instead of only displaying assorted technical milestones, related journal coverage helps build a nation's S&T brand and facilitate consistent consensus among the public. When domestic space science communication was still in its early stage, major published articles mainly focused on major engineering progress and the resolution of technical challenges. Reports of this kind constantly showcased practical achievements, covering satellite research and development, on-orbit experiments as well as deep-space exploration. This practice has created an "achievement-dominated" narrative pattern for displaying overall national strength. It is highly consistent with the typical feature of China's early science communication, the so-called "mobilization-oriented narrative centered on achievements" [1].

With the release of the National Medium- and Long-Term Development Plan for Space Science (2024–2050) [2], China's space science industry steps into the brand-new "application and development" era, alongside prominent shifts emerging in relevant news narration styles. Covering the years spanning 2020 through 2025, pertinent journal coverage abandons the single-minded achievement-focused writing mode and evolves toward hybrid narration featuring parallel achievement and livelihood descriptions. While retaining the expression of hard-core technological results, these reports have incorporated content related to public welfare, including space breeding, disaster monitoring, and public safety assurance, demonstrating a clear trend extending from technological display to value interpretation [3].

Even though such changes have taken shape objectively within space science communication's narrative system, targeted academic explorations focusing on this transition are still insufficient at present. Most previous scholarly outcomes either center on space engineering practices and concrete technical advances, or carry out generalized discussions over the macroscopic developing tendency of S&T news narration. Only a limited number of scholars launch long-term chronological research tracking how news narration

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frameworks of space science develop and evolve. There is a noticeable lack of in-depth analysis regarding the process, characteristics, and underlying logic of the shift from achievement-oriented narratives to hybrid narratives, leaving a clear research gap [4].

For the above reasons, the present paper selects mainstream Chinese media's space science news publications issued from 2000 to 2025 as core research materials. To explore diverse narrative modes embedded in space science news, this study combines quantitative statistics with qualitative analysis under a mixed methodological framework. The research team established the corpus based on complete metadata covering the years 2005 to 2025. Before data cleaning and content annotation, all raw texts were manually segmented. The AntConc tool was applied to analyze high-frequency word features, while Critical Discourse Analysis (CDA) helped conduct comparative analyses of core datasets across different periods. This comparative work covers multiple dimensions, including the proportion of core keywords, the composition of various narrative types, and real cases related to people's livelihood. All research objects are divided into two time groups: 2000—2019 and 2020—2025. Such multi-dimensional comparison makes the final research outcomes more objective and convincing.

This research links established theoretical results to real communication scenarios, so as to outline how space science news narratives have evolved throughout China's development. The analysis also expands the research perspectives available for exploring aerospace-related discourse and science communication. For practical application, the present work puts forward viable ideas to improve existing communication strategies in space science. It also helps coordinate the presentation of technological feats and the interpretation of livelihood-related values. In this way, modern science communication activities can respond more effectively to public needs and deliver sustained support for social progress.

2. Literature Review

2.1 A Review of Research on Science and Technology Narratives

As a core vehicle for science and technology communication, technological narratives play a crucial role in bridging scientific and technological achievements with the public. Existing research primarily revolves around three dimensions: narrative content, narrative models, and narrative functions. In the classification and discussion of narrative models, scholars generally agree that the types of technological narratives are deeply bound to a country's development stage and strategic industrial goals. Li Xiguang [5] explicitly states that high-tech development consistently serves national strategic needs, and its communication forms are adapted to the country's developmental stage. Early research focused more on "achievement narratives," defining them as a narrative form centered on technological breakthroughs, engineering progress, and the demonstration of national strength, and pointed out the significant value of such narratives in building social consensus and strengthening national confidence in the early stages of technological development [6]. Consequently, the "mobilization-oriented narrative centered on achievements" became a typical paradigm in early Chinese science and technology communication, particularly prominent in strategic fields such as aerospace and nuclear industries. As the integration of technology and society deepens, livelihood-oriented technological narratives have gradually become a research hotspot. Chen Peng [7] emphasizes that the importance of science popularization is increasingly prominent; technological innovation must respond to the daily needs of the public, and the service object of science communication is all citizens—a trend highly consistent with the overall shift toward livelihood concerns. Zhang Mingxin and Guo Xiaoping [8] further point out that, in the new era, science and technology communication is shifting from technological demonstration to value interpretation. Livelihood narratives, centered on the idea of "technology serving society and benefiting the public," enhance the accessibility of technology through practical cases and benefit data. However, existing research still has clear limitations: discussions on livelihood narratives are mostly concentrated in fields closely related to daily life, such as artificial intelligence and new energy, with significantly insufficient attention paid to cutting-edge strategic fields like space science.

In the study of the transformation of technological narratives, existing research

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mostly focuses on the analysis of single narrative type characteristics or macro-level descriptions of narrative trends, lacking systematic inquiry into the transformation of narrative models in specific fields. In response, Wu Lin and Li Yun [9] explicitly point out that research on technological narratives in China tends to emphasize macro-level theories and overall characteristics, lacking systematic, diachronic, specialized research and in-depth deconstruction of the transformation patterns of narrative models in specific fields such as aerospace and artificial intelligence. This situation is further corroborated by several CiteSpace visualization analyses: Liu Guicen [10], through a CSSCI bibliometric analysis, found that science communication research in China is characterized by a "focus on the macro and the whole, while neglecting the micro and the specific," lacking systematic exploration of narrative transformation in subdivided technological fields; Tan Lin [10] further clarifies that existing research mostly concentrates on macro-trend analysis, lacking deep deconstruction of narrative construction in specific fields such as space science; Jiang Xiaobo and Peng Li [11] add that the current field of science communication generally lacks top-level design and continuous tracking, and there is a shortage of systematic, targeted, in-depth analysis and applied research concerning communication practices and narrative construction in fields like space science. In summary, current research on technological narratives exhibits significant shortcomings in domain depth, systematic deconstruction, and diachronic tracking. In particular, there is a lack of systematic investigation into the narrative changes in strategic scientific and technological fields such as space science. This not only clearly defines the current academic gap but also provides a solid practical basis and a clear academic entry point for this study's focus on the field of space science and its systematic analysis of the transformation of narrative models. Existing research not only lacks specialized attention to the narrative characteristics of strategic fields like space science but has also yet to establish a complete analytical framework combining diachronic and synchronic perspectives. Most existing relevant literature also suffers from obvious drawbacks dominated by monotonous research designs with inadequate quantitative data backup. Against such existing deficiencies, targeted exploration focusing on space science's narrative evolution via a combined quantitative-qualitative framework carries prominent theoretical significance to remedy vacant research areas and delivers tangible practical worth.

2.2 Current Status of Space Science-Related Research

Regarded as a core strategic part of national scientific and technological innovation frameworks, space science has drawn sustained academic attention over the years. A large number of existing studies concentrate on technological breakthroughs and the advancement of engineering practices in this field. Researchers have explored diverse topics such as satellite development blueprints, deep-space exploration tasks and the collation of corresponding research outcomes. Representative studies cover the technical principles and detection data of Wukong and Mozi scientific satellites [12], alongside analyses of engineering advancement and intrinsic scientific value embodied by the Chang'e lunar exploration project and Mars exploration programs. Such prevailing research tendencies align closely with national top-down policy arrangements. From the 12th to the 14th Five-Year Plan, technological research and engineering implementation have always been the core priorities of China's aerospace sector. The 12th Five-Year Plan put emphasis on core aerospace technology breakthroughs and the building of engineering systems, attaching great importance to key projects like satellite development and manned spaceflight. The 13th Five-Year Plan further incorporated space science into key technological innovation areas, and explicitly launched major projects related to scientific satellites and deep-space exploration. The 14th Five-Year Plan continues to strengthen efforts to achieve breakthroughs in core and key technologies in the aerospace sector, making the advancement of projects such as manned spaceflight and deep-space exploration its core tasks. This orientation of national planning has naturally led space-science-related research to revolve around technological breakthroughs, engineering practices, and the realization of outcomes, forming a research focus that echoes top-level deployments. While such research provides important support for understanding the technological development trajectory of space

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science, it does not address the narrative and communicative dimensions of space science. The few studies that touch upon space science communication tend to concentrate on macro-level issues such as innovation in science popularization formats and international communication strategies, without delving into the characteristics and evolution of narrative models. For instance, some studies analyze the diverse forms of space science popularization—such as academicians visiting campuses, popular science documentaries, and space-themed activities—but fail to address the narrative logic behind these practices. Other studies focus on the international communication of space science, emphasizing the enhancement of international discourse power through international cooperation and data sharing [13], yet neglect the issue of adaptability of narrative models in domestic communication. As China enters the 15th Five-Year Plan period in 2026, and with the rapid and high-quality development of science and technology, the country's planning and deployment in the space and aerospace sector continue to follow the core orientation of technological breakthroughs and the implementation of major projects. This includes designating aerospace as a key area for the cluster development of strategic emerging industries, using deep-space exploration as an important lever for cultivating new quality productive forces, while explicitly requiring the advancement of new-type space satellite development, engineering practices related to manned lunar landing, and the upgrading of deep-space exploration missions. This top-level planning further drives space-science-related research to continue revolving around technological breakthroughs, engineering implementation, and the realization of outcomes, forming a research focus that deeply resonates with national strategic deployments. At the same time, the deep integration of aerospace engineering breakthroughs with public livelihood needs has been made an important priority, emphasizing the transfer and transformation of scientific and technological innovation outcomes in the aerospace sector to livelihood-related fields, thereby enabling the achievements of space science development to empower areas closely linked to the national economy and people's welfare, such as agriculture, healthcare, resource exploration, and public security. This top-level planning not only continues the core focus on technology and engineering but also enriches the livelihood orientation of space science research, prompting related research to gradually strengthen the exploration of outcome implementation and livelihood applications while focusing on technological breakthroughs.

From the perspective of research methods and the current state of the field, existing space-science-related research is predominantly based on qualitative description and technical analysis, lacking systematic analysis that combines quantitative and qualitative approaches. Although some studies mention the livelihood value of space science achievements and emphasize the practical pathways for transforming aerospace scientific and technological outcomes into livelihood applications, they do not analyze these as narrative elements, making it difficult to reveal the evolution of the relationship between “achievement” and “livelihood” in space science narratives. Current academic outcomes fail to construct a comprehensive analytical framework that integrates in-depth technological interpretation and standardized methodological systems, while neglecting multi-dimensional discussions on space science news narratives. Few scholarly efforts have launched targeted examinations of the internal correlation, expressive logic and evolutionary rules between achievement narratives and livelihood application narratives. Such unresolved academic deficiencies create feasible research room for follow-up specialized studies that adopt multi-method paradigms to interpret the integrated development of achievement and livelihood narratives. Overall, prior studies are restricted by evident flaws including insufficient research coverage, fragmented analytical systems and single research methodologies, and they lack targeted exploration concerning the narrative model transformation within the space science domain. To compensate for the above-mentioned academic deficiencies, this paper takes space science news reports spanning from 2000 to 2025 as analytical samples and adopts a mixed qualitative and quantitative research design to fill the research loopholes in existing studies.

3. Theoretical Foundations and Research Methods

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3.1 Research Methods

3.1.1 Corpus construction

For the sake of guaranteeing authoritative standards and sample representativeness in empirical analysis, this study collects space science news materials from mainstream domestic news outlets, which are split into Phase A (2000–2019) and Phase B (2020–2025). Material resources cover official authoritative newspapers including People's Daily and Science and Technology Daily, alongside the specialized professional portal China Science Communication Network; diversified data sources effectively eliminate one-sided deviation brought by single-data collection. Three successive operating steps govern corpus filtering and pre-processing: the primary screening step discards irrelevant non-news content and reserves intact news texts equipped with complete narrative characteristics; subsequent operations carry out text segmentation work; the final step completes the compilation of relevant metadata tables. After finishing all pre-processing operations, Phase A gains valid corpus content of over 500 words while Phase B obtains more than 3,000 valid words, constructing two mutually independent sub-corpus sets. The labeling work is implemented under the framework of "manual annotation + machine-assisted verification", with definite marking rules formulated for two sorts of core keywords: achievement-oriented lexicon including "launch", "breakthrough", and livelihood-oriented expressions marked as "China [as agent]", "we".

This study adopts AntConc 3.5.8 as the primary analytical software for empirical analysis. This tool is capable of calculating word frequency and extracting keywords from Chinese texts efficiently. It boasts user-friendly operation, high computational accuracy and broad applicability for academic discourse analysis. Meanwhile, researchers adopt Excel as an auxiliary statistical tool to sort and categorize collected data. Raw research data can be organized into standardized tables, which enhances the standardization and readability of analytical results. All experimental parameters were set uniformly throughout the whole research process. To be specific, the retrieval scope was limited to five lexical units on both the left and right sides of each core keyword. This configuration can effectively capture contextual collocation features and prevent redundant interference caused by an excessively large retrieval range. Mutual Information (MI) score is adopted to quantify the tightness of lexical collocation relations. Only collocation items with MI values no less than 3 are retained. Since a higher MI score corresponds to a stronger lexical correlation, this screening rule excludes random incidental collocations and ultimately guarantees the credibility and validity of the research outcomes.

The present study performs independent full-spectrum frequency statistics on the two sub-corpora (Phase A and Phase B). Keywords appearing no fewer than ten times are screened as core analytical objects, which eliminates the confounding influence of low-frequency vocabulary on the overall research findings. This research focuses on two major statistical indicators: the cumulative frequency of achievement-oriented and livelihood-oriented keywords, as well as their respective percentage shares in all high-frequency keywords. All indicators are calculated through a unified formula: (total frequency of categorized keywords ÷ total frequency of all high-frequency keywords) × 100%, which guarantees valid comparative analysis between the two research stages. All statistical data are exported and sorted in Excel for standardized archiving, intuitively demonstrating the discrepancies in frequency and proportion of the two types of narrative keywords across different periods. Relevant quantitative comparisons help researchers objectively summarize the evolving traits of news narratives. In Phase A, achievement-related keywords account for an overwhelming share while terms linked to people's livelihood are rarely seen. This outcome proves that achievement-focused narratives completely prevailed in this period. On the contrary, Phase A sees a sharp increase in both the frequency and proportion of livelihood-oriented words, whereas the share of achievement-related terms remains steady. Such statistical results strongly support the core viewpoint: domestic news reports on space science have shifted from a single narrative that highlights research accomplishments to a combined pattern which presents technological feats as well as their practical value for the public.

3.1.2 Qualitative analysis method

To compensate for the limitations of quantitative analysis, typical textual examples are selected from the two-phase corpus for qualitative

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interpretation, achieving a dual validation of "quantitative data + qualitative analysis." For Phase A, 10 or more typical passages are selected from texts containing high-frequency achievement-oriented keywords (e.g., "China's Shenzhou V manned spacecraft was successfully launched, achieving a major breakthrough in manned space technology"; "The Chang'e-1 satellite was successfully launched, completing the core mission of the lunar exploration program") to analyze the specific presentation methods of achievement narratives, including narrative focus, sentence structure, and emotional tendency. For Phase B, an equivalent number of typical passages are selected from texts containing both achievement-oriented and livelihood-oriented keywords (e.g., "China's remote sensing satellite technology has achieved a major breakthrough, and its data are now widely used in livelihood areas such as agricultural monitoring and disaster early warning"; "Results from in-orbit experiments on the space station have been successfully transformed, providing technical support for space medicine research and public health protection") to interpret the logical connections, transitional methods, and expression characteristics of the "achievement presentation"and "livelihood interpretation" within hybrid narratives, thereby providing micro-level textual support for the conclusion that a shift from achievement narratives to hybrid narratives has occurred.

3.2 Research Data

The core data source of this study is authoritative space-science-related reports from mainstream domestic media covering the period 2000–2025. Based on 65 valid samples, a "Master Metadata Table of Space Science Reports (2005–2025)" (hereinafter referred to as the "Metadata Table") is systematically compiled as the central carrier for empirical analysis. Following the rules of chronological classification, all collected samples are divided into two distinct research groups. Phase A includes 22 news pieces published between 2000 and 2019, and Phase B contains 43 corresponding reports from 2020 to 2025. The research samples are selected from authoritative mainstream media, namely People's Daily and Science and Technology Daily. With solid credibility and representativeness, these materials can fully reflect the overall narrative characteristics of space science news released in China.

We followed a rigorous and standardized data processing procedure to ensure the accuracy and reliability of all experimental data. At the first stage, sample filtering was carried out to remove duplicate, incomplete and invalid news texts, while retaining complete valid samples with clear narrative features. The coding work then adopted the mode of manual annotation combined with cross-validation. Multiple researchers independently tagged key contents including narrative types and core keywords. The inter-coder consistency coefficient reached over 95%, which enabled dual checks on all annotated information. Finally, the Metadata Table is constructed, covering key fields such as year of report, media source, narrative type, core keywords, and livelihood-related scenarios. This table comprehensively covers the information required for narrative analysis and provides direct and reliable data support for subsequent quantitative and qualitative analyses.

4. Research Results

4.1 Phase Comparison Based on the "Narrative Type" Field: Identifying the Pattern of Narrative Transformation

The "Narrative Type" field in the Metadata Table explicitly labels the narrative attribute of each report (pure achievement narrative / hybrid narrative / pure livelihood narrative). By calculating the proportions of each type across the two phases, the macro-level characteristics of the narrative transformation can be directly identified.

As shown in Table 1, the period 2000–2019 (Phase A, 22 reports) exhibits a characteristic of absolute dominance by pure achievement narratives. Among the 22 reports, 17 are labeled as "pure achievement narrative" (95.5%), 4 as "hybrid narrative" (18%), and only 1 as "pure livelihood narrative" (5%). The content of the "pure achievement narrative" reports focuses on three major directions (corresponding to the "Content Summary" field in the table): first, aerospace engineering implementation (e.g., "launch of Shenzhou V manned spacecraft," "Chang'e-1 lunar exploration mission"); second, core technological breakthroughs (e.g., "key technology breakthroughs in manned spaceflight," "independent development of deep-space exploration equipment"); and third,

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achievement of strategic goals (e.g., "achieving the first breakthrough in manned spaceflight," "completing the phase goals of the lunar exploration program"). The 4 "hybrid narrative" reports only briefly mention at the end that "the technology may serve agricultural production in the future," without specifying concrete application scenarios or livelihood value, representing a "supplementary and vague expression of achievement narratives" that does not constitute an independent livelihood dimension. The single livelihood narrative merely mentions expressions related to daily life. These data demonstrate that during Phase A, space science reporting was solely dominated by pure achievement narratives, with the narrative goal focused on "displaying scientific and technological strength and conveying engineering achievements," exhibiting no livelihood narrative characteristics.

Table 1. Statistics of Narrative Types (2000–2025)

Narrative Type	Phase A: 2000–2019	Phase B: 2020–2025
Achievement Narrative	17	5
Livelihood Narrative	1	7
Hybrid Narrative	4	31

In contrast, Phase B (43 reports) shows a trend toward the rise of hybrid narratives as the mainstream. The distribution of narrative types across the 43 reports presents a significant transformation: 5 reports are "pure achievement narrative" (12%), 31 are "hybrid narrative" (72%), and 7 are "pure livelihood narrative" (16%). Among these, the "hybrid narrative" reports are all labeled in the "Content Summary" field as "achievement presentation + livelihood application" (e.g., "technological breakthrough in space station cell experiments and medical translation," "development of Gaofen satellites and disaster warning service"), presenting both the technological achievements in space science and clearly explaining how these achievements are implemented in livelihood scenarios. The 7 "pure livelihood narrative" reports focus on "livelihood value" as their core (e.g., "Space Science Popularization on Campus: Letting Young People Touch the Stars and Sea," "Remote Sensing Technology Assists Rural Revitalization: Viewing Fields from Space"), achieving an independent presentation of livelihood narratives for the first time. This configuration—where the proportion of pure achievement narratives decreases, hybrid narratives become mainstream, and pure livelihood narratives serve as a supplement—directly confirms the core conclusion of a "transformation from achievement narratives to hybrid narratives," with livelihood narrative characteristics now clearly evident.

4.2 Cross-Analysis Based on the "Core Keywords + Narrative Type" Fields: Verifying the Lexical Support for Narrative Transformation

The "Core Keywords" field in the Metadata Table records the high-frequency core vocabulary of each report. Cross-tabulating these with the "Narrative Type" field allows for the identification of the internal logic of narrative transformation at the linguistic level—changes in keyword types serve as direct evidence of evolving narrative characteristics.

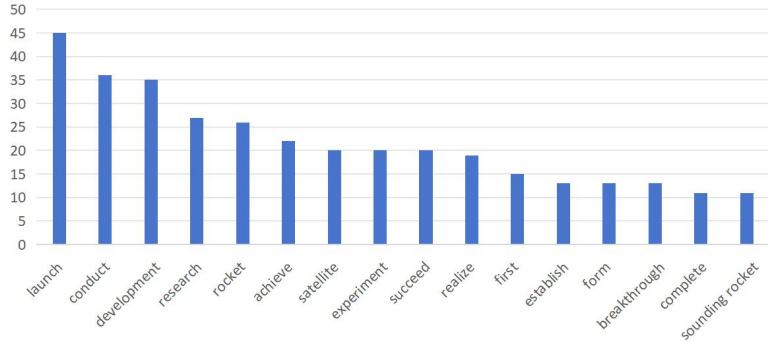

Figure 1. High-Frequency Words in Space Science Reports (2000–2019)

Phase A exhibits a characteristic of absolute dominance by pure achievement-oriented keywords. From the "Core Keywords" field of the 17 "pure achievement narrative" reports in Phase A, all keywords are achievement-oriented. Sorted by frequency, as shown in Figure 1, among the high-frequency words in space science reports from 2000–2019, "launch" ranks first with 45 occurrences, followed by "conduct/develop" with 36 occurrences and "develop/development" with 35 occurrences, all of which are achievement-oriented keywords

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pointing to technological implementation and achievement attainment. No livelihood-oriented keywords such as "application," "translation/transformation," "service," or "benefit" appear on the high-frequency list. Moreover, the "Core Keywords" field for all 22 reports contains no livelihood-oriented keywords, further confirming that Phase A narratives focus on the pure achievement attributes of "mission implementation, technological breakthroughs, and equipment R&D."

Phase B, in contrast, exhibits a mixed distribution of both achievement-oriented and livelihood-oriented keywords. From the "Core Keywords" field of the 31 "hybrid narrative" reports in Phase B, the top eight most frequent words exhibit a distinct "achievement + livelihood" hybrid characteristic. As shown in Figure 2, among the high-frequency words from 2020–2025, "our country" becomes the core keyword with 307 occurrences; livelihood- and society-related words such as "we" and "planning" appear 130 and 83 times respectively, while the proportion of achievement-oriented words such as "breakthrough" and "astronaut" decreases significantly. At the same time, achievement-oriented keywords remain as the foundation, while livelihood-oriented keywords are newly added and occupy the majority (e.g., our country [307 times], we [130 times], human [54 times], team [49 times]), with most frequencies approaching those of core achievement-oriented keywords. Further examination of keyword combinations in "hybrid narrative" reports reveals the widespread presence of fixed collocations of "achievement-oriented keyword + livelihood-oriented keyword" (e.g., "breakthrough + translation/transformation," "satellite + service," "realize/achieve + application"), corresponding to the "Livelihood-Related Scenario" field in the table. These collocations all point to specific livelihood domains, demonstrating that livelihood-oriented keywords do not exist in isolation but form linkages with achievement-oriented keywords, jointly constituting the lexical support for hybrid narratives and verifying the reality of the narrative transformation at the linguistic level.

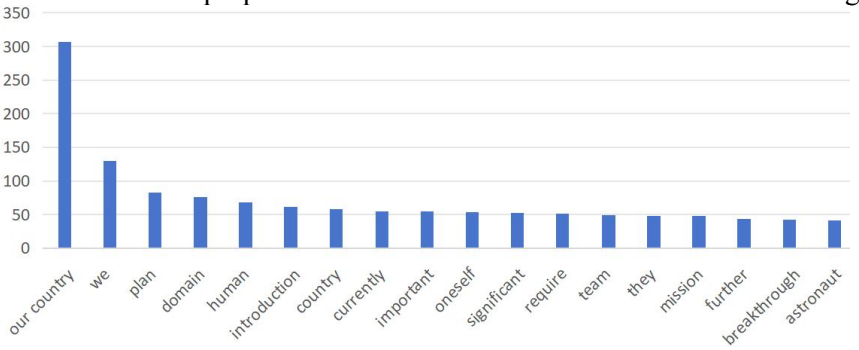

Figure 2. Distribution of High-Frequency Words in Space Science Reports (2020–2025)

4.3 Feature Analysis Based on the "Livelihood-Related Scenario" Field: Confirming the Concrete Presentation of Livelihood Narratives

The "Livelihood-Related Scenario" field in the Metadata Table specifically records the concrete livelihood domains involved in each report (labeled "None" if no such association exists). The phase difference in this field is the most direct manifestation of the "emergence of livelihood narrative characteristics."

Phase A exhibits a completely blank state of livelihood-related scenarios. For all 22 reports in Phase A, the "Livelihood-Related Scenario" field is 100% labeled "None." Even for the sole hybrid narrative report, this field is only labeled as "may potentially be applied to agriculture in the future," lacking both specific scenario details (e.g., specific aspects of agricultural monitoring, regional scope of service) and concrete implementation cases (e.g., cooperation with local agricultural departments, benefit data generated). Such content merely serves as an add-on to the dominant achievement-oriented narrative, rather than forming a separate dimension focused on people's livelihood. This finding therefore proves that news reports on space science in Phase A show no obvious traits of livelihood-related narratives at all.

Yet Phase B features rich and varied depictions of scenarios tied to people's livelihood. Out of its 24 relevant news pieces (21 mixed narratives and 3 narratives focusing purely on livelihood), tags for livelihood-related scenarios show obvious diversity and specificity across four

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major categories. Specifically, there are 8 reports in the agriculture and disaster domain, focusing on scenarios such as “satellite data serving agricultural monitoring” and “remote sensing technology supporting disaster early warning” (e.g., one report mentions that “Gaofen-7 satellite data assisted in monitoring wheat growth in Henan Province, achieving 92% accuracy”). There are 6 reports in the science popularization and education domain, centering on “space science popularization on campus” and “public open day activities” (e.g., “The third Tiangong Class was held, watched simultaneously by over 5 million teachers and students nationwide”). There are 5 reports in the medical and health domain, focusing on “space medicine technology translation” and “medical applications of space station experiment outcomes” (e.g., “Results from space station stem cell experiments are implemented, with new bone repair materials entering clinical trials”). There are 5 reports in the industry and rural revitalization domain, focusing on “technology translation of aerospace materials and industrial spillover effects” and “satellite data assisting rural revitalization” (e.g., “Civilian use of lightweight aerospace materials has led to the establishment of 3 rural enterprises, employing 120 people”). Each real-world application corresponds to set keyword combinations, including "satellite + monitoring + agriculture" and "technology + transformation + healthcare", together with supporting news cases. These elements form a complete logical thread: technological progress, practical application and public benefits. The empirical findings demonstrate that livelihood-related narrative content has undergone obvious changes. Unlike the fragmented and vague incidental remarks in Phase A, such content becomes specific and well-organized in Phase B, evolving into an essential part of the mixed narrative system.

5. Conclusion

With a total of 65 space science news reports selected as empirical samples, this research finishes quantitative empirical exploration and final reasoning via three core research links: metadata table compilation, core keyword statistical analysis and practical scenario textual inspection. Statistical results distinctly illustrate major transformations in the narrative structure of China’s space science news over the period 2000 to 2025. In Phase A from 2000 to 2020, news content was overwhelmingly dominated by accounts centered on technological achievements. Core vocabulary mainly revolved around engineering initiatives and project advancement, with few expressions or concrete cases associated with public livelihoods. This phenomenon reflects a long-standing tendency to stress technical progress while paying insufficient attention to the real-life application of such technologies. Since 2020, Phase B has seen mixed narrative styles become the mainstream of news writing. Words related to people’s livelihood account for more than half of all high-frequency terms, and stable collocations integrating technological introduction and public application have gradually taken shape. At the same time, comprehensive cases of livelihood-oriented applications have emerged, driving news logic to shift from merely demonstrating national technological prowess to valuing practical benefits for the general public. This profound transition is no coincidence. It objectively demonstrates that the development of space science has moved from a stage focused solely on technological innovation to one that prioritizes public interests, and is consistent with the people-oriented philosophy behind China’s overall science and technology development strategies.

A variety of interrelated forces jointly propel the evolution of narrative styles in China’s space science news. The change first stems from the inherent development rules of space science itself, as the field now places more emphasis on real-world application rather than merely pursuing technical breakthroughs. Furthermore, it caters to the public’s rising expectation to understand and benefit from scientific and technological advances, and complies with national strategies to enable technology to serve the general public. This evolution does not negate the importance of conventional achievement-focused narratives. While retaining their core essence, news content adds perspectives related to people’s daily lives, thus enhancing the overall value of space science communication. The updated narrative system can well showcase the progress of national science and technology, and also connect major scientific achievements closely with people’s everyday life. Moreover, it offers reliable references and definite guidance for the ongoing refinement of space science communication

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work in the future.

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