Open peer review: promoting transparency in open science

Abstract

Open peer review (OPR), where review reports and reviewers' identities are published alongside the articles, represents one of the last aspects of the open science movement to be widely embraced, although its adoption has been growing since the turn of the century. This study provides the first comprehensive investigation of OPR adoption, its early adopters and the implementation approaches used. Current bibliographic databases do not systematically index OPR journals, nor do the OPR journals clearly state their policies on open identities and open reports. Using various methods, we identified 617 OPR journals that published at least one article with open identities or open reports as of 2019 and analyzed their wide-ranging implementations to derive emerging OPR practices. The findings suggest that: (1) there has been a steady growth in OPR adoption since 2001, when 38 journals initially adopted OPR, with more rapid growth since 2017; (2) OPR adoption is most prevalent in medical and scientific disciplines (79.9%); (3) five publishers are responsible for 81% of the identified OPR journals; (4) early adopter publishers have implemented OPR in different ways, resulting in different levels of transparency. Across the variations in OPR implementations, two important factors define the degree of transparency: open identities and open reports. Open identities may include reviewer names and affiliation as well as credentials; open reports may include timestamped review histories consisting of referee reports and author rebuttals or a letter from the editor integrating reviewers' comments. When and where open reports can be accessed are also important factors indicating the OPR transparency level. Publishers of optional OPR journals should add metric data in their annual status reports.

Keywords Open peer review · Scholarly communication · Journal editorial policies · Open access · Peer review transparency · Transparent review models

Mathematics Subject Classification 62P99

JEL Code C80

Introduction

Peer[1] review represents one of the foundations of modern scholarly communication. The scrutiny of peers to assess the merits of research and to provide recommendations for

[1] This paper represents a greatly expanded version of a study presented at the 17th International Society for Scientometrics and Informetrics Conference held in Rome, Italy in September 2019 (Wolfram et al. 2019).

Comment [L1]: 1. Limited Understanding of Transparency

- **Overemphasis on Transparency Alone:** While OPR aims to increase transparency, it does not necessarily guarantee the quality or fairness of the peer review process. The topic may overlook other important aspects like reviewer expertise, biases, and the overall fairness of the review process.
- **Varying Definitions of Transparency:** Transparency in OPR can vary significantly, including open identities, open reports, or full publication of reviews alongside articles. The topic could fail to address the complexity and different levels of transparency involved.

2. Ethical and Privacy Concerns

- **Privacy Issues for Reviewers:** Open peer review might discourage honest and constructive feedback if reviewers' identities are made public. Concerns about potential retaliation, reputational risks, or conflicts of interest could inhibit participation.
- **Impact on Early-Career Researchers:** Early-career researchers or those without established reputations may fear open peer review due to the added pressure of ha ... [1]

Comment [L2]: The abstract provided does a good job of outlining the study's purpose, methods, findings, and implications, but there are several potential weaknesses that could impact its clarity and overall effectiveness:

1. Lack of Clear Focus or Objective

- **Unclear Research Purpose:** While the abstract mentions that the study is the "first comprehensive investigation of OPR adoption," it could more explicitly state the research question or hypothesis. For instance, the abstract doesn't mention *why* this investigation is crucial, beyond describing the trend of OPR adoption.
- **Overly General Introduction:** The first sentence introduces the topic broadly without directly connecting it to the specific aims of the study. It might be more effective to succinctly introduce the gap in literature or the issue that the study addresses.

2. Limited Detail on Methodology

- **Methodological Ambiguity:** The abstract mentions "various methods" were used to identify the 617 OPR journals, but it does not specify what methods were emplo ... [2]

whether research exhibits sufficient rigor and novelty to warrant publication is intended to reduce the risk of publishing research that is sloppy, erroneous or, at worst, fabricated. The process of peer review is intended to help improve the reporting of research and to weed out work that does not meet the research community's standards for research production.

Traditionally, peer review uses forms of blinded review where parties involved remain anonymous to reduce bias in the evaluation process. The most extensive form of blinded review, triple blind, anonymizes the process so that the author(s), reviewer(s) and the handling editor(s) are not aware of each other's identities. A more common implementation is double blind peer review, where the author(s) and reviewer(s) are not aware of each other's identities. To ensure author anonymity, authors must remove all content that might identify them to any reviewer. Single blind review is also commonly practiced, where reviewers are aware of the identities of the authors, but the authors do not know who has reviewed their manuscript. The question arises whether blinded peer review reduces bias and results in a more objective review. For authors, blinded reviews are like a black box. Blinding of reviewer identities may allow reviewers to use their anonymity to deliver more critical reviews or to write reviews that lack rigor because authors and readers will not know who the reviewers are. On the other hand, requiring reviewers to identify themselves may encourage greater accountability or could cause reviewers to blunt their criticisms (van Rooyen et al. 1999).

The open science movement has endeavored to increase the transparency of the production of scientific knowledge and to make products of scientific inquiry more broadly available. The most visible aspect of the open science movement to date has been open access (OA), where the products of scholarship are made freely available through open access journals or repositories. More recently, efforts have extended to the availability of open data and software, where datasets are shared and re-used. One of the last components of open science to be adopted is open peer review (OPR), where aspects of the peer review process, which have traditionally been hidden or anonymous, are made public.

Debate about the benefits of and concerns about OPR have been evident in scholarly communication. Malone (1999) believed that a fully open system increases responsibility and accountability and protects all parties more equitably: "Openness in peer review may be an idea whose time has come. What do you think?" (p. 151). At the 2016 Annual Meeting of the Association for Information Science and Technology, a panel of well-known scientists and editors engaged in a conversation and debate with conference attendees on the emerging open peer review innovation in the era of open science (Wang and Wolfram 2016). Similarly, at the 8th Peer Review Congress (2017), leaders in academic publishing held a panel on "Transparency in Peer Review." The panelists discussed the various shades or spectrum of transparency in open peer review practices. Also touched upon was the lack of transparency in research proposal reviews, especially for private foundations. Attendees at the Congress raised another important question: "Should there also be transparency in reviewing reports of rejected manuscripts if they are a part of the scholarly ecosystem?" Launched in 2015, Peer Review Week (2017) set its theme for 2017 as Transparency in Review. Clobridge (2016) compared the benefits and challenges of OPR for authors, reviewers, and readers. She also cited three major players of OPR, *PeerJ*, *F1000Research*, and *ScienceOpen*. She noted that "Open peer review, while still a relatively new phenomenon, is catching the interest of many researchers and

appears to be gaining momentum as part of the next wave of open knowledge and open science" (p. 62).

Will OPR become a more common scholarly practice like open access and open data in open science? Further research is needed to understand the concept of OPR and its diverse implementations by publishers as well as the perceptions and attitudes of scientists as authors and reviewers. The purpose of this study is to conduct a thorough search for and analysis of current OPR journals to address the following research questions:

1. What is the current state of OPR?
2. What has been the trend for OPR adoption?
3. Who are the early adopters of OPR?
    a. Which disciplines have adopted OPR?
    b. Which publishers are the front runners or leaders in OPR adoption?
4. How transparent are the emerging OPR implementations?
    a. Do these journals adopt open reports?
    b. Do these journals adopt open identities?

Literature review

In the era of digital open science, OA journals have mushroomed on the Web. Do these journals provide access to quality research? Does this openness extend to peer review and, if so, how is peer review conducted by these OA journals? In a sting-operation experiment, *Science* correspondent John Bohannon (2013) found that of the 304 versions of a fabricated paper with flawed research submitted to 304 OA journals, 255 submissions received a decision (the mean for acceptance was 40 days; the mean for rejection was 24 days). Surprisingly, 157 journals accepted a version of the paper. Was this reflected in the peer reviews? Only 36 reviews recognized the paper's scientific problems whereas "about 60% of the final decisions occurred with no sign of peer review" (p 64). Rupp et al. (2019) concluded "although predatory publishing did not exist ten years ago, today, it represents a major problem in academic publishing" (p 516). There is an "apparent rise in scientific fraud" (Naik 2011) as well as peer review fraud. A "peer review ring" scandal resulted in the retraction of 60 articles at once by a prestigious journal (Barbash 2014). BioMed Central discovered fake peer reviewers involved in 50 manuscripts and took actions to investigate and retract 43 papers (Lawrence 2015). Haven et al. (2019) report from their survey and focus group that "Biomedical researchers and social science researchers were primarily concerned with sloppy science and insufficient supervision. Natural sciences and humanities researchers discussed sloppy reviewing and theft of ideas by reviewers, a form of plagiarism" (Abstract, Results).

The mainstream peer review systems in scientific and scholarly communication typically operate anonymously (Kriegeskorte 2012). This established, blind peer review model for journals has been criticized as being a flawed process (Smith 2006) or a broken system (Belluz et al. 2016). Peer review bias and unfairness exist to varying degrees in different disciplines (Lee et al. 2013; Rath and Wang 2017). Is there a way to restore the

Comment [L3]: The **introduction** provided offers a broad overview of peer review and open peer review (OPR), but several limitations could be identified to improve clarity, focus, and depth:

1. Lack of Focus on the Study's Specific Contribution

- **Overemphasis on Background Information:** While the introduction provides valuable background on peer review and the open science movement, it spends a lot of time discussing the history of peer review and opinions from different sources, such as Malone (1999) and Clobridge (2016). This detracts from the specific purpose of the study and makes the introduction feel more like a general discussion rather than setting the stage for the research at hand.
- **Not Clearly Framing the Research Problem:** Although the introduction does outline that open peer review is one of the last components of open science to be adopted, it could do more to explain why this study is necessary. The issue of *why* examining OPR adoption and implementation is crucial in the current context isn't addressed until the very end, which makes the introduction feel somewhat scattered.

2. Insufficiently Defined Scope of Study

- **Unclear Scope of "OPR":** While OPR is defined as the process where peer review reports and reviewers' identities are made public, there is no clear explanation of the variations in how different journals implement OPR. For example, the introduction mentions "open reports" and "open identities," but there is no mention of the spectrum of OPR practices (e.g., fully open vs. partially open) that the study will investigate.
- **Lack of Context for OPR Implementation:** The introduction does not give the reader a clear sense of the diversity in OPR practices that will be explored. It only briefly mentions the need for further research into "diverse implementations by publishers" but doesn't explain what this diversity looks like in practice.

3. Weak Connection Between the Literature Review and the Research Questions

- **Literature Review Feels Disjointed:** While referencing relevant works like ... [3]

trust in peer review for scientific and scholarly publishing? Pioneers and innovators believe that transparency is the key (Fennell et al. 2017).

OPR initiatives and practices

A small number of pioneering journals have been offering forms of OPR since the turn of the century. Launched in 2001, the journal *Atmospheric Chemistry and Physics*, was among the first OA OPR journals (Pöschl and Koop 2008), along with 36 journals published by BioMed Central (https ://www.biome dcent ral.com/journ als-a-z).

More than 10 years ago, *Nature* conducted a four-month trial of a hybrid model in which the manuscripts underwent formal closed review by referees and were posted to a preprint site for open review by community readers. The exploratory results showed limited use in improving the process. (Opening up peer review 2007). In January 2016, *Nature Communications* started a new OPR trial where the authors could decide on a blind or open review model at submission time and have their review reports published upon the acceptance of the manuscript while the reviewers could decide if they would remain anonymous or sign the review reports (Nature 2015). One year into the trial, 60% of the 787 published papers had open reports (Nature 2016). Four years later, Nature announced that it would add eight Nature Research journals to the trial project beginning in February 2020. The announcement reports that in 2018, 70% of the trial journal articles published open reports; 98% of the authors who published their reviewer reports responded they would do so again. Over the four years, 80% of papers had at least one referee named, which seemed to corroborate the results of a 2017 survey of *Nature* referees: the majority favored experimenting with alternative and more transparent models (Nature 2020).

F1000 beta-tested an open research platform as *F1000Research* in 2012. Articles submitted to *F1000Research* are published within 6–14 days and followed by a totally transparent peer review process during which a reviewer's recommendation and report are published alongside the article. The process was not moderated by an editor. A key difference between post-publication OPR is that *F1000Research* does not make decisions on acceptance or rejection. Instead, it adopts the algorithm for indexing based on the review results: a minimum of 2 approved or 1 approved plus 2 approved with reservations by reviewers. Another distinct feature is that the review process is totally transparent and open in realtime with both open identities and open reports (https ://f1000 resea rch.com/for-refer ees/ guide lines).

Choosing a middle ground, *PeerJ* launched a new optional OPR journal in 2013; as of this writing, 80% of authors have chosen open reports, and 40% of reviewers have signed review reports (https ://peerj .com/benefi ts/revie w-histo ry-and-peer-revie w/). Adopting a similar model, the publisher MDPI first announced optional post-publication OPR in 2014 by the journal *Life* and by 2018 all journals adopted optional OPR. Rittman (2018) reports that 23% of MDPI journal papers published at least one review with open identities. The percentage of the 14 early OPR MDPI journals with open reports include *Publications* (60%), *Dentistry* (52%), *Medical Sciences* (51%), *Quantum Beam Science* (48%), *Life* (46%), *Brain Sciences* (44%), *J* (43%), *Behavioral Sciences* (41%), *Economies* (40%), *Cosmetics* (39%), *Administrative Sciences* (38%), *Condensed Matter* (37%), *Animals* (34%) and *Atoms* (33%). EMBO Press reports that currently, 95% of their authors chose to publish review reports alongside their papers (EMBO Press 2020).

Comment [L4]: The **literature review** you've provided appears to be extensive in its references to the challenges and issues surrounding open access (OA) journals and peer review, but it does have several weaknesses. These weaknesses could impact the clarity, comprehensiveness, and overall contribution of the review to the field. Here are some potential weaknesses:

1. Overemphasis on Negative Aspects of Open Access and Peer Review

- **Bias Toward Problems:** The literature review focuses heavily on the flaws of OA journals, such as predatory publishing, scientific fraud, and issues with peer review quality. While these are important concerns, the review does not seem to balance these with a discussion of the strengths or successes of OA publishing or peer review models. A more balanced review would address both the challenges and the positive aspects or improvements brought about by OA, particularly in the context of increased access and transparency in research.
- **Lack of Focus on Positive Developments in Open Peer Review (OPR):** The review mentions challenges like predatory publishing and peer review fraud, but it doesn't sufficiently explore the recent advancements in open peer review and how these innovations aim to address such problems. A stronger review would discuss how open peer review (OPR) models are being developed to address issues of transparency and bias.

2. Limited Exploration of Open Peer Review Models

- **Narrow Focus on Traditional Peer Review:** The review heavily critiques traditional peer review (e.g., blind peer review) without fully exploring emerging models like open peer review (OPR), which could be part of the solution to the problems identified. There is a missed opportunity to critically analyze different OPR models and their potential for improving transparency and accountability in publishing.
- **Lack of Discussion on Specific Examples:** The review mentions problems but does not delve deeply into specific examples of open peer review implementations that have addressed or mitigated these issues. It would be beneficial to include case studies of journals or ... [4]

Another option for open reports, in addition to appearing alongside the article (e.g., *PeerJ*) or in a stand-alone volume (e.g., Elsevier), is for reviewers to deposit their review reports to a research partnership service such as Publons.com. Here the decision to publish reports is made by the reviewers rather than the authors or publishers, given that Publons was created to credit reviewers and authenticate their claims. Recently, Wiley partnered with Publons for their OPR initiatives with 40 participating journals (Wiley2018). Wiley's prestigious journal *Clinical Genetics* was the pioneering journal for this initiative (Graf 2019). As of March 2020, Wiley added 10 titles in early 2020 to expand this initiative (Moylan 2020).

OPR research

As an innovation in peer review, OPR pursues transparency and openness to improve the process (Wang et al. 2016a, b). Transparency in peer review was rigorously studied by researchers for the journal *BMJ* in the 1990s before the first journals implemented OPR. These early research examples that studied the effect of making reviewer identities known to authors or posting reviewer names with the paper concluded that these practices had no effect on the quality of the reviews (Godlee et al. 1998; van Rooyen et al. 1999). Walsh et al. (2000) conducted a controlled trial in *British Journal of Psychiatry* to investigate whether open peer review was feasible. Of the 322 reviewers, 245 (76%) agreed to sign their reviews. A total of 408 unsolicited manuscripts of original research were randomly assigned to the two groups of reviewers. To evaluate the reviews, a seven-item instrument was used to compare the quality of the reviews: importance of research question, originality, methodology, presentation, constructiveness of comments, substantiation of comments, and interpretation of results; in addition, the tone of the review was rated. With cautious notes, the researchers reported that the signed reviews were more courteous and of higher quality than unsigned reviews. Bornmann et al. (2012) compared the reviewer comments of a closed peer review journal and an open peer review journal. They found that the reviewer comments in the open review journal were significantly longer than the reviewer comments in the closed review journal.

Since then, a few studies have investigated author and reviewer attitudes towards OPR, characteristics of open reviews and methods of OPR adoption by existing and new journals. In 2012, Elsevier began a pilot OPR project of selected trial journals (Mehmani and van Rossum 2015). A survey of editors, authors, and reviewers of the five participating trial journals was conducted in 2015 to assess the impact of open review (Mehmani 2016). Forty-five percent of the reviewers revealed their identities. The majority of the reviewers (95%) commented that publishing review reports had no influence on their recommendations. Furthermore, 33% of the editors identified overall improvement in the review quality, and 70% of these editors said that the open review reports were more in-depth and constructive. Only a small proportion of the authors indicated that they would prefer not to publish in open review journals. Mehmani reported high usage of review reports by counting the clicks to the review reports, which indicated the value of open review to the readers.

At a webinar sponsored by Elsevier to discuss how to improve transparency in peer review, Agha (2017) reported on the experience of two Elsevier pilot OPR journals (*International Journal of Surgery* and *Annals of Medicine and Surgery*) that published

peer reviewer reports as supplemental volumes. He concluded: "60% of the authors like it or like it a lot and 35% are more likely to publish because of it." Bravo et al. (2019) observed and analyzed Elsevier's pilot project of five OPR journals from 2015 to 2017. In order to compare referee behavior before and after OPR, the dataset included 9220 submissions and 18,525 reviews from 2010 to 2017. They found "that publishing reviewer reports did not significantly compromise referees' willingness to review, recommendations, or turn-around time. Younger and non-academic scholars were more willing to accept invitations to review and provided more positive and objective recommendations. Male referees tended to write more constructive reports during the pilot. Only 8.1% of referees agreed to reveal their identity in the published report." (Abstract). The authors also published review reports alongside their paper. Wang et al. (2016a, b) analyzed the optional OPR journal *PeerJ*'s publicly available reports for the first three years of the journal (2013–2016). They found that the majority of the papers (74%) published during this time period had open reports; 43% of which had open identities.

If transparency in peer review is the key to tackling the various issues facing the current peer review system, will authors and reviewers embrace OPR? Several large-scale surveys have collected data on attitudes towards OPR with diverse findings. Mulligan et al. (2013) found that only 20% of respondents were in favor of making the identity of the reviewers known to authors of the reviewed manuscripts; 25% of respondents were in favor of publishing signed review reports. In 2016, the OpenAIRE consortium conducted a survey of OPR perceptions and attitudes by inviting respondent participation through social media, distribution lists and publishers' newsletters. Of the valid 3062 responses, 76% of respondents reported having taken part in an OPR process as an author, reviewer or editor. The survey results show that the respondents are more willing to support open reports (59%) than open identities (31%). The majority of the respondents (74%) believe that reviewers should be given the option to make their identities open. (Ross-Hellauer et al. 2017) Another survey of European researchers conducted by the European Union's OpenUP Project in 2017 received 976 valid responses. The results of this survey also show that respondents support open reports (39%) more than open identities (29%). This survey also reports a gender difference in supporting open identities (i.e., 35% of female researchers versus 26% of male researchers) (Görögh et al. 2019).

A recent survey by ASAPbio (2018) asked authors and reviewers in the life sciences about their perspectives on OPR. Of the 358 authors, the majority were comfortable (20.67%) or very comfortable (51.96%) with publishing their recent paper's peer reviews with referees' names; when asked about the same reviews to be published without referees' names, the number dropped but still represented the majority: 19.56% were comfortable and 37.71% were very comfortable. Of the 291 reviewers, the majority would be comfortable (32.30%) or very comfortable (40.21%) with posting their last peer review anonymously given the opportunity to remove or redact appraisals or judgments of importance; regarding signing the same review, 28.15% of respondents were comfortable and 32.30% were very comfortable. These results suggest that the majority of the authors are willing to publish their papers' review reports, with a preference for signed reviews; the majority of the reviewers are willing to have their review reports published without sensitive information, with a preference for anonymity.

The analysis of nearly 2600 responses to Wiley's 2019 Open Research Survey indicates that the respondents' preferred peer review models are double-blind (79%), transparent

(44%), and single-blind (34%). Twenty-eight percent of the respondents were not aware of the transparent review model (Moylan 2019).

OPR conceptualization and implementation

Despite the growing interest in OPR, there still is no uniform definition of OPR or generally agreed upon best implementation model. Ford (2013) reviewed the literature on the topic to define and characterize OPR. Acknowledging the diverse views of OPR, she states "the process incorporates disclosure of authors' and reviewers' identities at some point during an article's review and publication" (p. 314). She further characterized OPR by *openness* (i.e., signed review, disclosed review, editor-mediated review, transparent review, and crowd-sourced/public review), and *timing* (pre-publication, synchronous, and post-publication).

Ross-Hellauer (2017) conducted a systematic literature review and identified seven elements based on 22 definitions of OPR. Of the seven elements, *open identities* and *open reports* are considered core elements to recognize OPR journals. The other five elements in the order of frequency of occurrences include *open participation*, *open interaction*, *open pre-review manuscripts*, *open final-version commenting*, and *open platforms/decoupled review*. These elements formed a framework for two surveys conducted by OpenAIRE (Ross-Hellauer et al. 2017) and OpenUP (Görögh et al. 2019). Similarly, Tennant et al. (2017) provided a comprehensive review of journals' peer review practices from the past to the present, which they published in the OPR journal *F1000Research*. Taking a much broader perspective, they examined the pros and cons of open reviews, including public commentary and staged publishing.

Fresco-Santalla and Hernandez-Perez (2014) illustrated how OPR has been manifested by different journals: open reviews (for all or specific papers), signed reviews (obligatory, pre- or post-publication), readership access to review reports (required or optional) and readership comments (pre- or post- publication). Wang and Tahamtan (2017) identified 155 OPR journals, of which the majority were in medicine and related fields. They also found the various characteristics in the implementations by the OPR journals. According to Tattersall (2015), there were ten leading OPR platforms.

Method

This research focuses on the two core elements of OPR journals that Ross-Hellauer (2017) identified: (1) open identities, where reviewer names were made public; (2) open reports, where the original reviews or integrated reviews were publicly available. In addition, we considered when a journal adopted OPR, the journal's discipline coverage, and its publisher. For included OPR journals, authors' rebuttals were not considered in this study, nor were open comments from registered or unregistered readers. This study did not include journals that implemented only one of the following OPR elements in Ross-Hellauer (2017): open participation, open interaction, open pre-review manuscripts, open final-version commenting and open platforms/decoupled review.

Comment [L5]: The **data collection** process described in the study presents several weaknesses that may impact the accuracy, generalizability, and comprehensiveness of the findings. Here are some specific concerns:

1. Narrow Focus on Only Two Elements of OPR

- **Exclusion of Other OPR Elements:** The study focuses solely on the two core elements of OPR: open identities and open reports, as identified by Ross-Hellauer (2017). However, the study excludes other important aspects of OPR that may influence its effectiveness and transparency, such as open participation, open interaction, and open pre-review or post-review comments. These elements also play a role in enhancing transparency and might provide valuable insights into the broader landscape of OPR adoption.
- **Missed Opportunities for Comprehensive Understanding:** By not considering other OPR elements, such as open final-version commenting or open platforms/decoupled review, the study narrows its scope, potentially overlooking other methods of enhancing peer review transparency that could be more commonly adopted across different disciplines or publishers. The exclusion of these practices limits the comprehensiveness of the research.

2. Exclusion of Authors' Rebuttals

- **Impact on the Transparency Picture:** The study does not consider authors' rebuttals, which are an integral part of the peer review process, particularly in open peer review settings. Authors' rebuttals provide critical context and insight into how review feedback is handled and whether it affects the final outcome of the manuscript. By excluding this element, the study misses an opportunity to evaluate the full transparency of the OPR process and the interaction between authors and reviewers.
- **Potential Underestimation of OPR Transparency:** If a journal allows authors to publicly respond to reviewers' comments, it can significantly increase transparency by showing how authors address criticism and how those interactions contribute to the overall review process. Excluding this element could result in an incomplete ... [5]

Data collection

Although a few journal directory sources attempt to identify OPR (e.g., Directory of Open Access Journals and Transpose), there is no established standard to describe aspects of OPR systematically. Journal records are submitted by users, and the schemas are open for interpretation. To identify relevant OPR journals, we used multiple search strategies and tracked different sources. The Directory of Open Access Journals (DOAJ) indexes more than 14.5 thousand journals and nearly 4.8 million articles. From the results of the advanced search for journals with the filter set to "open peer review," we retrieved 133 OPR journals. Some DOAJ entries for journals were blogs rather than venues for the publication of research and were thus excluded. Each of the journals was accessed to verify if it publishes open identities or open reports; those misclassified were removed from the dataset. Several websites about peer review and scientific publishing were periodically scanned to keep current on the OPR development: ASAPbio (Accelerating Science and Publication in biology); the International Congress on Peer Review and Scientific Publication; Peer Review Week. Transpose, a database of journal policies on peer review and preprinting (https ://trans pose-publi shing .githu b.io/#/), was a particularly rich source for identifying candidate journals but many records were not verified by the publishers or editors, and many duplicated or erroneous records had to be corrected by checking the original journals.

Data verification and cleaning

This study used two criteria to select OPR journals, *open identities* and *open reports*; at least one of the two core elements had to be implemented to qualify as an OPR journal. Data from different sources needed to be transformed and verified. As of 23 November 2019, the Transpose database listed 294 OPR journals that adopted open identities and 232 OPR journals that publish open reports, many of which were misclassified perhaps due to the crowdsourcing nature of the database and the record contributors' ability to distinguish OA from OPR. Unexpectedly, the publisher field was another confusing concept. For example, the newly launched journal *Geochronology* listed the European Geosciences Union (EGU) as the publisher while the journal's Website had Copernicus Publications as the publisher. Therefore, each OPR journal's website was visited to verify the data. Some journals (e.g., several journals published by Copernicus Publications and journals by Kowsar) indicated in their editorial policies that they follow OPR. To identify which year the journal started or transitioned to OPR, we accessed issues of the journals to find open reports or open identities in the published articles. If none of the articles published review reports or reviewer identities as of December 2019, the journal was excluded. Further efforts were made to search Websites of the publishers of known OPR journals to identify additional OPR journals that were not indexed in DOAJ or Transpose. For example, Transpose had listed 10 OPR journals for Wiley, but Wiley's Website news pointed to an excel file of 40 OPR trial journals. We also searched newsletters and lists related to peer review, from which we identified OPR adoption, for example, from *PLOS* in 2019.

Identification of the year a journal began OPR could be a difficult and time-consuming task if a journal did not provide the precise date it adopted OPR. In these cases, we

manually checked each issue to find the earliest OPR article. If a journal publisher clearly posted

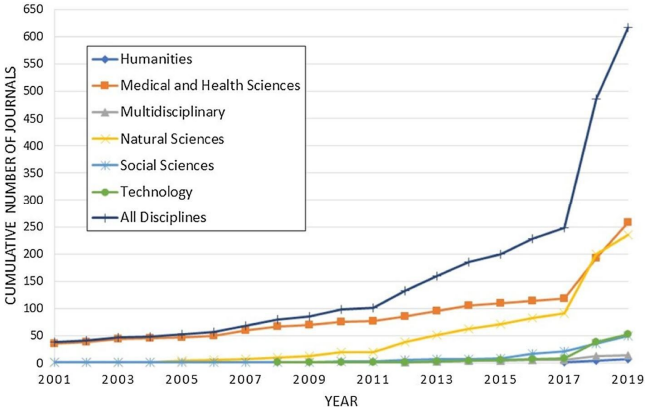

Fig. 1 Growth of OPR journals by discipline groups

information about when OPR was adopted on their editorial or peer review policy page, we used that year (e.g., Kowsar and Wiley).

In this paper, we updated the dataset reported in Wolfram et al. (2019), which was collected in 2018 and consisted of 20 publishers and 174 OPR journals. The final dataset for this expanded study includes 38 publishers and 617 OPR journals as of December 2019. Data were stored in an Excel spreadsheet and were analyzed using cross-tabulations, queries, and qualitative assessment of relevant journal content. Stored information included: journal metadata, year of first OPR use, publisher (name and country of headquarters), policy for reviewer identity, policy for report availability, and high-level journal discipline.

Results

Descriptive data

The growth of OPR adoption—measured either by existing or new journals—is summarized in Fig. 1 by broad discipline. The journals were classified into six broad topical areas using a modified form of the DOAJ classification scheme to determine which disciplinary areas have adopted OPR. Most journals did not report when they adopted OPR or if they have always used OPR. First OPR usage was confirmed by searching early issues of the journals to identify when OPR practices began. In many cases, OPR adoption coincided with the first journal issue.

The early adopters of OPR can be traced back to the beginning of the 2000s. The journals *Atmospheric Chemistry and Physics* and *European Cells & Materials* each

implemented a different OPR model, although both launched their first issues in 2001. Similarly, 36 OPR journals published by BioMed Central implemented another model in the same

Table 1 Adoption of OPR by discipline group over time

Discipline group	Year of first OPR journal	# of OPR journals in first year	Total	Percentage of all OPR journals (%)
Medical & health sciences	2001	36	258	41.8
Natural sciences	2001	1	235	38.1
Social sciences	2001	1	50	8.1
Technology	2008	1	53	8.6
Multidisciplinary	2012	2	14	2.3
Humanities	2017	1	7	1.1
Total			617	100.0

Table 2 Adoption of OPR by publishers

Publisher	OPR journals	Percentage of OPR journals (%)	Headquarters location
MDPI	204	33.0	Switzerland
SDI	111	18.0	India
BioMed central	70	11.3	United Kingdom
Frontiers media S.A	64	10.4	Switzerland
Kowsar	51	8.3	The Netherlands
Wiley	40	6.5	USA
Copernicus publications	21	3.4	Germany
PLOS	7	1.1	USA
Elsevier	7	1.1	The Netherlands
EMBO press	5	0.8	Germany
Other publishers	37	6.0	11 countries*
Total	617	100.0	

*United Kingdom (19 journals), United States (9), Argentina (1), Bulgaria (1), Canada (1), France (1), Germany (1), Ireland (1), Kenya (1), The Netherlands (1), Switzerland (1)

year. Since then, there has been steady growth in the number of journals that have adopted OPR, most noticeably in the Medical and Health Sciences, and more recently, in the

Natural Sciences over the past 10 years. This growth has increased dramatically since 2017, in which time the total number of OPR journals has more than doubled. The disciplinary distribution of OPR journals appears in Table 1. For each discipline group, its first OPR year and number of articles suggest how OPR is being adopted. Medical and Health Sciences had the most early adopters.

A summary of the most prolific publishers contributing to OPR and their headquarters' country appears in Table 2. Although many journals today attract an international audience and are managed by international teams of researchers, the prevalence of OPR journals associated with publishers based in Europe stands out. Twenty-four of the 38 (63.2%) identified publishers are based in Europe and account for 445 out of the 617 titles (72.1%).

Table 3 Adoption of open reports by discipline

Discipline	Mandated	Optional by author	Optional by editor	No open reports	Total
Medical and health sciences	165 (64.0%)	63 (24.4%)		30 (11.6%)	258
Multidisciplinary	7 (50.0%)	7 (50.0%)			14
Natural sciences	86 (36.6%)	111 (47.2%)	2 (0.9%)	36 (15.3%)	235
Social sciences	12 (24.0%)	30 (60.0%)		8 (16.0%)	50
Humanities	1 (14.3%)	5 (71.4%)		1 (14.3%)	7
Technology	3 (5.7%)	44 (83.0%)		6 (11.3%)	53
Total	274 (44.4%)	260 (42.1%)	2 (0.3%)	81 (13.1%)	617

Table 4 Adoption of open ic
b cipline

Discipline	Mandated	Optional by reviewer	Anonymous	Total
Medical and health sciences	146 (56.6%)	111 (43.0%)	1 (0.4%)	258
Multidisciplinary	7 (50.0%)	7 (50.0%)		14
Natural sciences	88 (37.4%)	139 (59.1%)	8 (3.4%)	235
Social sciences	17 (34.0%)	33 (66.0%)		50
Humanities	2 (28.6%)	5 (71.4%)		7
Technology	8 (15.1%)	45 (84.9%)		53
Total	268 (43.4%)	340 (55.1%)	9 (1.5%)	617

Although the publishers are based in Europe, many of the journals they publish may support journals originating from other areas of the world (e.g., Kowsar). Furthermore, 500 of the OPR journals (81.0%) are published by only five publishers (MDPI, SDI, BioMed Central, Frontiers Media S.A., Kowsar). This points to the important role that publishers have played to date in the promotion of OPR.

OPR transparency in current practice

A fundamental principle of OPR is transparency. This includes open identities and/or open reports. Publishers and editors of journals adopted different levels of transparency,

Table 5 Who decides about open identities and open reports

	Open identities			
Open reports	Decided by reviewer	Mandated	Anonymous	Total
Decided by Author	260	0	0	260
Decided by Editor	1	0	1	2
Mandated	77	189	8	274
Not Available	2	79	Blind review	81
Total	340	268	9	617

where one or both of the transparency elements may be optional or required (e.g., EMBO Press 2020). Table 3 reports the adoption of open reports based on the broad discipline of the journals. The percentage of mandatory open reports is highest in the Medical and Health Sciences (64.0%), and second highest in the Multidisciplinary category (50.0%). Mandatory open reports are much lower for Humanities (14.3%) and Technology (5.7%), where optional open reports are more common. The availability of mandated or optional open identities was much more common across all disciplines, with only 9 journals (8 from the Natural Sciences and 1 from Medical and Health Sciences) requiring anonymity. Summary data for open identity adoption by discipline appear in Table 4.

Open identities may be mandated, optional (decided by the reviewer) or anonymous. Similarly, open reports may be mandated, optional (decided by the author or editor), or not available. The frequency of each combination appears in Table 5. When reviewers remain anonymous and their reports are not made available, this is traditional blind peer review (the lower right cell). The vast majority of OPR journals (608 or 98.5%) either require reviewers to identify themselves (268 or 43.4%) or allow reviewers to choose whether to identify themselves (340 or 55.1%). Similarly, 536 (86.9%) of the journals either require reports to be open (274 or 44.4%) or allow authors or editors to choose whether to make the reports open (259 or 42.3%). Only 189 (30.6%) journals require both open identities and open reports.

Transparency of the emerging OPR implementation approaches

The current OPR landscape is complex and exhibits a variety of configurations ranging from opening some aspects of the established blind-review process to a fully transparent process. Although there is no simple way to define the emerging OPR practices, a descriptive framework focusing on how *open identities* and *open reports* are being fulfilled during the review process and what end products are available for open access are depicted in Fig. 2.

At the implementation level, an OPR journal needs to decide:

1. *Who* makes decisions: reviewer, author, and editor/journal;
2. *When* the decision is made for a specific core element: pre-, post, or concurrent process;

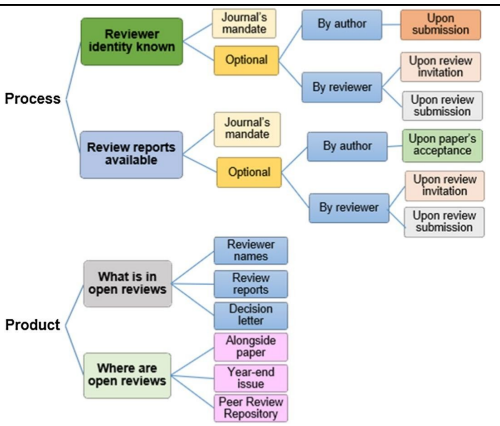

Fig. 2 Process–product approaches

3. *What* is contained in open reports: original reports, a consolidated letter, or invited commentaries by reviewers who made significant contributions to the paper's revision;
4. *Where* the open reports can be accessed.

These four factors can potentially define the level of transparency which a journal puts into practice for OPR. For example, *F1000Research* is the most transparent OPR journal because its peer review process is totally open; both referee identity and review comments are instantly accessible alongside the manuscript while it is being reviewed and revised. As a contrast, the OPR journals published by Frontiers only publish each paper with its reviewers' names, which is a minimum level of open identity. The process and the main product are still very much closed to the readers for whom the articles are published.

The emerging models varied in terms of transparency. Figure 3 shows four representative implementations:

1. Frontiers' OPR journals publish only referee identities alongside articles without open reports as an open identities-only model;
2. *PeerJ* provides optional open identities to referees and optional open reports to authors, representing a range of journals adopting this model;
3. BMC's OPR journals publish both open identities and open reports alongside articles;
4. *F1000Research*, the first of its kind, makes the review process itself open in addition to open identities and open reports. *F1000Research*, as post-publication OPR, has no acceptance or rejection decision to be made as a result of peer review, but an article will not be indexed in any bibliographic databases without passing the threshold

within a defined timeframe consisting of two approved (✔✔) or one approved (✔) plus two approved with reservations (??).

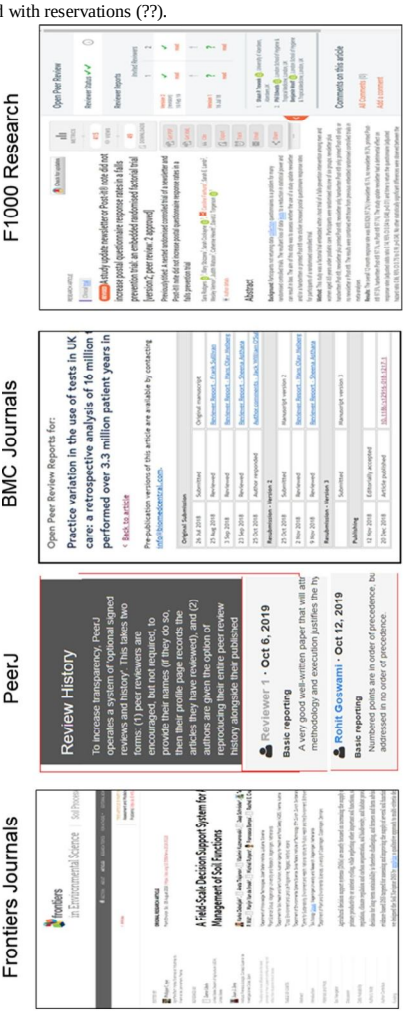

Fig. 2 OPR models as implemented by publishers

Discussion

This study represents the first comprehensive investigation of the scope and depth of OPR adoption in the open science era. Since the *BMJ* experiments with open reviews more than 20 years ago, the adoption of OPR has gone from 38 journals in 2001 to at least 617 journals by the end of 2019. Figure 1 demonstrates that there has been steady growth in the number of OPR journals over time, led by journals in Medical and Health Sciences and the Natural Sciences, but with much higher growth since 2017. This growth has been prompted by a small number of publishers. The remaining disciplines have been much slower and later to adopt OPR. The Humanities have different scholarship cultures as compared to the Natural Sciences and have been slow in adopting open access overall (Eve 2017; Gross and Ryan 2015).

Several publishers have served as pioneers and early promoters of OPR. The five publishers of the most OPR journals that have led the way—MDPI, SDI, BioMed Central, Frontiers Media S.A. and Kowsar–have adopted different implementations of OPR. BioMed Central, as one of the earliest OPR journal publishers in this study, and SDI require both open reports and open identities. Kowsar requires open reports but makes referee identities optional. MDPI makes open reports and open identities optional for authors and reviewers, respectively. Frontiers Media S.A. requires open identities but does not provide open reports for its OPR journals.

More than 60% of the publishers in this study, who publish more than 70% of the OPR journals identified, are based in Europe, signifying Europe's leading role in the OPR movement. This strong European effort is also seen in the larger open science movement, where organizations such as OpenAIRE and OpenUP are investigating all aspects of this movement, including OPR. Eleven of the identified publishers are based in the United States, indicating that there is also a growing interest in adopting OPR outside of Europe. Publishers based in other countries than those of the more prolific publishers have been slower to adopt forms of OPR as evidenced from the singular representation by these nations.

Multiple OPR practices emerge from the analysis of the data that show different levels of transparency in implementation. The level of transparency can be characterized along a continuum. The most transparent model is the concurrent open review process exemplified by *F1000Research*, where reviewers' identities and reports are instantly available alongside manuscripts and are published upon submission following initial format checking. Another model that promotes total transparency, exemplified by many BioMed Central journals, provides access to the complete report history and author exchanges as well as open identities alongside the published articles, after acceptance. The next several implementations that allow authors and/or reviewers to participate in open review decisions during the process include: mandated open reports but optional open identities (e.g., Kowsar journals), mandated open reports without open identities (e.g., the journal *Ledger*), and optional open reports with optional open identities (e.g., *PeerJ*). The most limited implementation, used by the Frontiers Media S.A. journals, is a closed review process with the published articles including only the names of the reviewers.

Two recommendations arise from the findings:

1) Publishers should make their OPR information (policies, open reports, open identities) more accessible and should more prominently display their OPR status and adoption. This information was sometimes buried and difficult to locate.

2) A repository or registry of OPR journals that provides key elements relevant to OPR is needed. Information contained in sources such as DOAJ and Transpose is limited and frequently incorrect.

Conclusion

The adoption of the OPR innovation is growing. This growth has been largely spurred by a small number of publishers, primarily based in Europe. To date, OPR has been adopted mostly by journals in the Medical and Health Sciences and the Natural Sciences. However, the number of OPR journals remains a very small percentage of scholarly journals, overall. The fact that there are multiple approaches to the adoption of OPR indicates there is no consensus at present regarding best practices. The highest level of OPR transparency includes open identities along with open reports, but only a minority of the OPR journals identified have adopted complete transparency.

Limitations of the present research must be recognized. Currently, there is no universal way to identify journals that adopt OPR. Our approach was to cast a broad net using multiple sources to identify candidate OPR journals, which is time-consuming and often hit-ormiss. It is possible that we have missed OPR journals that are not indexed by the databases searched or by the publishers already in our dataset despite the fact that we expanded our searches to the OPR publishers to ensure inclusion. Similarly, given the growth in the number of OPR journals over the past couple of years, the findings presented here represent a snapshot as of late 2019. The OPR landscape is changing quickly. Like any indexing source, there may also be a regional or language bias, where there are additional examples of OPR journals that may not be evident due to a lack of familiarity with the publication language. Although most publishers post annual reports with metric data including the number of articles, citation counts, Journal Impact Factor, rejection rate, etc., they lack annual OPR metric data on the number or percentage of articles with optional open reports and open identities; both are essential metric data to document OPR adoption.

The next phase of this research is examining open report contents using text mining approaches to determine if there are quantitative and qualitative differences in the open reviews based on the OPR approaches used. A scoring instrument is being developed and tested to measure different models.

Funding This research was partially funded by a University of Wisconsin-Milwaukee Research Growth Initiative Grant.

Data availability A csv file of the journal data can be found at: https ://doi.org/10.5281/zenod o.37371 97.

Compliance with ethical standards

Conflicts of interest All authors declare that they have no conflict of interest.

Comment [L6]: The **Discussion** section of this study has several weaknesses that could limit the clarity, depth, and overall impact of the conclusions drawn. Below are the specific weaknesses:

1. Limited Depth in Analyzing Growth and Adoption Trends

- **Over-Simplification of Growth Trends:** The study mentions the steady growth of OPR adoption since 2001, but there is limited analysis of the factors behind this growth. While the number of OPR journals has increased, particularly since 2017, the discussion does not delve into the underlying reasons for this rapid growth or the challenges that may have hindered adoption in other disciplines. For example, the role of specific technological advancements, policy changes, or funding initiatives in accelerating this growth is not discussed in detail.
- **Focus on Disciplines Without Exploring In-Depth Barriers:** While the discussion highlights that disciplines like the Humanities have been slower to adopt OPR, it does not explore in-depth why this is the case. A deeper exploration into cultural, economic, or methodological barriers ... [6]

Comment [L7]: The **Conclusion** section of this study has several weaknesses that may limit its overall clarity, impact, and scope. Here are the specific weaknesses identified:

1. Over-Simplified Conclusion

- **Lack of In-Depth Reflection on Implications:** The conclusion broadly states that the adoption of OPR is growing but doesn't provide deeper insights into the broader implications of these findings for scholarly publishing or the open science movement. For example, how will the growth of OPR affect the credibility of research, reviewer accountability, or transparency in scientific publishing? A more reflective discussion on the implications of these trends would strengthen the conclusion.
- **Vagueness in Addressing Future Developments:** The conclusion briefly mentions the future phase of research (examining open report contents using text mining) but does not offer any substantial insight into how this next phase will contribute to or influence the existing body of research. More concrete details on t ... [7]

References

Agha, R. (2017). Publishing peer review reports. *Webinar: Transparency in Peer Review*. https ://resea rcher acade my.elsev ier.com/navig ating -peer-revie w/funda menta ls-peer-revie w/trans paren cy-peerrevie w.

ASAPbio (2018). Transparency, recognition, and innovation in peer review in the life sciences (February 2018)/Peer review survey results. https ://asapb io.org/peer-revie w/surve y.

Barbash, F. (2014). Scholarly journal retracts 60 articles, smashes 'peer review ring', *The Washington Post*, July 10. https ://www.washi ngton post.com/news/morni ng-mix/wp/2014/07/10/schol arly-journ al-retra cts-60-artic les-smash es-peer-revie w-ring/?utm_term=.4ab26 f14ad b9.

Belluz, J., Plumer, B., & Resnick, B. (2016). The 7 biggest problems facing science, according to 270 scientists. *Vox*. https ://www.vox.com/2016/7/14/12016 710/scien ce-chall eges-resea rch-fundi ng-peer-revie w-proce ss.

Bohannon, J. (2013). Who's afraid of peer review? A spoof paper concocted by *Science* reveals little or no scrutiny at many open-access journals. *Science*, *342*, 60–65. https ://www.scien cemag .org/conte nt/342/6154/60.full.pdf.

Bornmann, L., Wolf, M., & Daniel, H. D. (2012). Closed versus open reviewing of journal manuscripts: how far do comments differ in language use? *Scientometrics*,*91*, 843–856. https ://doi.org/10.1007/ s1119 2-011-0569-5.

Bravo, G., Grimaldo, F., López-Iñesta, E., Mehmani, B., & Squazzoni, F. (2019). The effect of publishing peer review reports on referee behavior in five scholarly journals. *Natural Communication*,*10*, 322. https ://doi.org/10.1038/s4146 7-018-08250 -2.

Clobridge, A. (2016). Open peer review: the next wave in open knowledge? *Online Searcher: Information Discovery, Technology, Strategies*,*40*(4), 60–62.

Eve, M. P. (2017). Open access publishing models and how OA can work in the humanities. *Bulletin of the Association for Information Science & Technology*,*43*(5), 16–20. https ://doi.org/10.1002/ bul2.2017.17204 30505 .

EMBO Press. (2020). Transparent Peer Review. https ://www.embop ress.org/polic ies.

Fennell, C., Comey, A., & Ash E. (2017). Transparency—the key to trust in peer review, *Elsevier Connect*,https ://www.elsev ier.com/conne ct/trans paren cy-the-key-to-trust -in-peer-revie w.

Ford, E. (2013). Defining and characterizing open peer review: A review of the literature. *Journal of Scholarly Publishing*,*44*(4), 311–326. https ://doi.org/10.3138/jsp.44-4-001.

Fresco-Santalla, A., & Hernández-Pérez, T. (2014). Current and evolving models of peer review. *The Serials Librarian*,*67*(4), 373–398. https ://doi.org/10.1080/03615 26X.2014.98541 5.

Graf, C. (2019) Why more journals are joining our transparent peer review pilot. Director, Research Integrity and Publishing Ethics at Wiley. September 20, 2019. https ://www.wiley .com/netwo rk/resea rcher s/ lates t-conte nt/why-more-journ als-are-joini ng-our-trans paren t-peer-revie w-pilot .

Gross, J., & Ryan, J. C. (2015). Landscapes of research: perceptions of open access (OA) publishing in the arts and humanities. *Publications*,*3*, 65–88. https ://doi.org/10.3390/publi catio ns302 0065.

Godlee, F., Gale, C. R., & Martyn, C. N. (1998). Effect on the quality of peer review of blinding reviewers and asking them to sign their reports: a randomized controlled trial. *JAMA*,*280*, 237–240.

Görögh, E., Schmidt, B., Banelytė, V., Stanciauskas, V., & Woutersen-Windhouwer, S. (2019). OpenUP Deliverable D3.1—Practices, evaluation and mapping: Methods, tools and user needs. OpenUP Project. https ://doi.org/10.5281/zenod o.25572 72.

Haven, T., Tijdink, J., Pasman, H. R., et al. (2019). Researchers' perceptions of research misbehaviours: a mixed methods study among academic researchers in Amsterdam. *Research Integrity and Peer Review*,*4*(1), 25. https ://doi.org/10.1186/s4107 3-019-0081-7.

Kriegeskorte, N. (2012). Open evaluation: a vision for entirely transparent post-publication peer review and rating for science. *Frontiers in Computational Neuroscience*,*6*(79), 2–18. https ://doi.org/10.3389/ fncom .2012.00079 .

Lawrence, R. (2015). Preventing peer review fraud: F1000Research, the F1000 Faculty and the crowd. https ://blog.f1000 .com/2015/04/09/preve nting -peer-revie w-fraud -f1000 resea rch-the-f1000 -facul ty-and-thecrowd /.

Lee, C. J., Sugimoto, C. R., Zhang, C., & Cronin, B. (2013). Bias in peer review. *Journal of the American Society for Information Science and Technology*,*64*(1), 2–17. https ://doi.org/10.1002/asi.22784 .

Malone, R. E. (1999). Should peer review be an open process? *Journal of Emergency Nursing*,*25*(2), 150–152.

Mehmani, B. (2016). Is open peer review the way forward? https ://www.elsev ier.com/revie wers-updat e/story /innov ation -in-publi shing /is-open-peer-revie w-the-way-forwa rd.

Mehmani, B., & van Rossum, J. (2015). Elsevier trials publishing peer review reports as articles. https ://www.elsev ier.com/revie wers-updat e/story /peer-revie w/elsev ier-pilot -trial s-publi shing -peer-revie w-repor ts-as-artic les.

Moylan, E. (2019). How do researchers feel about open peer review? Wiley. September 17, 2019. https ://www.wiley .com/netwo rk/resea rcher s/submi ssion -and-navig ating -peer-revie w/how-do-resea rcher s-feel-about -open-peer-revie w.

Moylan, E. (2020). Progressing towards transparency—more journals join our transparent peer review pilot. Wiley. March 5, 2020. https ://www.wiley .com/netwo rk/resea rcher s/submi ssion -and-navig ating -peer-revie w/progr essin g-towar ds-trans paren cy-more-journ als-join-our-trans paren t-peer-revie w-pilot .

Mulligan, A., Hall, L., & Raphael, E. (2013). Peer review in a changing world: An international study measuring the attitudes of researchers. *Journal of American Society for Information Science and Technology*,*64*, 132–161. https ://doi.org/10.1002/asi.22798 .

Naik, G. (2011). Mistakes in scientific studies surge. *The Wall Street Journal*, 10 August 2011.

Nature (2015). Transparent peer review at Nature Communications. *Nature Communication*,*6*, https ://doi.org/10.1038/ncomm s1027 7.

Nature (2016). Transparent peer review one year on. *Nature Communication*,*7*, https ://doi.org/10.1038/ncomm s1362 6.

Nature (2020). Nature will publish peer review reports as a trial, Editorial 05 February 2020. *Nature*, 578. https ://www.natur e.com/artic les/d4158 6-020-00309 -9.

Opening up peer review. (2007). *Nature Cell Biology*,9, 1. https ://doi.org/10.1038/ncb01 07-1.

Peer Review Congress (2017). Under the microscope: Transparency in peer review. Panel after the Peer Review Congress. Peer Review Congress, Chicago, 10–12, September 2017. Panel chaired by Alice Meadows (ORCID) with panellists: Irene Hames (Board member of Learned Publishing), Elizabeth Moylan (BMC), Andrew Preston (Publons), and Carly Strasser (Moore Foundation). https ://peerr eview week.files .wordp ress.com/2017/05/prw20 17-panel ists2 2.pdf. Video at https ://www.youtu be.com/watch ?v=8x1dh o6HRz E.

Peer Review Week. (2017). Transparency In Review is focus for Peer Review Week 2017. https ://peerr eview week.files .wordp ress.com/2016/06/prw_2017-_press _relea se-5-sept.pdf.

Pöschl, U., & Koop, T. (2008). Interactive open access publishing and collaborative peer review for improved scientific communication and quality assurance. *Information Services & Use*,*28*, 105– 107. https ://doi.org/10.3233/ISU-2008-0567.

Rath, M. & Wang, P. (2017). Open peer review in the era of open science: A pilot study of researchers' perceptions (Poster) In *Proceedings of the Joint Conference on Digital Libraries (JCDL)*, 317–318.

Rittman, M. (2018) Opening up Peer Review. https ://blog.mdpi.com/2018/10/12/openi ng-up-peer-revie w/.

Ross-Hellauer, T. (2017). What is open peer review? A systematic review. *F1000Research*. 2017 apr; 6:588. Available from: https ://doi.org/10.12688 /f1000 resea rch.11369 .1. PMID: 28580134

Ross-Hellauer, T., Deppe, A., & Schmidt, B. (2017). Survey on open peer review: Attitudes and experience amongst editors, authors and reviewers. *PLoS ONE*,*12*(12), e0189311. https ://doi.org/10.1371/journ al.pone.01893 11.

Rupp, M., Anastasopoulou, L., Wintermeyer, E., Malhaan, D., Khassawna, T. E., & Heiss, C. (2019). Predatory journals: A major threat in orthopaedic research. *International Orthopaedics*,*43*, 509– 517. https ://doi.org/10.1007/s0026 4-018-4179-1.

Smith, R. (2006). Peer review: a flawed process at the heart of science and journals. *Journal of the Royal Society of Medicine*,*99*, 178–182. https ://doi.org/10.1258/jrsm.99.4.178.

Tattersall, T. (2015). For what it's worth—the open peer review landscape. *Online Information Review*,*39*(5), 649–663. https ://doi.org/10.1108/OIR-06-2015-0182.

Tennant, J. P., Dugan J. M., Graziotin D., Jacques, D. C., Waldner, F., Mietchen, D., … Colomb, J. (2017). A multi-disciplinary perspective on emergent and future innovations in peer review. *F1000Research 2017*, 6:1151, https ://doi.org/10.12688 /f1000 resea rch.12037 .3.

van Rooyen, S., Godlee, F., Evans, S., Black, N., & Smith, R. (1999). Effect of open peer review on quality of reviews and on reviewers' recommendations: a randomised trial. *BMJ*,*318*, 23–27. https ://doi.org/10.1136/bmj.318.7175.23.

Wang, P., Rath, P., Deike, D., & Wu, Q. (2016a). Open peer review: An innovation in scientific publishing. *2016 iConference*. https ://core.ac.uk/downl oad/pdf/15831 2603.pdf.

Wang, P., You, S., Rath, M., & Wolfram, D. (2016b). Open peer review in scientific publishing: A web mining study of peerj authors and reviewer. *Journal of Data and Information Science*, *1*(4), 60–80. https ://conte nt.scien do.com/view/journ als/jdis/1/4/artic le-p60.xml.

Wang, P., & Tahamtan, I. (2017). The state-of-the-art of Open Peer Review: Early adopters. (Poster Paper) *Proceedings of the 2017 Annual Meeting of The Association for Information Science & Technology*, October 27—November 1, Washington DC.

Wang, P., & Wolfram, D. (2016). *The last frontier in open science: Will open peer review transform scientific and scholarly publishing? at the 2016 Annual Meeting of the Association for Information Science and Technology*, October 14–18, 2016, Copenhagen, Denmark. [Panellists: Jason Hoyt, PeerJ; Ulrich Pöschl, Max Planck; Peter Ingwersen, Royal School of Denmark & Richard Smith, retired editor of The BMJ; discussant: Marcia Bates, University of California, Log Angeles].

Walsh, E., Rooney, M., Appleby, L., & Wilkinson, G. (2000). Open peer review: A randomised controlled trial. *The British Journal of Psychiatry*,*176*, 47–51. https ://doi.org/10.1192/bjp.176.1.47.

Wiley (2018). Bringing greater transparency to peer review: Wiley and Clarivate analytics partner to launch innovative open peer review, 13 September 2018, https ://newsr oom.wiley .com/press -relea se/bring inggreat er-trans paren cy-peer-revie w-wiley -and-clari vate-analy tics-partn er-launc h.

Wiley (2020). A list of participating OPR journals is referred at https ://autho rserv ices.wiley .com/Revie wers/ journ al-revie wers/what-is-peer-revie w/index .html (direct link: https ://autho rserv ices.wiley .com/asset / photo s/revie wers.html/Journ als%20Inc luded %20in%20Tra nspar ent%20Pee r%20Rev iew%20Pil ot.xlsx).

Wolfram, D., Wang, P., & Park, H. (2019). Open Peer Review: The current landscape and emerging models. *Proceedings of the 17th International Society for Scientometrics and Informetrics Conference*. (pp. 387–398).

Comment [L8]: Weaknesses of the references section:

1.**Outdated References**: Many of the references date back several years, with some as old as 2006 or 1998. This may limit the relevance of the sources, especially in a rapidly evolving field like open peer review (OPR). More recent publications and studies could provide a more up-to-date understanding of current trends, innovations, and challenges in the OPR landscape.

2.**Lack of Peer-Reviewed Sources**: Some references are from non-peer-reviewed platforms such as blogs or company websites (e.g., "Wiley blog" and "Elsevier Connect"), which may not always be authoritative or as reliable as peer-reviewed journal articles. Relying on a wider range of peer-reviewed sources would strengthen the credibility of the references.

3.**No Clear Citation Style Consistency**: The references are inconsistent in terms of formatting (e.g., missing capitalization in titles, inconsistent citation of websites, or journal volumes and pages). This lack of standardization may detract from the professional presentation and make it difficult for readers to follow or verify sources efficiently.

4.**Unclear Access to Some Sources**: Some sources are linked to external websites or PDFs that may no longer be accessible or available in the same format (e.g., "https://core.ac.uk/download/pdf/158312603.pdf"). This can pose challenges for readers who wish to verify the references or access the full content.

5.**Insufficient Information on Some Citations**: A few references are missing key details such as publisher information, volume/issue numbers, or DOI numbers (e.g., "Wiley (2020)"). This could create difficulties for readers trying to track down specific references.

6.**Regional and Language Bias**: As noted in the article itself, there might be bias in identifying OPR journals based on regional or language limitations. The references do not seem to fully address this limitation, and it could be argued that additional sources from a global range of publishers or languages could be included to reduce potential biases.

7.**Potential Conflicts of Interest**: Some of the references come from well-known ... [8]

1. Limited Understanding of Transparency

- **Overemphasis on Transparency Alone:** While OPR aims to increase transparency, it does not necessarily guarantee the quality or fairness of the peer review process. The topic may overlook other important aspects like reviewer expertise, biases, and the overall fairness of the review process.
- **Varying Definitions of Transparency:** Transparency in OPR can vary significantly, including open identities, open reports, or full publication of reviews alongside articles. The topic could fail to address the complexity and different levels of transparency involved.

2. Ethical and Privacy Concerns

- **Privacy Issues for Reviewers:** Open peer review might discourage honest and constructive feedback if reviewers' identities are made public. Concerns about potential retaliation, reputational risks, or conflicts of interest could inhibit participation.
- **Impact on Early-Career Researchers:** Early-career researchers or those without established reputations may fear open peer review due to the added pressure of having their identities exposed, potentially limiting candid feedback.
- **Potential Biases in Open Review:** Open peer review could inadvertently introduce biases, as reviewers' identities and comments become part of the public record. Reviewers may be less likely to critique influential or well-known authors, undermining the objectivity of the process.

3. Inconsistent Adoption and Implementation

- **Lack of Standardization:** There is no universal standard for implementing open peer review, leading to variability in how it's adopted across disciplines, publishers, and journals. This makes it difficult to compare the effectiveness of OPR practices.
- **Slow Adoption Across Disciplines:** OPR has been adopted more widely in fields like medicine and natural sciences, while humanities and social sciences are slower to embrace open peer review practices. The topic may not address the challenges specific to these slower-adopting disciplines.
- **Mixed Approaches to Implementation:** Publishers may adopt different aspects of OPR (e.g., open reports vs. open identities), but there is no clear consensus on the best model. This lack of uniformity can create confusion among authors, reviewers, and readers.

4. Resource and Technical Barriers

- **Increased Administrative Burden:** Implementing OPR can be resource-intensive, requiring additional infrastructure to handle open reports, reviewer identities, and public feedback. Smaller publishers or journals may lack the resources to implement these systems effectively.

- **Technological Limitations:** Not all journals or publishers have the technological infrastructure to support full transparency in the peer review process. This creates inequalities in adoption, as technologically advanced publishers are better equipped to handle the complexities of OPR.

5. Resistance to Change

- **Cultural Resistance:** Many academics and researchers are accustomed to the traditional peer review process, which maintains some degree of anonymity. There may be resistance from established scholars and institutions who are hesitant to embrace the full transparency OPR promotes.
- **Skepticism About OPR's Effectiveness:** There are concerns about whether OPR actually improves the quality of peer review or just adds a layer of visibility without addressing underlying issues such as reviewer bias or lack of accountability.

6. Impact on the Peer Review System

- **Potential for Reduced Review Quality:** Publicly available reviews may lead to rushed or less detailed feedback. Reviewers may feel pressured to provide less critical or superficial assessments if their identities are known.
- **Effects on the Journal's Reputation:** Journals adopting OPR may face challenges if the open peer review process exposes negative or unfair reviews, potentially damaging their reputation and the perceived value of their publications.

Suggestions for Addressing Weaknesses

1. **Clarify and Standardize Transparency Models:** Establish clearer standards for transparency in OPR to reduce variability and increase the reliability of the process.
2. **Address Ethical and Privacy Concerns:** Develop frameworks to protect reviewer anonymity when needed and mitigate the potential negative consequences for early-career researchers or underrepresented groups.
3. **Promote Gradual Adoption Across Disciplines:** Encourage interdisciplinary dialogue and collaboration to promote OPR adoption in fields that have been slow to adopt these practices.
4. **Provide Technical and Administrative Support:** Offer resources and tools to help smaller publishers or journals implement OPR practices effectively.
5. **Engage Stakeholders in Dialogue:** Foster discussions among academics, journals, and publishers to address concerns and collaboratively improve the peer review process through openness and transparency.

The abstract provided does a good job of outlining the study's purpose, methods, findings, and implications, but there are several potential weaknesses that could impact its clarity and overall effectiveness:

1. Lack of Clear Focus or Objective

- **Unclear Research Purpose:** While the abstract mentions that the study is the "first comprehensive investigation of OPR adoption," it could more explicitly state the research question or hypothesis. For instance, the abstract doesn't mention *why* this investigation is crucial, beyond describing the trend of OPR adoption.
- **Overly General Introduction:** The first sentence introduces the topic broadly without directly connecting it to the specific aims of the study. It might be more effective to succinctly introduce the gap in literature or the issue that the study addresses.

2. Limited Detail on Methodology

- **Methodological Ambiguity:** The abstract mentions "various methods" were used to identify the 617 OPR journals, but it does not specify what methods were employed (e.g., surveys, data mining, direct journal analysis). This lack of clarity makes it difficult for readers to gauge the rigor and reliability of the study.
- **Data Verification Process:** There's no mention of how the data was validated, cleaned, or verified (e.g., were journals checked for accuracy?). This is an important consideration, especially for a study investigating something as nuanced as OPR.

3. Lack of Concrete Results and Findings

- **Missing Statistical Insights:** While the abstract presents some key findings (e.g., "steady growth in OPR adoption" and "five publishers responsible for 81% of the identified OPR journals"), these could be more precise. For example, are the percentages based on journal count or article count? Additionally, the abstract could mention specific results like the number of journals in each category or the rate of increase from 2001-2019.
- **No Mention of Key Trends or Patterns:** The abstract highlights general trends but does not provide a clear sense of the variations in OPR implementations. For example, how do publishers differ in their approaches to open identities and open reports, and what does this imply about transparency in OPR?

4. Overuse of Technical Terms Without Explanation

- **Complex Terminology:** Terms like "open identities," "open reports," and "timestamped review histories" are used without providing adequate explanation for readers who may not be familiar with the specifics of open peer review. A brief definition or simplification of these terms might make the abstract more accessible to a wider audience.
- **Technical Language Could Be Simplified:** The sentence "Across the variations in OPR implementations, two important factors define the degree of transparency: open identities and open reports" could be clearer and more concise. For example: "The level of

transparency in OPR depends on two key factors: the publication of reviewer identities and review reports."

5. Unclear Implications

- **Missing Implications for the Field:** Although the abstract discusses findings, it doesn't explain the broader implications of these results. How might the findings influence the future of OPR adoption? Could the study's findings encourage publishers to adopt open practices, or is it intended to inform policy changes? The implications section could better highlight the study's contribution to the field.
- **Final Sentence Weakness:** The concluding sentence, which recommends that publishers of optional OPR journals should include metric data in their reports, feels somewhat detached from the rest of the findings. It doesn't fully tie back to the rest of the research or provide a clear call to action for advancing OPR practices.

6. Structural Issues

- **Flow and Organization:** The abstract lacks a clear organizational flow. The discussion of the findings and transparency factors feels somewhat disjointed. A more logical progression might start with the background, followed by the methods, key results, and then the implications or recommendations.
- **Length and Density:** The abstract is quite dense, with many details packed into one paragraph. Breaking it into shorter sections with clearer subheadings (e.g., Objectives, Methods, Results, Conclusion) could help with readability.

Page 1035: [3] Comment [L3] **Lenovo** **12/6/2024 12:45:00 AM**

The **introduction** provided offers a broad overview of peer review and open peer review (OPR), but several limitations could be identified to improve clarity, focus, and depth:

1. Lack of Focus on the Study's Specific Contribution

- **Overemphasis on Background Information:** While the introduction provides valuable background on peer review and the open science movement, it spends a lot of time discussing the history of peer review and opinions from different sources, such as Malone (1999) and Clobridge (2016). This detracts from the specific purpose of the study and makes the introduction feel more like a general discussion rather than setting the stage for the research at hand.
- **Not Clearly Framing the Research Problem:** Although the introduction does outline that open peer review is one of the last components of open science to be adopted, it could do more to explain why this study is necessary. The issue of *why* examining OPR adoption and implementation is crucial in the current context isn't addressed until the very end, which makes the introduction feel somewhat scattered.

2. Insufficiently Defined Scope of Study

- **Unclear Scope of "OPR":** While OPR is defined as the process where peer review reports and reviewers' identities are made public, there is no clear explanation of the variations in how different journals implement OPR. For example, the introduction mentions "open reports" and "open identities," but there is no mention of the spectrum of OPR practices (e.g., fully open vs. partially open) that the study will investigate.
- **Lack of Context for OPR Implementation:** The introduction does not give the reader a clear sense of the diversity in OPR practices that will be explored. It only briefly mentions the need for further research into "diverse implementations by publishers" but doesn't explain what this diversity looks like in practice.

3. Weak Connection Between the Literature Review and the Research Questions

- **Literature Review Feels Disjointed:** While referencing relevant works like those by Malone and Clobridge, the introduction doesn't effectively tie these studies into the research questions or objectives of the study. The introduction would be stronger if it clearly showed how the existing literature influenced the framing of the research questions.
- **Lack of Synthesis of Existing Research:** The introduction touches on various debates and challenges related to OPR but doesn't synthesize these viewpoints to demonstrate the gaps in knowledge that this study will address. For example, how does the research on OPR practices by PeerJ, F1000Research, and ScienceOpen contribute to our understanding of its current state?

4. Lack of Clarity in the Research Questions

- **Too Many Research Questions:** The introduction ends with a list of four main research questions, which are useful, but could be organized and presented more clearly. For example, the questions could be grouped under broader themes to reduce complexity.
- **Unclear Focus on Perceptions and Attitudes:** The mention of "perceptions and attitudes of scientists as authors and reviewers" is important, but the introduction doesn't fully clarify whether this will be part of the study's focus. This could be emphasized earlier in the introduction to connect the purpose with the broader implications of the study.

5. Overemphasis on General Debate Over OPR

- **General Debate on OPR's Benefits and Challenges:** The introduction spends a significant amount of space discussing different opinions on OPR (e.g., whether open peer review will become as widespread as open access), but this distracts from the main focus of the study. More emphasis should be placed on the current state of OPR, its trends, and the specific gaps in knowledge that the study aims to fill.
- **Debates Are Not Fully Explored or Connected to Study:** The debates over OPR benefits and concerns are mentioned, but they aren't connected to the study's aims. For instance, what specific aspects of OPR (e.g., transparency, accountability) are being investigated? The debate could be tied more explicitly to the study's research questions.

6. Lacks Justification for the Study's Methodology

- **No Explanation of Methodology or Approach:** The introduction doesn't hint at the methodology that will be used to investigate the research questions. For instance, how will the study identify OPR journals? What data sources will be examined? Providing a brief mention of the approach could make the introduction feel more complete and give the reader a clearer sense of how the study will answer the research questions.

7. Length and Detail Imbalance

- **Too Much Detail in Some Sections:** Certain aspects of peer review, such as types of blind reviews (single, double, triple), are covered in considerable detail but are not directly connected to the study's objectives. This results in an overly lengthy introduction that could be more concise and focused.
- **Missed Opportunity to Highlight the Study's Relevance:** While the introduction provides useful context, it could be more concise in terms of literature review and background, ensuring the study's purpose and relevance are presented more sharply.

8. Absence of Clear Thesis or Hypothesis

- **No Clear Statement of Thesis or Hypothesis:** While the introduction outlines the purpose of the study, it doesn't present a clear thesis or hypothesis. For example, a statement such as "This study investigates the current adoption rate and transparency of OPR across journals" would help focus the reader's attention on the study's key goal.

Page 1036: [4] Comment [L4] **Lenovo** **12/6/2024 12:48:00 AM**

The **literature review** you've provided appears to be extensive in its references to the challenges and issues surrounding open access (OA) journals and peer review, but it does have several weaknesses. These weaknesses could impact the clarity, comprehensiveness, and overall contribution of the review to the field. Here are some potential weaknesses:

1. Overemphasis on Negative Aspects of Open Access and Peer Review

- **Bias Toward Problems:** The literature review focuses heavily on the flaws of OA journals, such as predatory publishing, scientific fraud, and issues with peer review quality. While these are important concerns, the review does not seem to balance these with a discussion of the strengths or successes of OA publishing or peer review models. A more balanced review would address both the challenges and the positive aspects or improvements brought about by OA, particularly in the context of increased access and transparency in research.
- **Lack of Focus on Positive Developments in Open Peer Review (OPR):** The review mentions challenges like predatory publishing and peer review fraud, but it doesn't sufficiently explore the recent advancements in open peer review and how these innovations aim to address such problems. A stronger review would discuss how open

peer review (OPR) models are being developed to address issues of transparency and bias.

2. Limited Exploration of Open Peer Review Models

- **Narrow Focus on Traditional Peer Review:** The review heavily critiques traditional peer review (e.g., blind peer review) without fully exploring emerging models like open peer review (OPR), which could be part of the solution to the problems identified. There is a missed opportunity to critically analyze different OPR models and their potential for improving transparency and accountability in publishing.
- **Lack of Discussion on Specific Examples:** The review mentions problems but does not delve deeply into specific examples of open peer review implementations that have addressed or mitigated these issues. It would be beneficial to include case studies of journals or publishers that have successfully implemented OPR and discuss their impact.

3. Failure to Consider the Broader Context of Open Science

- **Absence of Open Science Frameworks:** While the review touches on OA and peer review, it does not adequately situate these issues within the broader context of the open science movement. Open science encompasses a wide range of practices beyond just open access and peer review, such as open data, open methodology, and public collaboration in research. The review could expand its focus to include how OA and OPR fit into this larger movement and how they interact with other components of open science.
- **No Consideration of the Role of Open Science in Addressing Criticisms:** There is no mention of how the principles of open science might offer solutions to the issues raised in the review (e.g., increasing transparency, ensuring reproducibility, and reducing fraud).

4. Overreliance on Specific Studies

- **Limited Source Variety:** The review relies heavily on a few specific studies and incidents (e.g., Bohannon's 2013 sting operation, Rupp et al. 2019, and Lawrence 2015) without providing a broader spectrum of evidence. While these examples are important, the review would benefit from a more comprehensive range of sources, including studies that look at the effectiveness and benefits of open peer review or other innovative publishing models.
- **Lack of Global Perspective:** The review mainly focuses on issues that are seen in Western scholarly publishing (e.g., predatory publishers, peer review fraud) but does not discuss how these issues may manifest or differ in other parts of the world. Including a broader perspective could enrich the discussion and make it more inclusive.

5. Missing Solutions or Alternatives

- **Lack of Discussion on Solutions to Identified Issues:** While the review outlines many problems with OA and peer review, it lacks a thorough discussion of proposed or existing solutions to these problems. For instance, while it mentions the need for transparency, it

doesn’t go into detail about how transparency can be implemented, what models have been tested, and how effective these solutions have been in practice.
- **Inadequate Focus on Innovations in Peer Review:** There is a general reference to the importance of transparency (e.g., Fennell et al. 2017), but there is no deep exploration of how specific innovations in peer review (such as open review processes) have worked in practice to restore trust or improve the process.

6. Structural and Stylistic Issues

- **Clarity and Flow of Argument:** The review jumps between issues without a clear organizational structure. For example, it shifts from discussing the problem of scientific fraud in OA journals to a critique of traditional peer review models, then to debates about the role of transparency. The flow could be improved by categorizing the literature into themes (e.g., challenges of OA, criticisms of peer review, solutions, and innovations in OPR).
- **Overuse of Direct Quotes:** While citations are important, the over-reliance on direct quotes (such as from Bohannon, Rupp, and others) can disrupt the flow of the review. Paraphrasing and summarizing the main points could make the review more concise and readable.

7. Inadequate Definition of Key Terms

- **Lack of Clear Definitions:** The review touches on complex terms like "predatory publishing," "peer review fraud," and "open peer review" without providing clear definitions or context for these concepts. Given that the review addresses multiple interconnected issues, it is important to define these terms upfront to ensure that readers understand the nuances of the discussion.

8. Absence of Evaluation Criteria

- **No Clear Criteria for Assessing OPR Models:** The review mentions transparency as key but does not provide clear criteria or frameworks for assessing the effectiveness of open peer review models. How can transparency in peer review be measured? What are the indicators of success or failure for OPR systems?

Page 1039: [5] Comment [L5] **Lenovo** **12/6/2024 12:52:00 AM**

The **data collection** process described in the study presents several weaknesses that may impact the accuracy, generalizability, and comprehensiveness of the findings. Here are some specific concerns:

1. Narrow Focus on Only Two Elements of OPR

- **Exclusion of Other OPR Elements:** The study focuses solely on the two core elements of OPR: open identities and open reports, as identified by Ross-Hellauer (2017).

However, the study excludes other important aspects of OPR that may influence its effectiveness and transparency, such as open participation, open interaction, and open pre-review or post-review comments. These elements also play a role in enhancing transparency and might provide valuable insights into the broader landscape of OPR adoption.

- **Missed Opportunities for Comprehensive Understanding:** By not considering other OPR elements, such as open final-version commenting or open platforms/decoupled review, the study narrows its scope, potentially overlooking other methods of enhancing peer review transparency that could be more commonly adopted across different disciplines or publishers. The exclusion of these practices limits the comprehensiveness of the research.

2. Exclusion of Authors' Rebuttals

- **Impact on the Transparency Picture:** The study does not consider authors' rebuttals, which are an integral part of the peer review process, particularly in open peer review settings. Authors' rebuttals provide critical context and insight into how review feedback is handled and whether it affects the final outcome of the manuscript. By excluding this element, the study misses an opportunity to evaluate the full transparency of the OPR process and the interaction between authors and reviewers.
- **Potential Underestimation of OPR Transparency:** If a journal allows authors to publicly respond to reviewers' comments, it can significantly increase transparency by showing how authors address criticism and how those interactions contribute to the overall review process. Excluding this element could result in an incomplete understanding of how transparent OPR practices are.

3. Lack of Inclusion of Open Comments from Readers

- **Limited Scope of Data:** The study does not include open comments from either registered or unregistered readers. Open comments are an essential part of the open science movement, as they allow a wider audience to engage with and critique the research, potentially enhancing the review process even after the manuscript is published. By excluding these comments, the study does not capture the full spectrum of transparency that open peer review can offer.
- **Potential Overlooking of Reader Contributions:** The failure to include reader comments, especially in journals that emphasize post-publication peer review, may limit the findings and overlook a critical aspect of the OPR ecosystem. In many OPR settings, comments from the scientific community and the public are integral to the ongoing evaluation of published research.

4. Exclusion of Journals with Partial OPR Implementation

- **Excluding Partial OPR Adoption:** Journals that implement only one element of OPR (e.g., open identities but not open reports) are excluded from the study. While this approach is justified to maintain consistency, it could result in overlooking journals that have adopted partial OPR models. These journals, even with limited transparency, might

still contribute valuable insights into the broader trend toward OPR adoption, especially in early stages or disciplines where full adoption is not feasible.

- **Potential Bias in Findings:** By excluding journals with partial adoption of OPR, the study might inadvertently create a bias toward more fully implemented OPR journals, potentially underrepresenting the adoption rates and trends in fields or publishers that are gradually moving toward more transparency.

5. Lack of a Clear Standard for OPR Adoption

- **Inconsistent Practices Across Journals:** Journals with different implementations of OPR might be excluded or included based on the presence or absence of certain elements. However, OPR adoption is not always uniform across a journal's portfolio of articles. Some journals may offer open identities and reports for certain articles but not for others. The study doesn't mention how it handles such cases, which could lead to inconsistencies in identifying OPR journals. This lack of clarity might impact the accuracy of the data collection process.
- **Ambiguity in OPR Classification:** The definition of what constitutes "open reports" or "open identities" may vary between journals. Journals that allow anonymous reviews or delayed publication of reviewer names may still be considered OPR journals in some contexts, but they are excluded by the study's strict criteria. This lack of flexibility in classification may limit the study's ability to capture the diversity of OPR implementations.

6. Limited Evaluation of OPR Impact or Effectiveness

- **Focus on Adoption Rather Than Impact:** The study focuses primarily on the adoption and implementation of OPR elements, without examining the effectiveness or impact of these practices. By not evaluating how these elements affect the quality of peer review or research outcomes, the study does not address the potential benefits or drawbacks of various OPR practices, which could provide valuable context for understanding the motivations behind their adoption.
- **Absence of Qualitative Data:** The study relies heavily on quantitative aspects (e.g., the presence or absence of open reports and identities), but it does not include qualitative data on how these practices are perceived by researchers, authors, or reviewers. Understanding the perceptions and experiences of the people involved could provide more nuanced insights into how OPR affects scholarly communication.

7. Limited Data on Publisher Practices

- **Lack of Publisher-Specific Insights:** The study focuses on journals as the unit of analysis but does not provide a detailed examination of how individual publishers implement OPR practices. Some publishers might have different policies for OPR adoption, which could vary by journal or discipline. Without considering publisher-specific strategies, the study may overlook important differences in OPR implementation across publishers and how those practices affect the broader adoption of open peer review.

The **Discussion** section of this study has several weaknesses that could limit the clarity, depth, and overall impact of the conclusions drawn. Below are the specific weaknesses:

1. Limited Depth in Analyzing Growth and Adoption Trends

- **Over-Simplification of Growth Trends:** The study mentions the steady growth of OPR adoption since 2001, but there is limited analysis of the factors behind this growth. While the number of OPR journals has increased, particularly since 2017, the discussion does not delve into the underlying reasons for this rapid growth or the challenges that may have hindered adoption in other disciplines. For example, the role of specific technological advancements, policy changes, or funding initiatives in accelerating this growth is not discussed in detail.
- **Focus on Disciplines Without Exploring In-Depth Barriers:** While the discussion highlights that disciplines like the Humanities have been slower to adopt OPR, it does not explore in-depth why this is the case. A deeper exploration into cultural, economic, or methodological barriers specific to certain disciplines would strengthen the understanding of OPR adoption patterns.

2. Limited Exploration of Publisher Practices

- **Surface-Level Overview of Publisher Differences:** The discussion lists the different OPR practices of major publishers (MDPI, SDI, BioMed Central, Frontiers Media S.A., and Kowsar), but it does not critically analyze how these differences affect the broader OPR landscape. For example, the varying requirements for open reports and open identities are noted, but the implications of these variations on peer review quality, transparency, or author/reviewer satisfaction are not addressed. How these differing implementations influence perceptions of fairness, credibility, and trust in the publishing process remains unexplored.
- **Lack of Comparative Impact Analysis:** The discussion could have benefited from comparing how the different OPR models from these publishers impact the quality of peer review, the timeliness of publication, or the overall academic discourse. A deeper comparative analysis would provide clearer insights into which practices are most effective in promoting OPR.

3. Regional Bias and Lack of Global Perspective

- **Overemphasis on European Publishers:** The study highlights Europe's leading role in OPR adoption, noting that over 60% of publishers and 70% of OPR journals are based in Europe. However, it doesn't adequately address the potential reasons for this concentration. A more nuanced analysis could explore the policies, funding mechanisms, or academic infrastructure in Europe that promote OPR. Additionally, while the United States is noted as showing growing interest, the study does not explore the relative speed

of OPR adoption in other regions, such as Asia or Africa, which could offer a more global perspective on the trend.

- **Underrepresentation of Non-European Publishers:** The discussion could be strengthened by exploring how publishers from outside of Europe and North America are adopting OPR, or why they may be lagging in this area. This would help to contextualize OPR's global spread and its impact on non-Western scholarly communication practices.

4. Superficial Discussion of Transparency Levels

- **Simplified Continuum of Transparency:** The discussion mentions a continuum of transparency levels, ranging from highly transparent models (F1000Research) to limited transparency (Frontiers Media S.A.). While this is a useful framework, the analysis lacks a deeper evaluation of how these levels of transparency actually affect the peer review process. For example, does the increased transparency of open identities and reports lead to better reviews, increased accountability, or greater trust in the publication process? These deeper implications are not explored in detail.
- **Absence of Evidence or Data Supporting Transparency Impact:** The study could have provided data or case studies from the journals mentioned (e.g., F1000Research, BioMed Central) to demonstrate how their OPR practices impact review quality, author satisfaction, or reader engagement. Without this, the continuum presented remains an abstract concept rather than a practically meaningful analysis of OPR’s effectiveness.

5. Vague Recommendations

- **Lack of Specificity in Recommendations:** The recommendations provided are somewhat vague and lack actionable detail. For example, while the suggestion for publishers to make their OPR information more accessible is valid, the discussion does not explain how this could be achieved (e.g., through specific platforms, better communication strategies, or clear guidelines on publishers’ websites). The recommendation for a registry or repository of OPR journals is also somewhat broad; it could be more effective if it provided guidance on what kind of data should be included in such a repository, or how it could be implemented effectively.
- **No Clear Path to Implement Changes:** Although the study identifies the need for a repository of OPR journals, there is no clear roadmap or discussion of the practical challenges involved in creating such a repository. For instance, challenges related to data consistency, journal inclusion criteria, and the maintenance of such a database are not discussed.

6. Limited Engagement with Criticisms or Challenges

- **Failure to Address Challenges in OPR Adoption:** The discussion does not critically address the potential drawbacks or challenges associated with OPR adoption. For example, what are the barriers to more widespread implementation, and how can they be overcome? These could include concerns over reviewer bias, the potential for “gaming” the review process, the impact of transparency on reviewer behavior, or the risks of

opening up peer review to public scrutiny. A more critical engagement with these concerns would make the study's findings more balanced and nuanced.

- **Inadequate Attention to Ethical or Practical Issues:** While the study acknowledges that some publishers have different OPR models, it does not delve into the ethical implications of these differences. For instance, how might journals with limited transparency (e.g., Frontiers Media S.A.) impact the fairness of the peer review process? What are the implications for authors and reviewers who may face bias or reputational risks when their identities are open? Addressing these questions would strengthen the study's critique.

7. Lack of Broader Implications for Open Science

- **Connection to Broader Open Science Movement Not Fully Explored:** While the study briefly mentions the open science movement, it does not adequately explore how OPR fits into the broader picture of open science. For example, how does OPR interact with other open science practices like open access, open data, and open methods? Exploring these connections could help situate the findings within the larger context of open science and scholarly communication.

Suggestions for Improvement:

1. **Provide a More In-Depth Analysis of Adoption Barriers and Regional Differences:** Explore why certain disciplines, regions, or publishers are slower to adopt OPR, and provide more context for the European dominance in OPR.
2. **Enhance the Analysis of Transparency Models:** Discuss how the varying levels of transparency in OPR models impact the review process, and provide data or examples to support the effectiveness of these models.
3. **Strengthen and Specify Recommendations:** Provide more concrete, actionable recommendations for publishers and researchers, with clear suggestions on how to improve OPR adoption and transparency.
4. **Address the Challenges of OPR Implementation:** Critically engage with the challenges and ethical concerns related to OPR, providing a balanced view of the potential drawbacks and how they might be mitigated.
5. **Link Findings to Broader Open Science Trends:** Integrate a discussion of how OPR fits into the larger open science landscape and its potential role in reshaping scholarly communication.

Page 1049: [7] Comment [L7] **Lenovo** **12/6/2024 12:58:00 AM**

The **Conclusion** section of this study has several weaknesses that may limit its overall clarity, impact, and scope. Here are the specific weaknesses identified:

1. Over-Simplified Conclusion

- **Lack of In-Depth Reflection on Implications:** The conclusion broadly states that the adoption of OPR is growing but doesn't provide deeper insights into the broader implications of these findings for scholarly publishing or the open science movement. For example, how will the growth of OPR affect the credibility of research, reviewer accountability, or transparency in scientific publishing? A more reflective discussion on the implications of these trends would strengthen the conclusion.
- **Vagueness in Addressing Future Developments:** The conclusion briefly mentions the future phase of research (examining open report contents using text mining) but does not offer any substantial insight into how this next phase will contribute to or influence the existing body of research. More concrete details on the expected outcomes of this future research could provide a clearer roadmap for readers.

2. Failure to Acknowledge Broader Challenges

- **Lack of Critical Engagement with OPR's Limitations:** While the conclusion touches on the limitations of the study, such as the challenges in identifying OPR journals and the snapshot nature of the data (as of 2019), it does not fully engage with the broader challenges or criticisms of OPR adoption. For example, issues such as reviewer bias in open review, the risk of reputational damage for reviewers, or the potential for undermining scientific rigor with poorly executed OPR systems are not addressed. These challenges need to be explicitly mentioned to provide a balanced view of the state of OPR.
- **Overlooking Ethical Considerations:** There is no mention of the ethical implications of making peer reviews and reviewer identities open, such as concerns over privacy or the possibility that some reviewers may alter their assessments due to the visibility of their identities. These ethical challenges are crucial to a holistic understanding of OPR.

3. Weak Link to the Broader Open Science Movement

- **Limited Connection to Open Science Principles:** While the conclusion touches on the growth of OPR and its impact on scholarly publishing, it does not sufficiently connect these developments to the broader goals and principles of the open science movement. How does OPR contribute to the democratization of knowledge, or to the potential for increasing scientific reproducibility and trust? The study could do more to relate its findings to these larger open science objectives.
- **Failure to Explore Wider Academic or Policy Impacts:** The study misses an opportunity to discuss how OPR adoption might affect academic policies or funding decisions. For instance, if more journals adopt OPR, how might this influence funding agencies, academic institutions, or other stakeholders in the research ecosystem?

4. Overemphasis on Methodological Limitations

- **Limited Depth in Addressing Study Limitations:** While the conclusion acknowledges some methodological limitations (e.g., the potential for missing journals and the snapshot nature of the study), it focuses primarily on the difficulties encountered during data collection rather than offering a deeper reflection on the implications of these limitations

for the generalizability of the study's findings. For example, the conclusion could explore how the rapid evolution of OPR adoption might make it difficult to draw definitive conclusions from a study that only includes data up to 2019. Additionally, a discussion of how these limitations could be addressed in future studies (beyond the future phase mentioned) would strengthen the section.

- **Absence of Discussion on Sample Bias:** There is a brief mention of the possibility of "regional or language bias" in the identification of OPR journals, but this is not explored in detail. The absence of a clear strategy for overcoming this bias in future research is a missed opportunity. A deeper analysis of how language, geography, and publishing culture influence OPR adoption could enrich the conclusions and provide more avenues for future inquiry.

5. Recommendations for Future Research Are Vague

- **Unclear Next Steps in Research:** The conclusion mentions that the next phase of the research will involve examining open report contents using text mining but provides no details about what specific research questions will be addressed or how text mining will be applied. The reader is left with an unclear sense of what the next steps will entail. A more detailed roadmap for the next phase of research, including specific hypotheses or anticipated outcomes, would make the conclusion stronger and more engaging.
- **Lack of Exploration of Alternative Approaches:** Although the conclusion references the next research phase, it doesn't discuss alternative methodologies or perspectives that could be used to explore OPR in more depth. For instance, qualitative interviews with authors, reviewers, and editors could provide valuable insights into the real-world implications of OPR practices, yet this approach is not considered.

6. Underdeveloped Recommendations

- **No Strong Actionable Recommendations:** While the study acknowledges the limitations of the research, it does not provide actionable or strategic recommendations for improving the adoption or transparency of OPR. For example, publishers could be advised on how to standardize OPR practices or improve accessibility of OPR information. There is also no recommendation on how to address the challenges of incomplete transparency in some OPR models. More concrete steps could be suggested for the scholarly community to enhance the effectiveness of OPR adoption.

7. Lack of Contextualization of OPR's Role in Scholarly Publishing

- **Failure to Frame OPR's Role in the Broader Publishing Landscape:** The conclusion does not address how OPR fits within the broader context of scholarly publishing reform. For example, what role does OPR play in addressing issues like publication bias, the reproducibility crisis, or increasing the accountability of academic publishers? Without this broader framing, the conclusion feels disconnected from ongoing debates in academic publishing.

Suggestions for Improvement:

1. **Enhance the Critical Discussion of OPR's Challenges:** Address the potential ethical, practical, and methodological challenges of OPR, and provide a more balanced discussion of its limitations.
2. **Expand on the Implications for Open Science and Scholarly Publishing:** Connect the findings more explicitly to broader trends in open science and scholarly publishing reform.
3. **Provide Clearer and More Actionable Recommendations:** Offer more specific and practical recommendations for publishers, researchers, and policymakers to improve OPR practices.
4. **Clarify the Next Phase of Research:** Provide a clearer and more detailed description of the next phase of the study and how it will build upon the current research.
5. **Address Potential Bias in Data Collection:** Acknowledge and propose solutions to the challenges related to regional and language bias in identifying OPR journals.

Page 1052: [8] Comment [L8] **Lenovo** **12/6/2024 1:00:00 AM**

Weaknesses of the references section:

1. **Outdated References**: Many of the references date back several years, with some as old as 2006 or 1998. This may limit the relevance of the sources, especially in a rapidly evolving field like open peer review (OPR). More recent publications and studies could provide a more up-to-date understanding of current trends, innovations, and challenges in the OPR landscape.
2. **Lack of Peer-Reviewed Sources**: Some references are from non-peer-reviewed platforms such as blogs or company websites (e.g., "Wiley blog" and "Elsevier Connect"), which may not always be authoritative or as reliable as peer-reviewed journal articles. Relying on a wider range of peer-reviewed sources would strengthen the credibility of the references.
3. **No Clear Citation Style Consistency**: The references are inconsistent in terms of formatting (e.g., missing capitalization in titles, inconsistent citation of websites, or journal volumes and pages). This lack of standardization may detract from the professional presentation and make it difficult for readers to follow or verify sources efficiently.
4. **Unclear Access to Some Sources**: Some sources are linked to external websites or PDFs that may no longer be accessible or available in the same format (e.g., "https://core.ac.uk/download/pdf/158312603.pdf"). This can pose challenges for readers who wish to verify the references or access the full content.
5. **Insufficient Information on Some Citations**: A few references are missing key details such as publisher information, volume/issue numbers, or DOI numbers (e.g., "Wiley (2020)"). This could create difficulties for readers trying to track down specific references.
6. **Regional and Language Bias**: As noted in the article itself, there might be bias in identifying OPR journals based on regional or language limitations. The references do not seem to fully address this limitation, and it could be argued that additional sources from a global range of publishers or languages could be included to reduce potential biases.

7. **Potential Conflicts of Interest**: Some of the references come from well-known publishers and commercial organizations (e.g., Elsevier, Wiley). This could raise concerns about potential biases or conflicts of interest, especially in a discussion about transparency and the openness of the peer review process.
8. **Over-representation of Specific Publishers**: A number of references focus on specific publishers (e.g., Wiley, Elsevier), which might skew the perception of OPR practices toward these organizations' models. Including studies and references from a broader range of publishers could offer a more balanced view.