Open Peer Review Practices in Academic Journals: A Survey and Analysis

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Abstract

Objective: Through investigation and analysis of a large-scale journal sample, this study aims to depict the current international practice status of open peer review (OPR) in academic journals, addressing the basic characteristics of OPR journals and the extent of adoption and strategies of OPR processes, thereby providing empirical reference for relevant practices of Chinese journals.

Methods: Taking 1,111 OPR journals and 11,110 articles published therein as the sample pool, this study investigates and statistically analyzes their publication information, academic impact, and specific practices regarding cycle, identity, and content transparency.

Results: The results show that OPR practices are highly concentrated in Europe, commercial publishers, and the medical and health sciences, dominated by non-top-tier journals, with medium- and low-impact journals actively participating. Adoption strategies vary across different open processes; as core dimensions, reviewer signature and review report disclosure are relatively rare, dominated by voluntary models, while standardized practices such as assigning DOIs to review reports are seriously lacking.

Conclusion: OPR practices exhibit strategic and differentiated characteristics, with conservative approaches toward opening core processes, and excessive reliance on voluntary models limiting the improvement of openness. To promote OPR from form to substance, journals need to gradually strengthen the openness of core processes and explore effective incentive mechanisms to enhance the initiative of authors and reviewers in core processes, overcoming the limitations of voluntary models.

Full Text

Preamble

An Investigation and Analysis of the Current Practices of Open Peer Review in Academic Journals

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Abstract: [Purposes] This study aims to depict the current international landscape of Open Peer Review (OPR) practices in academic journals through a large-scale survey and analysis. It seeks to identify the basic characteristics of journals adopting OPR, as well as the extent and strategies of OPR implementation. The goal is to provide an empirical reference for the adoption of such practices by journals in China. [Methods] The study is based on a sample library of 1111 OPR journals and 11110 articles published within them. An investigation and statistical analysis were conducted on their publication information, academic impact, and specific practices concerning the openness of the review cycle, reviewer identities, and review content. [Findings] The results indicate a high concentration of OPR practices in Europe, within commercial publishing houses, and in the disciplines of medicine and health sciences. The adoption of OPR is primarily led by non-top-tier journals, with active participation from journals of medium to low impact. The implementation strategies for different open elements vary. The core dimensions of OPR, namely signed reviewer identities and open peer review reports, are adopted less frequently and are predominantly based on a voluntary model. Furthermore, there is a significant lack of standardized practices, such as assigning DOIs to peer review reports. [Conclusions] OPR practices are characterized by strategic and differentiated adoption, with a conservative approach towards opening up the core elements of the review process. The heavy reliance on a voluntary model limits the potential for increasing the degree of openness. To advance OPR from a superficial to a substantive practice, journals need to progressively enhance the openness of core review stages. It is also crucial to explore effective incentive mechanisms to increase the willingness of authors and reviewers to participate in these core open practices, thereby overcoming the limitations of the voluntary model.

Keywords: Academic journals; Open Peer Review; Current practices

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Peer review (PR) serves as a critical component of academic journal publishing, playing a central role in controlling academic quality [?], maintaining the reputation of the academic community [?], and promoting the dissemination of research findings [?]. For centuries, the status and role of peer review have been irreplaceable, yet scholarly criticism of it has never ceased. Traditional peer review indeed has many flaws that affect its screening and gatekeeping functions, and these deficiencies are widely attributed to its "black box" nature: the opaque review process makes it difficult for outsiders to assess fairness, potentially undermining public and academic trust in research findings [?]; anonymity creates potential for reviewer power abuse, thereby affecting review quality [?]; the traditional model may fail to identify and evaluate non-consensus or disruptive research. Nobel laureates have reported that groundbreaking papers that eventually earned them the prize were rejected by multiple journals [?]; some reviewers procrastinate, resulting in lengthy review cycles [?] and considerable delays in the public release of research findings. Consequently, the academic community has gradually recognized that Open Peer Review (OPR) may offer a new solution to the ailments of peer review.

Against the backdrop of open science, open peer review has developed rapidly as a potential alternative or supplementary model to traditional peer review [?]. Unlike the "black box" decision-making of traditional peer review, OPR introduces a series of elements that make the review process and results publicly accessible. Although no unified definition of OPR has been reached in academia, mainstream research suggests it includes the following elements: open identities, open reports, open participation, open interaction, open preprint manuscripts, open comments, and decoupling of the review process from publishers [?]. As OPR continues to evolve, its current practices and development trends have become a new focus of attention. Existing research has primarily followed two approaches: one involves case studies that deeply analyze the OPR mechanisms and practical details of typical journals and publishing platforms (such as BMC series, PLOS series, Nature series, F1000Research) [?][?][?][?]. The other approach relies on large-scale empirical surveys to analyze the macro-level landscape of OPR practices. For example, some studies have investigated the OPR status of 82 [?] and 171 [?] journals respectively. The pioneering research by Dietmar Wolfram et al. covered a broader sample, comprehensively examining 617 journals that had published at least one article with open identities or open reports as of 2019 [?].

Existing studies provide important references for understanding the current state of OPR practices, but case studies lack breadth despite their depth, and the generalizability of their conclusions may face challenges from sample selection bias. Meanwhile, large-scale empirical survey data urgently needs updating in the context of rapid OPR development. The largest previous survey, such as Wolfram et al.' s, had a data collection endpoint of 2019 with a sample size of 617 journals, whereas this study shows this number has grown to 1111. There-

fore, this paper constructs a sample library encompassing 1111 OPR journals and conducts investigations and quantitative analyses of journals' basic information and adoption strategies for various OPR elements. It aims to answer: (1) What are the overall scale and compositional characteristics of international OPR journals? (2) What is the adoption degree of various OPR elements, and what strategies do they reflect? This will further reveal the latest practical status of OPR in international academic journals and provide empirical references for relevant practices in Chinese journals.

2 Research Design

2.1 Data Sources

To ensure data comprehensiveness, this study followed the "best-effort collection" principle [**?**], obtaining OPR journal directories from mainstream platforms including DOAJ, journal official websites, media statements, and data repositories. After screening and removing duplicate, discontinued, or unverifiable journals, a sample library of 1111 journals was constructed. Subsequently, using journal titles and ISSNs as indices, journal information was further supplemented and verified in Clarivate' s Master Journal List (MJL) database. The "Reviewer Guidelines" and "About the Journal" sections of journal websites were also examined to supplement OPR practice information, enhancing data accuracy and completeness. To further study and compare the OPR practices of each journal, the investigation time window was set from January 2024 to April 2025, with 10 randomly sampled articles serving as the observation sample set for each journal. The degree of OPR in the sample set was used to represent the journal' s current status. Ultimately, the sample library included 11110 articles from 1111 journals. This design not only ensures that the research conclusions reflect relatively recent practice dynamics but also guarantees comparability among journals with different publication cycles through a standardized sample size (N=10).

2.2 Variable Operationalization and Assignment

The specific indicators, variables, and operational definitions of this study are detailed in Table 1 . It should be particularly noted that the vast majority of OPR practices, such as open reviewer identities and open review reports, highly respect the wishes of authors and reviewers. This means that even when journals provide open options, not all articles will adopt them, resulting in varying actual degrees of openness across journals and phenomena such as occasional or partial openness. Furthermore, for the sake of refinement and differentiation, this study quantifies and assigns values to some OPR practices, avoiding traditional binary variables as much as possible to prevent masking actual differences in openness by simply judging journals as "yes/no" based on policy descriptions on their websites.

Table 1 Operationalization and Assignment of Journal Basic Information and

OPR Practice Variables

Variable Category	Operational Definition
Publication Information	
Publisher	Record the journal' s publishing institution, confirmed through the "About the Journal" section on the journal' s official website.
Country/Region	Record the country or region of the publishing institution.
Publisher Type	Record the publisher' s attributes: commercial, society, university, or research institute.
Founding Year	Record the year the journal was first published.
Publication Cycle	Record the interval between issues in months (e.g., 1 for monthly, 2 for bimonthly).
Academic Impact	
Discipline	Record the journal' s primary discipline, categorized into Earth and Environmental Sciences, Engineering and Technical Sciences, Agriculture and Food Sciences, Social Sciences and Humanities, Life Sciences, Physical and Chemical Sciences, and Medical and Health Sciences.
JCI	Adopt the Journal Citation Indicator (JCI) released by Clarivate in June 2024 (2023 edition).
Cycle Openness	
Processing Cycle Openness	Examine the sample (N=10) to determine if at least one article clearly marks the paper processing cycle on its webpage or in the final published version, such as "Received," "Revised," and "Accepted" dates.
Identity Openness	
Editor Identity Openness	Count the number of articles in the sample (N=10) that explicitly disclose the name of the editor responsible for handling the manuscript on the webpage, PDF, or in the acknowledgments section. Each article found counts as 1.

Variable Category	Operational Definition
Reviewer Identity Openness	Count the number of articles in the sample (N=10) where all accessible peer review reports explicitly disclose the real name or ORCID of at least one reviewer. Each article found counts as 1.
Reader Comment Openness	Examine the sample (N=10) to determine if the journal provides an online, public reader comment section function for at least one article. Focus on the presence of the function, not the content of comments.
Content Openness	
Review Report Openness	Count the number of articles in the sample (N=10) that have actually published peer review reports. Each article found counts as 1.
Review Report Presentation Format	Observe all accessible review reports in the sample (N=10) and record their main presentation format.
Review Report Unique Identifier	Examine all accessible review reports in the sample (N=10) to determine if at least one report has been assigned its own Digital Object Identifier (DOI), distinct from the article' s DOI.
Review Report Revision Version	Examine all accessible review reports in the sample (N=10) to determine if at least one report explicitly displays multi-round review comments or version revision information (e.g., marked with "Round 1," "Version 2," or similar identifiers).

3 Results and Analysis

3.1 Analysis of Journal Basic Information

3.1.1 Publication Information The 1111 journals in the sample library came from 154 publishing institutions, showing concentration trends in terms of publication scale, institutional attributes, and geographical distribution, with partial display in Figure 1 [Figure 1: see original paper]. Regarding institutional attributes, commercial publishers demonstrated larger publication scales. Specifically, 444 journals (40%) were from MDPI in Switzerland, 112 journals (10.10%) from SDI in India, and 68 journals (6.12%) from BioMed Central in the UK, followed by other well-known publishers such as Frontiers Media S.A. and Wiley. Some commercial institutions had smaller publication scales, with only 1-2 journals practicing OPR while blind review remained the primary peer

review model. Journals sponsored by societies, universities, and research institutes generally had narrow publication scopes and small quantities. Among them, IOP Publishing (managed by the UK Institute of Physics), Copernicus Publications (managed by the European Geosciences Union), Cambridge University Press (managed by the University of Cambridge), and Oxford University Press (managed by the University of Oxford) were relatively well-known publishing institutions with larger publication scales.

Geographically, the distribution was primarily concentrated in Europe, such as Switzerland, the UK, and the Netherlands, with 503, 196, and 66 journals respectively. The UK and the Netherlands had more diverse OPR ecosystems supported by multiple publishing institutions, while Switzerland was dominated by MDPI. This geographical clustering may be related to the long history of the open science movement in Europe [**?**]. Influenced by open science ideology, Europe has experienced rapid development in journal open publishing, abundant academic resources, and has spawned numerous journals advocating open access, open data, and open peer review. Coupled with a sense of European community, this open science movement has gradually shown a trend of radiating and diffusing across Europe.

As shown in Figure 2 [Figure 2: see original paper], regarding publication cycles, journals were mainly concentrated in short cycles of 1-4 months, indicating that monthly, bimonthly, and quarterly issues were mainstream, with quarterly being the peak. Additionally, a small number of annual publications created a secondary peak in the outlier distribution. Regarding founding years, most journals were established between 1990 and 2025, with the highest proportion in 2021 (8.19%), followed by 2020 (6.03%) and 2018 (5.85%). Overall, journals founded between 2012 and 2024 already accounted for half of the sample library.

3.1.2 Academic Impact Journal discipline analysis revealed significant imbalance in OPR practices across different disciplines, likely related to inherent differences in peer review traditions, academic culture, and social responsibility across fields. The MJL discipline classification is detailed but not suitable for macro-level understanding. Based on its classification, this study further consolidated disciplines into seven categories: Earth and Environmental Sciences, Engineering and Technical Sciences, Agriculture and Food Sciences, Social Sciences and Humanities, Life Sciences, Physical and Chemical Sciences, and Medical and Health Sciences. In terms of disciplinary distribution, Agriculture and Food Sciences had the lowest proportion (4.50%), while Medical and Health Sciences had the highest (31.77%). The dominance of Medical and Health Sciences may be closely related to high transparency, strict accountability for results, and public trust in the field. Especially when facing rapidly evolving public health crises such as pandemics, OPR can effectively accelerate scientific communication and information sharing [**?**]. For instance, BMC has practiced OPR for over 20 years, which has largely contributed to its high authority in the medical and health sciences field [**?**]. Life Sciences also has a favorable OPR

ecosystem, with many journals such as Nature Communications, EMBO, and eLife having made OPR an important option for authors and reviewers. Another noteworthy phenomenon appears in Engineering and Technical Sciences, where the computer science subfield shows relatively high acceptance of open comments. PLOS observations note that since scholars frequently discuss issues on technical platforms like GitHub, this open-source background helps foster spontaneous OPR practices in computer science [**?**].

This study introduced the Journal Citation Indicator (JCI) to assess the impact level of OPR journals. This indicator, through discipline normalization, overcomes the limitations of the traditional Journal Impact Factor (JIF) in cross-disciplinary comparisons [**?**], where JCI>1 indicates the journal performs above the global average within its discipline. Excluding journals with missing JCI fields, Figure 3 [Figure 3: see original paper] shows that most OPR-adopting journals have impact at or below the disciplinary average, indicating that OPR is not an exclusive practice of high-impact journals, with medium and low-impact journals also actively participating. Specifically, "Medical and Health Sciences" demonstrates a more mature and three-dimensional OPR ecosystem. Although journals with JCI 1 account for only 28.7%, the absolute number far exceeds other disciplines, indicating that OPR in this field has the largest practice base and most mature development, with broad participation across high, medium, and low-impact journals. In "Engineering and Technical Sciences," journals with JCI<1 account for as high as 89.7%, showing the primary driving role of low-impact journals. "Agriculture and Food Sciences" has fewer OPR journals but is the only discipline where journals with JCI 1 outnumber those with JCI<1, which may be related to its disciplinary characteristics or specific publisher strategies and warrants further investigation.

3.2 Open Peer Review Practice Elements

Open peer review is an umbrella term encompassing various practices aimed at increasing the openness of peer review. Divided by practice elements, it includes signed review, open review, transparent review, editor-mediated review, and crowdsourced review processes [**?**]. Combining stakeholders and open elements, this study extracted three dimensions—cycle openness, identity openness, and content openness—involving eight variables to measure journals' different model choices and differences in openness degree.

3.2.1 Cycle Openness This section analyzed whether OPR journals disclose the review cycle, i.e., the processing cycle from submission to revision to acceptance, where submission and revision dates indirectly reflect the time span of peer review. As shown in Table 2 , the vast majority of journals are highly open in this aspect: 90.10% of journals choose to disclose this information, while only 9.90% do not. This makes it the most widely adopted and least controversial practice among all OPR elements, having transcended the conceptual scope of OPR and perhaps evolving into a basic service standard for modern journals.

Most journal review cycles concentrate around 3 months, though individual cases exist where cycles reach half a year or more. Journals' internal motivation to improve processing efficiency also demonstrates transparency in review cycles to authors. Although this dimension is less profound than "identity openness" and "content openness," it is often considered an important factor in authors' submission decisions. In the current era of rapid scientific development and increasing importance of timely output, transparent and efficient review cycles can reduce authors' submission concerns and become one of the core competencies for journals to attract quality manuscripts.

3.2.2 Identity Openness This section analyzed the degree of identity openness for three stakeholders—editors, reviewers, and readers—in the review process and publication decision. Reviewer identity openness corresponds to pre-publication review, reader comment openness corresponds to post-publication review, and editor identity openness corresponds to transparency in the publication decision process. Additionally, as organizers and decision-makers of the review process, editors' identity openness ensures fairness in processing and review procedures. Considering that some journal policies are relatively vague, to better distinguish openness degrees, this study conducted standardized operations from the sample library: if all 10 articles were signed, the open element was defined as "mandatory model," otherwise it was "voluntary model." Editor identity openness and reviewer identity openness are quantitative indicators, while reader comment openness is a qualitative indicator focusing only on whether the journal provides corresponding functional modules to avoid interference from publication time and topic on comment quantity.

(1) Editor Identity Openness

Editor-mediated review characterizes most OPR processes, including any work editors conduct to facilitate OPR, such as manuscript pre-selection and acceptance or rejection decisions [**?**]. In the sample library, 680 journals (72.50%) adopted editor identity openness. Among them, 118 journals used a mandatory model, where every paper includes the editor' s name. Taking *Antibodies* as an example, editors sign their names in the table of contents, and readers can also access peer review reports on the journal' s official website to view reviewer comments and author responses. Statistically, the remaining 562 journals adopted this element but mainly in voluntary mode. Editors are mediators and key participants in OPR, and their selection and requirements for reviewers, evaluation of review reports, and communication decisions with authors directly affect review quality, completeness, and fairness [**?**]. Open editor identities help effectively supervise their "gatekeeper" role, thereby improving the review process and decision-making mechanisms. Compared to the controversial open reviewer identities and open reader comments, open editor identities bring benefits with lower risks and are more feasible.

(2) Reviewer Identity Openness

The adoption strategy for reviewer identity openness appears particularly conservative. As shown in Table 2, only 12.5% of journals adopted a mandatory model for reviewer identity openness, such as *Chemical Science International Journal*, *European Journal of Medicinal Plants*, *Journal of Advances in Medicine and Medical Research*, and *International Astronomy and Astrophysics Research Journal*. As high as 87.5% of journals leave the choice to authors and reviewers, i.e., adopting a voluntary model. Specifically, in terms of practical outcomes, the voluntary model produces two distinct results: one is partial anonymity due to selecting OPR. For example, among 10 articles in *Nature Immunology*, 5 had open reviewer identities while the other 5 remained anonymous. The other is rejection of OPR, resulting in 39.24% of journals showing no open reviewer identities. Although journals encourage and provide OPR, this strategy lacks mandatory force, making reviewers generally cautious about identity disclosure. The data indicates that in current reviewer identity openness practices, the voluntary model is far more widespread than the mandatory model. Without mandatory requirements, reviewers' willingness to disclose their identities is generally weak, and the effectiveness of reviewer identity openness is not ideal, corroborating findings from other scholars [**?**][**?**].

Through chi-square tests and contingency analysis, this study found a strong association between review report openness and reviewer identity openness (Cramer' s V = 0.526). This potentially indicates that journals' OPR elements exist in combination patterns. For instance, among journals adopting voluntary reviewer identity openness, 83.7% correspondingly adopted voluntary review report openness. Model choices also differ across institutions with different attributes. Mandatory reviewer identity openness is promoted by commercial publishers, while societies, universities, and research institutes favor the more robust voluntary model, reflecting differences in risk preferences and prudence levels among different types of publishing institutions when facing review model innovation. Regarding disciplines, Agriculture and Food Sciences still has relatively excellent reviewer identity openness. Although the total number of OPR journals in Medical and Health Sciences is large, its adoption degree of mandatory model for this most critical element still slightly lags behind Agriculture and Food Sciences. Additionally, there is no obvious linear relationship between different models of reviewer identity openness and publication or review cycles.

Table 2 Journal Reviewer Identity and Review Report Openness

Category	Reviewer Identity Openness	Review Report Openness
	Mandatory	Voluntary
Publisher Type		
Commercial	139 (12.50%)	972 (87.50%)
Society	129 (14.38%)	768 (85.62%)
University/Institute	5 (3.70%)	130 (96.30%)
Discipline		

Category	Reviewer Identity Openness	Review Report Openness
Medical & Health Sciences	3 (5.08%)	56 (94.92%)
Life Sciences	2 (10.00%)	18 (90.00%)
Physical & Chemical Sciences	50 (18.38%)	222 (81.62%)
Engineering & Technical Sciences	29 (12.78%)	198 (87.22%)
Social Sciences & Humanities	2 (3.51%)	55 (96.49%)
Earth & Environmental Sciences	14 (4.00%)	336 (96.00%)
Agriculture & Food Sciences	3 (37.50%)	5 (62.50%)
JCI Range		
[0,1)	41 (20.81%)	156 (79.19%)
[1,2)	113 (20.04%)	451 (79.96%)
[2,3)	18 (4.59%)	374 (95.41%)
[3,4)	7 (5.56%)	119 (94.44%)
[4,5)	1 (3.45%)	28 (96.55%)
[5,6)	53 (15.01%)	300 (84.99%)
[6,7)	27 (14.14%)	164 (85.86%)
[7,8)	11 (9.73%)	102 (90.27%)
[8,9)	9 (6.52%)	129 (93.48%)
[9,10)	16 (8.79%)	166 (91.21%)
[10,11)	6 (7.14%)	78 (92.86%)
[11,12)	17 (34.00%)	33 (66.00%)
Total	118 (42.75%)	158 (57.25%)

(3) Reader Comment Openness

Reader comments in online academic communities can be regarded as post-publication peer review [**?**], greatly expanding readers' scope to provide feedback on scholarly works and forming a communication link that supplements new perspectives and facilitates academic community exchange. Given this function of timely scientific self-correction [**?**], many journals have embedded reader comment modules into their platforms. In the sample library, 47.34% of journals support reader comment functions. *Ecology Letters* opens a reader comment module where readers can post comments without affecting review decisions. *Heritage* allows readers to interact directly with authors to discuss review opinions. *eLight* implements a real-name archiving system where reader comment content and timestamps are saved as attachments along with the paper. Perhaps due to concerns about personal privacy, platform technology, or manual review, 52.66% of journals still do not support this function, which somewhat limits the documentation of academic discussions after publication and negatively impacts article quality supervision.

3.2.3 Content Openness This section analyzed the quantity, standardization, and presentation characteristics of review reports. Review report openness refers to the practice where editors compile the complete interaction process between reviewers and authors into standardized reports for publication, covering

reviewer comments, author responses, and interaction records. Readers can clearly track the revision logic from initial manuscript to final version, deepening their understanding of the overall publication process and academic discussion. As above, if all 10 articles have review reports, review report openness is considered mandatory; otherwise, it is voluntary.

(1) Review Report Openness

Review report openness and reviewer identity openness constitute the core of OPR. Similar to reviewer identity openness, review report openness also shows a voluntary-dominant pattern. In the sample library, 24.84% adopted mandatory mode, while 75.16% adopted voluntary mode. Among journals adopting voluntary mode, approximately 38.61% showed no open review reports at all, which may mean the vast majority of reviewers or authors tend not to exercise their open rights. Notably, significant openness differences exist even within the same publisher: since 2022, all MDPI journals have provided OPR options. However, *Machines* had 10 open reports, *Education Sciences* had 5, while *Earth* had only 2. This shows that voluntary mode easily leads to differences in openness effectiveness among journals, with many journals' open intentions not translating into effective practices.

Contingency analysis shows that among journals with mandatory review report openness, commercial publishers still dominate, while societies and universities continue to prefer voluntary mode, again corroborating their more conservative development concepts. Regarding review and publication cycles, journals with mandatory openness tend to show longer time intervals, perhaps because report return and publication production consume more time. Disciplinarily, "hard"sciences based on quantitative and experimental methods such as Agriculture and Food Sciences and Life Sciences have higher proportions of mandatory mode. In these disciplines, open review comments can be seen as validation of research process objectivity, and openness instead promotes more detailed and credible result descriptions. Conversely, in "soft"sciences like Social Sciences and Humanities, open and subjective judgments may more easily trigger academic disputes, making the academic community more inclined to retain anonymity. Among journals with JCI in the [1,2) range, the proportion of mandatory mode reached its peak (32.54%) in this group, perhaps expressing aspirations to improve journal quality and expand academic influence through OPR practices.

Despite voluntary mode being mainstream, the trend toward mandatory review report openness is further emerging. In 2016, *Nature Communications* offered optional review report openness, which transitioned to mandatory openness in 2022 [**?**]. Similarly, since 2020, *Nature* has provided authors opportunities for review report openness without making it mandatory. However, to enhance the openness of scientific elaboration processes [**?**], starting June 16, 2025, new submissions will automatically include links to review reports and author responses. This means *Nature* has also transitioned from voluntary to mandatory review report openness.

(2) Standardization and Presentation Characteristics of Review Reports

The academic community has reached consensus on opening review outcomes, but falls short in standardizing them as citable academic contributions. This section analyzed collected review reports from three aspects: revision versions, Digital Object Identifiers (DOIs), and presentation formats, with results shown in Figure 4 [Figure 4: see original paper]. As high as 96.04% of review reports have revision versions, indicating that the vast majority of journals do not simply disclose final comments but tend to completely present academic exchanges from initial manuscript to final version, including multi-round review comments and author responses. A small portion of journals did not mark revision versions, possibly due to acceptance after only one revision. In stark contrast, as high as 97.95% of review reports were not assigned independent DOIs distinct from articles. This is a critical metadata deficiency that weakens the citability, traceability [**?**], and potential value of review contributions as components of open science. Organizations like Crossref have proposed metadata standards for assigning DOIs to review reports [**?**], but only a few journals and publishing platforms have actively explored this: *Journal of Computer Applications in Archaeology* displays DOIs in the peer review comments section, while Open Research Europe and *Nuclear Science and Technology Open Research* display DOIs in version reports, where clicking "Cite this Report" quickly provides citation formats. These reports are presented to readers through web pages (76.10%), attachments (16.13%), or mixed web-and-attachment formats (7.77%). Mixed formats facilitate unified management of review records for journals [**?**] and reduce readers' time and technical costs for obtaining review reports, but currently only a few journals adopt this approach.

4 Conclusions and Implications from the Survey of Open Peer Review in Academic Journals

This study conducted multi-dimensional quantitative analysis of 1111 OPR journals and over ten thousand articles, depicting the overall scale, compositional characteristics, and adoption degrees and strategies of OPR elements. The findings reveal:

(1) The OPR journal landscape is concentrated in Europe, commercial institutions, and medical and health sciences.

OPR journals show dominance by Europe, commercial publishers, and medical and health sciences across three dimensions: geography, publishing institution, and discipline. Geographically, Europe' s deep-rooted open science tradition provides an academic ecosystem for OPR promotion, with academia and funding agencies generally emphasizing openness of data, methods, and review. In terms of institutional attributes, a few leading commercial publishers such as MDPI, BioMed Central, Frontiers Media S.A., and Wiley have played important driving roles. With their market-oriented operation models and keen capture

of author needs, commercial publishers regard OPR as a strategy to attract manuscripts and enhance brand effects, actively implementing it, with many of their high-impact journals becoming typical demonstration cases. However, OPR popularization does not completely rely on high-impact journals; numerous medium and low-impact journals also actively participate, forming an important foundation and driving force. Compared to commercial publishers, society, university, and research institute publishers remain relatively conservative toward emerging review models, thus adopting a wait-and-see attitude in OPR transformation. Medical and health sciences are closely linked to public life safety, requiring high transparency for academic supervision and reflecting the concept that medical research serves society justly and reliably. Notably, Agriculture and Food Sciences journals have fewer OPR practices but a higher proportion of high-impact journals, presenting a completely opposite pattern to other disciplines.

(2) OPR core element practice strategies remain relatively conservative.

Academic journals' OPR practice strategies show characteristics of opening non-core elements while being conservative on core elements. Procedural, low-risk non-core elements such as "processing cycle openness" and "editor identity openness" have been widely accepted, nearly becoming industry consensus. However, when openness touches core elements like "identity openness" and "content openness," journals' attitudes become significantly more conservative and cautious. As other scholars have observed, the academic community generally supports review report openness more than identity openness, but small-scale academic communities have limited acceptance of both elements [**?**]. This reflects that in academic ecosystem transformation, OPR still follows a gradual, benefit-maximizing, and least-effort principle. Non-core elements are easy-to-implement "entry-level" modules that can serve as the first step in OPR transformation. However, it must be recognized that real, substantive change still depends on systematic investment in core elements. Avoiding openness of review reports and reviewer identities will always limit openness to a relatively low level.

The ability to open is only the starting point of OPR practice; numerous standards must be established after opening. According to survey results, journals are generally willing to present complete, multi-round revision review reports, yet as high as 98% of reports are not assigned DOIs, creating a disconnect between transparent review "processes" and value recognition of review "contributions," weakening the academic visibility of review work. This may be due to insufficient academic value mining of review reports and lagging supporting publishing infrastructure, leaving publishing institutions with inadequate capacity despite their intentions.

OPR is not an "all-or-nothing" single practice; academic journals can selectively combine different open elements according to their positioning and goals. For example, reviewer identity openness and review report openness are often jointly adopted, showing similarity in mandatory or voluntary modes, reflect-

ing journals' systematic considerations when strengthening core transparency. The value of identity lies in taking responsibility for reports, while the value of reports is amplified by identity; the realization of both values is inseparable.

(3) Mandatory openness of OPR core elements is low, with voluntary mode being mainstream.

Although journals in the sample library adopted OPR strategies, different journals have gaps in openness intensity (voluntary or mandatory mode) for core elements. Since OPR is still in its early development stage and involves complex multi-party interests, to respect stakeholders' wishes and avoid potential negative impacts such as decreased submissions or reviewer refusal, most journals generally adopt encouraging, voluntary rather than mandatory compromise strategies. On the other hand, over-reliance on voluntarism undermines OPR' s core objectives. While voluntary OPR can promote academic exchange, it limits its role in supervising academic integrity and improving review quality. Research reveals that voluntary openness may lead to selective disclosure by reviewers: those providing high-quality comments tend to sign openly, while others refuse [**?**]. Additionally, authors of manuscripts involving academic misconduct, questionable quality, or peer review fraud can also refuse review report openness.

Therefore, gradually promoting mandatory openness while safeguarding stakeholders' rights and interests to achieve effective balance between openness and participation willingness is an urgent issue in current OPR practice. Currently, *Nature Communications* and *Nature* have completed the transition from voluntary to mandatory review report openness, and whether this will drive strategy shifts in other journals remains to be observed. Alternatively, publishers can explore incentive mechanisms for identity and content openness, such as cooperating with author/reviewer institutions to incorporate OPR behavior into academic credential certification, establishing best OPR author/reviewer awards, or offering greater article processing charge discounts. Combining external incentives with internal academic honor may enhance authors' and reviewers' willingness to voluntarily participate in core elements, potentially being more sustainable than mandatory models.

5 Summary and Outlook

This study collected 1111 OPR journals and 11110 published articles as a sample library, investigating their publication information, academic impact, cycle openness, identity openness, and content openness. OPR journals are mainly driven by Europe and commercial publishers, with medical and health sciences as the core discipline. In terms of specific practice strategies, journals demonstrate a notable characteristic of differentiated adoption: elements such as processing cycle openness and editor identity openness have nearly reached industry consensus. However, when touching core elements like reviewer identity openness and review report openness, journals tend to adopt more cautious,

voluntary-mode-dominated strategies. Yet this voluntary mode often yields limited effectiveness due to low participation willingness. Combined with severe deficiencies in standardized elements such as DOI assignment for review reports, these factors challenge the transition of OPR practice from form to substance.

Looking forward, OPR promotion should focus on eliminating the "black box effect." On one hand, attention should be paid to core element openness and standardization of review outcomes. The ability to open is only the starting point; journals should pay more attention to increasing openness degree, not just staying at peripheral elements like processing cycles and editor identities. They should also emphasize standardized presentation of peer review outcomes to truly benefit the academic ecosystem. On the other hand, diverse incentive measures should be explored to enhance authors' and reviewers' willingness to voluntarily choose OPR.

Compared with previous research, this study' s innovation lies in more extensive and timely data and more diverse investigation dimensions. However, certain limitations remain. First, although the sample library covers over ten thousand articles, for journals with huge annual publication volumes, randomly sampling 10 articles may not fully capture all practices. Second, as a cross-sectional survey, it has not tracked the evolution of OPR practices over time. Future research could build upon this foundation to conduct more in-depth exploration through further sample expansion and longitudinal tracking.

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