Introduction

The purpose of this chapter is to introduce the reader to the growing idea of academics engaging in open post publication peer review of other's research. This is not a new idea but given that a large part of this book is focused towards scholarly communication and measurement, it would not be complete without some discussion around this growing area of interest. This chapter will be of particular interest to LIS professionals who are involved in open access and scholarly communication work. It will explain what open peer review in all its variations is as well as discuss and review some of the main protagonists in this area. The chapter will guide the reader as to the reasons why open peer review, in particular post publication, is gaining interest. In addition this chapter will discuss some of the barriers and opportunities the opening up of academic research presents.

Main Body

When said together, the words peer review are likely to send shudders down the spines of most researchers who have ever edited, reviewed or written a piece of research. Yet it is a necessary part of the research process and without it we would see every Tom, Dick and Harry publish their work to a potential audience. That said, there is plenty of evidence that fraudulent publishing still occurs despite peer review in its present incarnation. Peer review is a way of making sure that a piece of research is of good quality, thorough and fit for purpose in that particular publication. There are several models of peer review in research, firstly the most common being single blinded, where the reviewers know the identity of the author/s. Secondly there is double-blind peer review where neither author and editor know each other's identity. Open peer review is where one or both of the parties involved are aware of each other's identities. Some platforms such as Peerj encourage open peer review but it is not a requirement. Usually traditional peer review as a process takes place before the research is published. This is for various reasons, firstly as a filter to ensure the paper is right for the publication, that it is a rigorous piece of research and that it provides new evidence to that particular topic. After a piece of research is published that is usually where the peer review usually ceases. The research may be presented as a talk or a poster at a conference or delivered at a seminar in a university setting. There may be discussion and questions following such as exercises but usually on an informal, personal basis. The research may be commented on in discussion forums, on social media, written about in blogs and even covered in the media. All of this has the potential to be beneficial to the research as well as measurable via tools like Altmetric.com, but it does not maximise the potential of an open research web. Open peer review platforms, whether they be pre or post publication, have the potential to stretch the conversation beyond that of traditional peer review, conference poster and presentation. With open peer review there are a few caveats to ensure it maximises its potential, and this is where the problems appear.

The benefits and problems with Open Peer Review

Open peer review has many potential benefits for the research field or individual working within it. Firstly it can potentially improve the quality of reviews as reviewers have to put their name by their comments. Anonymous commenting does provide some level of security for reviewers to say what they want. This is of course not to say that they use peer review as a way of grinding their axe. Nevertheless reviewers are the gatekeepers and decide whether and how quickly a paper is published. There are examples where reviewers have held back research because it has contained competing work, or because they wish to plagiarise it for their own publications and profile. Whilst in some extreme cases reviewers can find

themselves hoodwinked by fictitious research, sometimes by researchers trying to test the peer review system, or by others out for ill-gotten gains. One high profile case being that of 43 papers retracted by BioMed Central in 2015 when they became suspicious and began their own investigation into 50 published papers. In some situations authors have been found reviewing their own papers, with one high profile case leading to the retraction of 28 journal papers. The website Retraction Watch totals the number of papers retracted due to them being fake at about 170, but the number is likely to be higher than that when we consider fake papers could very well still exist in print.

Given that the author does not know the identity of the reviewers in many peer review situations and that it is very hard to discover who they are, it can be a frustrating process. In situations where there may be some wrongdoing in the review it can be hard to voice concerns over potential bias or malpractice, especially if the lead author is a junior academic. Opening up peer review has similar potential to that of altmetrics. Both are about a new openness within academia, as are other recent developments such as MOOCs, big data and open access. Altmetrics not only delivers new data as to where content is being shared and discussed but by who, which has the potential benefits of developing collaborations that go beyond the traditional formal routes. There is no exact science to this, by making content and identities open does not guarantee collaboration, but at least it offers the opportunity for those willing to take it. Pre publication open peer review also provides an opportunity for the research community to identify inaccuracies before they are formally published. It is not uncommon for researchers to publish their findings to discover similar research with similar or quite different outcomes. The scientific research publication is restricted by the limitations of the publication model. Invariably publications are still wholly textual, complete with tables, graphs, charts and images. They are not accompanied by sound and video, pre publication peer review comments are rarely accessible. The whole publishing process, as with the research process, happens behind closed doors. Yet pre publication peer review could open research up to a wider audience of experts who can offer their own insights, ones that could identify flaws that the peer reviewers have missed. Of course there is the old saying; ‘too many cooks spoil the broth’ and there may be some truth in this; yet for some research it could flourish provided there are the right checks and balances in place. These would include only authorised experts and authors allowed to comment. Databases such as PubMed and its post publication peer review platform PubMed Commons sets out strict criteria as to who can comment. This is limited to authors of publications indexed in PubMed or those with an invite from an author.

Altmetrics and open peer review share much of the same agenda, invariably driven by those unhappy with the current status quo. Both are about opening up research and making it more transparent for the benefit of researcher, funders and to some extent the general public. However, they do not share the entirely same fan base with some in favour of one over the other. Whilst many would like both to exist as part of a modern research environment, some see open peer review, primarily in its pre publication format as the true way to improve and measure research. This value is not tied to numbers and charts as we see with citations and impact scored, but to objective, critical, expert opinion.

The history of open peer review

Open peer review is nothing new, with notable trials in the late 1990s by (Smith 1999) and (Godlee et al. 1998) in the leading medical journals, BMJ and JAMA. Added to that is that

the BMJ and other research publications accepting letters, email communications and Rapid Responses about research published in their journals. Despite some of the snail mail aspects relating to these methods, they are to some extent open post publication peer review. There are plenty of blogs and social media sites where researchers discuss other's work with an open attitude. whilst websites such as The Conversation enable academics to publish their ideas, thoughts and research to wider audiences. All of these audiences can then comment on the work directly, often with no formal expertise in the area they are discussing. For any researcher with the inclination, it would not take too long for them to find some mention of their work on the web that goes beyond the usual citation.
(Ford, 2013) conducted a literature review of open peer review and discovered there was no established definition of the term accepted by the scholarly research and publishing community. Instead (Ford, 2013) identified several common open peer review characteristics that describe the openness of the review process: signed review, disclosed review, editor-mediated review, transparent review, and crowdsourced review. In addition there are three additional characteristics that describe review timing, similar to traditional peer review: pre-publication review, synchronous review, and post-publication review.

The world is changing

Social media is a testament of how individuals and groups have exploited a new openness on the web, yet in academia it has been less forthcoming. The model of peer review in all its variants within academia is one that pre-dates the first scholarly journal. (Fitzpatrick 2011) notes its origins with the formation of the national academies in the 17th Century. Nevertheless, not a lot has changed within peer review as a check and balance for good quality research. The reasons are various, but also are rooted in a wider academic culture that despite having the technologies and pedagogies to do otherwise is still firmly rooted in the lecture style presentation as the dominant teaching method. Nevertheless there are genuine concerns as to an open model of peer review. These range from the fear of reviewer backlash, clashes of personalities as well as reviewers feeling scrutinised by fellow reviewers. There is also the issue that some reviewers may be junior to the author they are reviewing and may fear that it could affect their own career prospects. The issues around open peer review are complicated, not just based around ethical and practical reasons but also legal ones. Yet with other changes afoot in academia that we touched on previously in this book, most notably MOOCs, open access, impact, altmetrics and big data; it seems the noise around open peer review will just get louder. To some extent open peer review is a very subjective issue, as it is not just about academic rigour, but also identity. Not just the identity of the reviewers and authors, but also the identity of research as a whole. As with social media and altmetrics, it is an opportunity for research to open itself up, warts and all. In an ideal world, research would benefit from absolute openness on a global scale, but there is some research that cannot be discussed, or revolves around sensitive topics which could spark fierce debate. Take for example any research relating to religion, politics and sexuality, all very emotive topics. Retaining balance and focus in such as post publication peer review, open or otherwise could be hard for some academics. These issues and many others will no doubt be covered more comprehensively as more platforms and websites explore open peer review. For the purpose of the remainder of this chapter it is more important to investigate the leading open peer review platforms and how they operate. We will look at the different approaches taken by ten of the leading academic open peer review platforms.

Traditional blind peer review

Alongside open peer review, there are several models of peer review currently in practice with the standard models being single or double blind. Single blind is where the author's identity is usually revealed to reviewers and double-blind is where all identities are kept hidden. As (Smith 2006) highlights, people have a great many fantasies about peer review, and one of the most powerful is that it is a highly objective, reliable and consistent process, yet in reality, many are discontent with the model of traditional blind peer review, thinking of it only in negative terms- lacking in rewards, slow in return, inconsistent, and occasionally open to fraud and bad behaviour. Despite its key, idealised role in the history of scholarship, peer review has at times been subject to criticism (Sullivan 2014), whilst the traditional academic publishing model has been criticised for being somewhat behind the rest of the modern publishing industry. Given modern day communications and publishing technologies, a large part of this criticism is fair. If we consider that a piece of research can take over a year to complete, and then just as long to get published. After such time, work in that research area could have moved on, with new methods, technologies and ideas all appearing. Open peer review could potentially reduce this inertia whilst also make researchers aware of potential future collaborators or similar research already being undertaken.

A Review of the Platforms

Whether we like it or not, technology is very much ingrained into how we work within research and support. Technology on the Internet should never drive how we work but invariably it has a very large impact. Often technologies, whether they be web or otherwise, are created when someone sees that there is a problem that needs solving or that there is a gap in the market. Often, technologists try to horizon scan and guess where a solution might be needed for a future problem. In academia we have many problems some of which can be referred to as 'wicked problems' (Churchman 1967). Peer review could be considered a wicked problem, one that is difficult or impossible to solve because of varying factors such as its incompleteness, contradiction and changing requirements. Often with all of these factors difficult to recognise. Technologies such as open peer review via discussion forums, post publication comment and social media have been heralded by some as the solution to that problem. As you will see below, the possible solutions are perhaps just the start of a revolution in open peer review. One that might bring with it many different options and a growing number of new platforms that help facilitate open peer review. At present only a small collection of established and fledgling platforms exist, some of which are looking to carve out their own imprint on the scholarly communication landscape. Often with niche technologies their narrow focus comes as a result of limited resources; it is much better to do a few things right rather than many averagely. The web is very good at homogenising society, so once a platform or technology starts to create attention then critical mass can soon follow. As more academics embrace the online tools for scholarly communication, more are likely to follow to see what all the fuss is about. This increase in attention and usage can then only mean an increase in the number of platforms. The platforms below are by no means an exhaustive list but do account for a lot of the current activity and discussion around open peer review.

F1000Research

Faculty of 1000 combines three different strands, all committed to publishing research and communicating its findings. Firstly there is F1000Prime, which is a personalised

recommendation system for biomedical research articles from F1000. Like PLOS ONE, F1000Research is an open science journal that tries to speed up publishing turnaround times with a transparent referee model. F1000Research now contains F1000Posters which was previously its own separate entity as a platform for academics to host their own posters. The final strand is the most recent addition, F1000Workspace which allows scientists to collect, write and discuss scientific literature.

The peer review approach by F1000Research's is to be totally open, where there are published referee comments and subsequent replies by the authors. As with the traditional blind peer review process, submissions are either 'approved' at once or 'approved with reservations' or 'not approved'. The approach taken by F1000Research is that it not only ensures the author's research is revealed to the wider world but also the abilities of, and comments from, the reviewer. The whole commenting process is date stamped and unlike most peer review gives a right to reply by the authors. Visitors to F1000Research can track the conversation and even discuss the article at the foot of the publication page. Visitors can see a timeline of the research publishing process. Referee's reports can also be cited in F1000Research and published under a Creative Commons By Attribution License. A DOI (digital object identifier) is assigned to every referee report, thus allowing it to be cited independently from the article.

Open Review

Many people reading this book will be aware of the huge academic social network ResearchGate. Open Review is part of that platform and gives researchers the ability to publish an open and transparent review of any paper they have read, worked with, or cited. ResearchGate takes the approach of looking at the evaluation of research from a different angle and ask if this research is reproducible. Registered users chose an article that is listed on ResearchGate and then can go through a simple review process. This process involves answering simple 'yes' and 'no' questions relating to the research's methodology, analyses, references, findings and conclusions. Supporting resources can be attached and the reviewer is asked to leave free text statements relating to each question. After which, the completed review can be viewed with each aspect scored, which over time collates with any further reviews. Reviewers can add the names of other colleagues involved in the review process but they must consent to their admission.

Peer J

Peer J is an open access peer-reviewed scientific journal with a focus on publishing research in the biological and medical sciences. Peer J employs a points system for authors and commentators as an incentive to publish and comment on research. The incentive is very much like many typical massive online multiplayer games where achievements and positive actions are rewarded with points. The more you interact the more you are rewarded. A reviewer can gain anything from 100 points for being an editor or an author on a PeerJ article to just one point for receiving an 'up vote' for a reply to a question or comment. Obviously this system is not without its flaws as critics of altmetrics would also agree based on the issue of attention over quality of content. Gaining a lot of points might not necessarily mean you are providing quality to the system. As with the multiplayer game analogy, some players might be at the top of the rankings purely as they can put in the excessive hours to play rather than being the most skillful players. Nevertheless, it is an interesting take on the open peer review model and one that could appeal to the more competitive of academics.

Peer J host tables showing the top authors and reviewers which can be filtered by topic area and publication date. In addition the tables show those who have asked the most questions and given the most answers. This question and answer approach is very different to the commenting ones as witnessed on other platforms. It is another option for potentially opening up more dialogue between authors and commentators. At present, as seen with other similar platforms there is not a lot of activity with regards to comments. The points ranking system will appeal to some researchers, especially those with a competitive streak. The flipside to this however it that it may make others equally uncomfortable. As with altmetrics, some academics like to see their research measured in Tweets and downloads as well as traditional metrics, so the points system will appeal to them. Peer J's point system is a clear attempt to encourage academics to engage with scholarly communications more, especially via their platform. Nevertheless, as with open peer review as a whole, this approach is certain to split the academic community.

Peerage of Science

The website Peerage of Science is not explicitly an open peer review platform but does give authors who submit content the option for reviewers to see their details. Peerage of Science aims to offer authors the opportunity to have their manuscripts reviewed by qualified, non-affiliated peers. Whilst it encourages authors to remain anonymous, it is not compulsory. At such an early stage of review it would be interesting to see who would be willing to reveal their name. There are some merits for authors to submit their manuscripts to such a model, whilst it could also suffer the same problems of traditional peer review. For researchers, especially early career ones, who do not have contact with peers in the field it is worth investigating. Yet any kind of early review platform could also become a hub for predatory journals and academics, with the latter taking the opportunity to steal emerging ideas and manuscripts. On the other side of the fence however is the opportunity for academics to build their reputation and skills as a reviewer of research. Peerage of Science operates like an agency that matches reviewers with manuscripts. The problem with such a model is that reviewers could build their reputation based on a quantity of reviews, not quality, yet, given the problems some authors have in sourcing early appropriate opinions on their work, the benefits could outweigh the risks.

PLOS ONE

PLOS ONE was launched by the Public Library of Science as an open access, mostly traditional peer-reviewed scientific journal publisher. Pre-publication article submissions are usually a blinded review, although reviewers have the option to go down the open route. The pure open peer review happens after the paper is published. Reviews and comments can be submitted by registered PLOS ONE members only. PLOS ONE has the advantage of being the world's largest journal based on the number of papers it publishes. It has a mandate to make research more discoverable and engaging whilst speeding up the publication process. When a registered user leaves a comment it is with the desired purpose of adding to the research or by clarifying aspects of it. This involves identifying and linking to materials and evidence that will form threaded discussions with regards to the published research. PLOS ONE sets no limits to the amount a commenter can post, it can be as simple or in-depth as they wish. The person commenting has the option to just focus on a single part of the research. Naturally this can be just the results, the methodology or the conclusion, whilst they are under no obligation to write more than just a few lines. Some academics may

decide to provide more in-depth reviews about the paper as a whole. As previously mentioned, anyone who comments on papers in PLOS ONE must be a registered user, in addition must identify any competing interests. PLOS ONE sets out a clear set of rules that state that when commenting on someone else's research, they must not post content as stated below:

1. Remarks that could be interpreted as allegations of misconduct
2. Unsupported assertions or statements
3. Inflammatory or insulting language

Anyone who breaches these rules are removed from PLOS ONE and their account disabled. For the more mischievous of commentators this does not prevent them from creating new account, but we have to remember that this is kind of abuse and subsequent workarounds are not a problem exclusive to open peer review websites.

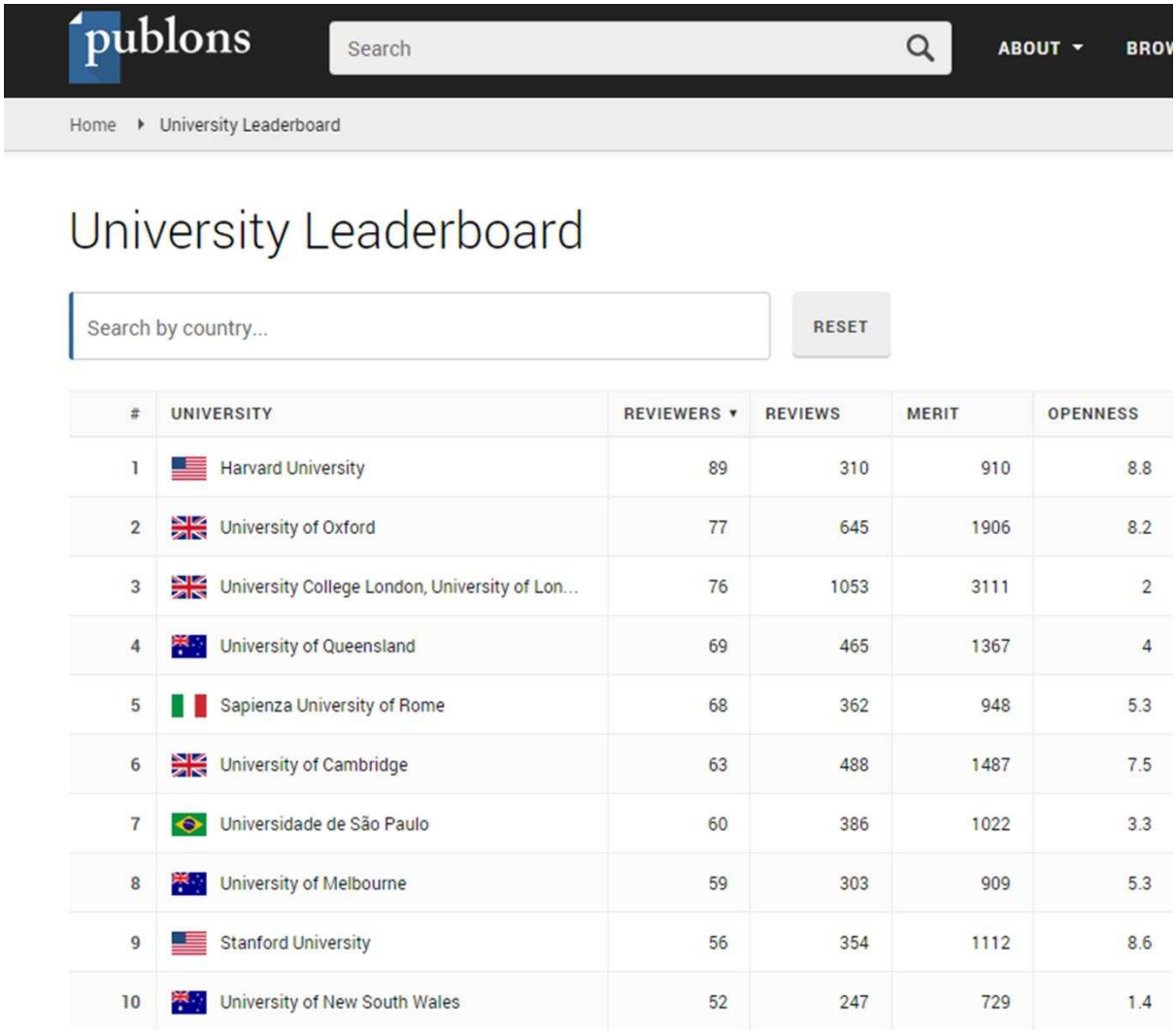
PubMed Commons

Anyone working in life sciences and biomedical research and support will be aware of PubMed. PubMed is a huge publicly accessible search engine that accesses the Medline database of references and abstracts in the aforementioned research field. PubMed launched Commons as a platform that authors of papers hosted in PubMed could use to post comments on research in the database. Only researchers who are authors of PubMed hosted content are eligible to comment, therefore creating a barrier to prevent just anyone leaving inaccurate, unevidenced or mischievous comments. Emails of eligible authors are collected from the National Institutes of Health, the Wellcome Trust and author's email addresses within PubMed and PubMed Central. In addition there is the option for authors not listed in this databases to ask a colleague who is already on the system to send them an invite. The open review is transparent as anyone wishing to leave comments must use their real name and disclose any conflicts of interest.

Publons

Publons looks at open peer review from a different angle by focussing more on the reviewer. The primary aim of Publons is to highlight and aid researchers and their reviewing activity rather than the publication side of academia. As discussed earlier peer review is not regarded as one of the most enjoyable parts of the academic's job role. To some extent it is regarded as a necessary evil, why review someone else's research when you could be creating your own? It is less formally acknowledged as part of their public profile and kudos, mainly as much of it happens behind closed doors. In an attempt to correct that Publons was set up with the idea that academics should get credit for their peer review work. Nevertheless, reviewing is very much part of the academic's career building strategy, but given the often hidden element of this role it is not always so easy to measurable. Especially compared to the roles of editor or author when applying for jobs or promotion. Peer reviewing can be beneficial with regards to the researcher's CV and promotion prospects, as well as the bonus of getting to see emerging research; but it is much harder given the existing anonymous culture. Publons' strategy is to work with reviewers, publishers, universities, and funding agencies with the goal to turn peer review into a measurable research output. They do this by collecting peer review information from reviewers and publishers, and using the data to create reviewer profiles. Publishers then verify this information so that researchers can add these contributions to their CV. This allows

reviewers to control how each review is displayed on their profile, whether that be blind, open, or published. Reviewers can add pre-publication reviews they write for journals in addition to post-publication reviews of any article.



#	UNIVERSITY	REVIEWERS	REVIEWS	MERIT	OPENNESS
1	Harvard University	89	310	910	8.8
2	University of Oxford	77	645	1906	8.2
3	University College London, University of Lon...	76	1053	3111	2
4	University of Queensland	69	465	1367	4
5	Sapienza University of Rome	68	362	948	5.3
6	University of Cambridge	63	488	1487	7.5
7	Universidade de São Paulo	60	386	1022	3.3
8	University of Melbourne	59	303	909	5.3
9	Stanford University	56	354	1112	8.6
10	University of New South Wales	52	247	729	1.4

University Leaderboard of institutions using Publons

PubPeer

PubPeer is an online journal club that allows users to search for papers via DOIs, PMIDs, arXiv IDs, keywords and authors among other options. PubPeer's aim is to create an community of digital academics that engage in commentary and discussion revolving around the publication of research results. Researchers can comment on almost any scientific article that is published with a DOI or preprint in the arXiv. In addition they can browse a comprehensive list of journals with comments. At this point however, it is important to point out that like so many other commenting platforms, the majority of titles only have one or two comments. Anonymous commenting is also possible within PubPeer, although as a safeguard users are still required to sign up. One problem is anonymous commenting, especially when they are posted in large numbers, is the lack of moderation. Thankfully PubPeer moderates them first, although how quick an anonymous comment is accepted depends on the number of items there are in the queue. Any kind of anonymous commenting is always susceptible to trolling and abuse, quite simply because those posting

such comments feel an extra level of protection and distance from what they say. PubPeer gained extra attention in 2014 when one researcher filed a lawsuit over anonymous comments. The researcher claimed the comments resulted in them losing a job offer after accusations of misconduct in their research.

ScienceOpen

As you can imagine from the title, ScienceOpen is an open peer review platform with full transparency of reviewers and comments. The website is an independent publishing platform that makes their referee reports available under a Creative Commons By Attribution Licence. In essence it is part publishing platform, part social network. As with some of the aforementioned platforms ScienceOpen gives reviewers the ability to build a public collection of reviews. The purpose of this is to showcase researchers not just as authors but critical reviewers. Once users register for an account it can be automatically synchronised with their ORCiD profile.

The Winnower

One of the smaller platforms that is committed to open research is The Winnower. The platform appeared around the same time as PeerJ, Publons and Peerage of Science and attempts to extend the long tail of discovery and dialogue around research. Like some of the other platforms mentioned, The Winnower has a mandate that is; “is founded on the principle that all ideas should be openly discussed, debated and archived.” As with similar small independent online research start-ups, The Winnower began life thanks to a PhD student, and as with so many other things in academia, small, new platforms can be less attractive to academics. There is a need for evidence, such as why should they use a technology or website when no one else is using it? This also applies to using one to critically review someone else’s work, especially when they compare it to large established entities such as PLOS ONE and PubMed. It is increasingly hard for web startups to break into an already crowded market. If you want to start a video hosting site you have YouTube to contend with, a social network then it is Facebook’s market you might want to eat into. It really is easier said than done, but we must always remember that from acorns, oak trees grow. One very good example of this is Mendeley, a platform that started in a similar vein after three early career researchers worked to development a technology that was underdeveloped in their eyes. At the time of starting they would have been up against established tools like Reference Manager, Refworks and Endnote, but they saw how they could improve on those models. As they say, the rest is history and Mendeley was reportedly acquired by Elsevier for $100m in 2013. An interesting experiment and alternative measurement by The Winnower is the ‘Grain and Chaff’ web pages. The 'grain' features publications with more than 1000 citations or a Altmetric score above 250. Whilst at the other end, the 'chaff' features papers that were pulled from publication and offer a voice for rejected authors to talk about their research rather than just providing a simple a ‘name and shame’ list.

The Winnower, The Grain and The Chaff discussion page

Platform	Open Pre or Post Publication Review/ Comment	Level of Openness	Owner	Year Established	Key Audience	Other Services	Creative Commons Licence
F1000Research	Post	Open	Faculty of 1000	2002 as Faculty of Biology (Now F1000 Prime)	Life Sciences	F1000Prime F1000Posters F1000Specialists F1000Journal Clubs	NA
Open Review	Post	Open	ResearchGate	2008 as ResearchGate 2014 Open Review	Non-Specific	ResearchGate	NA
Peer J	Pre and Post	Open Review encouraged	Jason Hoyt Pete Binfield	2012	Biology Medicine	PeerJ Computer Science PeerJ PrePrints	CC-BY-4.0
Peerage of Science	Pre	Open - Onymous	Janne Kotiaho, Mikko Mökkönen, Janne-Tuomas Seppänen	2012	Science		NA
PLOS ONE	Pre and Post	Optional for pre-publication. Open for post comment	The Public Library of Science	2006	Medicine Science		CC BY 4.0
PubMed Commons	Post	Open	U.S. National Library of Medicine	2015	Biomedicine	PubMed	CC BY 3.0
Publons	Pre and Post	Optional	Andrew Preston, Daniel Johnston	2012	Non-Specific		CC BY 4.0
PubPeer	Post	Optional	NA	2013	Non-Specific		NA
ScienceOpen	Pre and Post	Open	ScienceOpen	2013	Non-Specific	ScienceOpen Research ScienceOpen Posters	CC BY 4.0
The Winnower	Pre and Post	Open	Josh Nicholson	2012	Non-Specific		CC BY 4.0

Table 1. Comparison of pre and post publication open review and comment platforms

A wealth of options

The variety of options available is an indication as to some of the issues that not only open peer review platforms must address, but academic technologies as a whole. There is to some extent, with learning and communication technologies, a drive to find their own markets and lead them. This invariably means trying to find the right technology for you and your academics. As we have have seen already, many research web sites will fall by the wayside, including some of those mentioned in this book. Some of them will run out of money, some out of energy and others will simply not take off. The sad fact is that some of the technologies covered in this book will disappear and on their expiry they will take with them some great ideas and features. Even with something that can seem so simple as open peer review, there are many facets and ways in its delivery and management. This is because there are diverse opinions on how best to improve scholarly measurement and communication via peer review, whether that be open or blind. As we have seen with the platforms covered in this chapter, being open is not necessarily a two way relationship, nor is it compulsory. There are some who believe that open peer review can only work if every aspect of it is transparent whilst others will prefer some degree of anonymity, and a third faction will still wish to remain in the shadows of blind peer review. The ten platforms covered in this chapter are potentially just part of the first wave of open peer review platforms. Others are sure to follow and we will no doubt see further iterations of open peer review.

As we have seen with the platforms covered in this chapter and table 1, that they all have similar themes but differing approaches to open peer review. Some focus on commenting, others are more discussion based, whilst some employ a points systems in addition to question and answers. We see alternative metrics, such as The Winnower's 'Wheat and Chaff' as well as systems that look to reward and gain formal acknowledgement for those who spend time reviewing other's content. Some options within open peer review will be more popular than others depending on the researcher's own set of professional beliefs. Naturally some will congregate around platforms that focus on their own specific research topic areas. Whilst as with any area of the web that allows for comment and discussion, some academics will feel they have nothing to hide, and go as far to embrace open peer review to openly discuss research. At the other end we will see academics fearful of what they read about their own hard work and in return becoming reluctant to interact with negative comments, constructive or otherwise. Deciding which is the best, most active and rewarding platform will no doubt cause concern and confusion for some researchers and reviewers. We also have to pay heed to other potential problems that are not exclusive to peer review, such as the problem of predatory journals and conferences, as it is likely we could see similar ventures in open peer review. Only time will tell.

Other notable mentions

We have looked at some of the more prominent and established open peer review platforms but is also worth mentioning other existing platforms and the also-rans. PaperCritic was created by the Mendeley API and works with Mendeley to monitor papers in your reference collection and via your Mendeley contacts list. For a tool that is based around social interaction, it ceased posting updates on its various social media platforms in early 2014, which is never a good sign. Another interesting tool is Chapter Swap which focused at the grassroots of research by providing an opportunity for authors to swap draft copies of their work for review. Chapter Swap aimed itself at the postgraduate and postdoc market and

those working within the discipline of the arts and humanities. Along with PaperCritic, the once active Twitter feed ceased in 2013 indicating that the service was no longer active. Libre is an open peer review platform that is hosted by Open Scholar C.I.C and operates solely within the academic community. The aim of Libre is to switch roles and put authors in the driving seat of the review process. They do this with transparency and openness with content published under a Creative Commons Licence. At the time of writing this chapter Libre was still in a testing phase but potential users were encouraged to sign up in time for the first stable release. The next platform is Science Open Review, which is not to be confused with Science Open or SciOR. Science Open Review is based at Queens University in Canada with a remit to connect authors with reviewers in author-led non-blind peer review. Finally the Journal of Visualized Experiments (JOVE) is a platform that has been gaining much traction over the last few years. JOVE is the leading online video journal and has a remit to support the replication of published research. The pre-publication review model is anonymous as is part of the post publication comment. JOVE's inclusion is based on it allowing users to leave comments that include their first name and the initial from their surname, possibly enough in some cases for recognition.

A Mixed Model Approach

Research is driven by the idea of solving problems, improving systems, creating a better understanding and bringing about enlightenment. Open peer review as with altmetrics sets out to do the same for the research process and how we communicate scholarly work. If we think about the old and the new, citations, blind review, indexes and impact scores alongside altmetrics, snowball metrics and open peer review as just steps towards a better understanding of research, we should be in a better place than we are. The alternative is for us and our research colleagues to get bogged down in a mire of processes and technologies, all competing, all offering a multitude of confusing choice. That said, as we have already seen, there is invention resulting from the advancement of scholarly communication. Certainly one novel idea that has been suggested is giving those who have actively contributed to a piece of research a digital badge. This badge will reflect their role in that particular piece of research. (Cantor & Gero 2015) propose the creation of an R-index scale of reviewer recognition. We have to consider the consider the connection with and purpose of open access, that being to remove access barriers not quality filters (Suber 2012). We are perhaps yet to see the true impact of open access, despite its increased adoption and the fact that academics have been pushing this model for a few decades now. Yet the connection between open access and open peer review, although obvious to some is less so to others. (Ford 2013) argued that whilst open access and open peer review go hand in hand, open peer review does not need to occur only in open access journals.

Conclusion

At present most of the open peer review platforms have just a few comments for some research articles, the majority have none. This is understandable considering the various factors such as lack of awareness, permission, confidence and that all important critical mass. Why start a conversation in a room when no one else is there to listen? In time this could all change but for now, despite the huge amount of published research, navigating and responding to posted comments is quite manageable. However, as we have seen with such as Twitter and Facebook, once a connection joins a social network, others will follow. We may get to a stage where some channels become so popular as they open up scholarly communication that we find ourselves dealing with a cacophony of noise if not properly

moderated. Perhaps we only have to look at the words of (Shirky 2008) who argues our problem is not one of information overload, it's filter failure. We have to think about whether encouraging researchers to comment more than they have done in the past is productive or disruptive. Tasks such as responding to and leaving comments can be another potential disruptive interruption to their focus, especially when a topic becomes increasingly debated, argued or even heated.The disruptive aspect is very noticeable with non-academic social media and discussion forums, in fact any kind of modern day communication, whether that be Snapchat or text messaging. It can be an overpowering temptation to continually peek back to see if anyone has responded to your latest update or message. As with any kind of debate or argument, there is often a strong a temptation to get the last word in. Yet for for open peer review, in particular the post publication type, to blossom and benefit research it needs human interaction, this being researcher's comments and if possible constructive ones, but it might be too much to expect all of them to be so The web has broken down many of the high walls and silos that researchers work in, but there is still more to be done. Many still operate within a system where their work does not appear above the parapet until published or when delivering a talk at a conference. Not only do they miss opportunities to share and discuss work early but also be aware of similar research taking place elsewhere. Of course not all research can be open, no open peer review initiative can ever be in place to discuss certain sensitive or strategic information, it just has to stay out of sight. For the research that is not shrouded in secrecy researcher's already have the tools covered in this chapter in addition to the many others such as Twitter or Mendeley. With such technologies, they can get a feel for what relevant research is going on around them. Open review and commenting on published research can help identify incorrect findings.These potential benefits of a new openness are succinctly highlighted by David Goldstein, Director of Duke University Centre for Human Genome Variation (Mandavilli 2011). Goldstein (Mandavilli 2011) said; "When some of these things sit around in scientific literature for a long time, they can do damage: they can influence what people work on, they can influence whole fields."

Peer-review as we know it may not be perfect, but as LIS professionals and researchers learn to understand the social web in its many forms, it could become better. It has the potential to become more useful, both as a formal and informal platform for discussion and knowledge sharing within the academic community. Given we have these tools and that many are now firmly established, it makes sense that we explore every possible option. Blind and open peer review currently co-exist and there is no reason for that not to continue. The case for both open and blind peer review is no different for that of altmetrics which has often been regarded by detractors as a whole new alternative to the traditional measurement through citations. Proponents of altmetrics now promote the idea of alternative indicators, rather than whole measurement. Open peer review platforms need to be clear in their aims and explain any considerations clearly to researchers, commentators and reviewers alike. As with social media, it is doubtful we will see every researcher using these platforms. Even if they became standardised, formalised and part of the research cycle, there is still likely to be resistance in some quarters. Many academics are likely to feel vulnerable by making their research open for comment, Yet the reality is that this happens already, often without them knowing it. Research that makes it into the public domain, especially via media coverage, is exposed to open review, just not always from peers but by the sometimes highly critical, often inexperienced general public. Open peer review is nothing new and has been discussed, theorised and trialled for some time, but as yet it remains the junior partner to the traditional model of peer review. For the existing open peer review platforms there is still

some mileage to cover before anything like critical mass occurs. All the while it becomes increasingly important for it to be a worthwhile exercise for reviewers and authors that is structured, aided by moderation and authentication. If not, as (Van Noorden 2014) asks; “will online comments look more like a scattered hodgepodge of reviews, comments and discussions across websites unlinked to original publications?” Whatever happens, the chances are that regardless of formal or informal peer review, someone could comment on yours or a fellow researcher’s work. Whether you respond remains your choice.

Other recommended reading:

There has been much already written on the subject of open peer review, pre and post publication. Below are just a few of the more notable web articles.

Pre-publication posting and post-publication review will facilitate the correction of errors and will ultimately strengthen published submissions
http://blogs.lse.ac.uk/impactofsocialsciences/2013/04/19/pre-publication-posting-and-post-publication-review/

The new dilemma of online peer review: too many places to post?
http://blogs.nature.com/news/2014/03/the-new-dilemma-of-online-peer-review-too-many-places-to-post.html

Stick to Your Ribs: The Problems With Calling Comments “Post-Publication Peer-Review”
http://scholarlykitchen.sspnet.org/2014/04/15/stick-to-your-ribs-the-problems-with-calling-comments-post-publication-peer-review/

Science and Technology Committee - Eighth Report - Peer review in scientific publications
http://www.publications.parliament.uk/pa/cm201012/cmselect/cmsctech/856/85602.htm

Useful Links
http://retractionwatch.com/

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