

## Research on Nature's Non-academic Columns and Their Implications for Chinese Scientific Journals

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### Abstract

[Objective] To reveal the role and operational mechanisms of non-academic sections in Nature journal, so as to guide Chinese scientific journals in enhancing their academic impact. [Methods] Four issues of Nature published in different years were selected as research subjects to analyze the composition of non-academic sections, article content, and target readership, and to statistically examine article word counts, citation counts, and self-citation counts. [Results] It was found that the primary function of non-academic sections is to publicize/interpret academic papers in a popular science manner, while the secondary function is to construct a favorable ecosystem for Nature, rather than to obtain citations and self-citations per se to inflate the SCI impact factor. [Conclusion] Non-academic sections publicize/interpret Nature's academic papers in the form of popular science short articles. Chinese scientific journals should learn from Nature's approaches to adequately publicize academic papers, among which Nature's 120-word/180-character popular science short article publicity method is simple, effective, and easy to emulate and apply.

### Full Text

#### Preamble

Non-academic Columns in Nature: Components, Functions and Implications for Scientific and Technical Journals in China

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## Abstract

**[Purpose]** To reveal the role and operational mechanisms of non-academic columns in *Nature* and provide guidance for Chinese scientific and technical journals to enhance their academic influence. **[Methods]** Four issues of *Nature* from different years were selected to analyze the composition of non-academic columns, article content, and target readership, with statistical analysis of word counts, citation frequencies, and self-citation rates. **[Findings]** The primary function of non-academic columns is to publicize and interpret academic papers through popular science approaches, while their secondary function is to construct a favorable ecosystem for *Nature* itself, rather than to directly generate citations and self-citations to inflate the SCI impact factor. **[Conclusions]** Non-academic columns effectively promote and interpret *Nature*'s academic papers through short popular science essays. Chinese scientific and technical journals should adopt *Nature*'s comprehensive promotional strategies for academic papers, particularly the simple yet effective method of using short popular science essays of approximately 120 words (or 180 Chinese characters), which is easy to emulate and apply.

**Keywords:** *Nature*; non-academic column; non-academic article; academic paper; scientific and technical journal; science communication; 120-word/180-character short essay promotion method

## Introduction

For nearly a century, *Nature* has been recognized as a top-tier scientific journal, whether measured by the groundbreaking scientific achievements it publishes, the prestige scientists attach to publishing therein, or its consistently high ranking in SCI impact factor (IF) listings [1-3]. Consequently, it has become a model for China's scientific journal community [4-6]. *Nature*'s content comprises multiple sections. Beyond conventional academic columns (Brief Communications, Review Articles, Articles, Letters to Nature—renamed Letters after 2016, and Nature Insight), it features numerous non-academic columns that publish substantial numbers of popular science articles. *Nature*'s stated aims explicitly commit to “providing timely, authoritative, and in-depth news, as well as influential commentary and analysis of future trends for science, scientists, and the public,” acknowledging its dual nature as both an academic and popular science journal [7]. However, the rationale for publishing extensive non-academic content alongside academic material remains unclear.

Domestic experts have noted these non-academic articles [6-8], with some suggesting they could increase total citation counts through their own citations and self-citations while not being counted as citable items, thereby artificially inflating the journal's IF [7]. Yet no objective, detailed research has verified this claim. Notably, *Nature* now distributes some non-academic articles free of charge via email to subscribers, seemingly using them for deeper journal promotion. Do these articles contribute to enhancing journal influence? Do they create

advantages for SCI impact factor calculations? And what positive implications might they hold for Chinese scientific journals?

This study conducts a sampling statistical analysis of *Nature*'s non-academic columns and articles since 2000 to reveal their role in promoting journal influence and explore scientific approaches to journal management, providing references for enhancing the influence of Chinese scientific and technical journals.

### 1.1 Sampling of Individual *Nature* Issues

This study examined non-academic articles from four printed issues of *Nature* [Figure 1: see original paper]: Volume 405 Issue 6787, Volume 411 Issue 6835, Volume 529 Issue 7534, and Volume 547 Issue 7651. The first two were purchased from used book stalls, while the latter two were gifts from *Nature*'s Shanghai editorial office. These four issues constitute a sample of all *Nature* issues published in 2000, 2001, 2016, and 2017.

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**Figure 1.** The four sampled print issues of *Nature*. From left to right, published on June 8, 2000; May 17, 2001; January 7, 2016; and July 6, 2017.

### 1.2 Scope of Non-academic Columns

In the four sampled issues, Brief Communications, Review Articles (in 2000), Articles, Letters to Nature (renamed Letters after 2016), and Nature Insight (in 2001) were considered academic columns. All columns preceding these in the print version were classified as non-academic columns. Content appearing before or after the table of contents with Roman numeral pagination (excluding advertisements) was also considered non-academic and included in this study. Columns appearing after the academic sections, such as “New on the Market,” were essentially commercial advertisements and thus excluded from this research.

### 1.3 Statistical Analysis

We statistically analyzed the composition and evolution of non-academic columns in the four selected issues, categorizing them while recording article quantities, lengths, and citation counts from the JCR database. We also examined how non-academic columns publicized current, past, forthcoming, and *Nature* series journals (hereinafter “Nature sister journals”). Citation data were retrieved from the Web of Science website on January 3, 2018.

## 2.1 Relative Proportion and Changes of Non-academic Articles

Table 1 shows that from 2000 to 2017, the number of non-academic articles per issue increased from 41 to 63 (a 50% growth), while total pages increased by only four pages, causing the average pages per article to decrease from 0.68 to 0.51. This indicates that non-academic articles have become more numerous and shorter. Conversely, academic papers decreased from 21 to 16 per issue, while total pages grew from 75 to 80, increasing the average pages per article from 3.57 to 5.00. Academic papers have thus become fewer in number but longer in length. The ratio of non-academic to academic articles per issue nearly doubled (2.0 vs. 3.9), while the ratio of average pages per article decreased by half (0.19 vs. 0.10). These comparisons suggest that *Nature* has increasingly favored publishing more numerous and shorter non-academic articles relative to academic papers.

**Table 1.** Changes in total pages, total articles, and average pages per article for *Nature*'s non-academic and academic articles

## 2.2 Citation Counts and Relative Proportion Changes of Non-academic Articles

Table 2 presents citation statistics for non-academic articles in single issues of *Nature* since the turn of the century. The four sampled issues from 2000, 2001, 2016, and 2017 received 284, 243, 30, and 5 citations respectively, showing substantial growth over time. Citation counts for academic papers in these issues and total citations followed the same trend. Non-academic articles accounted for 3.239%, 1.363%, 3.704%, and 5.319% of total citations, roughly showing an inverse trend where more recent issues have higher proportions, though the maximum remains only 5.319%. The 2016 figure roughly indicates the contribution rate of non-academic article citations to the 2017 journal IF (similar to the 3.616% calculated by removing citations from the publication year in SCI IF calculations, see Table 2 note). Even if non-academic article counts are excluded from total citable items in SCI IF calculations, their contribution to raising *Nature*'s IF is only 3.704%. Projecting this proportion to *Nature*'s latest IF of 41.577 in 2017, the direct contribution would be merely 1.540. Subtracting this contribution would still leave *Nature*'s impact factor above 40, hardly affecting its ranking.

**Table 2.** Annual citation counts of non-academic articles and their proportion of total citations

*Note: Statistics from the Web of Science on August 13, 2018, for the 2016 Nature\* issue show that after removing citations from 2016, non-academic articles received 29 citations in 2017, while research articles received 773 citations. Thus, the ratio of non-academic article citations to total annual citations in 2017 was  $29/(29+773) = 3.616\%$ , similar to the 3.704% calculated from historical data in the table.\**

These findings suggest that *Nature's* increasing enthusiasm for publishing more numerous and shorter non-academic articles since 2000 is not aimed at directly inflating its IF to create a false impression of high impact. Why then does *Nature* invest manpower (reporting, writing, commissioning, editing), layout space, and financial resources in this seemingly “useless” work?

### 2.3 Composition and Functions of Non-academic Columns

Table 3 shows the composition of non-academic columns in the 2000, 2001, 2016, and 2017 issues. Over the past 18 years, each issue comprised 13, 13, 11, and 12 non-academic columns respectively. Although some short-essay columns have been added recently, most represent rebranding or repositioning of existing columns, resulting in no substantial change to the actual column composition.

**Table 3.** Composition, pages, and article counts of non-academic columns and their changes

*Note: Columns marked with* *appear before the table of contents and are not considered formal journal content; those marked with # appear after the table of contents with Roman numeral pagination and are also not formal content.\**

Analysis of Table 3 reveals that based on column position and average pages per article, non-academic columns can be categorized into five types: 1) Pre-contents columns; 2) Columns with articles  $< 1/5$  page; 3) Columns with articles between  $1/5$  and 1 page; 4) Columns with articles  $\geq 1$  page; and 5) News and Views columns (special category). The content and functions of these five categories are discussed below.

**2.3.1 Pre-contents Columns** These columns appear before each issue's table of contents. In 2000 and 2001, they were printed in Japanese (likely for Japanese print editions), beginning with a one-page Highlights section that introduced seven important academic articles from the current issue (Table 4), including page numbers and occasionally referencing related News & Views articles. Each introduction occupied a space equivalent to a “tofu cube” (small block). Since these were in Japanese, word counts were not recorded. Following Highlights was a Japanese-language table of contents with English column titles, where most article titles were accompanied by brief Japanese summaries occupying either one “tofu cube” (for Articles, Letters to Nature) or one-quarter “tofu cube” (for News and Views). In 2016 and 2017, the pre-contents section featured Chinese-language introductions to 11 (in 2016) or 5 (in 2017) important academic articles from the current issue (likely for Chinese print editions), including page numbers and often referencing related News & Views articles. These summaries used popular science Chinese accessible to readers from all science and engineering backgrounds, averaging 183 characters—effectively providing brief promotions of key academic articles to readers from all disciplinary backgrounds.

**Table 4.** Composition and languages of pre-contents columns in print *Nature*

These columns are not formal journal content, are not indexed by SCI, and have no citation data recorded in the Web of Science. Clearly, they do not directly contribute to the journal's IF. However, their placement in the most prominent position at the beginning of each issue follows the principle of “presenting the most important content first,” promoting the most significant academic content to readers through accessible language (local language, popular science style) and concise text to create lasting impressions and stimulate interest among readers from diverse disciplinary backgrounds to follow and read related papers or News & Views articles. Notably, the 2016 and 2017 Highlights sections also dedicated approximately half a page to introducing one academic article each from two *Nature* sister journals.

These arrangements suggest two key functions: 1) Promoting current academic articles to stimulate reading interest among readers from different disciplinary backgrounds and facilitate potential future citations; and 2) The most direct and effective way to promote an academic journal article is through a popular science short essay of approximately 180 Chinese characters per article. Otherwise, *Nature* would not invest such effort and layout space, given that its publisher is a commercial company pursuing maximum profit and minimum cost. In fact, as early as 2001, *Nature* had already created a dedicated one-page column called Nature View after the table of contents to specifically promote its newly launched sister journals (Table 5 ).

**2.3.2 Columns with Articles < 1/5 Page** This category includes five column types appearing after the table of contents, none of which are indexed by SCI or have citation data recorded. Their primary function is to publicize academic paper content using popular science language, with varying approaches and emphases (Table 5 ).

**Table 5.** Composition, word counts, and functions of columns with articles < 1/5 page

The “In this Issue” column (2000, 2001) provided one-to-one promotion of current issue academic papers, averaging only 86 words per article. The “Nature View” column (2001) specifically promoted the latest academic papers from *Nature* sister journals, averaging 127 words per article. “News in Brief” indirectly promoted recent past-issue academic papers by reporting weekly global hot news, inserting citations in parentheses (Nature, volume, page, year), with short texts of approximately 130 words (2000, 2001). This column was retitled “Seven Days” in 2016 and 2017, with the subtitle “The news in brief,” but shifted to implicitly promoting recent past-issue papers without parenthetical citations—essentially becoming news-style soft advertising. In 2016, the one-page layout featured 8 short articles of only 80 words each, expanding to a two-page layout with 14 articles in 2017.

In 2016 and 2017, *Nature* eliminated the “In this Issue” column that directly promoted current academic papers, but created the one-page “New on Line”

column to introduce academic papers published online but scheduled for print publication in the next issue (forthcoming issues), advancing the promotional timeline. Average word count was 98 words in 2016, adjusted to 134 words in 2017.

Starting in 2017, *Nature* also added the “Research Highlights” column, spanning two pages with 9 short articles averaging 142 words each. This column promoted not only *Nature* or *Nature* sister journal papers but also recent papers from other prestigious journals, intentionally strengthening connections with these publications and fostering a harmonious ecosystem among leading journals.

All these columns feature short articles with low word counts. Based on 18 years of practice and recent word count adjustments, essays of 100-140 words (averaging 120 words) appear most effective for promotion—shorter or longer texts may be less impactful.

**2.3.3 Columns with Articles Between 1/5 and 1 Page** These columns feature short articles of intermediate length, including four column types that are indexed by SCI and have citation data recorded (Table 6 ). Over the past 18 years, the first column after the table of contents has been “Opinion” (2000, 2001) or “Editorial” (2016, 2017). Despite the name change, the actual content is essentially similar and can be summarized as “Editorial Opinion”—editor-written pieces introducing and commenting on important or major global science and technology news of the week, inserting citations to past *Nature* papers (volume, page, year) in the main text. These unsigned articles typically occupy less than one page, with either two articles per page or three articles per two pages. While Web of Science can retrieve these short articles’ titles, none of the eight such articles from the four sampled issues received any citations. This column addresses relaxed topics of broad interest to the scientific community, serving as a bond to unite researchers into loyal readers and making the journal a spiritual home for scientists.

**Table 6.** Composition and citation statistics of columns with articles between 1/5 and 1 page

The “News” column (2000, 2001) consisted primarily of half-page short articles with author bylines and institutional affiliations, each accompanied by one photograph. Content focused on important international science and technology events and policies, clarifying scientific issues within news stories and calling for further exploration or solutions. Each issue contained 10-11 such articles, with only one article receiving three citations within the SCI IF calculation validity period. Approximately three-quarters of these short articles received no citations over the 18-year period. In 2016 and 2017, the corresponding column was renamed “News in Focus,” with length increased to nearly one page, often featuring multiple photographs and even data charts, enhancing citation value. In 2016, four of the five articles received 17 citations total, with 10 contributing to IF calculation. In the 2017 issue, all citations failed to contribute to that

year's IF calculation.

The “Book Review” column (2000, 2001) or “Comments—Books & Arts” column (2016, 2017) featured short essays reviewing newly published books or artworks, typically receiving no citations during SCI IF calculation periods. Only one such article from this study received a single citation. Thus, this column contributes almost nothing to *Nature*'s IF, likely serving only to recommend books or emphasize connections between humanities/social sciences and natural sciences.

The “Correspondence” column publishes letters from readers, typically discussing important academic issues from past *Nature* or other journal articles to promote scientific rigor and deeper research. These letters can receive citations, though usually only 1-2 per column (maximum 5 in 2000), with no more than one contributing to IF calculation and most receiving none. Letters include reader signatures and affiliations, occasionally with references, but never constitute self-citations of *Nature*.

**2.3.4 Columns with Articles  $\geq 1$  Page** Articles reaching one full page represent complete, structured pieces with clear viewpoints and substantial evidence, such as those in News Feature, Commentary, Words, Comment, and Concepts columns (Table 7). These articles include references (though sometimes without a “References” heading or marked as “Further Reading” without numbered citations), giving them citation value while directly promoting academic papers from sister journals (primarily *Nature*, *Nature* sister journals, *Science*, *Cell*, *PNAS*, *PRL*, *Trends* series, *ACS* series, and other prestigious journals), though not limited to the IF calculation period. They can be considered quasi-academic papers or mini-reviews written in popular science language, organized around personalities, measures, events, or environmental/ecological themes rather than conventional research progress narratives. Target readers are likely peers in the authors' broad field. In 2000, 2001, and 2016, contributions to IF calculation from these columns were limited to 4, 17, and 3 citations respectively.

**Table 7.** Composition and citation statistics of columns with articles  $\geq 1$  page

The “Millennium Essay” column (published in the turn-of-the-millennium 2000 issue, addressing science, scientists, and science communication) and “Futures” column (featuring science fiction by writers, essayists, lyricists, and actors), along with the 2016 “World View” column (addressing science and religion, research value assessment), focus on the intersection of science and philosophy with stronger orientation toward humanities and social sciences. Consequently, they have little connection to other academic papers and receive almost no citations, though they encourage scientists to reflect on their research, societal contributions, public value, and academic standing—again serving as a spiritual home for scientists and a bond to unite the research community.

**2.3.5 The News & Views Column** The News & Views column warrants special classification due to its unique role. Each issue contains about 6 articles (Table 3). Most precisely promote current academic papers (though occasionally some articles make no promotional effort), deconstructing complex points for non-specialist readers by explaining methods, principles, significant breakthroughs, and implications. Articles typically identify the specific Article or Letter being discussed in the title, usually interpreting one academic paper though sometimes addressing two related papers. The main text begins with two bolded summary sentences (not an abstract), followed by author biographies and references (without a “References” heading). These polished mini-reviews not only promote citations of the discussed papers but also frequently receive citations themselves (Table 8).

**Table 8.** Citation statistics for News & Views column articles

Since News & Views articles include references, they have the potential to self-cite *Nature* papers. We examined effective self-citation counts (citations of *Nature* papers from the previous two years) in this column compared to other referenced columns. News & Views does exhibit effective self-citation (Table 9), but the total is minimal: 9 instances each in 2000 and 2001, decreasing to 4 and 0 in 2016 and 2017. Meanwhile, other columns had either zero or only one effective self-citation. Thus, while News & Views is indeed the primary source of self-citations contributing to IF, such self-citations are negligible compared to total citations per issue and have substantially decreased or disappeared in recent years.

**Table 9.** Statistics and proportions of effective self-citations in News & Views column

*Note: Effective self-citation counts refer to citations of Nature\* academic papers published within the previous two years, which contribute to SCI IF calculations.\**

### 3.1 Functions and Implicit Effective Promotion Methods of *Nature*'s Non-academic Columns

*Nature* is widely regarded as an international top-tier scientific journal [1-5], yet it also curates over a dozen non-academic columns presented alongside academic papers. Our 18-year sampling survey of print *Nature* issues provides preliminary answers to why *Nature* publishes numerous non-academic articles. Based on the statistical findings, classifying *Nature*'s non-academic columns by function (Table 10) reveals that most serve to promote academic papers, primarily current *Nature* articles, followed by past issues, forthcoming issues, *Nature* sister journals, and other prestigious journals (Table 10). Promoting papers from other prestigious journals also helps *Nature* build a favorable journal ecosystem. The most effective promotional format appears to be short essays of 100-140 words (averaging 120 words), though Chinese promotional essays work best at approximately 180 characters—a method we term the “120-word/180-character short

essay promotion approach.”

Columns with minimal or no promotional function include the turn-of-the-millennium “Millennium Essay” and “Futures” columns and the current “World View” column, each occupying only one page (Table 10). Meanwhile, *Nature* uses these columns along with Opinion/Editorial articles to provide topics of broad interest to the scientific community, constructing a spiritual home that unites scientists and building a favorable ecosystem of scientist authors and readers.

**Table 10.** Functional classification of *Nature*’s non-academic columns

### 3.2 Purpose of *Nature*’s Non-academic Columns

Except for columns with articles under 1/5 page (the “tofu cube” size) that are not indexed by SCI for IF calculation, all other column articles are indexed and have the potential to contribute to total citation counts, particularly during the SCI IF calculation period. Some columns contribute substantially (Table 10), but the overall contribution rate is less than 4% (Table 2). In 2005, Eugene Garfield estimated this contribution rate for prestigious journals at 5%-10% [8], but this study shows *Nature*’s actual rate is lower. For *Nature* with its annual IF around 40, this contribution is negligible. This 反过来 proves that *Nature*’s primary purpose in establishing non-academic columns is to promote academic papers, with secondary goals of building a favorable ecosystem among author/reader scientist communities and fostering harmonious relationships among journal groups. Clearly, *Nature*’s non-academic columns are not as purely public-oriented as its founding aims suggest [7]; their essence is publishing popular science soft advertising for academic papers.

### 3.3 How Non-academic Columns Lock in Quality Manuscripts

For nearly a century, *Nature* has maintained its position among the handful of top-tier journals. Its ability to continuously attract quality manuscripts likely stems not only from its high IF (which didn’t exist decades ago) but also, based on this study’s findings, from the efficient promotion of its academic papers through numerous non-academic columns. Such promotion expands readership and enhances dissemination power [6]. Authors publishing in *Nature* receive an additional popular science promotional/interpretive article, creating a sensational effect in their circles and generating multiplied joy and prestige. This tailored pleasure that *Nature* provides authors is unmatched by most other journals. Similarly, when authors’ papers in other journals are featured or promoted in *Nature*’s short essays, they receive significant additional recognition. Naturally, these authors have compelling reasons to submit their best future work to *Nature*. *Nature*’s non-academic columns thus effectively lock in quality manuscript sources.

Since the turn of the century, promotion has expanded beyond print media,

largely replaced by online promotion. *Nature's* non-academic and academic columns have long been available online ([www.nature.com](http://www.nature.com)) with additional extensions (email-delivered *Nature Briefing*). In the past without or with limited internet, these non-academic columns were particularly valuable for promoting *Nature's* academic papers. While Table 10 highlights the promotional role of most non-academic columns, these columns also simultaneously build favorable scientist and journal ecosystems to varying degrees, uniting high-level scientists and thereby securing quality manuscripts.

### 3.4 Common Features and Significance of Different Non-academic Columns

Each *Nature* non-academic column has its own characteristics, whether in length, word count, or content focus. However, they share two important commonalities: 1) non-academic writing perspectives and narrative threads, and 2) popular science writing language. Only through these features do non-academic columns become readable [9] (or “grounded”) and maintain vitality without expanding the total article count in SCI IF calculations. Only thoroughly popularized research results can be understood by scientists in broader and more distant fields, enabling interdisciplinary applications and generating greater scientific innovation. Jiang Xiaoyuan considers *Nature* a typical amphibious journal that publishes both academic and popular science articles [8,10], noting that 9 of the top 20 IF-ranked journals are amphibious (with 10 being review journals), demonstrating the enormous impact of incorporating popular science articles on enhancing journal influence. Combined with this study's findings, it is evident that *Nature's* success stems not only from publishing top-tier research but also from its effective popular science promotion system.

## 4. Implications for Chinese Scientific and Technical Journals

The functions and operational methods of *Nature's* non-academic columns offer the following insights for Chinese scientific and technical journals:

1. **Scientific journals must prioritize academic paper promotion.** *Nature* uses over a dozen non-academic columns with nearly four times as many non-academic articles as academic papers (Table 1) to promote its academic content. Given *Nature's* emphasis on promotion, Chinese scientific journals should similarly value multifaceted, multi-angle, and comprehensive promotion of academic papers from various temporal perspectives.
2. **Directly emulate *Nature's* 120-word/180-character short essay method.** *Nature's* longest-standing and broadest-promotion columns predominantly feature short essays of approximately 120 words (or 180 Chinese characters), offering simple and effective promotion. This length

falls within adult one-minute reading capacity, making readers willing to spend 30 seconds to one minute scanning the text and increasing reading probability and promotional effectiveness. Such 120-word/180-character popular science short essays can be directly applied to email and WeChat public account promotions.

- 3. Promotional effectiveness depends on popular science language and non-academic narrative approaches.** Non-academic articles must be readable to be read and effectively disseminate academic papers. The popular science appeal of non-academic articles determines promotional success.
- 4. Popular science talent is fundamental for both promotion and journal development.** *Nature's* non-academic articles are highly appealing because their authors excel at popular science writing, whereas most Chinese researchers currently lack this skill. Scientific journals need to cultivate editors' popular science writing abilities and develop researchers' capacity to write popular science articles for university-educated audiences who can accept, apply, and innovate (rather than for primary/secondary students or amateur science enthusiasts). China has recognized popular science's importance for improving public scientific literacy and promoting research innovation and industrialization [11,12], but has not yet fully appreciated the critical role of popular science and popular science talent in developing Chinese scientific journals.

## 5. Conclusions

This study of *Nature's* print non-academic columns since the turn of the century yields the following conclusions and recommendations:

1. The primary function of non-academic columns is to promote academic papers, with secondary functions of building a favorable journal ecosystem.
2. *Nature's* purpose in establishing non-academic columns is not to manipulate citation counts and deliberately inflate its SCI impact factor, nor is it purely for public science communication. The essence is publishing popular science soft advertising for academic papers.
3. Promotional effectiveness is likely optimal for short essays of approximately 120 words (or 180 Chinese characters).
4. Two crucial common features of non-academic columns are non-academic narrative perspectives and popular science writing language.
5. Chinese scientific journals must fully recognize non-academic columns' promotional value for academic papers and can adopt *Nature's* 120-word/180-character short essay method.
6. The scientific journal community needs to prioritize cultivating editors' and scientists' abilities to write high-level popular science promotional articles (like those in *Nature* and *Science*) to support academic content dissemination and journal development.

This study provides preliminary exploration of *Nature's* non-academic columns and their implications. However, given the complexity of these columns, comprehensive and detailed research remains challenging. How to innovatively adapt *Nature's* model to Chinese journal editing and publishing contexts while maintaining distinctive features requires further in-depth exploration.

## References

1. Zhai Wanyin. Analysis of highly cited papers in *Nature* and its implications for Chinese scientific journals [J]. Chinese Journal of Scientific and Technical Periodicals, 2015, (1): 27-37.
2. Liu Fang, Zhu Sha. Research on differences between major evaluation indicators of academic journals and academic achievement influence: A case study of *Nature* [J]. Journal of Intelligence, 2015, 34(8): 65-69.
3. Zhang Haichao. Comparing Chinese and American research strength from multi-dimensional evaluation of *Nature* journal papers [J]. China Science & Technology Resources Review, 2016, 48(6): 68-79.
4. Ren Shengli, Wu Guozheng. Statistical comparative analysis of papers in *Chinese Science Bulletin* and *Nature* [J]. Acta Editologica, 2000, 12(4): 203-205.
5. Zhou Qinghui, Yin Huixia, Ling Changquan. Successful experience of British *Nature* magazine and its implications for Chinese scientific journals [J]. Chinese Journal of Scientific and Technical Periodicals, 2006, 17(6): 1062-1065.
6. Zhang Gaoming, Zhou Jianhui, Huang Guifang. Analysis of *Nature* magazine's methods for expanding readership (Part 1) [J]. Journal of Hunan University, 2000, 27(6): 122-130.
7. Jiang Xiaoyuan, Mu Yunqiu. *Nature*: From popular science journal to academic myth [J]. Zhejiang Academic Journal, 2017, (5): 199-204.
8. Jiang Xiaoyuan, Mu Yunqiu. Impact factor can be manipulated—Lifting the academic veil of impact factor (Part 2) [J]. Reading, 2016, (9): <http://www.aisixiang.com/data/101177.html>.
9. Tian Xiaowen. Selection criteria for manuscripts published in *Nature* magazine [J]. Chinese Journal of Neurosurgical Disease Research, 2002, 1(3): 212.
10. Mu Yunqiu, Jiang Xiaoyuan. Examining the current status of Chinese journals' integration with international standards from SCI review article citation rules: Empirical study No. 5 on *Nature* magazine [J]. Journal of Shanghai Jiao Tong University (Philosophy and Social Sciences), 2017, 25(116): 78-86.
11. China Association for Science and Technology (ed.). Characteristics and future trends of popular science journal development in China. Blue Book of China STM Journals Development (2017), 1st ed. [M]. Beijing: Science and Technology Press, 2018: 207-217.
12. Bai Chunli. Preface [J]. Bulletin of Chinese Academy of Sciences, 2018, 33(7): 661-662.

*Note: Figure translations are in progress. See original paper for figures.*

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