Open Science and peer-review in the humanities[1]

Hanne Rennesund Tallaksen

The purpose of this paper is to consider alternatives to the traditional system of peer review. I will argue that new methods of review should be more in accordance with the principles of Open Science. Current modes of carrying out peer review are functioning as barriers against more transparent ways of doing research. I will focus on peer reviewing as it is done in the humanities. These sciences seem to be clinging particularly tight to traditional ways of publishing and doing peer review. After looking at traditional peer review and the troubles related to it, I will discuss alternative ways of reviewing scholarly material. The anonymity of reviewers and authors, the appropriate time to make papers public, and how to reward reviewers are topics that are of importance in this context.

What is Open Science?

Open Science is a movement that works toward cultural change in the scientific communities. It sees the social features of Web 2.0 as important means to realize this goal. Web 2.0 opens for user-participation, collaboration, sharing and networking("Web 2.0," 2014). Open Science uses this technology to make the scientific research process more transparent for members of the scientific community and to outsiders. According to Open Science, new technology should be used to share scientific results to a wider audience. The internet provides new ways to communicate within the scientific community, as well as new ways of assessing and spreading scholarly output. Scientists are already using these new tools to enrich and simplify research. It is too early to tell how the sciences ultimately will be transformed through this technology. Bartling and Friesike claim that we are currently in a «legacy gap». New tools are available, but they have not gained proper footing in the scientific communities (Bartling & Friesike, 2014, p. 8). Peer review is a scholarly practice that to a large degree still is done without significant influence from new technology. If we are to fully realize the potential of Open Science, the peer review process needs to be altered and opened. It needs to allow for communication and discussion within the scientific communities. Ideally, it should also be open for and accept input from the general public.

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What is peer-review?

One of the reasons scholars are so reluctant to open up and change traditional peer review is its importance, and the diversity of functions it serves, within academia. Merriam-Webster online dictionary defines peer review in the following way: «[peer review is] a process by which a scholarly work (such as a paper or a research proposal) is checked by a group of experts in the same field to make sure it meets the necessary standards before it is published or accepted». Originally, the peer review process had two functions: to help the editor of a journal on deciding what to publish, and to ensure that the articles fit certain standards and frameworks. To establish an efficient system, the evaluation of a scholarly text was «outsourced» from the editorial board to external expertise (the scientists themselves). The aim of peer review was to guarantee that the motives behind the selection of texts for publication is not biased, but made out of competence and knowledge of the field (Godlee, 2000, p. 61). In the publishing industry the original functions of peer reviews have remained relevant and important. If we broaden our scope to look at peer reviewing in a larger academic context, we discover that it is even more important today. Within the scientific community peer reviews have become a way of assessing the merits of a scholar, with more far reaching consequences. Getting papers through the peer review process and published in the «right» journals serve a wide range of functions. It is the basis for tenure reviews, grant receptions, and government funding. Peer reviewing is important for how academic disciplines develop and govern themselves. On a smaller scale, peer review is important for each individual scholar because it affects his or her career and reputation in significant ways.

Open Science and the humanities

The humanities show a slower development towards realizing some of the central tenets of Open Science, than the natural sciences[2]. Within the humanities we find no (significant) parallels to arXiv or ResearchGate, online communities that facilitate collaboration, discussion and dissemination of scientific research. A reason for such a slow progress is the culture of research in the humanities. The dominant conception of the humanities scholar is as a «lone wolf» working with printed materials. He writes individual treatises and upholds traditional routes of publication. There is some truth behind these prejudices. Open Access principles and new technology are not shaping scholarly communication and output in the humanities to the same degree as in the natural sciences. Knowledge creation in the humanities is largely done through writing, which by itself does not nurture cooperation. Further, knowledge is disseminated through relatively closed circuits of publication (Sidler, 2014, pp. 81-83).

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[2] See f.ex. Sidler (2014) and Fitzpatrick (2011).

However, there seems to be a slow, but steady movement towards new scholarly practices. In the last two decades collaboration between researchers within the humanities have increased, largely because the web has made formal and systematic collaboration easier. The information sources they work with is also shifting from printed material to more digital content (Bulger et al., 2011, p. 7). Digital humanities is perhaps the most prominent example of how new technology has made an impact in the humanities. The time seems to be ripe for establishing new publication practices that is more in accordance with the Open Science movement.

What is wrong with traditional peer-review?

In this section I want to highlight some features of traditional peer review that is in opposition to the principles of Open Science. I also want to point out several ways peer review, in its current form, is flawed. In *Planned Obsolescence* Kate Fitzpatrick worries that new and innovative systems will be choked before they can establish themselves, because no one dares to accept alternative ways of doing peer review (Fitzpatrick, 2011, p. 16). Partly, this is because peer reviewing not only serves the function of assessing quality of individual papers. It has been given the role as «institutional warrant»; a way for government and university administration to measure the accomplishments of scholars, and to evaluate whether or not these scholars «deserve» tenure, promotions, raises and funding (p. 30). The validation of publications through peer reviewing is closely tied to the «fate» of each individual scholar. No one is willing to bear the risk of using alternative procedures. Similarly, Michael Nielsen points to social inertia as the main reason why traditional peer review is so hard to replace. Journals must use peer review to be taken seriously by the stakeholders in the scientific communities (Nielsen, 2009).

In some ways traditional peer review is the anti-thesis of Open Science. It does not enable fruitful collaboration or discussion; rather it creates artificial competition between scientists (Binswanger, 2014, p. 54). Each scientist wants his or her work to be published in the top-ranking journals to secure his or her place in the academic field. The practice of peer review promotes a culture where publishing is done for the advancement of the scientist, and not for the advancement of science.

Double-blind peer reviewing is a common way for articles to be assessed today. In order to secure an objective evaluation, neither the reviewer nor the author know each other's identities. This procedure is supposed to give the reviewer the freedom to express her opinion without fear of retributions from the author. The blindness should also prevent reviewer-bias on the basis of sex, race, affiliation and opinions. It is implemented to avoid «old boys networks» that promote the work of their own peers, and exclude

papers by women or innovative young scholars[3]. Several studies has pointed out that the blinding in many cases is unsuccessful. Scientists have often already discussed or presented a draft of the paper in formal or informal fora. This makes it easy for the reviewer to recognize the author behind the anonymized paper. For small research areas blinding is particularly difficult to implement because everyone already knows each other's work. As we see, total blindness may often be unachievable. There is also reason to claim that blindness in itself is undesirable. Godlee points out that an anonymous review process gives the reviewers powers without attaching responsibility (Godlee, 2000, p. 65). Reviewers may choose to spend little time on the evaluation, or pass the job on to less qualified research assistants (Binswanger, 2014, p. 56). This makes the quality of the reviews poor. Lastly, an author may struggle to properly understand or interpret the reviewer's feedback. How important is a suggestion for revision? What does the reviewer mean with a particular comment? Is this statement a general opinion, or just the expression of one scholar's idiosyncricity? One author expresses his frustration the following way:

> In most cases, when I get back the traditional, blind peer review comments on my papers and book proposals and conference submissions, I don't know who to believe. Most issues are only raised by one reviewer. I find myself wondering, «Is this a general issue that I need to fix, or just something that rubbed one particular person the wrong way?» (Noah Wardrip-Fruin sited in Fitzpatrick, 2011, p. 33)

It is problematic that the direction of communication is one-way. One could say that the resources that goes in to the review process is not being used to its full potential. The suggestions or opinions expressed by reviewer are either accepted by the author or not. However, they bear the potential of being a starting point for discussion and knowledge exchange. They can promote the advancement of scholars and community. As we have seen, traditional peer reviewing is far from being a process that is open to the public, or even to the scholars themselves. It seems more likely that it «closes», rather than opens, science.

After these paragraphs it is not inappropriate to ask whether traditional peer review is a reliable method? In the following I use Michael Nielsens understanding of reliability. Peer review should verify the validity and secure the quality of scientific papers, while at the same time not stand in the way of innovation (Nielsen, 2009). The literature is overflowing of anecdotes and studies that prove that this is not the case. The story of Dutch psychologist Diederik Stapel is a frightening example. He was an established scientist studying the association between human behavior and psychological states at Tilburg University. In 2011 it was discovered that he was responsible for widespread fabrication of data, and had

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[3] That being said, anonymizing author and reviewer cannot correct for a reviewer caught in her own intellectual bias (Fitzpatrick, 2011, p. 29).

successfully published at least 55 papers of a fraudulent nature. However, in the investigation report blame is not solely given to Stapel. Journals, editors and reviewers are made responsible for allowing his papers to get published (Bhattacharjee, 2013). The peer reviews repeatedly failed to discover the fabricated data, and therefore also failed to secure the validity (and quality) of the papers. Nielsen refers to a study where the researchers inserted several errors into papers already accepted for publication, and sent these to a large number of potential reviewers. On an average, only two of eight errors were discovered (Nielsen, 2009). Given these and several other examples, we have good reason to suspect that traditional peer review is unrealiable as a system for filtering quality and securing validity. What about the relationship between peer-review and innovation? In the same text Nielsen lists scientific breakthroughs that was originally rejected for publication (amongst them several Nobel Prize winning discoveries). Given such facts, it is likely that peer review is less that ideally conductive of innovation. Further, Kathleen Fitzpatrick sites a study where papers were resubmitted to journals with some minor alterations, such as changing the institutional affiliations from high-status to low or no-status. The majority of the papers were rejected, not because they had already been published, but because they had serious methodological errors (Fitzpatrick, 2011, p. 28). This makes it very likely that the reviewers have an institutional bias. This makes fraud possible, as the case of Diederik Staples shows. It points to the existence of scholarly networks that enjoy certain privileges. These networks may be hindrances to innovation. New and unestablished institutions have to work against the systematic bias of their peers.

In this section we have seen that traditional peer review is flawed in several dimensions. Before we continue on to other subjects, I want to ensure that one important point is made explicit. Peer review can only be flawed if there exists some way to do it right. Kathleen Fitzpatrick highlights the ideal purpose of peer review, which she sees as two-fold. On one hand, peer-review is a way of creating discussion and feedback with the aim of strengthening scholarly output. On the other, it functions as a quality control mechanism, securing that only the very best contributions is published (Fitzpatrick, 2011, p. 27). We need to find ways of doing peer review that fulfill these functions. At the same time we must prevent «modes of perverse behavior», as Mathias Binswanger bluntly calls it (Binswanger, 2014, p. 56). We need procedures of assessment that strengthen scholarly output by facilitating discussion and feedback within scientific communities. This means working to eliminate negative competitiveness that suppress innovation and scientific advancement. These procedures must in some way highlight or secure the quality of what is published, and at the same time secure the quality of the review process itself. (Fitzpatrick 2011, p. 38). Open peer review and post-publication peer review are alternatives to the traditional method. In the following section I want to look more closely at these methods, and how they provide better ways of reviewing scholarly output.

How can we fix peer-review?

It is important that the humanities acknowledge that the central features of contemporary channels of publication are of a digital and social nature. Using online networks to spread and share research data are common in the natural sciences. This is due to the importance of getting out results quickly within these fields, as well as the ease of collaboration such systems provide. In the humanities speed is rarely an important factor in the publishing practice (Sidler, 2014, p. 84). Putting all barriers aside, digital publication should become the norm in the humanities, and scholarly material should be disseminated through online networks. Digital technology and online environments allow for experimentation and development of tools that are customized to fit the needs of different communities and research fields. Each scientific discipline may have their own practices and work with different assumptions about how scholarly output should be shared, evaluated and used. New technology makes it possible to experiment with review methods before settling for a (more) final solution (Soergel, Saunders, & McCallum, 2013).

«Open peer review» is a term that lacks a fixed definition. It is used to denote several dissimilar practices. Information or publications can be open in different ways, but the variables are usually *who* can access information, *what* is made open, and *when* a paper is released (Soergel, Saunders & McCallum, 2013). I will not limit myself to any specific definition of the term, but let the term cover all the different modes of more or less open review practices. Differentiating between dissemination and evaluation of scientific papers makes it possible to approach the issue of peer-review from two separate, but related, angles. With the help of technology methods of open peer review allow more people and different people to comment or review papers. An open environment makes possible new and different ways of configuring the anonymity of the authors and the reviewers. In many cases the method leaves out anonymity completely. Post-publication review relates to when and for whom a paper is made public (Soergel, Saunders & McCallum, 2013). Different versions and blends of these two aspects result in solutions with different strengths, weaknesses and target groups. To clarify how these methods may be put to use, I want to present to initiatives. One such initiative is a scholarly publishing network developed for the field of media studies. The members of MediaCommons can read what is published within the network, make comments and read the comments of other members. The second case, OpenReview.net, describes itself as a «reviewing infrastructure». It provides software that enables flexibility and alteration of the policies for publication and reviewing.

I've chosen to present MediaCommons because it is an example of innovation in the humanities, and it is well documented through several research projects. In the following paragraph, I will present one of these projects, a monograph that was published and reviewed in the MediaCommons network. MediaCommons is a

> ... wide-ranging scholarly network — an ecosystem ... — in which folks working in media studies can write, publish, review, and discuss, in forms ranging from the blog to the monograph, from the purely textual to the multi-mediated, with all manner of degrees in-between. (Fitzpatrick, 2007, ch. 7)

It was created in partnership with the Institute for the Future of the Book in 2006. The network is in continual development and the central focus is always to find open alternatives to spread scholarly output. An important feature of their work is not only to improve the discovery and access to documents, but to create discussion and make connections in the scholarly community and the wider public. Anyone can join, and the users make profiles that link to their publications (such as papers, comments and reviews) within the network (Fitzpatrick, 2007). Kathleen Fitzpatrick, one of the founders of the network, envisions a future where traditional peer review is replaced by peer-to-peer review carried out after the texts is released to the public. On other words, this tool uses both open review and post-publication review. All texts will be published in a networked online community for scholars that not only encourage participation, but demands it. A central feature of the network is that it fosters fairness and «helpful criticism» amongst scholars, instead of creating the kind of competitiveness we discussed earlier in this paper (Fitzpatrick, 2011).

Let's look at a concrete instance of how the publishing and peer-to-peer review takes place in the MediaCommons network. *Planned Obsolescence* by Kathleen Fitzpatrick was published on NYU Press in 2011, after going through the traditional vetting processes of the publishing house. Simultaneously, Fitzpatrick conducted an experiment using the MediaCommons network (with the permision of NYU Press). She uploaded the final draft of the book on MediaCommons and used CommentPress to facilitate the open review process. CommentPress is an open source WordPress plugin for commenting and discussion of a paper. It is very flexible and allows commenting on a fine-grained level (a specific line or paragraph), as well as the text as a whole (CommentPress, 2014). The plugin has features that make the commenting of a paper similar to a conversation. It hereby realize the central tenets of the MediaCommons network, namely to strengthen participation and communication. Fitzpatrick allowed and encouraged everyone, not just peers and scholars, to comment and review the book. Fitzpatrick's own evaluation of the experiment is interesting. The peer-to-peer review gave Fitzpatrick a wider range of feedback and opinions than what traditional peer-review would have generated. At the end of the trial period 44 commenters had left 295 comments. The conversation functionality had not been left idle: Fitzpatrick replied to comments, and the readers discussed the text among themselves. Another important issue is the statistics the publishing platform provides. The site was loaded more than 31 000 times, with 12 000 first time visitors and 3 300 returns. The inbound links left in the text made Fitzpatrick aware of at

least 40 other sites writing about or linking to the book (Fitzpatrick, 2011, p. 189). Needless to say, the open review process made Fitzpatrick able to harvest valuable information about the content and usage of her book. Importantly, this information would have been impossible to access through the traditional process, or not produced at all. In getting the text out to readers, Fitzpatrick's solution seems far superior to the traditional print publishing platforms. In average, a monograph on one of the scholarly presses sells less than 400 copies (p. 189). Of course, this number does not reveal the number of actual readers. Due to the high price of an academic book it is very likely that a substantial number of readers use the library to get hold of it. On the other hand, the lack of usage information for print material further highlights the superiority of the MediaCommons model. Fitzpatrick was able to reach a large number of readers (who could read the book free of charge) and generate fairly detailed statistics about the usage of the text. When she compared the online with the traditional reviews she found that mistakes and errors were more often discovered by the online commenters. She also enjoyed the possibility to challenge and elaborate on the online feedback (p. 190).

Fitzpatrick points to some challenges and shortcomings of the MediaCommons peer-to-peer review method. The site statistics in themselves do not tell much about the readers, they need the context provided by comments and other signs of the actual usage of a text (tweets, links, mentions in other media). As web statistics in general, they cannot be fully accurate. A user who use different browsers, upload the site from several computers or clears his cookies regularly are not corrected for. The way readers approach texts online further complicates the review process. Fitzpatrick found that the majority of comments were made in the early sections of the book. In conventional peer review you can be quite sure that the whole text is read and evaluated. In the method used by Fitzpatrick, you cannot know if the commenters have read the book in its entirety. Fitzpatrick wonders if many readers stop reading after a few pages because they find it uncomfortable to read on a computer screen. And what if a section or chapter is left uncommented by readers? Does it signify a lack of interest or comprehension, or does it mean that everything is ok? Interpreting such silence is an issue that the author must deal with. Fitzpatrick is hopeful that some of these issues can be solved technologically, for instance by developing systems that encourage discussions about the work as a whole (and at the same time allows for paragraph specific commenting). There is also challenges to the social sides of this project. To realize the full potential of the MediaCommons review system, it is crucial to reach a sufficiently large number of readers and make these readers leave comments. Social incentives, such as encouraging and rewarding participation is key.

Unrelated to MediaCommons, the collaboration between CASRAI and ORCID is a way of making such rewards possible. CASRAI and ORCID are both non-profit organizations, and amongst the big players that try to improve research infrastructure. CASRAI is working for the development of internationally shared research standards to ease cooperation between institutions and across borders.

ORCID administers a system of persistent IDs to identify individual researchers and their work. Together these organizations are working on connecting reviewers and their reviews through persistent IDs. The ORCID IDs are given to the reviewers, and the reviews are identified with DOIs (Haak, 2014). This makes it possible to create persistent connections between a text and its review. These connections make it easier to see which reviewers produce quality reviews, and reward or acknowledge them in some way. As we've already seen, getting some kind of acknowledgement or reward from the work you do as reviewer is crucial. With reward systems implemented researchers will have clear incentives to be more fair because the reviews can be connected to their identities (though, it is up to each community to decide how open the process should be). These structures can be used to reward researchers on an institutional level, making review activity matter for promotion etc. With time, perhaps we will see a shift from the individual focus to a more communal approach to scholarly publishing?

OpenReview.net, or Open Reviewing Network, is a peer review platform that can host the submission and review of papers for a journal or conference. It is developed and maintained by the School of Computer Science at University of Massachusetts. They acknowledge the diversity of open review policies and field-specific needs, and emphasize the flexibility of the platform (OpenReview.net). It is possible to custom fit the platform to the needs of individual communities, and experiment with transparency and openness. When the structure of the platform was created, they pictured the process of publishing a scholarly paper as a series of messages between different recipients. Each step towards the final publication of a paper was envisioned as a message sent from one party to another. Instead of using e-mail to send these messages, OpenReview.net sets up a structured environment where the communication are open to the public. The structure makes it is possible to configure licenses for access to texts and identities. The reviews, comments and revisions are attached to the paper making it easy to follow the discussions. An interested reader can observe a paper as it evolves from draft to final version through reviews and discussions. Documentation of the evolution of a paper can also be made available with the text after it is officially published (Soergel et al., 2013).

To test their platform OpenReview.net hosted the submission and reviewing of papers for the International Conference on Learning Representations in 2013. This specific implementation of the platform was constructed to facilitate public discussion. Everyone could read and comment on the papers and official peer reviews. Only the official reviewers could partake in the discussion anonymously. A survey conducted among the conference participants highlights some of the strengths and issues involved with the platform and policy choices. According to the participants the papers were of increased quality because of the discussions, and the official reviewers were more «constructive and diplomatic» (perhaps because their comments were open for everyone, even though their identities were not). A notable observance is that the question of anonymity caused most disagreement. In contrast, what content to make

visible was not a controversial issue (Soergel et al., 2013). The community seems to embrace open access policies. There is less agreement on how the review process should be opened. Even though networked peer-to-peer review is a new development, with its own shortcomings and challenges, we see that these two examples secures continuity of the two-fold purpose of peer-review: functioning as a mechanism for quality control and the facilitation feedback and communication.

Conclusion

At the end of the paper I want to sum up. The traditional way of doing peer review is not compatible with Open Science. It is a practice that promotes competitiveness and closed networks, rather than facilitating discussion, collaboration and sharing. It is also not particularly «innovation friendly». In the humanities alternatives to traditional review methods seems to be far from realized due to the general unfamiliarity with digital technology. However, this may change in the near future. We have looked at a few initiatives that work to implement more open ways of doing peer review. MediaCommons, OpenReview.net and the CASRAI/ORCID-initiative. They all try to correct the flaws of traditional peer review, and at the same time promote the advancement of Open Science through policy choices. We need not worry about the technicalities connected with alternative review methods. The real challenge seems to be of a social nature: to find solutions that fit and is accepted by each community. In our examples they emphasized flexible systems as an important factor in dealing with social issues. Patience may also be another important aspect, as we have to allow the innovations to mature with the communities.

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