

Additional experiments required: A scoping review of recent evidence on key aspects of Open Peer Review

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Abstract

Diverse efforts are underway to reform the journal peer review system. Combined with growing interest in Open Science practices, Open Peer Review (OPR) has become of central concern to the scholarly community. However, what OPR is understood to encompass and how effective some of its elements are in meeting the expectations of diverse communities, are uncertain. This scoping review updates previous efforts to summarize research on OPR to May 2022. Following the PRISMA methodological framework, it addresses the question: “What evidence has been reported in the scientific literature from 2017 to May 2022 regarding uptake, attitudes, and efficacy of two key aspects of OPR (Open Identities and Open Reports)?” The review identifies, analyses and synthesizes 52 studies matching inclusion criteria, finding that OPR is growing, but still far from common practice. Our findings indicate positive attitudes towards Open Reports and more sceptical approaches to Open Identities. Changes in reviewer behaviour seem limited and no evidence for lower acceptance rates of review invitations or slower turnaround times is reported in those studies examining those issues. Concerns about power dynamics and potential backfiring on critical reviews are in need of further experimentation. We conclude with an overview of evidence gaps and suggestions for future research. Also, we discuss implications for policy and practice, both in the scholarly communications community and the research evaluation community more broadly.

Keywords: peer review; scoping review; open peer review; open science.

1. Introduction

Diverse efforts are underway to reform the journal peer review system (Tennant et al. 2017; Kaltenbrunner et al. 2022). In combination with a growing interest in Open Science practices, Open Peer Review (OPR) has become of central concern to multiple stakeholders within the scholarly communication process. However, what Open Peer Review is understood to encompass and how effective some of its elements are in meeting the expectations of the peer review system, is uncertain. In 2017, Ross-Hellauer (2017) performed a systematic review to summarize research on OPR to date. Since 2017, major steps have been taken to further implement Open Science practices, also affecting the discourse on OPR. The aim of the current study is to update the efforts in the previous systematic review, using the PRISMA methodological framework (<http://www.prisma-statement.org/>). We thereby strive to establish an overview of current knowledge that may inform best practices on OPR.

1.1 Background

In 2017, Ross-Hellauer (2017) published a systematic review of definitions of Open Peer Review. The review found a total of 122 definitions of OPR and identified three core elements (see Box 1).

Of those elements, Open Identities and Open Reports were the traits most often identified under the term. The review also synthesized evidence-to-date on efficacy and uptake of Open Peer Review. Since that time, Open Peer Review has seen increased uptake and debate on its efficacy (Wolfram et al. 2020).

The 2017 review identified the following potential benefits and problematic aspects of OPR, noting that evidence for most of these was incomplete or entirely lacking. Proponents of peer review with Open Identities argue that this system will enhance accountability and transparency, potentially leading to a decrease in (undisclosed) conflicts of interest and less uncivil interaction during peer review (van Rooyen et al. 1999). Because reviewers would be more motivated to invest time in review, Open Identities would arguably lead to higher quality reviews (Ford 2013). In addition, Open Identities provide a means to credit reviewers for their efforts. Alternatively, opponents of this review format argue that signing reviews will lead to poorer quality reviews, as reviewers would be less inclined to be critical to avoid causing offence (McNutt et al. 1990).

Proponents of systems incorporating Open Reports argue that the long-term availability of reports will facilitate increased scrutiny of the review process, adding another layer of quality assurance (Peters and Ceci 1982). Especially when combined with a system of Open Identities, publishing reports would contribute to raising the recognition and reward of the work of peer reviewers (Hanson et al. 2016). In addition, publishing review reports along published papers could serve as a way of demonstrating the editorial work done by a journal, thereby acting as a quality seal, allowing legitimate journals to distinguish themselves from illegitimate (viz. ‘predatory’) journals (Al-Khatib 2016). Finally, Open Reports was speculated to provide junior scholars or those inexperienced in performing peer review a guide to support them in writing their reports, e.g. concerning appropriate tone, length, and formulation (Ross-Hellauer 2017).

Box 1. Attributes of Open Peer Review according to [Ross-Hellauer \(2017\)](#).

Core elements of Open Peer Review

- Open identities: Authors and reviewers are aware of each other's identity
- Open reports: Review reports are published alongside the relevant article.
- Open participation: The wider community are able to contribute to the review process.

Others are afraid that such a system will lead to more difficulties with finding suitable reviewers ([van Rooyen et al. 1999](#)) and could potentially increase time taken for reviewers to write their report ([van Rooyen, Delamothe and Evans 2010](#)), thereby further decelerating the already slow review process and/or increasing the burden on reviewers. In addition, just as with the system of Open Identities, the risk that Open Reports could lead to more cautious reviews and reviewers being less critical of the reviewed content has been voiced by several commentators (e.g. [Ford 2013](#); [Cosgrove and Flintoft 2017](#); [Tennant et al. 2017](#)).

Despite a wealth of opinions and claims, the evidence-base against which to judge such arguments was, at the time of writing the previous review, not large enough to enable strong conclusions. Hence, while proponents and critics have voiced ample and sometimes strong opinions, the extent to which these materialize in practice is still largely unknown. In the time since the previous review, our awareness of diverse new studies, combined with perceptions of growing uptake, made a new synthesis of evidence relating to these themes seem worthwhile. The aim of this study is to update the 2017 review regarding evidence on the two central aspects of OPR, Open Identities and Open Reports, in order to orient research communities (including authors, reviewers and editors), publishers and others on the general state of evidence across a range of factors, and to provide meta-researchers with an overview of continuing evidence gaps and suggestions for priority areas for further investigation.

The main research question is “What evidence has been reported in the scientific literature in the period 2017 to May 2022 regarding uptake, attitudes, and efficacy of two key aspects of Open Peer Review (Open Identities and Open Reports).¹

2. Methodology

The review is guided by the methodological frameworks proposed by the PRISMA Extension for Systematic Reviews (PRISMA). The work was structured according to the following five steps: (1) Identifying the research question, (2) Identifying relevant studies, (3) Selection of eligible studies, (4) Charting the data, and (5) Collating and summarizing the results, including an assessment of their limitations.

2.1 Identifying the research question

We used the PRISMA framework to align study selection with the research question and followed the relevant aspects of the PRISMA framework for Systematic Reviews (PRISMA) to ensure thorough mapping, reporting and analysis of the literature. This scoping review aimed to gather evidence from the literature from 2017–22 on attitudes towards, uptake of and efficacy of the three core elements of Open Peer Review: Open Identities, Open Reports, and Open

Participation (although, for the reasons above stated, results for Open Participation are not reported here).

2.2 Identifying relevant studies

Search was conducted for published peer reviewed material and grey literature on the research area from January 2017 to the 19th May 2022. The search was limited to articles published in English. The authors developed a search strategy to conduct a query of electronic databases (Scopus and Web of Science) for citations and literature using relevant keywords. Note that the databases used only search in titles, abstracts and keywords, rather than full texts. Search parameters were identified through iterative test searching. [Table 1](#) lists key terms and synonyms for OPR elements. These terms were combined into the queries for Scopus and Web of Science ([Table 2](#)).

Database search was then accompanied by “snow-balling” and web search:

- **Snowballing:** We used the articles marked as ‘highly relevant’ by either of the coders in the initial search to initiate the snowballing. Studies were marked as ‘highly relevant’ when they were relatively large-sample empirical studies specifically targeting any of the core elements of OPR. Using Web of Science we gathered all citations to these articles, finding 78 unique articles. 18 of these were already present in our sample. For the others, we performed a scan based on title and abstract to check for relevance, finding 15 to be potentially of interest. In addition, we checked all references in the highly relevant papers (again in Web of Science) published after 2017. Based on titles and abstracts, we only found one article that was potentially of interest and not yet included in our sample. This hence resulted in a sample of 16 articles. We added these to a separate folder in Zotero and performed the scoring in the same way as we did before, on a new sheet in the Google spreadsheet. In the end, two articles/reports turned out to meet all inclusion criteria for our review. This snowballing search was conducted by one of the authors (SH).
- **Web search:** In addition, web search-engines and other sources were used to identify strongly relevant grey-literature from bodies likely to have produced relevant reports, including: Google Scholar, Google Books, EU

Table 1. Key terms and synonyms for OPR elements

Terms	Alternatives/synonyms
Open Peer Review	transparent review, open review
Open Identities	signed review, unblinded review, non-anonymous review, non-blinded review
Open Reports	published review
Open Participation	peer-to-peer review, community review, public review

Table 2. Search strings used for searching in scientific databases Scopus and Web of Science

Database	Search string
Scopus	TITLE-ABS-KEY ((“open peer review” OR “transparent peer review” OR “open review” OR “transparent review”) OR (“peer review”) AND (“signed” OR “unblinded” OR “non-anonymous” OR “non-blinded” OR “open identities” OR “transparent identities” OR “published review” OR “open reports” OR “peer-to-peer review” OR “community review” OR “public review”))) AND PUBYEAR > 2016 AND (LIMIT-TO (LANGUAGE, “English”))
Web of Science	(TS=(((“open peer review” OR “transparent peer review” OR “open review” OR “transparent review”) OR (“peer review”) AND (“signed” OR “unblinded” OR “non-anonymous” OR “non-blinded” OR “open identities” OR “transparent identities” OR “published review” OR “open reports” OR “peer-to-peer review” OR “community review” OR “public review”)))) AND PY=(2017–22)

Publications Office, National Academies of Science, publishers and publisher associations, contributions to the PEERE conference, Science Europe, OECD, UN/UNESCO. European University Association, Sense about Science, Committee on Publication Ethics, ASAPbio, and Publons. This web search was conducted by one of the authors (TRH).

2.3 Selection of eligible studies

Title and abstract screening was guided by the PRISMA framework, with specific eligibility criteria applied to ensure relevance for the study and its research questions. The selection process followed the recommendations in the Preferred Reporting Items for Systematic Reviews PRISMA 2020 checklist and mapped using the PRISMA 2020-flowchart. The following inclusion criteria were used:

- Articles on uptake, attitudes, and efficacy of any of the three core elements of OPR
- Conducted internationally or nationally
- Published from 1 January 2017 until 19th May 2022
- Available in English
- Full-text available
- Study is a research article, review article, commentary article, editorial, conference paper, or other peer-reviewed article²
- Study is a grey-literature report from a recognized stakeholder
- All types of methodology (quantitative, qualitative, mixed, etc) are eligible

Results (title/abstract) were screened by both authors. If at least one assessed an item to be of relevance, it was included (50% necessary percentage agreement). If not, the study was excluded (and reasons detailed). Results from each database search, and from manual searches, were exported to a single library in the Zotero open source software. Full-texts of the relevant studies were then sought. All reasonable attempts

were made to obtain full-text copies of selected articles (e.g. via inter-library loans or contacting the authors). Where this was not possible, the study was excluded and the reason recorded. The screened articles, together with any literature identified via snow-balling and grey-literature search, was then de-duplicated. A master shared spreadsheet (Google Sheets) was used to keep track of the status of all studies, and for data collection (see below). In a next stage enhanced checking of full-texts by at least one author (with regular inter-author checks on criteria and discussion of edge-cases) determined: (1) whether full-text reveals the article to be ineligible; and (2) to which research sub-questions the article was relevant (ie which core element of OPR was addressed and whether the article contained information on attitudes, uptake and/or efficacy).

Edge-cases of studies that appeared to meet criteria for inclusion criteria, but which were disputed were discussed between authors until consensus decisions were reached. Reasons for all excluded studies are given in the dataset (<https://doi.org/10.5281/zenodo.10540827>), with a specific reference to the edge-cases.

Full-texts were then allocated for data-extraction to one or other author, based on the study’s main relevance to the particular aspects of OPR for which each author would lead.

2.4 Extracting the data

We used a data-extraction form (included as fields in the master Google Spreadsheet) to extract the relevant information from each included study. Table 3 describes each field and the types of information extracted under those headings.

Apart from extracting the relevant data from studies, the following parameters were observed at this stage, all of them independently assessed by both authors with a consensus procedure in case of disagreement:

- **Bias:** We included an optional item to note risk of bias in individual studies, e.g. in terms of sample composition. Any major concerns were noted in the narrative description of the study along with our assessment of their implications.
- **Data synthesis:** As anticipated, the studies were very heterogeneous and not suitable for data synthesis. Hence, no supplementary analysis of synthesized data was performed. However, wherever comparable data is gathered this is reported in a summative way, including noting effect sizes and possible contradictions. Examples of the latter include studies that build on each other or use similar survey instruments.
- **Meta-bias(es):** No specific assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies) was conducted, because the level of evidence on OPR is not sufficiently well developed to allow such analysis.

2.5 Collating, summarizing, and reporting the results

We compiled results from data-extraction of all full-texts using the Google Spreadsheet, which are available via Zenodo (<https://doi.org/10.5281/zenodo.10540827>). Responsibility for writing up the narrative report summarizing the extracted data was then assigned between authors. During writing, it was decided that evidence regarding uptake more naturally

Table 3. Main elements of data-extraction form used to extract data from assembled literature

Data chart heading	Description
Author	Name of author/s
Date	Date article sourced
Title of study	Title of the article or study
Publication year	Year that the article was published
Publication type	Journal, website, conference, etc.
Source title	Name of journal/book/platform
DOI/URL	Unique identifier
Study details and design (if applicable)	Type of study, empirical or review, etc. Notes on methods used in study (whether qualitative or quantitative, which population demographics studied, etc.)
Reason for exclusion	If relevant, explanation of why article is not included in our study
Study aims	Overview of the main objectives of the study
Relevance to which OPR element	Records whether relevant to Open Identities, Open Reports, and/or Open Participation
Evidence of uptake, attitudes, efficacy	Uptake: Study reports evidence regarding degrees to which relevant aspects of OPR are in use at publication outlets Attitude: Study reports evidence regarding the feelings and dispositions of relevant actors towards the studied aspects of OPR Efficacy: Study reports evidence regarding the effects of relevant OPR aspects upon peer review processes or outcomes, including efficiency, inclusivity and quality of peer review. Multiple: Study is relevant to two or more of these three factors
Types of data sources included	Detail the data sources
Key findings	Noteworthy results of the study that contribute to the systematic review question(s)
Prioritization	Assessment of importance of results for scoping review (high/medium/low)
Bias assessment	Optional field to note any concerns about bias at the outcome or study level, or both

suited a combined consideration at the start of the results section. Hence, we decided to collate evidence on uptake in a separate section, rather than discussing it in relation to each of the individual OPR traits. Drafts of materials were regularly reviewed by both authors. Following the narrative summarizing of all studies, a table was constructed listing the main statements on aspects of OPR encountered in the literature. For each statement, we assessed whether it was supported or contested by the available data. Statements for which the available studies come to mixed or diverging conclusions, are marked as ‘unknown’. In addition, we assessed the level of evidence for each statement on a three-point scale, based on the number and size of the studies addressing the statement: level one in case of only few, small-scale studies; level two in case of studies addressing multiple journals or contexts; and level three in case of total study samples spanning various contexts providing some generalisability of the findings. These assessments were done in discussion between both authors until consensus was reached.

Our reporting on these results deviates in two significant ways from the aims originally stated in our pre-registered protocol (<https://osf.io/dvhxt/>):

- **Study is a scoping, not systematic, review:** The study was originally foreseen to follow the PRISMA protocol for systematic reviews. Munn et al. (2018) advise that while systematic reviews should offer a “critically appraised and synthesised result/answer to a particular question,” scoping reviews “rather aim to provide an overview or map of the evidence.” However, in attempting to synthesize findings from the diverse range of studies assembled, and noticing the diversity and limitations of this evidence, it became clear that the broader “Scoping Review” methodology better suits the aims of the study to scope literature pertaining to a range of factors of uptake, attitudes and efficacy (across a range of dimensions).

- **Results pertain only to Open Identities and Open Reports, but not Open Participation:** As signalled above, we do not include results regarding Open Participation within the main study findings. Doubts raised by the low number of studies identified on this topic during searching were later confirmed by colleagues who reviewed earlier manuscript drafts and conveyed concerns that by omitting “pre-print review” and its cognates, the assembled literature potentially overlooked many studies which may apply to Open Participation (since having early versions openly available as preprints is a clear way of enabling Open Participation processes in review). Recognizing this error at a later stage in our study, we had to decide whether to go back and systematically identify, chart and synthesize this extra literature. However, since the manuscript synthesizing the literature already identified was already very long, we have instead decided that the best course is to streamline the study by reporting only on evidence regarding Open Identities and Open Reports. We feel this led to a more easily readable manuscript, though it reduces its scope. As the evidence on Open Participation turned out to be so thin, we feel this reduction of scope is only minimal. We encourage future work to authoritatively chart the evidence regarding Open Participation processes. To assist this, we nevertheless publish our process and synthesized findings for the literature we did identify as part of the [supplementary material](#) to this study ([Supplementary data S1](#)).

3. Results

3.1 Quantitative summary

Via database searching, snowballing and free-searching techniques, 57 distinct studies were identified as relevant to the current review (Figure 1). We next report the findings extracted from this literature, organized according to the

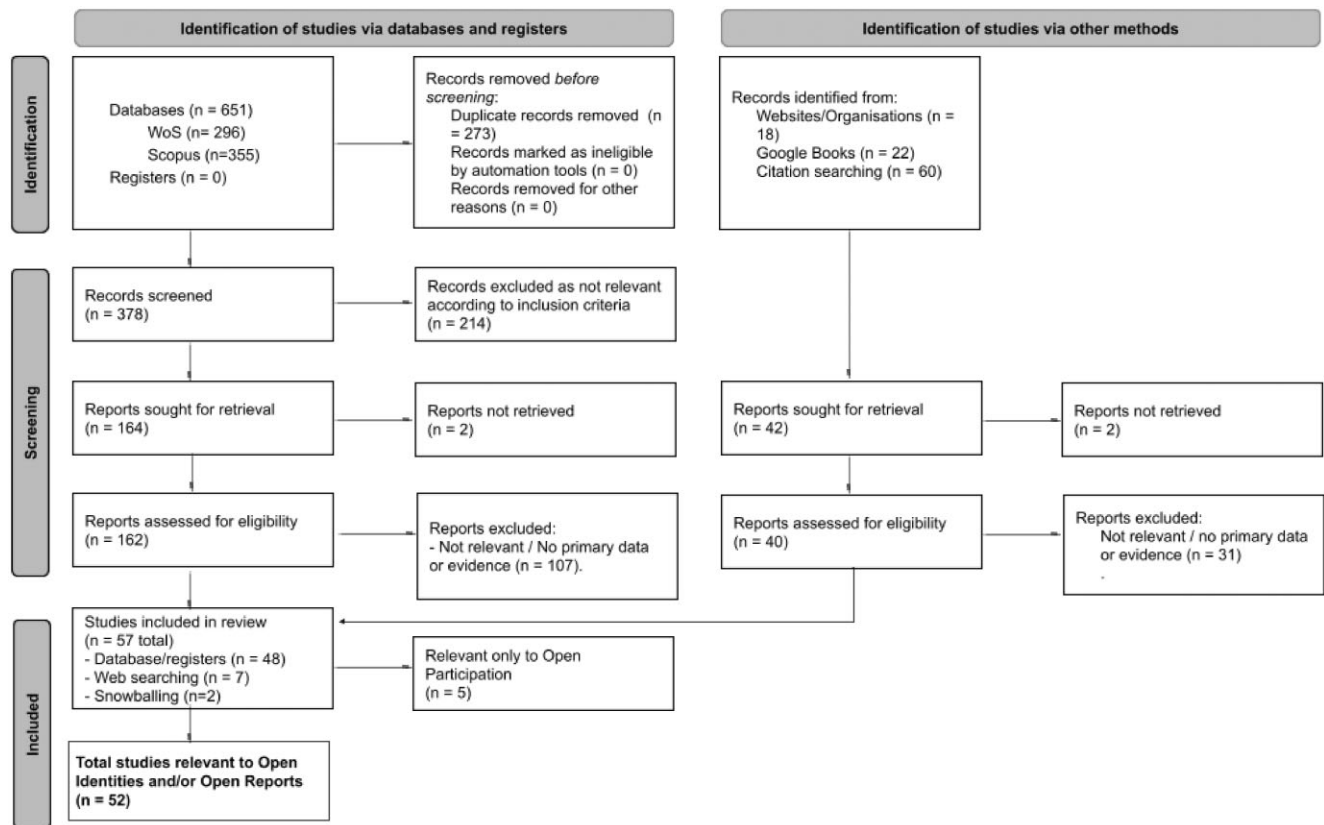


Figure 1. PRISMA diagram showing the literature searching and scoping process. Adapted from Page et al. (2021).

respective elements of OPR, but beginning with a general section on uptake/general observations that considers the evidence related to both Open Identities and Open Reports.

3.2 Uptake and general observations

The most complete analysis of uptake is (Wolfram et al. 2020).³ In that study, the authors combined data from multiple sources to identify 617 OPR journals which had published at least one article with Open Identities and/or Open Reports. Starting from 38 journals practising some form of open identities/reports OPR (mandatory or optional) at the turn of the century, adoption had grown steadily, rising more sharply since 2017. Adoption was most prevalent in medical and natural science disciplines (accounting for 79.9% of identified journals). However, just five publishers were responsible for more than four-fifths (81%) of identified journals. The authors noted that the ways in which Open Identities and Open Reports were combined, as well as differences in what was made transparent at what stage of the process, resulted in very different levels of transparency amongst the journals observed. Only a “minority” of journals (not further specified) achieved complete transparency, with most journals achieving only partial transparency, ie only transparent to some actors or only at a later stage in the process. However, the authors were transparent in reporting their difficulties in compiling their data, and advised that especially where sources were not indexed in databases, some journals may have been missed, possibly resulting in “regional or language bias”. Estimates of total scholarly journals vary but could be as high as 50,000 or more (Tenopir 2004). If so, the 617 OPR journals identified by Wolfram et al. would

constitute just 1.2% of the total. Even taking a far more conservative number, total active journals indexed by Scopus (22,000 journals), which certainly excludes many thousands of titles (especially from the Global South countries), would still only mean OPR models account for 2.8% of the total.

However, in line with our recognition that OPR is a diverse phenomenon, depending on the definition used, numbers differ. In radiology, nuclear medicine and medical imaging”, (Kwee, Adams and Kwee 2020) found 1.7% of journals used a form of OPR. A survey of 193 journals in Public, Environmental and Occupational Health by (Barbaro, Napolitani and Barbaro 2021) found 4.8% employed a form of OPR.

Parks and Gunashekar (2017), reporting on data compiled from Publons for the European Commission’s “Open Science Monitor”, concluded that of 3,700 journals with review policies tracked by Publons, 3.5% allowed Open Identities, while 2.3 allowed Open Reports. This varied (between 1 and 6%) by field, with fields like natural sciences achieving a higher rate. The difference here is perhaps that although Wolfram et al. used a definition that identities were published, Parks and Gunashekar included journals which had policies of revealing reviewer identities to authors, but not then necessarily publishing those identities alongside the paper. Note, however, that (Wang and Tahamtan 2017) examined 155 journals with an Open Identities policy, where the majority (92.3%) made it mandatory for reviewers to either be identified or to sign their reports, with 5.2% making this decision optional.

However, it is important to realize that even in “closed” systems, reviewers may choose to sign their names within the

report text. Although often the editors may remove this information before passing reviews to authors, many will not. If we hence include journals which (often informally) allow (not necessarily encourage) a system of allowing reviewers to reveal their identities in otherwise anonymized systems if they wish, the number of “OPR journals” is likely much higher. [Hamilton et al.’s \(2020\)](#) survey of 322 ecology, economics, medicine, physics and psychology journal editors found that “55 editors (18%) of blinded journals reported that reviewers are free to reveal their identities to authors if they wish.” Hence, this would be a kind of “optional”, unflagged “opt-in” Open Identities peer review. Considering such sometimes informal arrangements as variants of OPR would significantly increase estimates of “OPR journals”.

These figures mean, then, that depending on whether we use a strict or liberal definition, OPR involving some combination of Open Identities and/or Open Reports is only practised as formal policy at between 1 and 5% of journals, but that informal practices of allowing reviewers to sign would increase these numbers greatly. However, the conclusion must be that despite increased uptake and attention in recent years, OPR remains far from the norm.

3.3 Open Identities

3.3.1 Attitudes

Attitudes are generally very sceptical towards Open Identities. [Ross-Hellauer, Depe and Schmidt’s \(2017\)](#) survey of authors, editors and reviewers ($n = 3,062$) engaged in scholarly communication, targeted via various channels found Open Identities to be the least favoured of all OPR traits, with 50.8% thinking it would make peer review “worse or much worse”. Summarizing free-text responses, the authors advised this “seems to reflect persistent concerns that opening reviewer identities will lead to a lack of control. In particular, protection from undue influence, making it more difficult for particularly junior researchers to give candid feedback for fear of possible reprisals from aggrieved authors”. In addition, respondents to the study strongly believed (73.9% agree/strongly agree) that where Open Identities were in place, it should be optional, and that making it mandatory would discourage reviewers from reviewing (67.2% agree/strongly agree).

This general picture is validated in similar studies. Using the same survey instrument, ([Fontenelle and Sarti 2021](#)) surveyed 151 stakeholders (society members, authors, reviewers and readers) of a Brazilian medical journal. The authors found that Open Identities received least support amongst all OPR elements, with no more than a fifth of any stakeholder group supporting it (despite more than half of respondents believing that Open Identities would improve review quality). [Rodríguez-Bravo et al. \(2017\)](#) conducted interviews with 116 early-career researchers across disciplines and found much greater support for anonymization than for Open Identities, which was characterized as “dangerous”, “risky”, and rife with risks of “unwanted effects”. Qualitative work by ([Rath and Wang 2017](#)) indicated that although four out of seven interviewees signalled their willingness to sign reports, concerns regarding potential backbiting were common among respondents. In software engineering, one survey ($n = 203$) found that only 14% chose Open Identities as their first preference regarding levels of anonymization in review ([Ernst et al. 2021](#)). In the same discipline, ([Prechelt, Graziotin and Fernández 2018](#)) found around a third of respondents

“believe reviewers ought to give up their anonymity and sign their reviews”, however. A small qualitative survey of authors and reviewers in Human Computer Interaction ([Besançon et al. 2020](#)) found that 14 of 30 respondents (46.7%) “expressed concerns that reviewers might fear being truly critical and, consequently, self-censor their reviews”, while 13.3% worried that negative reviews might result in retaliation.

In biomedical disciplines, however, ASAPbio’s survey of self-selecting respondents (i.e., drawn from an open invitation to all users of the platform and through social media channels, resulting in a sample with overrepresentation from US/Europe and Life Sciences) reported that 42.8% of 285 respondents thought Open Identities should be more widely used ([Polka 2018](#)). In oncology, [Käsmann et al. \(2021\)](#) found via a survey ($n = 281$) that double-anonymous was preferred by 70% of respondents (single-anonymous 16%, Open Identities 14%). In microbiology, [Howat and Clark \(2021\)](#) found that 43% of respondents “would always be happy to provide their name to their review”, with just 17% preferring blanket anonymity and 40% favouring sometimes remaining anonymous. No difference in attitudes between junior and senior researchers was found. Most common reasons given for preferring anonymity, in line with other studies, were perceived risks related to criticising senior researchers, avoiding future conflict, and concerns that signing reviews might compromise review quality.

Three studies addressed the issue of Open Identities in the social sciences and humanities (SSH), finding some discipline-specific attitudes. [Karhulahti and Backe \(2021\)](#) performed a semi-structured interview study of SSH journal editors. Noting that OPR is rare in SSH, the authors reported that double-anonymous peer review remained “the gold standard”, perceived as “ethically superior due to the protection it provides”. Again, concerns over blunted criticisms and discouraging researchers from reviewing were primary concerns, but the authors importantly noted that these concerns were particularly pronounced in smaller academic communities. In journals of smaller regional/disciplinary scope, smaller reviewer pools mean that anonymization is thought necessary to overcome conflicts of interest. Even though more valued within SSH, however, double-anonymous is clearly no panacea. A Committee on Publication Ethics (COPE) survey of 656 SSH editors reported 48% considered upholding reviewer and author anonymity as amongst the most widespread issues they faced ([Committee on Publication Ethics 2019](#)). Finally, and more optimistically for Open Identities in SSH, ([Kulczycki et al. 2019](#)) investigated scholarly book publishing in Central and Eastern Europe, reporting that Open Identities is actually a common practice amongst publishers in that region, where reviewer names are usually published on the editorial page and function as “a type of certificate” to “confirm that monographs were peer-reviewed”.

Finally here, we can also observe important geographical/demographic considerations. While most studies are conducted among participants from the US and Europe, some studies specifically target other populations and reflect on the impact of geographical differences. ([Hodonu-Wusu, Noorhidawati and Abrizah 2021](#)) surveyed Malaysian researchers and found that although respondents tended as authors to see Open Identities as “fairer”, nonetheless a majority believed it somewhat true that as reviewers, Open Identities would discourage strong criticisms. [Gownaris](#)

et al.'s (2022) survey of 32 early-career researchers reported similar concerns regarding Open Identities as described above. The authors, however, further highlight the importance of cultural factors, arguing that “OPR may suit ‘Western values’ better than regions where ‘saving face’ is an important cultural value”.

3.3.2 Efficacy

Studies addressing the efficacy of revealing reviewer identities can be grouped under two broad headings: (i) reviewer behaviours and demographics with regard to willingness to reveal identities, and (ii) effects of opening identities upon the content of reviews.

From the above, we have seen that researchers are largely sceptical of Open Identities, and that in many cases where it is implemented it remains optional for the reviewer to do so. Studying these cases allows us to observe demographic differences in who chooses to engage in this format. Fox (2021) reported that amongst reviewers at the journal *Functional Ecology* (where reviewers were given the option to “opt-in”),⁴ only 5.6% of reviewers chose to sign their reviews. Fox found marked differences according to gender, with men 2.2 times more likely to do so (6.3% of men, compared to 2.9% of women; effects more or less consistent over time). In addition, seniority of reviewers was a factor: “Reviewers that self-identified as ‘Professor’ were 1.6 times more likely to sign their reviews than those that self-identified as ‘Dr’”. However, the geographic location of the reviewer did not influence results significantly. The decision to sign seemed also strongly linked to the content of the review. Of reviewers who reviewed more than one submission for the journal, most who signed did not do so all the time, tending to sign reviews in which they scored the quality of the assessed manuscript higher.

Bolek et al. (2020) studied 343 review reports from European Scientific Journal (ESJ), a journal operating single-blind review with optional Open Identities. They report that in their journal, when given the choice, around half of reviewers chose to reveal their names (much higher than other studies report). Note that the reviewer’s choice was framed as to “opt out” (“They could approve to reveal their names, reject such option, or do not prefer to answer to the question”) rather than “opt in” (as in, e.g. Fox 2021). Hence, framing of options seems to also play a role in uptake. Gender differences were again prevalent: men (59%) chose to reveal their identities much more than did women (33%). Note, however, that the authors did not control for potential confounding factors, such as level of seniority, and so we cannot determine the extent to which these gender differences reflect a causal effect, or just a correlation based on confounding factors. Regarding other demographics though, the study showed that reviewers from “developing” countries chose to reveal their identities slightly more often than those from “developed” countries (52.5% and 45% respectively).

In line with these findings, Bravo et al. (2019) found that at five Elsevier journals (disciplinary fields not specified) only a “small minority” (8.1%) opted to have their names published alongside reports, and that those reviewing positively were “noticeably” more likely to opt to sign. The authors posit this to be “a self-selection process”, with those reviewing positively “more keen to reveal their identity later as a reputational signal to authors and the community”.

Hence, status effects seem linked to who chooses to reveal their identities, likely heavily related to concerns over repercussions or anticipated benefits of increased visibility as discussed by (Sacco et al. 2020). The actual evidence for such repercussions is limited, however—more supposition and anecdote than evidence (likely linked to the difficulties of quantifying such phenomena). However, Bianchi and Squazzoni (2022) constructed an agent-based model⁵ simulating reviewer behaviour regarding Open Identities under different levels of competition in the scientific system. Their results found that Open Identities “can induce scientists to play direct reciprocity strategies. In conditions of high competition, these “tit for tat” reviewer reciprocity strategies were found to increase publication bias to as high as 70%. In addition, in the model, Open Identities was found to be “more demanding in terms of resources at a system level” (~10% more than anonymized peer review). The authors hence conclude that the results “suggest that if referees are sensitive to competition and status, the transparency achieved by open peer review could backfire on the quality of the process.” While interesting, the authors admit such a modelling exercise remains “abstract and theoretical”, and so it seems essential that further research should examine the extent to which these forces are actually at play in real world implementations of Open Identities.

Another cluster of research examines whether reviewers behave differently when reviewing openly, especially as regards publication decisions and the content of reviews.

Perhaps most crucially, although we saw above that reviewers are more likely to sign when reviewing positively, this seems not to mean that Open Identities lead to generally more positive reviews overall. In line with the foregoing, Bolek et al. (2020) also found average review scores were higher when reviewers signed (average 3.06) than when they did not (avg. 2.62), and that reviewers were more likely to reveal identities when recommending acceptance of the paper. However, the average score across all reviews (signed and unsigned) of 2.94 was almost exactly the same as the average score from reviews conducted before the Open Identities option was made available. Hence, this study offers valuable evidence that indeed making reviewer identities optionally open does not affect average scores *per se*, but that when reviewers are scoring more highly, they are more motivated to reveal their identities.

Indeed, rather than leading to more fawning reviews, in one agent-based model (Radzvilas et al. 2022), Open Identities increased “effort expenditures” under Open Identities if reputational boosts were assumed to accrue to those reviewing more stringently. That is, there were heavier incentives for reviewers to “require high levels of effort [from authors] before they recommend acceptance” (although effects were variable depending on other factors). Hence, the authors surmised that Open Identities may raise author effort in submitting/revising manuscripts and so increase the quality of publications.

As detailed in our below section on combined Open Identities and Reports, however, in practice, it seems that reviews with Open Identities are somewhat more constructive and less harsh (Le Sueur et al. 2020). This might be due to self-selection though. Where reviewers do sign, their reviews do seem to be longer. Comparing signed versus unsigned reviews from the same reviewer, Fox (2021) noted that signed reviews tended to be longer (average 719 words, compared to

616 for unsigned reviews). Similarly, [Thelwall \(2022\)](#) examined reports from MDPI journals where reviewers could opt for Open Identities, finding that signed reviews were on average ~15% longer than unsigned reviews. The author speculated that the extra length was a result of reviewers' intent "to be more careful or polite", and argued that "[t]his indirectly supports the belief that open peer reviews tend to be higher quality". However, given that the association between review length and review quality seems itself speculative, we may caution against strong interpretation in this direction. The interpretation of increased length being attributable to reviewers' increased care or politeness is also somewhat contradicted by [Wolfram, Wang and Abuzahra \(2021\)](#) who studied prevalence of "hedging terms" in reviews at 17 journals, finding no notable differences between reviews performed with or without Open Identities.

A final, fascinating finding on changes to behaviour under Open Identities comes from [Sacco et al. \(2020\)](#), who observed that men were more likely to seek author clarifications on possible "questionable research practices" when reviewing with Open Identities, whereas reactions of women were not affected significantly whether anonymous or not. The authors suggested this may reflect "inherent sex differences in conspicuous consumption, a process wherein individuals become especially prosocial (e.g. donating money) when there is a public opportunity to demonstrate their social value, a behaviour repertoire more frequently performed by men". They hence suggested that men were performatively demonstrating their ethics in this more public setting.

3.4 Open Reports

3.4.1 Attitudes

Attitudes toward Open Reports are more positive than those toward Open Identities, with most studies of attitudes showing that authors and reviewers are either positive or neutral towards this innovation. [Ross-Hellauer, Deppe and Schmidt's \(2017\)](#) survey of authors, editors and reviewers ($n = 3,062$) found Open Reports to be the second most favoured OPR trait, with 59% of respondents believing publishing reports would be an improvement in peer review processes, against 21% thinking it would make things worse. The majority agreed or strongly agreed that Open Reports "provide useful information for the reader" (65.4%) and that "publishing reports will increase review quality" (60.2%). Using the same survey instrument among Brazilian stakeholders in scholarly communication, [Fontenelle and Sarti \(2021\)](#) found that stakeholders believed Open Reports would improve peer review by providing more information to readers and higher quality reports. Their findings suggest that Open Reports are implicitly taken to be the core element of OPR by the survey's respondents. However, the survey also found that participants worried Open Reports may inhibit reviewers from making strong criticisms or from agreeing to review.

Various articles identified several potential benefits of sharing Open Reports. In a study on the attitudes of scientists and communicators regarding misinformation in the COVID-19 pandemic, [Parker et al. \(2021\)](#) found that open peer review reports were considered one of the most promising methods of addressing misinformation. Based on qualitative interviews with Australians who produce, communicate and study health sciences, they suggest to mandate open peer review reports to allow readers to assess rigour.

Considering geographic differences, in their survey among 541 Croatian scientists, [Baždarić et al. \(2021\)](#) find a generally neutral attitude towards the sharing of review reports (mean 3.2 on a five-point scale). Though respondents were more negative about this practice when applied in small scientific communities. Generally, no significant differences between gender were found, and only minor differences between academic fields, with the Natural and Technical Sciences somewhat less receptive towards Open Reports than the Biomedical and Health Sciences. Participants who had education in Open Science practices, had more positive attitudes towards sharing peer review reports. In their survey among Malaysian scholars, meanwhile, [Hodonu-Wusu, Noorhidawati and Abrizah \(2021\)](#) found rather sceptical attitudes towards OPR in general, but somewhat more positive attitudes towards Open Reports, with the majority of respondents choosing 'somewhat true to me' when asked whether they "always choose to make their peer review open" and "published review reports in order to provide useful information for the reader".

Considering disciplinary differences, [Prechelt, Graziotin and Fernández \(2018\)](#) surveying researchers in software engineering found support for publishing review reports for accepted articles (50%) and rejected articles (31%). The survey conducted by ASAPbio (answered heavily by life science scholars), found even more favourable attitudes regarding Open Reports, concluding that 218 of 285 respondents (76.5%) thought Open Reports should be more widely used ([Polka 2018](#)). Thereby this format received much more favourable recommendations than the system with Open Identities, as discussed above.

Finally, [Knöchelmann \(2019\)](#) examines open sharing of reports in the Humanities. Based on a review of research and publishing practices across various disciplines, he argues that peer review in humanities depends less on "abstract, objectified quality" than "the sciences", since "[s]tatements of quality are much harder to be made in the humanities than they are in the sciences; it is, here, rather a question of consensus and agreement of reviewers or editors on a particular level of intelligibility." Knöchelmann concludes that OPR can improve this to "make the terms of inclusion more transparent" and "profoundly change the purpose of reviewing from gate-keeping to improving".

3.4.2 Efficacy

Studies addressing the efficacy of publishing review reports alongside accepted papers can be grouped in three clusters, studying (i) the willingness of reviewers to engage in such a review format, (ii) the behaviour of reviewers knowing their reports will be published, and (iii) the impact on citation counts of articles that have their reviews published.

For the first topic, engagement in review formats with Open Reports, an editorial in *Communications Physics* shared data from that journal's experience in implementing optional Open Reports ([Communications Physics 2022](#)) (author's decision). Of 158 articles published in 2019, 70% of authors opted to publish reports, which slightly decreased in 2020 (65%). Minor disciplinary differences were noted with experimental physicists (67%) somewhat more likely to publish reports than their counterparts in theoretical physics (61%).

In a trial with optional Open Reports in *Nature* in 2021, 447 out of 974 (46%) of the authors chose to publish their

They found that the OPR policy was the second-highest factor that influenced authors' decision to submit (rated important/very important by almost 70% of the respondents). Finally, concerning review of research outputs beyond publications, in a small-sample interview study by [Luzi, Ruggieri and Pisacane \(2019\)](#), respondents saw potential for OPR to aid “transparency as a means of reconstructing the methods and procedures” in review of datasets.

4.5.2 Efficacy

Continuing themes reported in previous sections, studies into the efficacy of Open Reports and Open Identities mainly target the likelihood of reviewers to engage in this format of review, as well as the impact of these systems on the content and “quality” of review.

Regarding variations in willingness to disclose identities or publish reports, [Wang et al. \(2017\)](#) studied articles published in *PeerJ*, which operates optional Open Reports with optional Open Identities. They found that 73.9% of articles were published alongside Open Reports, with no discernible trends over time. Out of these reports, 43.2% were signed. Addressing the same matter, [Bolam and Foxe \(2017\)](#) reported on the first-year experiences implementing OPR (Open Reports, Open Identities) at *European Journal of Neuroscience*. They reported that of all reviewers invited, only 0.5% (19 of 3847) had specifically declined due to the review system. Both studies also addressed impacts on review reports, with [Wang et al. \(2017\)](#) finding no significant relationship between number of revisions and reviewer anonymity. Signed reviews were somewhat longer, but not statistically significant, and no differences in duration of submitting signed or anonymous reviews was observed. [Bolam and Foxe \(2017\)](#) also note that reviews are of the same or higher quality as previously, although they present no data, nor specify the criteria used to ascertain this.

Three studies examined Open Identities and Open Reports at multiple journals of a single publisher. Firstly, [Moylan et al. \(2020\)](#) reported the results of the pilot-phase of implementation of OPR at 27 Wiley journals (optional Open Reports and Open Identities). 86% of authors given the option opted to publish reports alongside published articles (choice was framed as “opt-out”, something the authors attribute as a factor in the high participation), but only 15% of reviewers opted to sign their published reports. Rates of submission, as well as time to initial and final decision, were unaffected by the OPR intervention. The number of reviewer invitations required to obtain the required number of review reports increased slightly, from average 6 to average 7, with no difference observed in a control set of comparable non-OPR journals. Next, similar results were found by [Bravo et al. \(2019\)](#) studying five Elsevier journals (titles and disciplines unknown). The study found no effect of the OPR pilot on reviewers' willingness to review (controlling for general increase in difficulty attracting reviewers over the pilot period, also in non-OPR journals). Neither was any effect on time to review observed. Thirdly, [Le Sueur et al. \(2020\)](#) evaluated “harshness, constructiveness and positiveness” of a small corpus of 596 reviews from 10 randomly selected BioMed Central (BMC) journals with Open Reports and Open Identities. Comparing this with a smaller (46 reviews) corpus of anonymous reviews, the authors qualitatively coded reports and found that “Overall, anonymous reports tended to be harsher, less positive and not as constructive as

those published alongside the manuscripts”. Note however, that this is based on a relatively small sample, and that the anonymous reports were gathered via a crowdsourcing technique, which although including “only reports of papers that were eventually published and in the fields of medicine or biology (or related fields)” does not ensure like-for-like comparison.

Lastly, looking at OPR from an editor's perspective, [Peters et al. \(2020\)](#) presented a discussion among the editors of a philosophy journal regarding an OPR pilot, pointing at potential benefits and experienced, practical drawbacks of a system with Open Reports and Open Identities. They concluded that OPR is ‘important’ in their non-empirical field, where it can contribute to collective or collaborative academic practices and provide alternatives for ‘industrial’ forms of publishing.

4. Discussion

4.1 Summary of evidence

In [Table 4](#), we give an overview of the main statements regarding OPR addressed in the literature. The table indicates whether the available evidence is either supporting, contesting or inconclusive, as well as indicating the level of the evidence.

Generally, attitudes towards Open Reports are considerably more positive than towards Open Identities. Evidence about changing reviewer behaviour because of either Open Identities and/or Open Reports is limited, though it suggests that reviewers are more likely to sign positive reports; male and senior researchers are more likely to reveal their identities; and both formats do not seem to lead to lower acceptance of review invitations. The uptake of both formats seems to be contextual, with disciplinary and geographic differences. In addition, specificities of the way in which the format is communicated (e.g. ‘opt-in’ or ‘opt-out’) have a strong impact on uptake. We did not find sufficient studies to claim generalisability across fields or journals. Unfortunately, we found little evidence related to how Open Identities and/or Open Reports influence quality control or improvement of manuscripts, the main goals of peer review.

4.2 Implications for policy and practice

The accumulated evidence has various implications for policy and practice of journal peer review and research evaluation more broadly. While the current state of evidence is still inconclusive on several topics, other aspects now seem ready for implementation or more targeted experimentation.

First, we believe that the evidence presented here shows Open Reports to present little harm to the procedural aspects of review processes, including time spent on review and likelihood of accepting review invitations, and could hence be much more widely implemented by publishers. Even though some caution should be adopted, particularly in small research communities, the available evidence points to greater benefits than drawbacks of Open Reports. While this evidence was gathered in relation to journal peer review, it seems likely that similar results might hold for peer review in funding contexts, resulting in implications for the implementation of open reports in those contexts too.

In order to maximize the usefulness of Open Reports, however, additional efforts are required to create and adopt common standards to make Open Reports more findable, reusable and citable. This could for instance include the use

Table 4. Overview of statements on aspects of OPR and whether they are supported (✓), or contested (✗) by the available data

OPR aspect	Statement	Direction/level of evidence	Explanation of evidence
General	OPR is increasingly used	✓✓✓	Multiple studies indicate increased uptake of various OPR elements, particularly Open Identities and Open Reports. Some variation in disciplines.
	OPR is now mainstream	✗✗✗	Depending on definitions, OPR is only practised at between 1 and 5% of journals, but this includes several prominent or highly visible outlets.
Identities	Reviewers are more reluctant to agree to review with Open Identities	✗✗	Studies in various contexts indicate no impact of Open Identities on likelihood of accepting invitations and time to complete reviews.
	Reviewers are afraid of repercussions and backbiting when signing critical reports	✓✓✓	This is the primary concern voiced in commentaries and discussion pieces, and it is backed up by empirical evidence, mostly survey data. It leads to the associated concern that reviewers may blunt their criticism (and hence compromise review processes).
	Backbiting and repercussions occur when reviewers sign critical reviews	?	Despite widespread concern, apart from indications from one abstract Agent-Based model, there is no empirical evidence of such repercussions actually happening. Neither is there evidence of the contrary.
	Open identities lead to more constructive reviews	✓✓	Some evidence that signed reviews are less harsh and more positive in tone, as well as more constructive. Also, multiple studies indicate signed reviews to be (10–15%) longer.
	Reviewers are more likely to write positive reviews when their identities are revealed	✗	One study indicated that overall scores of all reviews after implementation of optional Open Identities were almost exactly the same as the average score from reviews conducted before the Open Identities option was made available.
	Reviewers are more likely to sign reviews when they review positively than negatively	✓✓	Higher scores for signed reviews seem to mostly emerge from reviewers being more likely to reveal their identities in case they rate a manuscript positively, shows evidence from various studies.
	Senior and male researchers are more likely to sign their reviews	✓✓✓	Both survey experiments and trials with optional signing, indicate that senior researchers and men are more likely to sign their reviews. These results need to be interpreted with caution as confounding factors are not always taken into account. Other studies suggest that this may be a way of using Open Identities performatively to signal virtue or increase visibility.
	Reviewers from the academic periphery or minority groups are less likely to sign their reviews	✗✗	No impact of geographical origin or demographics other than age and gender on likelihood of signing reviews has been found.
Reports	Reviewers are more willing to publish reports than reveal their identities	✓✓✓	Surveys of researchers' attitudes towards OPR consistently report more support for Open Reports than Open Identities, for which generally favourable attitudes are reported. However, for both OPR elements, concerns remain, especially in smaller communities.
	Reviewers are more reluctant to agree to review with Open Reports	✗✗	As with Open Identities, studies in various contexts found the likelihood of accepting invitations and time to complete reviews are unaffected by publishing review reports.
	Open Reports lead to higher citation counts of published papers	?	Two studies examining correlations between Open Reports and citation counts (of studies published in <i>PeerJ</i> and <i>Nature Communications</i> , respectively), have diverging conclusions.
	Open Reports lead to more constructive reviews	✓	One study indicating a combination of Open Identities and Open Reports review leads to more constructive tone and less harshness in review.
	Open Reports lead to less critical reviews	?	No empirical evidence was found for significant changes in reviewers' levels of criticality when reports are published, despite formal models predicting the opposite.

Statements for which the available studies come to mixed or diverging conclusions, are marked by a question mark (?). The number of icons indicates the level of evidence and is based on the number and size of the studies addressing the statement: One icon in case of only few, small-scale studies; two icons in case of studies addressing multiple journals or contexts; three icons in case of total study samples spanning various contexts providing some generalisability of the findings.

of best practice guidelines (Beck et al. 2018; Ross-Hellauer and Görögh 2019) so that, for example, reports are assigned individual DOIs and are made available in machine-readable and interoperable formats for downstream indexing by scholarly communication infrastructures (e.g. major databases, libraries and search engines).

Open Identities remains a much more contentious innovation than Open Reports. Concerns about backbiting or blunted criticisms are still not properly addressed, with evidence of the existence or non-existence of such factors still lacking. Consequently, these concerns do mean that scholars remain heavily sceptical. In addition, the evidence assembled here points to potential ill-effects upon power dynamics and levels of visibility depending on who is more willing to review under these models. This hence requires for further experimentation, including evaluation of long-term effects before widespread implementation can be responsibly pursued.

The wealth of new evidence collected here also further clarifies the range of models being implemented and tested under the banner of OPR. In that respect, recent implementations of innovative review formats depending on new workflows involving, for example, preprints and/or post-publication review formats (e.g. in eLife, see Eisen et al. 2022) or further implementations at high-profile venues like *Nature Communications* (Nature Communications 2022) are a promising development. This complexity further underlines the need for publishers to foster increased transparency on policies and their implications for authors and reviewers (Klebel et al. 2020), and to use common language like the STM peer review taxonomy (Jones et al. 2020). Without such clarity, discussions about the implementation of OPR models risk quickly derailing into misunderstandings.

Finally, the lack of evidence on various topics highlights the continued need for publishers to share data more systematically for large-scale analysis (Squazzoni et al. 2020). Elsevier, for example, recently announced the Peer Review Workbench, a platform enabling access to their data on peer review processes (Petchiappan et al. 2022). Further coordinated action in this direction will spur the evidence-based uptake of OPR for the benefit of transparency and integrity in scholarly publishing. In addition to these appeals to publishers for providing access to data and to OPR researchers to subsequently use them, we call upon funders and publishers to recognize the need to fund this kind of research.

4.3 Evidence gaps

In addition, this updated review of the evidence allows us to identify several evidence gaps which the research community may wish to address. For both Open Identities and Open Reports, in combination or separately, there is still an urgent need to better determine the extent to which these innovations actually affect the overall quality of reports and hence the published literature. Quality of review, and its impact in shaping rigorous scholarly work, is perhaps the most important factor and hence the lack of compelling evidence thus far must be a major concern. This deficiency should be urgently addressed. We also note that actors' willingness to engage in Open Identities and/or Open Reports peer review seems highly contextual, with studies suggesting variations between disciplines, career stages and article or review content. Hence, we suggest prioritizing further study on how power structures are affected by Open Identities (including when optional), the extent to which biases may be enabled, and

whether (and how) early-career researchers/other demographics are especially disadvantaged. We also suggest further work to examine the extent to which performing reviews is included in academic reward and recognition structures (i. e., is credit obtained by performing reviews?). More evidence on this would ultimately allow the development of alternative publishing, review and reward structures that aim to address issues of bias and power imbalances.

Given scepticism towards Open Identities, studies examining what experiences reviewers or authors have under these review conditions, including the extent to which opinions are blunted or repercussions have later been incurred, would possibly do a great deal to either allay fears or point towards possible safeguards. Intervention studies via randomized controlled trials could also contribute to this. Furthermore, regarding Open Identities, current models and evaluations of them hitherto heavily focus on the identities of some actors—particularly authors and reviewers—while still obfuscating the identities and roles of other actors in the editorial process, including handling editors, managing editors, and other editorial staff (Tennant et al. 2019). To fully reach transparency in editorial review, the roles of these actors should be better understood.

For Open Reports, there seems to be solid evidence that in many contexts these are welcomed by researchers, and that they at the very least seem to not compromise review processes. However, when are Open Reports not a good idea? What risks may be presented through publishing of anonymized reviews in, e.g. smaller communities (niche disciplines, or smaller communities publishing in local languages)? In addition, even where publishing reports seems to do no harm, does it do any good? The extra resources required to amend systems to publish reports, as well as support the extra editorial effort to curate their publication, mean that those advocating for such change should be able to demonstrate their benefits. Yet we still have very little information on who is using these reports and for what purposes, how they impact trust in scientific outputs, or what their value-add is, beyond “performative transparency”.

For Open Identities and Reports in combination, meanwhile, we call for research to examine the impact sharing signed reports has on the content of the reports and the implications of this for reviewers, authors and review processes.

Beyond these gaps related to specific traits, there are also some more general issues. Firstly, there is very limited new evidence on how these models of OPR apply to review of other objects, such as datasets, software/code, monographs, and funding proposals. Especially given recent calls to reform research assessment to better recognize a diversity of research outputs beyond the journal article, linked to the Open Science agenda (COARA 2022), it may be surprising that the use of Open Science principles within the review of such outputs has not been more widely investigated. Similarly, there is very limited evidence on how models of openness play out in non-traditional journal outlets, including “publish-review-curate” models where review is conducted over publicly available preprints (Kramer et al. 2022), that engage in some elements of OPR more or less by default. As these models are likely to gain prominence and uptake in the upcoming years, more evidence about the efficacy of these models is desirable.

Finally, more research on disciplinary differences in attitudes towards these various models would be highly desirable. Where evidence is available, it is sometimes in specific

disciplinary contexts, which raises the questions how generalisable or robust these findings are across ‘epistemic communities’ (Knorr Cetina 1999). As stated, the various elements of OPR can be combined in a great number of ways, and specific approaches should be tailored to the social and epistemic needs of specific communities where possible. Additional issues arise in interdisciplinary contexts that may fall between various disciplinary traditions and requirements. Here, OPR can both create additional challenges, but also provide (as an anonymous referee also points out) opportunities to shed light on these dynamics and thereby contribute to solutions. More experimentation in these areas is desirable.

4.4 Limitations

This study suffers from several limitations. First, several aspects of the search strategy might have caused omissions of potentially relevant work. Our study only included evidence on OPR published in English, thereby potentially omitting valuable information gathered and published in different languages. In addition, the search being based on the Web of Science and Scopus databases might have omitted relevant literature not covered by these databases, this particularly includes material only published as preprints, rather than journal articles. While these outputs were covered by the snowballing and web search, these searches are potentially not exhaustive. Also, the definition of search terms may have not been sufficiently sensitive to all innovative forms of publishing and reviewing, including preprint peer review. This may particularly have led to omission of relevant initiatives relating to Open Participation review. Relatedly, this study focussed on OPR of scholarly outputs, thereby potentially omitting some evidence, particularly in grey literature, of review formats in other academic contexts, including student evaluation, grant review or hiring and promotion processes. Last, the current level of evidence led us to provide narrative summaries rather than full meta-analyses. When additional evidence is gathered, there might be scope for a full meta-analysis leading to a more authoritative synthesis of findings.

4.5 Conclusions

All in all, the current evidence on OPR shows that some initial concerns are unfounded (e.g. that it will make reviewers less likely to review). However, some major concerns (e.g. that Open Identities might limit critique or expose reviewers to risk) just do not yet have sufficient evidence to take a definitive position. In addition, key questions over whether OPR improves review quality or leads to better manuscripts, or whether these processes increase trust in manuscripts or scholarly work in general, have hardly been addressed. Most solid evidence has been gathered in relation to Open Reports, which does not seem to compromise review processes, with some weak evidence such reviews are more constructive. Open Identities does seem to present issues for equity, in terms of the demographics most likely to embrace openly signing reviews, and these issues urgently require further attention. For now, those editors wishing to experiment with such a system may wish to mitigate any potential issues by making Open Identities optional until more concrete evidence is available. Or, to use editorial terminology, “we request additional experiments before a final decision on OPR can be reached”. We urgently call upon all stakeholders to contribute to this.

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Supplementary data

Supplementary data are available at *Research Evaluation Journal* online.

Conflict of interest statement. None declared.

Pre-registration

The study was pre-registered on May 19th 2022, with the study protocol available at: <https://osf.io/dvhxt/>.

Data availability

Data for this study is available CC BY, via Zenodo: <http://doi.org/10.5281/zenodo.10540826>

Notes

1. As detailed in our original pre-registered protocol (<https://osf.io/dvhxt/>), the study originally also aimed to also scope evidence over the same period for another major aspect of OPR, Open Participation. However, as is detailed below under Methodology (section 2.5), issues with the search strategy for that element, combined with concerns over the general length of the manuscript, mean that we do not detail those results in the main body of the final study manuscript. For transparency, we nonetheless report those findings in the [supplement S1](#).
2. Reviews and editorials are included, although the main focus is on new primary evidence, since pilot testing has revealed that some studies classified as, e.g., editorials in fact do contain new primary evidence (e.g., of results of implementation of OPR at specific journals).
3. A provisional version of that analysis, with a less complete dataset, is also reported in (Wolfram, Wang and Park 2019).
4. A possibility signalled by the text “Your review will be anonymous unless you identify yourself” in the review submission form.
5. We acknowledge that the validity and usefulness of agent-based modelling approaches have been the subject of a long-standing debate (see, for example, Manzo 2014, Miller 2015).

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