



OpenAIRE: Experiments in Open Peer Review



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1 Introduction: The OpenAIRE Open Peer Review Experiments



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1.1 DEFINING OPEN PEER REVIEW

Open peer review (henceforth OPR), although no longer an unknown quantity, is far from well-understood. The concept of OPR has been around since the early 1980s (Armstrong, 1982). With the first implementations and trials to explicitly categorize themselves as such emerging in the late 20th Century (van Rooyen et al., 1999), some variation of OPR is now the established mode of peer review for many journals and publishers (Amsen, 2014). Yet, as has been consistently noted (Ford, 2013; Hames, 2014a; Ware, 2011), OPR has neither a standardized definition nor an agreed schema of its features and implementations. The literature reflects this with a myriad of overlapping and often contradictory definitions. While the term is used by some to refer to peer review where the identities of both author and reviewer are disclosed to each other, for others it signifies systems where reviewer reports are published alongside articles. For others it signifies both of these conditions, and for yet others it describes systems where not only “Invited experts” are able to comment.

OPR is perhaps best defined in contradistinction to traditional or classical peer review, which is generally (1) anonymous, with either the reviewer unknown to the author (single-blind review) or both author and reviewer unknown to each other (double-blind review); (2) selective, with reviewers selected by editors; and (3) opaque, with neither the review process nor the reviews themselves made public.

This traditional model of peer review has been subject to varying lines of criticism. Peer review has been variously accused of being unreliable (Fang et al., 2012; Hames, 2014b; Jefferson et al., 2007; Kravitz et al., 2010; Schroter et al., 2004), taking too long (Armstrong, 1997; Benos et al., 2007; Ware, 2008), being unaccountable and enabling bias (Kriegeskorte,



2012; Mahoney, 1977; Smith, 1999), lacking in incentive for reviewers (Armstrong, 1997; Ware, 2008) and being wasteful of effort (Jubb, 2016). In response to these criticisms, a variety of innovations have been suggested, with many of them labelled, at one time or another, “open peer review”.

Upon OpenAIRE’s understanding, OPR – although often narrowly defined as peer review where author/reviewer identities are disclosed to one another (see e.g., Ford, 2015) – is best understood as an umbrella term describing a variety of innovations which “open up” the traditional peer review process by modifying one or more of aspects to make it more inclusive, transparent and/or accountable. Primary aspects are:

- 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 to able to contribute to the review process.

Possession of one of these traits is usually sufficient to qualify a system as OPR. Secondary characteristics, usually insufficient in themselves to qualify a system as OPR, but nonetheless often included in many definitions, are:

- Open pre-review manuscripts:** Manuscripts are made immediately available (e.g., via pre-print servers like ArXiv) in advance of any formal peer review procedures.
- Open final-version commenting:** Review or commenting on final “version of record” publications.
- Open Interaction:** Direct reciprocal discussion between author(s) and reviewers, and/or between reviewers, is allowed and encouraged.
- Open platforms:** Review is de-coupled from publishing in that it is facilitated by a different organizational entity than the venue of publication.

These elements are often complementary, and can be combined in various ways to produce a broad continuum of ‘openness’ in OPR. Hence, while some journals might only include optional open identities, others publish the entire multi-staged review process: the manuscript under review, the review reports and the authors’ responses, and the revised manuscript(s), while inferring links between the earlier released version(s) and the final version of record (Pöschl, 2012; Sandewall, 2012).

1.2 OPENAIRE AND OPR

OpenAIRE (Open Access Infrastructure for Research in Europe, <http://openaire.eu>) follows a holistic approach to representing and linking the process of knowledge generation and is committed to testing new forms of scholarly communication. Bridging eInfrastructures and publishing services, OpenAIRE is a sociotechnical digital infrastructure for Open Scholarship in Europe and beyond. It brings together more than 50 institutions to foster and further the



implementation of Open Science. In addition to operating an OA support, outreach and advocacy network of 33 National Open Access Desks (NOADs) across Europe, OpenAIRE serves the public interest by increasing the visibility of research outputs and linking digital entities to enable navigation. This technical infrastructure assists in organizing the ‘records of science’, in particular through exposing and curating links between digital objects: authors, institutions, research outputs such as publications and research data, projects and public funding streams who funded the research. Publishing environments, digital infrastructures and tools for open science continue to converge. However, gaps between these environments remain, limiting seamless navigation and selective sharing from one stage to another. Hence, one aspect of OpenAIRE’s broad research activities into how openness and transparency can improve scientific processes is its investigation of new models of peer review to literature and beyond.

To this end, OpenAIRE’s current project phase (“OpenAIRE2020”) has played host to three innovative experiments that aim at promoting OPR and studying its effects in the context of digital infrastructures for open scholarship. The main aims of these activities were to:

- Encourage experimentation in OPR.
- Investigate ways in which OPR technologies might integrate with OpenAIRE’s infrastructure, including the repository [Zenodo.org](https://zenodo.org) as well as other content aggregated, inferred, and interlinked by OpenAIRE.
- Provide case studies for evaluation in OpenAIRE’s wider investigation of open peer review.

To achieve this, in mid-2015 OpenAIRE ran an open call for tenders for open peer review prototypes/experiments, with two grants of up to 25,000 Euros each available. Twelve bids were received. After a thorough evaluation process, the awards were granted to (1) a consortium of organizations led by Open Scholar CIC (lead investigator Pandelis Perakakis), and (2) The Winnower (lead investigator Joshua Nicholson). In addition, a third experiment was already specified in the OpenAIRE2020 project proposal, led by (3) OpenEdition (lead investigator Julien Bordier). The three experiments, whose results are presented in the following sections of this report, were diverse in their aims and methods:

- (1) **Open Scholar** and their consortium aimed to turn repositories into functional evaluation platforms by building an open peer review module for integration with Open Access repositories and then implementing this module in two high-profile institutional repositories.
- (2) **The Winnower** sought to integrate the Winnower platform with repositories like Zenodo via DOIs and APIs to facilitate open peer review of repository objects, as well as offering financial incentives to encourage open participation in the sharing of ‘journal club’ reviews and documenting user experiences via survey.
- (3) **OpenEdition** aimed to use open services such as the annotation software hypotheses.org and OpenEdition’s platform for academic blogs to model a workflow



(selection, review and revision) that would develop blog articles into peer reviewed publications in the Humanities and Social Sciences.

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2 Experiment 1: Open Peer Review Module (OPRM) for Open Access Repositories



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Project consortium:

- Open Scholar CIC — An open organization of research scholars
- DIGITAL.CSIC — The Institutional Repository of the Spanish National Research Council
- e-IEO — The Repository of the Spanish Oceanographic Institute
- ARVO — A company of DSpace professional development and services
- IIIA — The Artificial Intelligence Research Institute
- SECABA — A multidisciplinary laboratory of Library and Computer Sciences

2.1 INTRODUCTION

Research productivity is increasing at an unprecedented rate. Technological innovations, a surge in available computing power, and the ease with which digital information is stored and communicated are all helping researchers to cross experimentation boundaries, to increase data availability, and to facilitate the transfer of knowledge. As a result, traditional research is being transformed into a dynamic and globally interconnected effort where ideas, tools and results can be made instantly accessible to the entire academic community. Institutional and multidisciplinary open access repositories play a crucial role in this emerging landscape by enabling immediate accessibility to all kinds of research output.

One important element still missing from open access repositories, however, is a quantitative assessment of the hosted research items that will facilitate the process of selecting the most relevant and distinguished content. Common currently available metrics,



such as number of visits and downloads, do not reflect the quality of a research work, which can only be assessed directly by peers offering their expert opinion together with quantitative ratings based on specific criteria.

To address this issue we developed an Open Peer Review Module (OPRM) to be installed on existing open access repositories and offered as an overlay service. Any digital research work hosted in a compliant repository can then be evaluated by an unlimited number of peers who offer not only a qualitative assessment in the form of text, but also quantitative measures that are used to build the reputation of the research work and its authors. Crucially, this evaluation system is open and transparent. By open we mean that the full text of the peer reviews are publicly available along with the original research work. By transparent we mean that the identity of the reviewers is disclosed to the authors and to the public. In our model, openness and transparency are two elemental aspects we consider necessary to address the issue of biased or non-expert opinions, which is inherent in the anonymous peer review model, characterized by the unaccountability of reviewers.

Importantly, the open peer review module includes a reviewer reputation system based on the assessment of reviews themselves by other peer reviewers. This allows a sophisticated scaling of the importance of each review on the overall assessment of a research work, based on the reputation of the reviewer.

The implementation of a peer review layer on top of institutional repositories could have the potential to transform the current academic publication landscape by introducing new scholarly workflows where a research item can be openly evaluated by the world's experts right at the institutional repository of its authors, before being submitted to an academic journal. This workflow challenges the current practices of peer review research evaluation. In most cases, journals, acting as brands in a competitive market, foster academic competition for a limited number of publication slots, instead of promoting open scholarship and collaboration. The integration of peer review in repositories will enable direct and transparent academic collaboration between authors and reviewers. In addition, the use of the OPRM will produce novel metrics directly reflecting the perceived quality of a research work by expert peers, contrary to current available altmetrics that only indirectly account for quality through usage statistics.

2.2 OPEN PEER REVIEW MODULE

2.2.1 TECHNICAL IMPLICATIONS

The OPRM can be considered as an add-on or plug-in for the DSpace platform. Detailed instructions on how to install the plug-in on top of DSpace JSPUI or XMLUI are provided at the module's webpage on Github: <https://github.com/arvoConsultores/Open-Peer-Review-Module/wiki/Installation>



The module is built around the following components and elements:

- Invitations subsystem
- Reviews subsystem
- Comments subsystem
- Object data model
- Reputation engine

Invitations subsystem: The system allows the author to send review requests to select peers. The submission-item-interface has been extended to specify the email addresses of the proposed reviewers. The system sends a customized email including a token that grants the reviewer access to the research object and to the reviews subsystem.

Reviews subsystem: The reviewer accesses the reviews subsystem acting with sufficient privileges granted by the token. The evaluation forms are then presented to the reviewer, together with relevant terms and conditions regarding the whole review process. The proposed forms can be configured using standard data types when applicable, although an additional schema has been added to accommodate specific model's metadata. The submission-item interface, already available in Dspace, is used to support this step, covering metadata declaration and attaching license attributions. The submission workflow can assign the review object to the repository administrators, with a single Accept/Reject/Edit Metadata step or just deposit the review in a specific collection. Following this step, specific background tasks are attached to the process, via consumer events, to perform automatic validation of the metadata, linking reviews and reviewed objects, and calling the reputation submodules to calculate new numeric values (for authors and research objects) and automatically incorporate them into the reviewed object and into the review.

Comments subsystem: This subsystem is complemented with the judgments subsystem, a specialization of the reviews subsystem that allows reviewers to judge other reviews of the same research object.

Object data model: The object data model has been extended to incorporate relevant metrics as well as the back-and-forth relations between research objects and their reviews. In order to process information about the reputation of the authors, and make this information persistent, the system uses extensions to the author's data-model (DSpace-CRIS and other extensions). However, the module can be used without these extensions, although in this case the consolidation and visualization of the reputation of authors and reviewers is not available.

Reputation engine: The Digital object's reputation submodule bundles the functions to invoke, calculate and retrieve a digital object's reputation. This submodule obtains information about the digital object and its reviews, calculates reputations based on the submitted parameters and updates reputations with the new calculated values. In order to



maximize its evolution and reuse across platforms, this submodule is an independent plugin, facilitating the installation and deployment process and even its substitution by any other set of algorithms. The Author/reviewer reputation submodule exposes the functions of obtaining reputation information from objects, including reviews, calculate the author's reputation and update the reputation with the new calculated values.

2.2.2 REPUTATION ASSESSMENT MODEL

The reputation assessment model is based on peers evaluating (quantitatively, in addition to qualitatively) each other's research works as well as each other's reviews. The latter allows for a sophisticated scaling of the importance of each review on the overall assessment of a research work, based on the reputation of the reviewer. We note that our model assumes that evaluations may be done on a number of dimensions (e.g. originality, technical soundness, predicted impact, etc.), however, an 'overall quality' dimension is needed for computing the general reputation of the research work. This is because aggregating the reputation for all dimensions into a single index may depend on a number of issues that are outside the scope of this work.

The model quantifies a reputation for articles (or any other research object hosted by the repository), authors, reviewers, and reviews. The reputation of an article is the weighted aggregation of the reviews it receives, where the weight depends on the reputation of the reviewer (discussed below). A single metric is provided for each evaluation dimension: overall quality, expected impact in the field, expected impact for society, etc. A scholar's reputation as an author is an aggregation of the reputation of their papers. Again, this reputation is computed for each dimension separately. The reputation of a reviewer is essentially a weighted aggregation of the judgements over her reviews by other reviewers who evaluated the same research works. The weight in this case is the reputation of reviewers who offer an opinion. Finally, the reputation of a review is similar to the one for articles, but using judgements instead of reviews. Extensive information about the model, including the code for its implementation, is provided in the published conference paper (also attached in this report):

- Osman, N. & Sierra, C. (2016). Reputation in the Academic World. In Proceedings of the 18th International Workshop on Trust in Agent Societies (TRUST @ AAMAS 2016) (pp. 1--17). CEUR Workshop Proceedings.

2.3 IMPLEMENTATION AND PRELIMINARY RESULTS

As part of this project, the OPRM was implemented in two Open Access repositories: the Institutional Repository of the Spanish National Research Council (DIGITAL.CSIC), and the Institutional Repository of the Spanish Institute of Oceanography (e-IEO). What follows is a



description of the implementation process and a report of preliminary results from these two repositories.

2.3.1 DIGITAL.CSIC

DIGITAL.CSIC has taken part in the OPRM project through different working lines. First, the repository has participated in discussions about the design and workflow of the module to be integrated with DSpace software. DIGITAL.CSIC runs on the DSpace-CRIS 4.3 version which means that besides developing an OPRM module that is interoperable with the standard DSpace system, the ARVO partner needed to consider some characteristics inherent to the DIGITAL.CSIC specific DSpace version, in particular the DSpace-CRIS author module. In addition, the DIGITAL.CSIC team worked closely with ARVO so as to customize the OPRM module in line with general item submission workflow and metadata records visualization on the repository. Last but not least, the repository team has contributed to preparing the support guides to help authors and reviewers with all elements of the OPRM.

The OPRM went live in DIGITAL.CSIC in April 2016 and in preparation for its release the repository team launched a preliminary internal campaign to attract CSIC researchers to test the module. The strategy was based on a one-to-one approach where selected researchers across all scientific areas were contacted to invite them to take part in the role of authors willing to receive open peer reviews. The selection of researchers took into account several considerations: in the first place, the repository team contacted researchers with a well-known OA-friendly attitude and a long record of item submissions into DIGITAL.CSIC. Second, the repository produced a list of CSIC researchers with a public profile on the reviewer-based platforms Publons and PubPeer and with publications in the open peer review F1000Research journal. In total, the repository collected around 60 potential candidates and amongst them 20 researchers in Humanities and Social Sciences, Chemistry, Natural Resources, Biology and Biomedicine, Food Science and Physics were briefed on the OPRM project and invited to participate. It is worth mentioning that except for 2 researchers who openly declined the invitation all the others showed interest in the module and committed to participate in its pilot phase.

Without being exhaustive, below is a list of selected comments gathered during this process. This preliminary feedback by scientists can shed light on the sort of issues that caught their attention the most when understanding the goals and functioning of the module in this first phase. This process is also explained in the DIGITAL.CSIC presentation (<http://digital.csic.es/handle/10261/131576>) at the OPRM official launch at the end of April.



First feedback from CSIC researchers:

"A long awaited service in the repository."

"It is a great idea that merits success as currently peer review is not credited in researchers CVs at all due to its anonymity. But researchers will not have time to review and comment on other peers' works as long as this activity remains outside of CVs recognition and lacks strong support from the research institutions."

"The functionality may be also used to evaluate, accept and comment on conference contributions before the event."

"The project seems very interesting, but I decline to participate right now due to lack of time and current demands [preparation of proposals for a national research call]."

"I have contacted 3 reviewers: one has no time available, another is against any type of peer review as reviewing is a subjective activity in such a reduced scholarly discipline and the third one has accepted to do it."

"The service should promote spontaneous discussion by anybody willing to send comments."

"Inviting peers to an open evaluation may place people in an uncomfortable situation, the module should work 100% open."

"The service is great for preprints and other unpublished works but has limited applicability for works that have been already evaluated and published. Moreover, the service has a difficult application for very recent publications as publishers reserve an exclusive exploitation for a period of time."

"How does open peer review operate in relation to "finished" pieces of work (i.e., a book)?"

"How will the service compete with Academia.edu open review/comments?"

To date, DIGITAL.CSIC hosts five open peer reviews: two in the area of Natural Resources/Biology, one in Physics and two in Bibliometrics and Documentation Studies: they are all accessible from the Open Peer Review Collection in the repository: <https://digital.csic.es/handle/10261/131210>).

As a general consideration, it may be useful to note that (1) even for those researchers supportive of this new service on the repository, finding the time to select works to be reviewed, invite peers and comment on the reviews received was reported to be an issue that can slow down the uptake of the module, and (2) in all the real cases already available in the repository, as well as in those that are underway, the authors decided to select works that have already been peer-reviewed (i.e., published papers and conference contributions), with the exception of a policy paper waiting to be reviewed.

These factors may be a major deterrent for the wide and timely applicability of the module. Further, it remains a challenge to convince authors to use the module for their article



preprints, as fears of later journal rejection still prevail. In addition, it is paramount to design an effective and attractive campaign to reach out to the wider institutional community in order to consolidate the service as an active one on the repository in upcoming months. Without such a campaign, reticence concerning the lack of linkages with institutional assessment exercises and rewards system, limitations associated with an invitation-based module and misunderstandings about the OPRM reputation sub-module and what type of open peer review it supports are expected to be potential stumbling blocks.

2.3.2 E-IEO

With the OPRM, the IEO aims to foster scientific collaboration among its research community via peer discussion. With the OPRM, the IEO enhances its policy of providing added value, further to already implemented functionalities, such as authority control and author profiles.

The OPRM was set up and launched in e-IEO in March 2016. Its release was accompanied by an official announcement (<http://hdl.handle.net/10508/9996>) and an internal communication to all scientific staff of the IEO, via e-mail, and preceded by the OPRM Project at e-IEO (<http://hdl.handle.net/10508/9990>) one week earlier.

The OPRM runs at e-IEO on DSpace version 5.2, with user interface xmlui and authority control system in which the authority values are stored in the solr indexing system and search engine. e-IEO has also implemented the author profiles, where author reputation and reviewer reputation are shown.

Following the module's release, the e-IEO team carried out a pilot study evaluating three published works, one for each IEO scientific area (Fisheries, Aquaculture and Marine Environment and Environmental Protection). We had the full collaboration of nine IEO scientists who responded in three weeks: three of them as authors to be evaluated and six as reviewers to provide reviews and comments. IEO authors also commented on the reviews of their works.

In summary, the pilot resulted in:

- 6 reviews (2 reviews per work)
- 12 comments (2 comments per review, one by the author and one by the other reviewer)
- weighted reputation metrics for the works, authors, reviews and reviewers

At the repository, a work's page displays the work's reputation value ("Publication reputation"), and provides links to related reviews and their quality ratings given by each reviewer. A review's page displays: the review (pdf), the overall quality of the work, the reputation of the particular review, and links to the related work (with its reputation value), and to related comments with their corresponding quality ratings. A comment's page



displays: the comment, the overall review quality and a link to the related review with the corresponding reputation value. Author reputation and reviewer reputation are shown at the author profile, if available. All reviews and comments are grouped in a new community at the repository called OPRM.

A list of reviewed works at the e-IEO:

- <http://hdl.handle.net/10508/8123> (Fisheries: article published in Journal of Marine Biology, 2011).
- <http://hdl.handle.net/10508/2494> (Aquaculture: poster, abstract published in Aquaculture Europe 14 Congress, 2014).
- <http://hdl.handle.net/10508/7818> (Marine Environmental and Environmental Protection: article published in Marine Ecology Progress Series, 2009).

Examples of researcher profiles:

- [García-Rodríguez, M. \(Mariano\)](#)
- [Jerez, S. \(Salvador\)](#)
- [Orejas, C. \(Covadonga\)](#)
- [Rodrigues-dos-Santos-Domingues, P.M. \(Pedro Miguel\)](#)

The Open Peer Review Module at the Spanish Institute of Oceanography is also available at the e-IEO presentation <http://hdl.handle.net/10508/10124> (from OPRM official launch, 27 April 2016).

Some initial feedback from IEO researchers suggests that the Open Peer Review Module (OPRM) could be a useful objective tool to evaluate scientific papers as it is intuitive and easy to use. Comments suggest it is a very good idea because it may lead to a future of open collaboration fostering research, development and innovation. By knowing the reviewers' identity, authors can ensure that the review of their works has been made by experts in the field. Moreover, revealing the texts of the reviews and the comments of other referees, an exchange of information among experts is possible, thereby avoiding, as far as possible, subjectivity by the reviewers. This open peer discussion facilitates the evaluation by the reviewer. Nevertheless, the current peer review journals system is so integrated in the scientific community that the OPRM implementation will take a long time to really change researcher behaviors on a larger scale. Some researchers suggest that a negative assessment of a colleague's work could create an uncomfortable situation among colleagues. However, many researchers expect the OPRM to unveil its full potential in the future and say that everyone should support this initiative to ensure full open science as soon as possible. Regarding future prospects, in order to encourage researchers to use the module, it seems essential that the OPRM should become a cross-platform evaluation system whose advantages are widely disseminated, resulting in comparable platform-independent metrics.



2.4 DELIVERABLES AND DISSEMINATION

The OPRM source code: <https://github.com/arvoConsultores/Open-Peer-Review-Module/wiki>

OPRM launch event (organized and hosted by DIGITAL.CSIC on the 27th of April 2016) website: http://proyectos.bibliotecas.csic.es/digitalcsic/oprm/programa_eng.html

Blog posts and press releases:

- <http://www.openscholar.org.uk/developing-the-first-open-peer-review-module-for-institutional-repositories/>
- <http://www.openscholar.org.uk/institutional-repositories-start-to-offer-peer-review-services/>
- <http://www.repositorio.ieo.es/e-ieo/handle/10508/9996>
- <http://www.repositorio.ieo.es/e-ieo/handle/10508/9990>
- <http://digital.csic.es/dc/noticias/listarNoticias.jsp?pos=10&locale=en>

Presentations:

- Open Peer Review Module for Open Access Repositories: <http://digital.csic.es/handle/10261/131572>
- The Open Peer Review Module – some technical details: <http://digital.csic.es/handle/10261/131573>
- Reputation in the Academic World: <http://digital.csic.es/handle/10261/131575>
- OPRM Pilot Project in Digital. CSIC: first experience and thoughts: <http://digital.csic.es/handle/10261/131576>
- The Open Peer Review Module at the Spanish Institute of Oceanography (IEO): <http://www.repositorio.ieo.es/e-ieo/handle/10508/10124>
- Dissemination material (logos): <https://digital.csic.es/handle/10261/129662>
- Poster presentation: <https://digital.csic.es/handle/10261/136937>

FAQs:

- OPRM FAQs: <http://digital.csic.es/handle/10261/135982>



3 Experiment 2: The Winnower

the WINNOWER

Joshua Nicholson & Juan Pablo Alperin

The Winnower is an open access online scholarly publishing platform that employs open post-publication peer review. It believes that transparency from start to finish is critical in scientific communication. Its aim is to revolutionize science by breaking down the barriers to scientific communication through cost-effective and transparent publishing for scholars.

3.1 OVERVIEW

Peer review is an integral part of scientific communication. Traditionally, journal editors solicit reviews from two to four subject experts to assess whether the work is suitable for publication. While this process remains the norm in scholarly publishing, new models of review have emerged, including online discussion via social media and informal meetings amongst scholars known as journal clubs.

In our project, we sought to test whether publishing post-publication peer reviews can be incentivized by elevating peer reviews to the same level as original research, with all the affordances and services of scholarly publications.

In efforts to answer this core question, this project carried out three activities, all of which are described in further detail below:

- The integration between The Winnower and OpenAIRE through the development of an open source tool that identifies metadata from a DOI or a URL
- The incentivizing and publishing of student journal club proceedings
- A survey of Winnower users and Twitter followers about their attitudes towards social publishing peer reviews.

Although the project has formally come to a close, some of the activities of the project remain ongoing, as they have become part of The Winnower's core functionality.



3.2 ACTIVITIES

3.2.1 INTEGRATION BETWEEN THE WINNOWER AND OPENAIRE

In order to integrate the two platforms, we developed an open source tool called “[Terrier](#)” to extract metadata from scholarly articles published across publishers (via DOI or URL). In cases where work was available on the Zenodo repository, Terrier also fetches the article itself, as well as the metadata.

On The Winnower, Terrier is used so that when users want to publish a review, they can easily import the article metadata (and in the case of Zenodo, the articles themselves). As a result, The Winnower actively promotes the publishing of reviews, and does so by following best-practices (referring to the reviewed work). An example review can be found in Figure 1.

Since the tool was developed as a Ruby Gem and released to the community on Github, it has been possible for others (researchers, platforms, etc.) to reuse the work. It was immediately recognized as a useful tool, as can be seen from the following Tweets:

“awesome! I’ve been slowly trying to build the same thing in Python. Tricky problem!” -Dan Lurie, (<https://twitter.com/danilurie/status/707267395908337664>)

“Thanks, that’s just what I was looking for today!” --Bastian Greshake (<https://twitter.com/gedankenstuecke/status/705169901795844096>)

“I knew Terrier was going to come in handy. Using it now to resolve metadata for ~70,000 papers. Thanks”☺ - Chris Hartgerink (<https://twitter.com/chartgerink/status/721625578500132864>)

3.2.2 INCENTIVIZING AND PUBLISHING JOURNAL CLUB PROCEEDINGS

Prior to and concurrent with the development of Terrier, we launched an online-campaign to solicit participants to publish their journal club discussions with us. We searched for groups via Google that advertised their meetings online and invited them to participate in the pilot. We emailed these groups to invite them to our pilot and offered to pay them to publish their journal clubs should they publish five journal club proceedings over the course of our pilot.

A total of 12 groups agreed to participate, but very few proceeded to post reviews in spite of the financial incentive. Even those that did publish reviews failed to meet the 5 proceedings minimum.

This small sample suggests (although not in a conclusive way) that small financial incentives are insufficient to motivate the publishing of journal clubs. This is further reinforced by comments from most participants that their desire to participate was not financially motivated. In fact, traditional hierarchies seemed to be at play, with more senior researchers advising their students to write the journal clubs.



There were blog posts created to recruit participants. Additionally, the same text was circulated via email to Winnower users.

As a result of this activity, The Winnower published only 6 journal club proceedings over the course of 2 months, although several more were expected. This number represented the participation of two groups led by a senior researcher (professor or postdoc) with the content being written by individual students. Despite commitment from more groups, there have been delays in actual submissions, in part caused by our own delays in integrating Terrier, and in part caused by the natural schedule of journal clubs (which tend not to meet very often). While this number may seem small, it is in line with numbers of publications received when new journals are launched. We are optimistic that some of the other journal clubs who expressed interest will publish proceedings, as we continue to reach out to them periodically with reminders. We also expect that as new users discover The Winnower, and as researchers become more accustomed to publishing different article types beyond the traditional research article, this will become a valuable resource for groups meeting to publish journal clubs.

3.2.3 SURVEY ON ATTITUDES TOWARDS OPEN PEER REVIEW

We invited scholars to take part in our survey by invitation through Twitter and The Winnower emailing list. Although this type of convenience sampling is unlikely to be representative of a larger population, we believe it reflects an audience that is likely more willing to consider Open Review than the average researcher, particularly because our community of users and followers tend to be biased towards individuals who are interested in new models of publishing and scholarly communication (because of our own model of publication and review). We received seventy-nine responses over the course of a few weeks of solicitation.

The results of this survey are published on The Winnower online: <https://thewinnower.com/papers/4659-a-brief-survey-on-peer-review-in-scholarly-communication>.

3.3 A BRIEF SURVEY ON PEER REVIEW IN SCHOLARLY COMMUNICATION

3.3.1 INTRODUCTION

Peer review, the process by which subject experts evaluate a piece of work, is an integral part of scholarly publishing. In most cases peer review is coordinated by an editor at a scholarly journal and is performed privately amongst two to three peers. There is often no standard report that peer reviewers complete, however, they are generally asked to make a decision if the paper is acceptable for publication or not based on the merits of the paper. The traditional process of peer review, while widely regarded as being crucial in scholarly



publishing, has become increasingly criticized for its shortcomings. Strikingly, tests on the veracity of peer review have shown that most major errors are not detected during peer review (Smith 2010, Godlee, Gale, and Martyn 1998, Baxt et al. 1998). These findings have called for new ways of improving peer review to be explored. One suggestion is to make peer review more transparent (i.e. reports are open to the public) and for it to occur post-publication (Smith 2010). Post-publication peer review is organized similarly to pre-publication peer review except that it occurs after a paper has been published or made public. Post-publication peer review has also been used to describe blogging, journal clubs, and other forms of review that occur on the Internet or in private. To better understand how researchers view traditional peer review versus open peer review, and other new forms of peer review we surveyed the scholarly community via an informal survey.

3.3.2 RESULTS & DISCUSSION

We invited scholars to take part in our survey by invitation through Twitter and The Winnower emailing list. We acknowledge that our methods of recruitment may represent a population of researchers biased towards new models of publishing and scholarly communication, given The Winnower's model of publication and review. We received seventy-nine responses over the course of a few weeks of solicitation. Of these seventy-nine, 70% (55) were faculty, librarian, or researcher, including early career researcher with the remainder made up of PhD students, Master students, and other, at 18% (14), 4% (3), and 8% (6) respectively. Those identifying as "other" in the survey included publishers, independent scholars, and retired professors. In agreement with this, 61% of respondents identified as being at University.

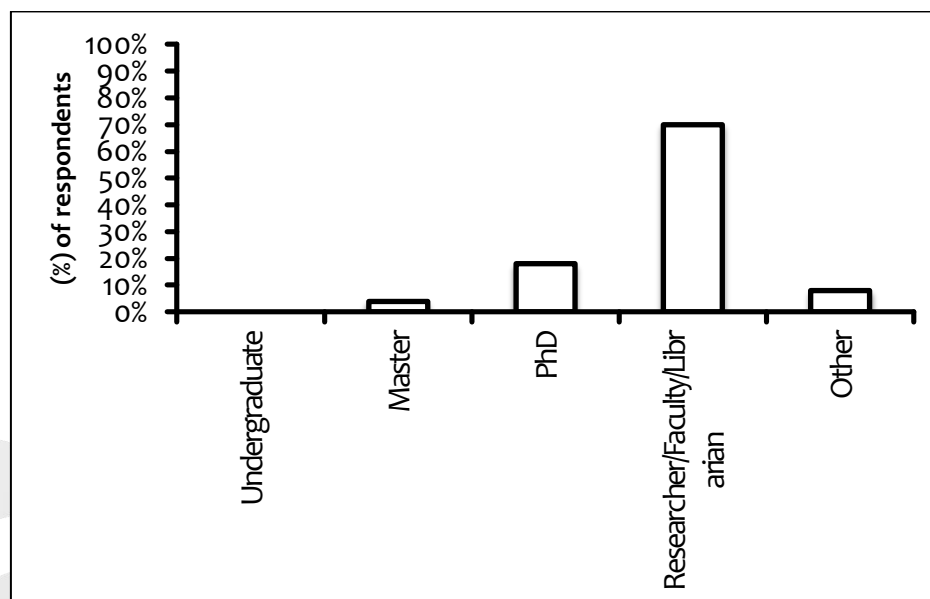


Figure 1: Employment level of 79 respondents



70% (55) were faculty, librarian, or researcher, including early career researcher. The remainder was made up of PhD students, Master students and other, 18% (14), 4% (3), and 8% (6) respectively.

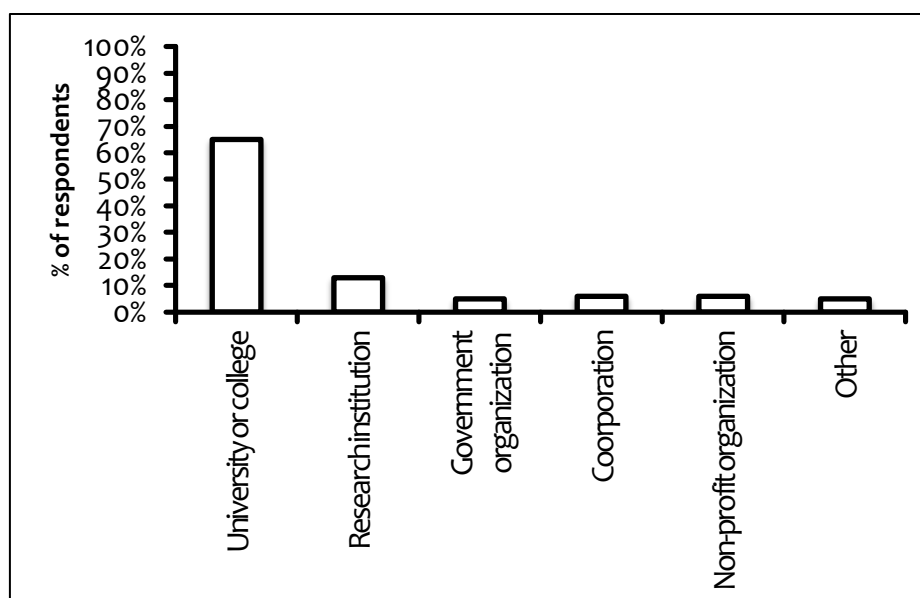


Figure 2: Employer/Organization of 79 respondents

The respondents polled came from a diverse background of study with Biology and the Life sciences making up the largest percentage of the group (Table 1). Most respondents had previously had their own work peer reviewed (92%) and had performed peer review of others work before (94%).

Table 1. Fields of study

Field of Study	% of respondents
Agriculture and Food sciences	0%
Arts and Architecture	1%
Biology and Life sciences	30%
Chemistry	0%
Earth and environmental Sciences	8%
Health Sciences	12%
History and Archeology	1%
Languages and Literature	3%
Law and Political science	0%
Mathematics and Statistics	1%
Physics and Astronomy	7%
Social Sciences	16%
Technology and Engineering	11%
None of these	10%



In general the survey showed that most believe peer review to be beneficial, both to give and to receive. While the merit of reviews was recognized amongst researchers the poll showed most believed that peer review did not aide greatly in the advancement of their career (Table 2).

Table 2. Benefits of peer review

Question	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I benefit from being peer reviewed	0.0	6.3	3.1	34.4	56.3
Others benefit from my reviews of their work	1.5	3.1	4.6	40.0	50.8
Reviews DO count for career advancement in my current position (salary reviews and/or tenure and promotion)	36.9	16.9	24.6	18.5	3.1
Reviews should count for career advancement in my current unit (salary reviews and/or tenure and promotion)	4.6	4.6	21.5	38.5	30.8

Because peer reviews are currently closed and thus hard to measure as an output by promotion and tenure committees and others, it is possible that open reviews may rectify this. Moreover, would making peer reviews open change their content or tone? When asked if peer reviews were made public, would they change? Most respondents answered yes, but to varying degrees (Figure 3). When asked how, many seemed to suggest that reviews may improve in various aspects from tone to better justification of critiques.

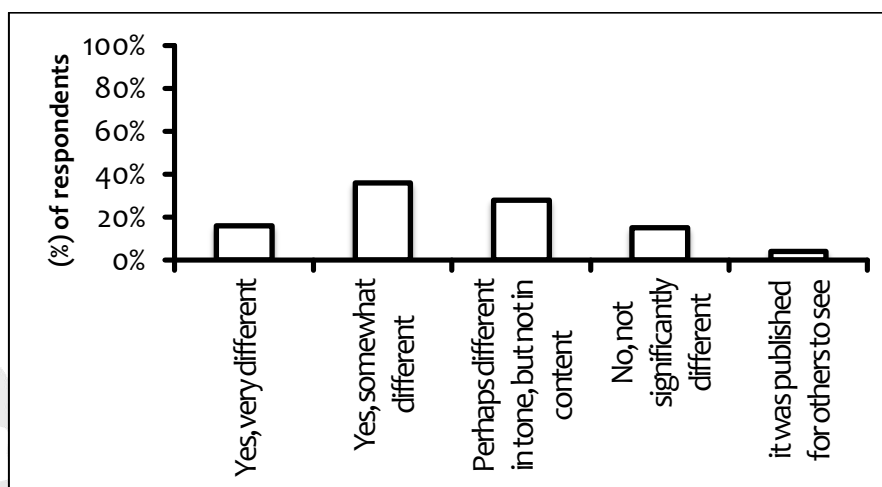


Figure 3. Do you think the review would have been different if it had been published for others to see?

Most respondents believe that making their reviews open would not require a significant amount of more work to be undertaken (Figure 4). If peer reviews were open and could consequently be counted by various evaluators from grant agencies to promotion and tenure, where would researchers list their reviews? The majority responded that they would list them on their curriculum vitae under “professional service” (Figure 5)

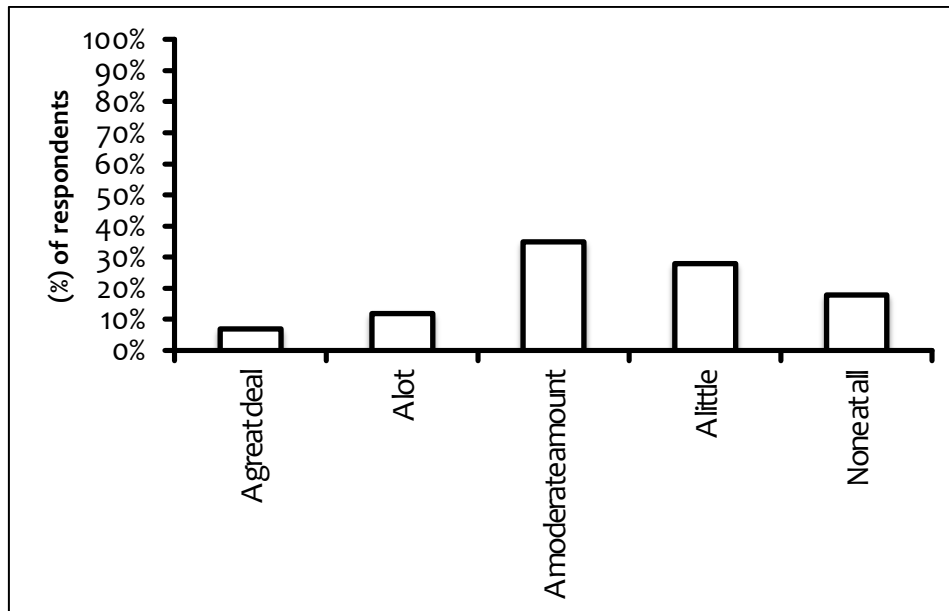


Figure 4. Assuming you wanted to: how much more time/effort do you think it would take to make your peer review something that could be posted publicly?

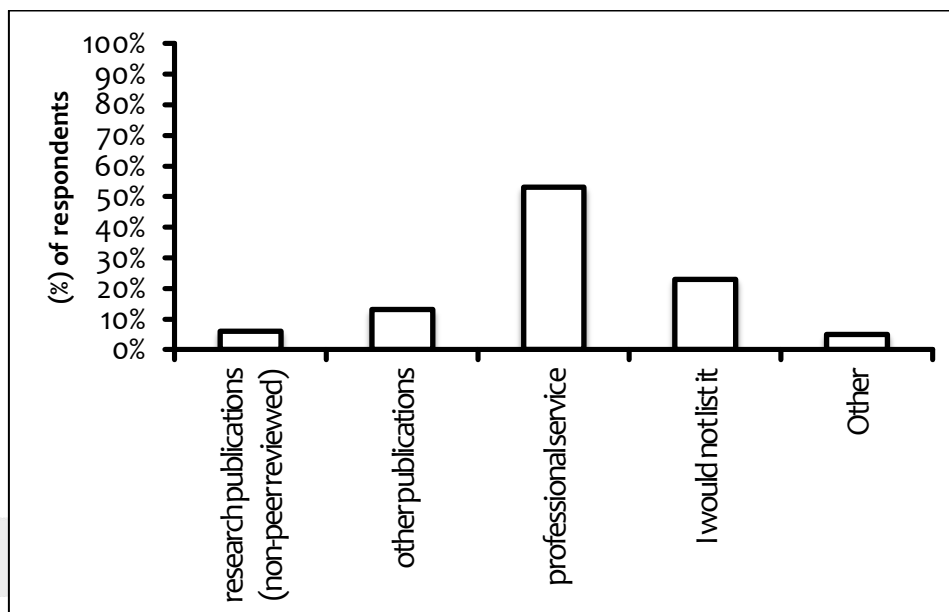


Figure 5. If published, researchers would largely consider reviews as professional service



Thus, based on our survey researchers see value in peer review, believe that open review would generally improve reviews, and that peer reviews should count for career advancement. However, most reviews remain private. When asked what change would need to happen for reviewers to make their reviews public, most said if tenure and promotion committees explicitly valued them and if their peers also published theirs (Figure 6).

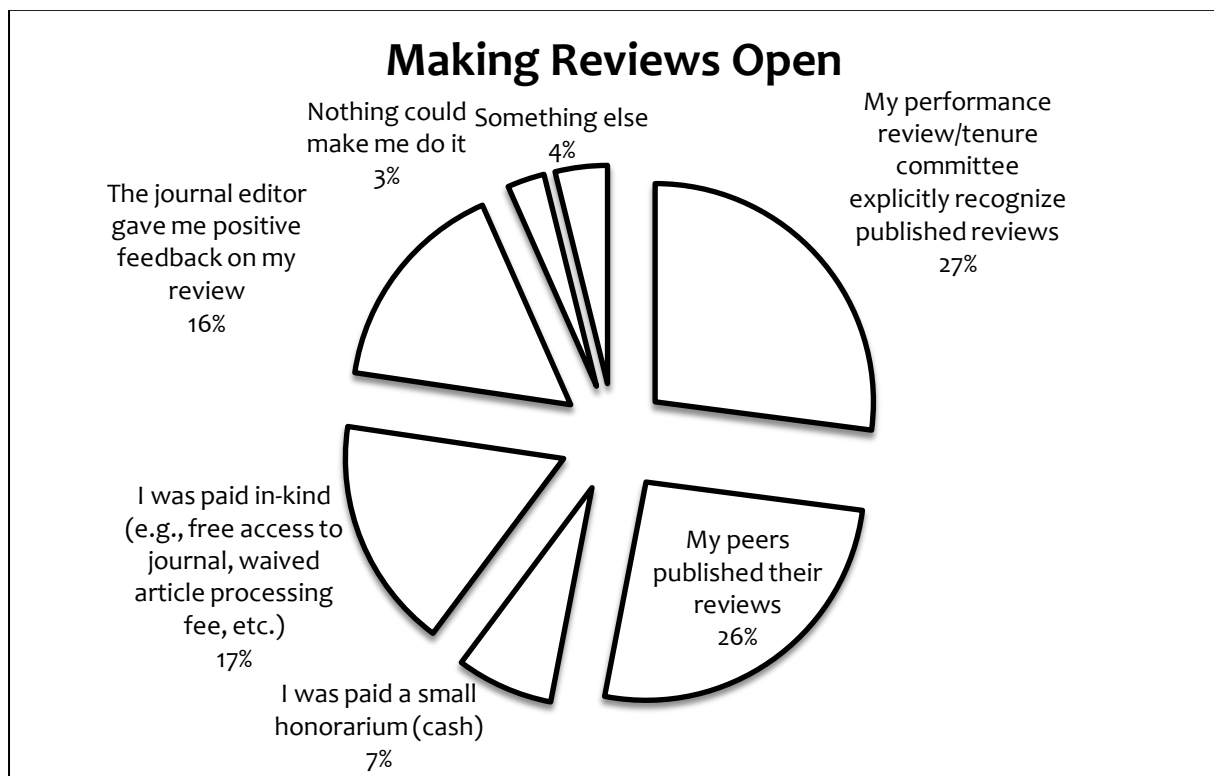


Figure 6. Reasons that would incentivize scholars to make their peer reviews publicly available

Respondents selected two reasons that would make them more likely to take the effort to make their reviews public.

Given the value of openly reviewing work amongst peers, many labs participate in a semi-regular meeting called “journal club.” In our survey 56% of respondents participate in journal clubs at varying frequencies (Figure 7). Although the majority of those we surveyed participate in journal clubs, the large majority of them do not publish them (67%). Again, when polled what would change this most pointed their promotion and tenure committees explicitly valuing them and their peers also publishing theirs (Figure 8).

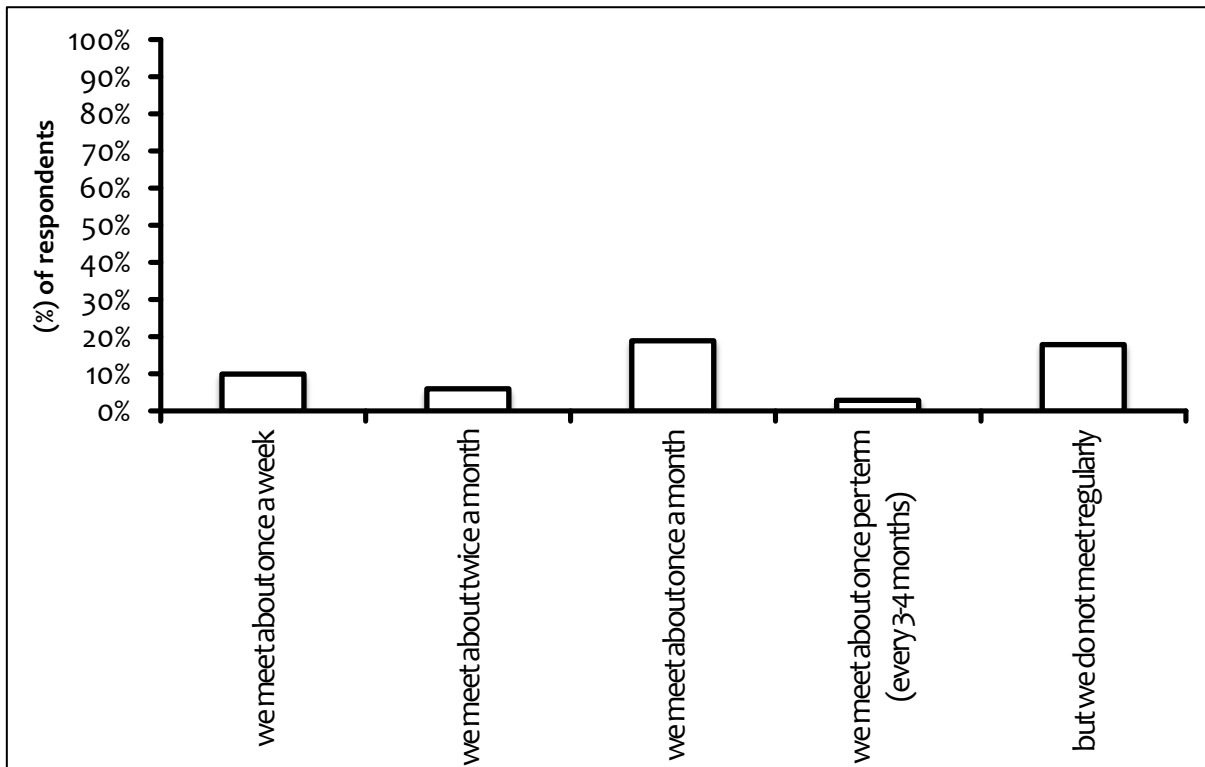


Figure 7. Do you or any of your peers participate in a "journal club" (meet informally to discuss published academic papers)?

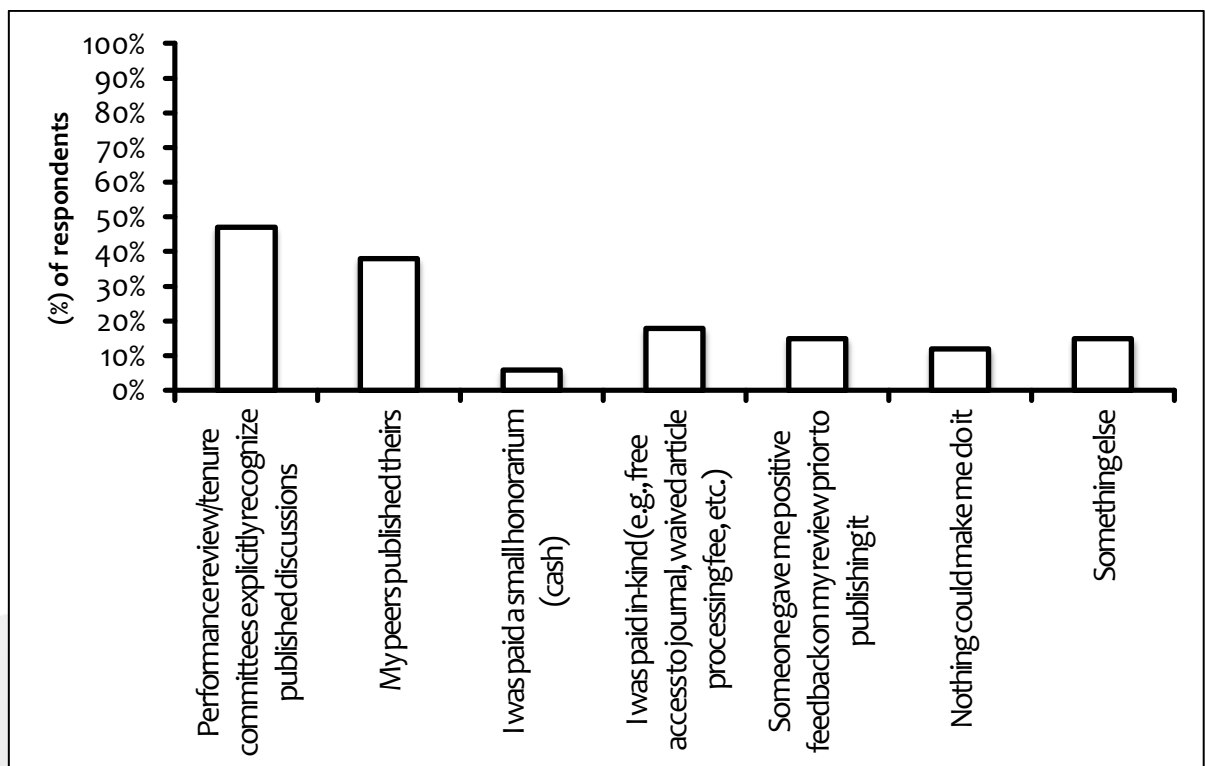


Figure 8. Reasons that would incentivize scholars to make their journal club discussions publicly available



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4 Experiment 3: OpenEdition - Experimenting with Open Peer Review and Open Peer Commentary



Julien Bordier

OpenEdition serves the humanities and social sciences research communities through four publication and information platforms: OpenEdition Books (books series), Revues.org (scientific journals), Hypotheses (research blogs), and Calenda (academic announcements).

Overview: This article narrates the experimental development of workflows for open peer review (OPR) and open peer commentary (OPC). This work was undertaken in conjunction with the open access environmental sciences journal Vertigo. Although the experiment did not last long enough (4 months) and was not deployed on a large enough corpus (10 preprints) to lead to firm quantitative conclusions, it nonetheless highlights the potentialities and limitations of open review processes – in the broadest sense – for scientific publishing. Based on this research, and the first-person participant observation narrative of the mediating-editor involved in coordinating open peer review activities, the article finally proposes a model for using freely available blog and annotation platforms to enable OPR and OPC. This model could be implemented in other publishing contexts for social sciences and humanities.

Note: An extended version of this report is available: <https://hal.archives-ouvertes.fr/hal-01302597/document>.

4.1 INTRODUCTION

A central and much debated activity in the academic world, peer review refers to different practices such as control, validation, correction and allocation of resources that the scientific community exercises upon itself. This control of the scientific community over itself is taken to be the guarantee of scientific quality. This control becomes even more important in an international context of increasing competition between universities and even scholars



themselves¹. This article will focus on peer review for scientific publishing. Peer review, briefly defined, consists in the evaluation of a pre-publication manuscript (preprint) by experts (referees), who indicate to the publisher whether the text should be published and/or indicate how the text should be modified. Traditionally, the authors do not know who reviews their manuscript (single blind) and sometimes neither the authors nor the referees know the names of each other (double blind). The reviewing work is an important part of a scholar's activities, but it is usually invisible and unrewarded. The principle of peer review is widely accepted, but its conventions are controversial². The main critique of peer review concerns the effective competence of referees. It turns out that the classical review process does not prevent the publication of false results or even hoaxes.³ In a general way, the impartiality assumed by peer review appears to be a myth⁴. This fact may be even more delicate in social sciences and humanities, which rest heavily on theory and interpretation, and therefore are not always best served by a model that aims at “accuracy” per se.

There are a host of proposed methods for reforming this process, for opening peer review in order to encourage scientific interaction around editorial content. These alternatives are born from a simple intuition expressed by many voices in the scientific community. As long as classical peer review does not prevent the publication of mistakes or fraudulent research, reviewing should be taken for what it is: a way to collaboratively improve texts and to guide editorial committees. OPR practices are more advanced in the English-speaking sphere and in the Science-Technology-Engineering-Mathematics (STEM) academic fields. Although OPR takes different forms, we here use the term to refer to a system where referees' reports are disclosed, accessible, signed, and that authors and referees are able to discuss them⁵.

¹ BOURE Robert, “De l'évaluation collégiale à l'évaluation à dominante gestionnaire”, Communication et organisation [En ligne], 38, 2010, <http://communicationorganisation.revues.org/1391> (accessed on the 11/02/2016).

² Among the rich literature about this subject, see the bibliographical landmarks proposed at the end of this text and see for example: WICHERTS Jelte M., “Peer Review Quality and Transparency of the Peer-Review Process in Open Access and Subscription Journals”, in PlosOne, 29 Jan 2016, doi : 10.1371/journal.pone.0147913.

³ As articles generated by SCIGen, see VAN NORDEN Richard, “Publishers withdraw more than 120 gibberish papers”, in Nature, 24/02/2014, doi:10.1038/nature.2014.14763 and in the journal Société, see COULMONT Baptiste, “L'Autolib' révélatrice de la sociologiepostmoderne”, in Le Monde, 9/03/2015.

⁴ See for example the blog post from the scientific journalist Michael Nielsen on this topic: <http://michaelsen.org/blog/three-myths-about-scientific-peer-review> (consulted on the 08/02/2016).

⁵ For a general view about open peer review, I allow myself to refer to the paper written during the exploratory research linked to this project: “Evaluation ouverte par les pairs : polysémie et problématiques”, published on OpenEdition LAB, <http://lab.hypotheses.org/1453> (consulted on the 08/02/2016).



This open alternative to conventional review today finds fertile ground in scientific digital publishing, enabled by new forms of editorialization⁶. Where scientific discussions before took place via the stilted exchange of paper copies, online they flow easily. The average Internet user has become familiar with practices such as commenting and online discussion, whether in collaborative practices or through the use of social media. It is not such a leap to transpose these processes to OPR. OPR further fits the spirit of the open access agenda defined by the 2003 Berlin Declaration, as it promises to make public a significant part of the research work that is usually invisible: the behind-the-scenes discussion and process of improvement. This seems especially crucial for social sciences and humanities, whose research objects help shape the worldly interpretations of a wide part of society and its social movements.

In this article we describe an experiment conducted by OpenEdition in the framework of the European project OpenAIRE2020, in partnership with the digital and open access journal of environmental sciences Vertigo and the Couperin consortium. This analytic description of the experiment will lead to model operational workflows for OPR and OPC.⁷ The qualitative approach adopted here – with first-person participant observation narration from the mediating-editor involved in coordinating the OPR activities – aims to describe the experimental workflow in order to draw out the significant elements of the system. Since the experiment took place over a short time and with a limited corpus of preprints (five preprints subjected to OPR and five to OPC), its results cannot be considered conclusive. However, it is hoped that these observations will inform the development of future OPR and OPC systems. In any case, the choice of a qualitative approach is justified because it seems safe to assume that issues related to peer review are closely related to the character and the subjectivity of authors, contributors and referees. The scientific community is a human community, shaped in part by personalities meeting and interacting. Thus, taking advantage of an approach based on specific examples, we want to express the need for case-by-case analysis before risking over-generalization. A prior hypothesis was that OPR protocols require specific human facilitation. This hypothesis was confirmed, as will be seen in the remainder of this report.

This article is a socio-anthropological study about an editorial innovation, on a reduced corpus, in a representative environment. This participant observation is enriched by feedback on the experiment collected from most participants (authors, referees and contributors). It also relies on verbal and written informal discussions that helped to clarify the purpose and context of scientific publishing and reviewing processes. In addition, two

⁶ For a definition, see: VITALI ROSATI Marcelo, "What is editorialization?" in Sens Public, Janvier 2016, <http://sens-public.org/article1059.html> (consulté le 11/02/16).

⁷ Protocol in situation : <http://vertigo.hypotheses.org/evaluations-et-commentaires-ouverts> (consulted on the 08/02/2016).



scholars in social sciences and humanities (who did not otherwise participate in the experiment) were interviewed to collect their thoughts and opinions about the experiments.

The following description and analysis of this experiment is organized in three sections:

- **Background and methodology:** describes briefly the two kinds of experiments, with open peer review and open commentary, as well as their editorial and technological contexts.
- **Results:** focuses on the limits of the workflows employed and the proposal of possible ways to improve the system.
- **Recommendations:** gives concrete advice on the implementation of open peer review and open commentary workflows.

4.2 DESCRIPTION OF THE EXPERIMENTS

4.2.1 PLATFORMS AND EDITORIAL CONTEXT

The experiments used OpenEdition's existing platforms for journals (Revue.org) and academic blogs (Hypotheses.org). The venues chosen were the French language journal VertigO: The digital journal of environmental sciences⁸ (hosted on Revues.org) and VertigO's research blog⁹ (hosted on Hypotheses). Although journals hosted on Revues.org need not necessarily be linked to a scientific blog hosted on Hypotheses, the latter platform is encouraged as a kind of research notebook, to enable the rapid dissemination of research results.¹⁰ The relationship between a journal and a research notebook hosted on two platforms managed by the same structure was thought to create an editorial consistency that would be beneficial to the development and progress of the experiment.

4.2.2 SCIENTIFIC CONTEXT: VERTIGO, ENVIRONMENTAL SCIENCES

The social sciences and humanities have traditionally been less enthusiastic than the STEM subjects in embracing open peer review experimentation. Given that the environmental sciences operate at the border between biological and human approaches, they offer an interesting area for experimentation with OPR and OPC. VertigO therefore creates a fertile interdisciplinary ground for experimentation. It is also a linguistically interesting venue since it is based in Montreal, at the crossroads of linguistic areas and therefore also at the crossroads of different traditions of scientific communications. VertigO's research blog

⁸ www.vertigo.revues.org.

⁹ www.vertigo.hypotheses.org.

¹⁰ 2016, for 1459 blogs hosted on Hypotheses, only 42 are "publications blogs" that is to say, attached to a publishing device.



provided a low-technology solution to the implementation of OPR. The research blog already functioned as a public space for the discussion of preliminary research results. Hence, it makes a natural home for the public evaluation of journal articles. VertigO's research blog is usually used by the journal for several purposes (e.g. calls for contributions, opening published articles to comments, and reporting journal activities and publication).

4.3 DESCRIPTION OF THE EXPERIMENTS

The experiment took place over five months, with the first month devoted to desk research, and developed along two distinct branches inspired by the existing multitude of forms taken by open peer review. This choice was also shaped by the types of articles' proposals available by VertigO's editorial board, some of which were spontaneous contributions that the journal was having difficulty dealing with due to their number and variable quality (particularly issues with their language).

4.3.1 OPEN PEER REVIEW WORKFLOW

Five texts were selected for the OPR workflow. Review was conducted according to the same table of reviewing criteria as is used in the journal's classical 'blind' review.¹¹ These criteria cover the different levels and features of the text, with some criteria to be quantified (rated from one to four), while others allow for free text. The reviewing document concludes with sections for the referee's opinion on the relative strengths and weaknesses of the paper, their publication recommendation (accept, accept with major/minor revisions, or reject) and comments addressed to the author.

Within this experiment, the review process is open because it is transparent and open to public visibility (open reports) and both authors and reviewers are known to each other (open identities). Articles were uploaded as blog posts and reports were submitted using the blog's commenting function just below the article text. Texts were uploaded online once at least one referee agreed to review the preprint. Hence, the content of the submitted article was also published from an early stage in the review process (post-publication review). Potential referees were assigned by the journal, with the authors having previously given their consent to participate in the experiment.

At the end of the reviewing process, the respective blog page (with the article's first version, reviews, annotations and answers from authors) remains online. Where the text was accepted for publication, the published version carries an editorial note indicating that the article was openly peer reviewed and crediting the referees (with a link to the relevant blog

¹¹ This document is public, available among the "Instructions for authors": <https://vertigo.revues.org/5401> (accessed on the (2.02.2016)).



page). A link to the published version was also added to the blog page, with text indicating that the article was subject to OPR, and that this process is now complete. Where a text was not accepted, however, the article text and reviewer comments were deleted, and only the article's title, the names of authors and referees, and a note that the text had been subject to unsuccessful open peer review remained online.

EVALUATION OUVERTE

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“Synoptique et impacts d’un événement hydrométéorologique : les inondations du 6-7 octobre 2014, Grabels (France méditerranéenne)” par T. Rey, S. Defossey, F. Vinet et L. Boissier

PAR TONY REY · 6 NOVEMBRE 2015

Cet article est soumis à une évaluation ouverte par les pairs. Les rapports d'évaluation sont ou seront postés à la suite du texte. Pour consulter les annotations faites sous [hypothes.is](#), le plug-in est activable en cliquant sur ce lien.

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Résumé : Dans la nuit du 6 et 7 octobre 2014, une crue éclair frappe le nord de Montpellier et notamment la commune de Grabels. Au cours de ce bref épisode pluviométrique, les ruissellements de versants, les cours d'eau -du petit ruisseau au fleuve de la Mosson- sont entrés en crue et sortis de leur lit endommageant près de 500 habitations. Pour reconstituer au plus près la synoptique de la crue rapide et ses impacts, nous avons mené un retour d'expérience dès le lendemain de la catastrophe. A partir des indicateurs morpho-sédimentaires et des dégâts observés, nous avons reconstitué l'enveloppe de la zone inondable ; caractérisé les hauteurs d'eau maximales atteintes ; identifié la cinématique des écoulements de crue ; estimé les débits de pointe et la puissance spécifique et caractérisé les modifications morpho-sédimentaires. Le retour d'expérience, réalisé à l'échelle locale, a mis en lumière les dynamiques hydrogéomorphologiques et leurs effets, comme l'existence de deux ondes de crue, la sous-estimation à certains endroits de la zone inondable, l'inadaptation de certains aménagements, ou encore des effets de site ou la forte capacité d'incision des matériaux. Il a en outre permis d'estimer les dommages sur la zone urbanisée.

Up: draft

4 RÉPONSES

[Commentaires](#) 4 [Pingbacks](#) 0

Yves Guermont · 14 décembre 2015 à 10:20

Evaluation ouverte par Yves Guermont, CNRS/UPRESA 6063 IDEES, Université de Rouen, France

Appréciation du sujet
Moyenne

Appréciation générale
L'information contenue dans l'article est à jour, mais manque de précision technique. Son contenu est appuyé par des recherches valides et soutenu par une bibliographie. Les statistiques utilisées sont valides. Les arguments présentés sont logiques. L'article est pertinent pour la revue *Vertigo*, le lectorat de la revue, ses mandats et ses objectifs.

Appréciation concernant les articles de résultats de recherche et de réflexion théorique
Concernant la valeur scientifique: acceptable, demande de modifications mineures.
Concernant la qualité méthodologique: acceptable, demande de modifications mineures.

Appréciation concernant les articles de transfert de connaissance (synthèse)
Concernant l'exhaustivité: acceptable, demande de modifications mineures. Concernant la qualité de synthèse: acceptable, demande de modifications majeures (une localisation insuffisante des aires inondées et de leur relation avec l'urbanisation, ce qui est pourtant le cœur de l'article).

Appréciation concernant la correction de la langue, l'écriture et le style
Acceptable, demande de modifications mineures.

Appréciation concernant l'élégance de la présentation, l'organisation et la structure du texte
Acceptable, demande de modification majeure.
Le plan est un peu fouillis, ce qui entraîne de fréquentes redites. Pourquoi ne pas adopter un plan, certes classique, mais plus clair et convaincant. Par exemple:
- 1 Le contexte hydrogéologique et météorologique
- 2 Cinématique de l'écoulement de crue et calculs des débits
- 3 La péri-urbanisation non contrôlée vecteur d'exposition aux risques

Commentaires généraux
Points forts: une analyse sérieuse des données hydrologiques.
Lacunes ou faiblesses: un lien mal explicité avec les conséquences sur l'habitat.
Compréhensibilité: un plan un peu fouillis.

Down: reports

Illustration 1: A report published below a preprint



4.4 OPEN PEER COMMENTARY WORKFLOW

The second experimental workflow did not aim to review articles for publication but rather to use crowdsourced commentary to help authors to improve their initial drafts before submitting for review. Five texts were published within this open commentary condition. The texts were contributions which were felt by *Vertigo's* editors to have significant problems and to be not yet ready for peer review. These texts were open to substantive and formal comments from any member of the public (open participation). This part of the experiment is henceforth referred to as the open peer commentary (OPC) workflow; those who post comments and annotations will be called *contributors*.

In this experiment, editorial content was not published at the end of the process, but the blog page did remain online, indicating just the article's title, along with the names of the authors and contributors. Where an article is eventually submitted and published (after a traditional peer review process), authors are asked to add the contributor's names to the *Acknowledgements* section of the article. A link refers back to the page of the blog where comments and annotations would then again be made available.

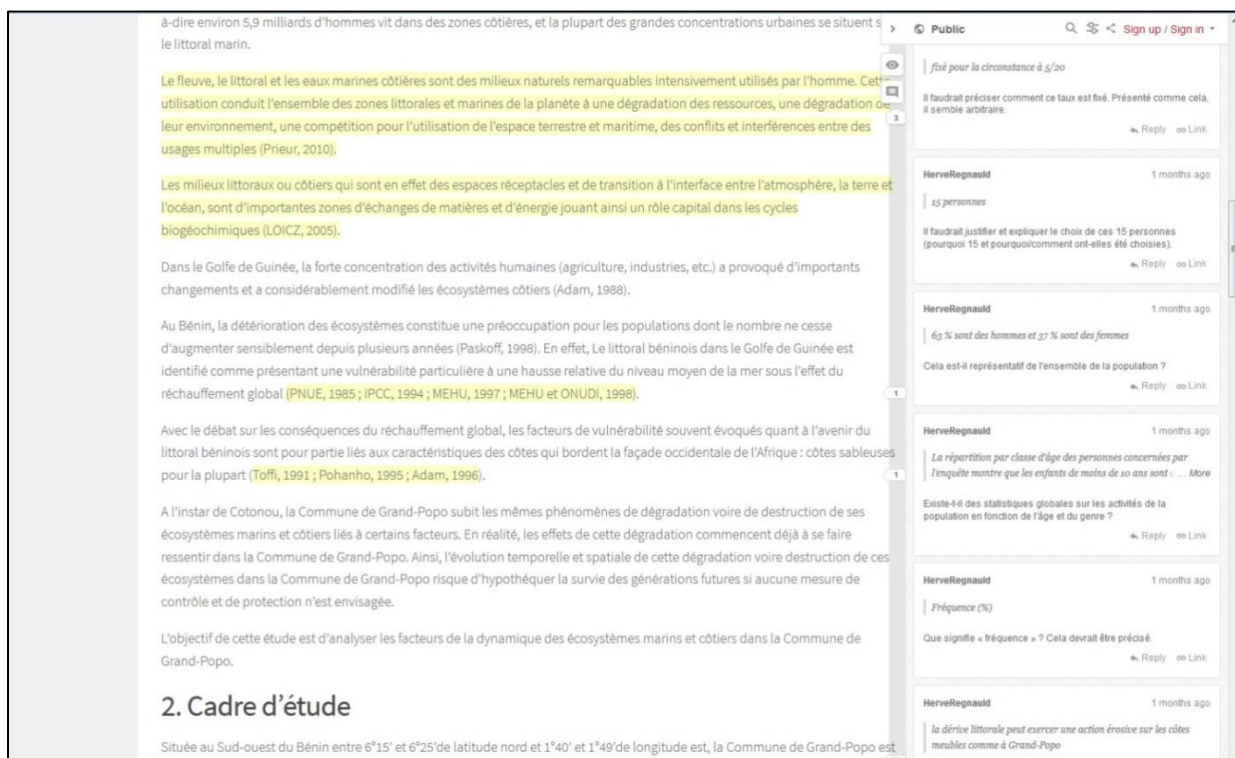


Illustration 2: A contributor annotates an initial draft

4.5 TECHNICAL MODALITIES FOR REVIEW AND COMMENTARY

The experiment was conducted on Hypotheses, OpenEdition's blogging platform operating on WordPress. This blog platform's commenting feature was used for both the review and commentary workflows. However, the blogging platform does not include the ability to



annotate, i.e., to publish comments inside the text itself. For this purpose Hypothes.is¹², a free Web browser plug-in based on the open-source JavaScript library Annotator¹³, was chosen. It allows users to easily annotate editorial content online by overlaying an annotation layer on a webpage (cf. Illustration 2).

4.6 RESULTS

4.6.1 INTEREST IN EXPERIMENTATION WITH OPR AND OPC

The first element to note is the almost unanimous enthusiasm for the experiments from participating authors, referees and contributors, as well as in various informal discussions about the experiment. This enthusiasm was felt even during the search for referees/contributors. As in classical peer review, many peers declined the invitation to review. Yet, even those who declined to take part expressed an interest in this experiment. The recurring reason given for not participating was lack of time. This observation applies to both potential referees and contributors. This same enthusiasm toward the experiment was expressed in feedback from participating authors, referees and contributors. All were positive, save for one example from the “review” condition (described and analyzed later).

4.6.2 OPEN INTERACTION: POTENTIAL DISCUSSION BETWEEN AUTHORS AND REFEREES

Our workflow for OPR enabled interactive discussion between authors and referees/contributors. Interactive discussion took place in only about half of cases, however, even with mediational intervention in the form of inviting authors to answer reports. Generally, even where interactive discussion did not take place, reviewer and contributor comments were still taken into account during revisions.

Where discussion did take place, it generally took the form of a single detailed response by the author. However, some discussions developed into long exchanges, with new answers raising new questions. A basic typology of these discussions can be drawn:

- Modification: the author notes the observation and proposes a modification or announces that a modification will occur.
- Precision: the author asks for precision over the observation or the requested modification.
- Justification: the author justifies his/her position regarding a point of criticism.

¹² <https://hypothes.is>.

¹³ <http://annotatorjs.org>.



At the end of the process, the record of this discussion can be a useful tool for an editor, enabling the arbitration of differing points of view and more precise requests for modifications. Although interactive discussion was undertaken in only about half of the cases, feedback from participants suggests that this did not represent a rejection of the idea of interactive discussion, but rather reflected a lack of time on the participants' behalf or a wish to wait for the results of the final review before addressing the requested modifications. This seemed to be the case in the "open commentary" condition, where articles were simultaneously under traditional review. Had these articles only been subject to open commentary, conditions would have likely been more favorable to discussions between authors and referees.

Studies suggest that openness encourages a better quality of comments in their contents and form^{14,15}. This may be because openness leads to a greater consideration of these factors: open identities personalize the process and open reports lead reviewers and contributors to take into account that their words will be exposed to an open audience for potential criticism of their own. In these experiments, these factors led to four reviewers and contributors reporting experiencing difficulties in finding the right tone and language for their observations. A concern in OPR is that these factors blunt the critical edge of reviews, but the experience in these experiments was that they led to constructive and relevant discussion where lack of clarity could be questioned. This recalls a "seminar effect", where the discursive possibilities enable a kind of "orality", with some of the benefits of face-to-face conversation enabling a critical but cordial exchange. Moreover, the review reports were longer and more detailed than is usually the case for the journal in question. This cordiality required facilitation, however. Three reviewers and contributors directly approached the mediating editor for advice regarding language, and one case in the open review condition resulted in the breakdown of communication between author and reviewer, necessitating intervention.

This latter case encapsulates many of the difficulties of open peer review. Conflict began when the preprint appeared online, as it seems that the author had not understood the conditions of the OPR. This demonstrates the need for clarity amongst all participants as to the terms under which the peer review is to be conducted before the beginning of the process. The author's preprint accrued a negative review which advised that the article should be rejected. The author immediately requested that their text be removed from the Web and from the experiment. After some explanatory mediation regarding the OPR

¹⁴ Which is a common preoccupation, see for example: <http://blogs.plos.org/everyone/2015/05/01/plos-one-update-peer-review-investigation> (accessed on the 2/02/2016).

¹⁵ As for example: WALSH Elizabeth, ROONEY Maeve, APPLEBY Louis, WILKINSON Greg, "Open peer review: a randomized controlled trial", in *The British Journal of Psychiatry* 176, 2000, doi: 10.1192/bjp.176.1.47.



workflow, the author was persuaded to continue with the experiment and to express these objections directly to the referee via the review protocol. The author rejected out of hand each of the reviewer's negative comments and in the end again requested that their text be removed from the process. As it had not been agreed beforehand what would happen in such a case (whether the text would remain online or not), we agreed to the author's wishes. This points again to the need for the clear description of the open peer review process so that authors and reviewers are aware of the consequence of the process ahead of time.

This case is not representative of the whole experiment, however. Another author of a text negatively reviewed (text 3), accepted critique and was ready to reply in order to get their work published. Indeed, the possibility for an author to answer referees' observations is a central advantage to OPR. In an OPR process, the referee's point of view need not be fixed, insofar as the author is able to directly question or counter criticisms they regard as illegitimate.

Furthermore, the authors' open answers can be a way for both the journal and readers in general to evaluate the relevance of the referee's objections and the efficacy of author revisions in answering reviewers' concerns. Authors can also investigate their referees' specializations and have a better understanding of their observations and better evaluate their relevance. As one referee put it, "the referee is reviewed". Indeed, the referee's hegemony, usually mediated by the journal behind the curtain of anonymity, is open to question. Thus, openness introduces reciprocity into the peer review process, which is publicly performed under the scrutiny of the community.

4.6.3 OPEN PEER COMMENTARY: MOTIVATING DISCUSSION

The five texts open to commentaries were chosen because of their formal problems. The goal was not to review them for publication, but rather to help authors improve their preprints until they were ready for submission. In practice, it transpired that this novel condition was not sufficiently clear for participating commentators accustomed to traditional review. Again, clearer information regarding the relevant processes, in particular regarding the differences between the two conditions was perhaps necessary. However, the "commentary" branch proved useful in opening an international space where researchers could discuss and develop their work. Within this condition, all texts came from authors from Sub-Saharan Africa, perhaps indicating its efficacy for scholars with fewer chances for exchange with the wider international academic community.

As with previous experiments with open commentary, it proved difficult to find contributors for this condition. On VertigO's blog, where a section is dedicated to commenting on articles published in the journal, it is quite rare that readers post comments. Of 29 post-prints open



to commentary, only 9 received comments, with two comments the maximum any article received.¹⁶ Hence, different strategies were employed to find contributors. The first was the sending of semi-targeted emails to scholars found via university webpages. This strategy failed to bring in contributors, despite about ten percent of recipients responding positively to the emails with comments like “exciting”, “totally interesting”, “practice that should be developed”, “very relevant”, and “very interesting principle”. Once again, the issue was often lack of time, but also a professed lack of expertise, with answers like “I’m not specialist at all in this field”, “I feel far away from these issues”, and “I’m not sure to have the proper competences”. Given that commentators were only being asked to comment on purely formal elements such as language and structure, which requires no disciplinary specialism, this again shows the difficulties of communicating the conditions of such novel experiments, but also the fact that for some academics it is difficult to separate issues of form and content.

As this first strategy failed to attract contributors, a second wave of communication sent targeted emails to scholars based on their specialisms inviting them to comment on a specific text relevant to their interests. This strategy increased the number of contributors from two to ten, indicating that contacting scholars to invite comments on specific texts works to generate open-commentary interaction.

This strategy showed another interesting result. About twenty persons from outside of academia were invited to comment on the preprints based on their professional profiles – in particular for texts about water and water treatment. Despite each being contacted twice, no responses from this group were received. Here, as well as an issue of time, we can ask whether this was because those contacted did not feel themselves able to comment or if it indicates a deeper schism between industry and academia and the need for work to increase interaction between the scientific community and non-academic experts.

To sum, the open commentary condition was a success. All texts received comments and/or annotation, although their distribution was unequal. This fact separates the articles treated in this experiment from most open commentary trials, which struggle to attract commentators. The main factor in this success was the mediational activity of targeted requests sent to experts based on their familiarity with an individual article’s topic.

All the authors from the open commentary condition who gave feedback about the experiment (three of five) reported appreciated submitting their text to open commentary and asserted that they would do so again if given the chance in order to improve their preprints. Five texts were commented upon, four of them had their modified versions sent back within the time of the experiment, which proves the authors' interest in and commitment to the exercise.

¹⁶ At the end of January 2016.



Most contributors to the open commentary condition preferred to use the blog commentary feature rather than the annotation function, even where the latter would have been more effective in enabling comments on specific portions of text. This was despite the provision of specific tutorial materials for users. Here it seems participants were inhibited by being unfamiliar with the Hypothes.is Annotator plug-in software. Hypothes.is requires work to create a user's account, to activate this account, to activate the browser plug-in, to understand how to write an annotation, to type the annotation and finally to click to publish the annotation. Annotation would have perhaps found greater use had it been directly implemented on the blog rather than externally.

4.7 CONCLUSIONS

These experiments reveal open peer review and commentary as both social and technical challenges. The OPR and OPC workflows were enabled via relatively simple web technologies. Although these technologies functioned surprisingly well, their limitations nonetheless can be seen to have inhibited uptake of, for example, the annotation feature. However, although OPR undoubtedly faces technological challenges, these seem overshadowed by the social problems of training, outreach and engagement required to bring users to take up these in novel processes.

4.7.1 TECHNICAL IMPLEMENTATION

The experiments showed the suitability of a simple blog platform like Hypotheses as a platform for open peer review and open peer commentary. This suitability derives from its relative ease-of-use for administrators and its intrinsic commenting feature¹⁷. There remain a few technical modifications that could improve its operational processes, however:

- Enable users to easily export texts to read offline before commenting or reviewing and enable users to easily export annotations and comments. (In fact, in the “review” condition, the referees were also provided with a file containing the text. This possibility could be generalized and automated.)
- Enable the numbering of the paragraphs (as is done in Revues.org) to allow referees and contributors to easily refer to specific parts of the text that they want to

¹⁷ About utilization and appropriation of the blog-form by the scientific community see: DACOS Marin et MOUNIER Pierre. “Les carnets de recherche en ligne, espace d’une conversation scientifique décentrée”. in *Lieux de savoir, T.2, Gestes et supports du travail savant*, 2010, Albin Michel, Paris, pp.333-352 (disponible sur HAL: <sic_00439849>).



comment. These modifications concern the WordPress theme that is employed. The CommentPress Core¹⁸ plug-in developed by WordPress could be an alternative.

- Integrate the annotation tool directly into the blog. As described above, annotation was under-used. This could be rectified if instead of a web-browser plug-in, annotations were built directly into the blogging platform itself. Such an integrated tool would also enable the attribution of annotations to individual authors/referees/contributors.

4.7.2 HUMAN MEDIATION

The experiments demonstrated that enabling open peer review and open commentary are not merely technical problems. Their success depends upon mediation in its various stages. Firstly, clear tutorial/introductory materials to clearly explain the workflows are necessary. Secondly, mediation seems necessary to motivate the community to comment. Thirdly, the relative novelty of such forms of peer review means that there is an initial period of familiarization during which mediators can help orient participants. Finally, there is sometimes a need to guide discussions or mediate disputes.

OPR often requires human mediation to help the protagonists to find the proper tone to interact. In order to improve and control the quality of the language employed by protagonists, specific good behavior charters for open review and commentary could be proposed. Such rules could be a way to guide authors, and could be a reference for a journal in order to know who is an efficient referee or contributor to contact. Such facilitation activities are also necessary for technical support. Although the commenting function was clear for all protagonists, use of the more complex the annotation tool had to be specifically supported. Hence, it is important to note that setting up open peer review and open commentary workflows is unlikely to remove the need for editorial mediation. Opening reviewing processes modifies the tasks of the editor but does not render them unnecessary – especially as long as such workflows remain novel.

- **Facilitating OPR:** For the “review” workflow it is was necessary to guide authors as much as referees. In a classical review process, the main task is to make sure that referee will send back their review in time. In an interactive open peer review process, both referees and authors must be tracked, especially to encourage interaction around the review. In the frame of this experiment, it appeared necessary to invite authors to react to the reviews.

¹⁸ For example, see: futureofthebook.org/commentpress, or its utilization for open peer review on <http://adareview.fembotcollective.org> (accessed the 2/02/16).



- **Facilitating OPC:** For the “commentary” workflow, just publicizing the implementation of the experiment was clearly not sufficient to attract contributors. Instead it was necessary to invite specialists to comment. In addition, the experiment noted that even where scholars accept an invitation to participate in the commentary process, they must still be encouraged to remain effectively involved in the experiment. Finally, as in the “review” condition, it is necessary to invite authors to react to comments.

4.7.3 ESTIMATION OF THE NECESSARY WORKING-TIME

It is not easy to precisely determine the necessary working-time that has to be granted to OPR and OPC workflows. But such devices obviously continue to require efficient editorial mediation¹⁹. Achieving the level of engagement around the ten texts described here, with a reduced review period of one month, required the activity of a mediating editor for the period of four months. The mediating editor did not work full-time here, as this time was also occupied by background research into OPR. Nevertheless, the investment of time in implementing and mediating the workflows was substantial. We estimate that the time invested in bringing the 10 pre-prints through the review/commentary process required around 17 hours a week.²⁰ We can then further divide this into 7 hours for the “review” condition and 10 hours for the “commentary” condition, including the search for contributors, making an estimated time and cost per text of 17 hours (~448€) for an open peer reviewed text, and 24 hours (~638€) for a preprint open to commentaries, which is not excessive compared to the average article processing charge (though this does not include type-setting and operational costs).

4.7.4 CREDITING REFEREES AND CONTRIBUTORS

The difficulty in motivating open participation in OPR can potentially be offset by the new incentives enabled by open identities and open reports. Making review reports and reviewer identities open, enables reviewers to gain credit for their peer review activities. This issue is at the core of initiatives like Publons, which index review activities in collaboration with reviewers and publishers. Enabling reviewers to gain the symbolic reward of credit for reviews is seen as a key way of incentivizing review activities. One issue arising for publishers from this is the need for formal review citation practices, in order to enable reviewer credit that does not rely on a third-party service such as Publons or Reviewer Page. For us the best

¹⁹ CONTAT Odile et GREMILLET Anne-Solweig, “Publier : à quel prix? Étude sur la structuration des coûts de publication pour les revues françaises en SHS”, in *Revue française des sciences de l’information et de la communication*, 7, 2015, (accessed on the 11/02/16), URL: <http://rfsic.revues.org/1716>.

²⁰ Considering that this task occupied half of the working-time during this experiment, which means 17 to 20 hours a week.



solution seems to be to integrate all information linked to the reviewing process in the metadata of preprints and postprints.

4.8 FINAL WORDS

This experiment was remarkable for the level of enthusiasm with which it was greeted, and hence the eagerness of the scientific community to bring innovation to reviewing processes. Yet it is also remarkable for the difficulties faced during implementation, especially in motivating potential reviewers. As well as facilitating the understanding of the openness and the technical aspects of the process, much time was required to facilitate the contact and the discussion modalities. Opening up peer review is just making public some necessary and routine parts of the scholar's work, but it seems that traditional processes and the conventions of invited, anonymous review are deeply engrained in research cultures. We should not forget, however, that what is done in OPR is common practice in seminars, conferences and colloquies. Perhaps what is required is the gradual introduction of such novel practices – this, at least, was the message from the interviews conducted for this study.

Thanks: The author would like to thank the numerous participants to the experiment (authors, referees and contributors), Eric Duchemin and Jessica Onitsoa Andriamasinoro (journal VertigO) for their availability, Emmanuelle Corne (Editions de la Maison des Sciences de l'Homme) for accepting to be interviewed, and all those who contributed their thoughts about peer review. Finally, the author particularly thanks Pierre Mounier (OpenEdition) for following, thinking and committing to the experiment and this report.



5 Conclusion

These experiments aimed at promoting OPR and studying its effects in the context of digital infrastructures for open scholarship. The main goals were to encourage experimentation, investigate ways OPR might integrate with OpenAIRE's infrastructure, and provide case studies for evaluation. All of these goals have been met:

- Open Scholar and partners aimed to enable direct and transparent academic collaboration between authors and reviewers by turning repositories into functional evaluation platforms through the development of an Open Peer Review Module (OPRM) to be installed in open access repositories. The OPRM's reputation system allows the quantification of a reputation for repository-hosted research objects, authors, reviewers, and reviews, and thereby integrates an element often said to be an incentive for open review: bringing the work of peer review into the scholarly reputation system. The OPRM was implemented in two repositories as part of this initial experiment. Selected researchers from all scientific disciplines were invited to have their work reviewed. First results indicate that such processes take time to develop and that some authors remain reluctant to take part. Hence the OPRM will likely continue to require human mediation to coordinate and motivate reviews. Nonetheless, the OPRM is ground-breaking in demonstrating the potential for incorporating peer review workflows into public, participatory scientific infrastructures.
- The Winnower looked to incentivize the publication of post-publication peer reviews through three activities: (1) Integration of the Winnower platform with repositories like Zenodo via DOIs and APIs to facilitate open peer review of repository objects through the development of an open source tool called "Terrier" to extract metadata from scholarly articles (and in the case of Zenodo, the articles themselves). Terrier proved a good technical solution for connecting articles/metadata with the reviewing platform, which not only became part of The Winnower's core functionality but is also reusable and open for other purposes; (2) an online-campaign to solicit participants to publish their journal club discussions. This proved less successful: While a total of 12 groups agreed to participate, The Winnower published only 6 journal club proceedings over the course of two months, even with small financial incentives on offer; (3) a survey of Winnower users and Twitter followers about their attitudes towards the publication of peer review reports. The survey showed that the strongest incentives for researchers to take part in OPR are the behaviors of other members of the academic community and the possibility of garnering reputational rewards.



- Finally, OpenEdition focused on developing and evaluating workflows for open peer review (OPR) and open peer commentary (OPC) using the existing infrastructure of hypotheses.org, OpenEdition's platform for academic blogs, and the annotation tool hypotheses.is. The experiment was successful in showing that OPR need not require technologically-elaborate solutions, and can be implemented (with some hiccups) successfully across openly available social platforms. It showed quite starkly, however, the extent to which OPR is a social problem. The systems invited open interaction and open participation, but a great deal of human mediation was required to motivate participants, as well as to introduce the workflow, guide discussions and mediate disputes.

These experiments created innovative, open-source technical solutions for realizing OPR beyond traditional publishing infrastructures in the OPRM and Terrier". Open Edition's workflow showed the possibilities for re-purposing freely available online tools like blogging and annotation software for the similar purposes. At the same time, however, they also showed the social challenges of implementing OPR. All three experiments had difficulties in motivating authors and/or reviewers to take part. Hence, the role of human mediation, in educating users in new systems, motivating participation, guiding discussion and mediating disputes, cannot be understated.

The multitude of ways in which the various traits of OPR like open identities, open reports, and open participation can be configured, alongside the relative scarcity of research into how effective these various possible OPR configurations are in addressing the perceived deficiencies of traditional peer review, mean that experiments such as OpenAIRE has here supported are much needed. But these experiments point to further questions that urgently require further research and practical experimentation, like a common understanding of OPR, effective incentives, reputation metrics for works, reviews, authors and reviewers across different platforms, ways of acknowledging reviewing activities, disciplinary differences, ethical issues, relative costs, and much more.