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Should Biomedical Publishing Be “Opened Up”? Toward a Values-Based Peer-Review Process

Wendy Lipworth, Ian Kerridge, Stacy M Carter, Miles Little,

Abstract

Peer review of manuscripts for biomedical journals has become a subject of intense ethical debate. One of the most contentious issues is whether or not peer review should be anonymous. This study aimed to generate a rich, empirically-grounded understanding of the values held by journal editors and peer reviewers with a view to informing journal policy. Qualitative methods were used to carry out an inductive analysis of biomedical reviewers' and editors' values. Data was derived from in-depth, open-ended interviews with journal editors and peer reviewers. Data was “read for” themes relevant to reviewer anonymisation and interactions among editors, reviewers, and authors. Editors and peer reviewers provided three arguments that would support a more open and interactive peer-review process. First, a number of participants emphasised the importance of not only ensuring the scientific quality of published research but also nurturing their colleagues and supporting their communities. Second, many spoke about the ongoing moral responsibilities that reviewers and editors felt toward authors. Finally, participants spoke at length about their enjoyment of social interactions and of the value of collective, rather than isolated, reasoning processes. Whether or not journal editors decide to allow anonymous review, the values of editors and reviewers need to be seriously addressed in codes of publication ethics, in the management of biomedical journals, and in the establishment of journal policies.

Keywords: Peer review, Social values, Qualitative research, Research ethics, Bioethics: Medical ethics Research (humans)

Background

The Field of Publication Ethics

Peer and editorial review of manuscripts submitted to biomedical journals is a fundamental part of biomedical research and clinical practice. The process is well entrenched in academic biomedicine and is used not only as a means of ensuring the quality and dissemination of published material, but also as a means of distinguishing those scientists who deserve academic promotion from those who lack the requisite publishing—and by implication scientific or clinical—skills and dedication. In recent years, however, the process of reviewing manuscripts for publication in biomedical journals has become the object of increasing academic and regulatory critique. While most people believe that some form of prepublication manuscript review is essential, questions have been raised about both the quality and integrity of the peer-review process (Smith 2006; Atkinson 2001), and the field of “publication ethics” has emerged (Godlee 2000; McLellan and Riis 2003).

The publication ethics literature tends to focus on the perceived moral failings of peer reviewers and on ways these failings (or their effects) can be reduced. Peer reviewers have been accused of many different forms of unethical practice. The most serious of these involve outright plagiarism or extreme bias due to conflict of interest, but instances of perceived reviewer misconduct also include failure to disclose conflicts of interest as well as more subtle misdeeds such as rudeness, deliberately delaying the publishing process, and failure to take the review process seriously (Rennie 2003b;

Wager and Herxheimer 2003). Such abuses of power have, in turn, been attributed to a wide variety of personal vices on the parts of reviewers, including greed, jealousy, egoism, favouritism, malice, caprice, lying, unscrupulousness, abuse of privilege, strategic manoeuvring, self-promotion, disingenuousness, predatory behaviour, and corruption (e.g., Smith 1997; Osmond 1983; Godlee 2000).

While not confined to biomedicine, people with an interest in publication ethics have often tended to have biomedical backgrounds and/or to focus their attention on biomedical publishing. This is not surprising given that biomedical journals are read largely by a community of practitioners who do not have the time or skills to review unfiltered research material and whose actions can have immediate and serious clinical and public health consequences (Gannon 2001). The wide-ranging effects of publication of flawed or fraudulent biomedical research are clearly evident in the professional and public health consequences of the 1998 publication in *The Lancet* of a study fraudulently linking autism to the measles, mumps, and rubella (MMR) vaccine (Godlee et al. 2011). This type of controversy provides a context for the emergence of a number of international organisations charged with overseeing biomedical publication in general, and peer review more specifically, including the International Committee of Medical Journal Editors (ICMJE), the Committee on Publication Ethics (COPE), and the World Association of Medical Editors (WAME), all of which have focused their attention on the ethics of biomedical publishing (International Committee of Medical Journal Editors 2007; Committee on Publication Ethics; World Association of Medical Editors).

Debates About Reviewer Anonymity

Those writing about the field of publication ethics generally acknowledge that reviewers and editors possess considerable power, and many of the key debates within this field focus on ways in which abuses of power can be minimised, including: asking reviewers and editors to declare their (inevitable) conflicts of interest—both financial and nonfinancial, including epistemological, methodological, ideological, and pedagogical conflicts (e.g., Kumashiro 2005; Godlee 2000; Hojat et al. 2003); allowing authors to exclude potentially biased reviewers (Mruck and Mey 2002); and managing the anonymity of the review process.

Of all the issues that have concerned those with an interest in publication ethics, few have been more contentious than the question of reviewer anonymity. Those in favour of anonymous review argue that, by forcing reviewers to identify themselves, reviewers will be reluctant to give honest criticism or, indeed, to participate in the review process at all. This is seen to be particularly the case for junior reviewers evaluating the work of senior scientists in their field. Critics of anonymous review, on the other hand, argue that, rather than promoting integrity, allowing reviewers to act “under the cloak of anonymity” (Godlee 2002, 2762) insulates reviewers from accountability, leading to laziness, irresponsibility, failure to suppress whims and self-interests, and even to outright abuses of power (e.g., Gannon 2001; Altman 1996; Atkinson 2001; Rennie 1998; Baez 2002). Those in favour of signed reviews argue that even the technical quality of reviews may be improved by increasing transparency, since there would be no “cover for ignorance” and no reinforcement of a “false sense of superior status” (Atkinson 1994, 155). And those with a broader sociopolitical perspective argue that, all else being equal from a quality point of view, reviewers should be identified and should be made to declare potential conflicts of interest, both because justice needs to be seen to be done and because power without responsibility should not be tolerated (Godlee 2000, 2002; Smith 2003; Hojat et al. 2003). Some take this further, arguing that the entire review process should be opened up, turning the peer-review process into an “enlightened debate that is public spirited, as well as public” (Dayton 2006, p. 7), rather than “a series of tablets being brought down from the mountain” (Smith 2003, 340).

Empirical studies of reviewer anonymity have focused on: the effects of reviewer anonymisation on review quality and consistency; time taken to review; and the kinds of recommendations that reviewers make (e.g., Walsh et al. 2000; McNutt et al. 1990; van Rooyen et al. 1999; van Rooyen et al. 1998). Some of this research (including several studies included in a 2006 Cochrane Review [Jefferson et al. 2007]) has shown that signed reviews are possibly of higher quality and are judged by authors and editors to be fairer, more constructive, and more courteous. For the most part, however, the results of these studies have been equivocal (Jefferson et al. 2007) and interpreted by biomedical journal editors in a variety of ways (Rennie 2003a; Fletcher and Fletcher 2003)—with most choosing to retain anonymous review. A few studies have focused on the feasibility of publishing reviews electronically in a system of “open review,” and it has been demonstrated that, at present, such efforts are likely to be thwarted by practical issues such as the time and resources it takes to administer and oversee such processes (e.g., Bingham and van der Weyden 1998; Smith 2003; Altman 1996; Bingham 2003; Ginsparg 2003; Godlee 2002).

Rationale, Aims, and Research Question

The Need for a Study of Reviewers’ and Editors’ Values

In the face of both philosophical and empirical uncertainty, it becomes important to consider the views of stakeholders. But here, too, the results of empirical research have been inconsistent. Surveys of stakeholder preferences regarding anonymisation have shown that an increasing number of reviewers are willing to sign their reviews, but there is also evidence that many reviewers would prefer to remain anonymous and may refuse to review if forced to identify themselves (e.g., Bingham and van der Weyden 1998; Snell and Spencer 2005; Kearney and Freda 2005; Regehr and Bordage 2006).

One possible way of breaking through such impasses is to carry out detailed empirical inquiry into the values of stakeholders. The distinction is made here between “values” and “preferences,” with the former referring to the foundations for specific preferences that are played out in particular contexts (for example, in the context of debates about anonymity [Shiell et al. 1997]). While qualitative research would be best suited to the exploratory study of values (Flyvbjerg 2001), almost all published research into biomedical manuscript review has been quantitative and reductionist—reducing the process of review to its component parts and studying the effects of various technical interventions on each of these parts (Atkinson 2001; Callaham and Tercier 2007). And insofar as qualitative research has been conducted into manuscript review, this has tended to focus either on the language or criteria used by reviewers in assessing manuscripts (Gosden 2002; Day et al. 2002; Dickersin et al. 2007) or on stakeholder preferences, rather than on the underlying values of reviewers and editors.

In this study, we set out to generate a rich, empirically grounded understanding of the values of journal editors and peer reviewers through in-depth interviews with journal editors. There was no a priori hypothesis regarding reviewer anonymity or any other aspect of peer review, and we made an effort (to the extent that this is possible) to set aside any preconceptions as to what editors and reviewers would say. As such, our research question was deliberately broad, asking simply: “What values do journal editors privilege in their work and in the development of policies of peer review?” Our process of analysis was inductive and there were no specific predefined outcome measures. We were, however, alert to the importance of the debate about anonymisation and therefore “read for” relevant findings once our data had been collected. The results in their entirety are summarised elsewhere (Lipworth et al. 2011), and the findings relating to negotiations of power and authority are described in detail in an article by Lipworth and Kerridge (2011).

Methods

Data Sources

Thirty-five in-depth interviews were conducted over 6 months in 2006. We aimed for conceptual exploration and theory generation rather than population representativeness. The primary focus of the project was on the values of editors of general medical journals. We interviewed twenty-three such editors, twenty-one of whom were full-time editors, including three editors-in-chief (one retired), and two of whom were part-time editors who also did clinical work. Attempts were made to vary the sample as much as possible, and interviews were carried out in three different countries (the United Kingdom, the United States, and Australia) with editors of different ages and from a variety of professional backgrounds (for example, clinical, research, other publishing). Although the focus of this study was on editors of subscription-based general medical journals publishing primary research and commentary, we also interviewed nine current or past part-time editors of specialty journals (in medicine, basic science, public health, bioethics, and health social science); three current or past editors of “review” journals (i.e., journals publishing review articles, systematic reviews, and/or meta-analyses); two past editors of non-peer-reviewed medical journals; one editor of an open-access journal; and two people who had been reviewers but not editors. Our purpose in doing so was not to examine these groups in-depth or to identify subtle differences between groups, but rather to ensure that we were not missing any major issues that might be obscured by the experience of editing “mainstream” biomedical journals. Of these editors, the majority had been, or were currently, engaged in research, academic writing, and/or peer reviewing (as distinct, for example, from moving into editorial work from journal production and copy editing, purely clinical roles, or junior research roles without reviewing responsibilities). While many participants reflected spontaneously upon their experience of being authors on the “receiving end” of manuscript review, authors’ experience was not the focus of this study. (Please note that the numbers in this section add up to more than thirty-five, as participants often fulfilled more than one role). A snowball sampling technique was used, and all editors and reviewers who were approached agreed to participate. More details about the research participants can be found in the supplementary content¹ associated with Lipworth et al. (2011).

Interview Technique

As discussed above, the research question was kept deliberately broad. The interviews lasted approximately 1 h and were semi-structured, exploring very broadly the process of peer review and the social context of peer review of academic manuscripts, which allowed participants to define and discuss manuscript review as they wished. In each case, participants were simply asked to describe their career paths and their experiences of acting as editors and/or peer reviewers. While we had prepared an interview schedule, our research participants were extremely articulate and it was seldom necessary to make use of these prompts. Instead, the interviews took the form of a conversation in which emergent themes were clarified and followed-up. Interviews were carried out by one researcher (W.L.) and were recorded and transcribed verbatim.

Data Analysis and Interpretation

The method of data analysis drew on both Morse’s outline of the cognitive basis of qualitative research (Morse 1994) and Charmaz’s outline of data analysis in Grounded Theory (Charmaz 2006) and involved: 1) initial coding using Charmaz’s method of line-by-line analysis and “gerunding” (encoding action or process); synthesis of codes into categories, until no new codes could be developed from the data; 3) focused coding for categories; and 4) abstraction of categories into more abstract “concepts” (corresponding to Charmaz’s “analytic categories”). A coding tree was generated using the qualitative research software NVivo 7. Throughout the data analysis process, a process of constant comparison was employed. Existing codes, categories, and concepts were

¹ Included at the end of this article (p 16-20)

constantly refined, enriched, and reorganised as new codes, categories, and concepts were developed, or as similarities and differences among existing codes, categories, and concepts were recognised. Enough material was analysed to allow for variety to emerge and for some degree of thematic saturation to be reached (i.e., to reach a point in which all codes appeared to fit under one or more existing themes without enlarging the sample size to the point that in-depth analysis would be precluded).

This study was approved by the University of Sydney Human Research Ethics Committee and consent was obtained from all participants and from the editors-in-chief of all journals. The procedures followed were in accordance with the Helsinki Declaration of the World Medical Association.

Results

The results of this study pertaining to the anonymisation of reviewers and the overall “openness” of the manuscript review process can be divided into two broad categories: 1) findings demonstrating that reviewers, editors, and authors value a process that is “scientific,” both in terms of its goals and process; and 2) findings demonstrating that reviewers and editors value the “social” dimensions of review at least as much as the scientific.

Valuing the “Scientific”

On the one hand, the review process was described as an objective and impersonal process, and both editors and peer reviewers spoke at length of their efforts to be as “scientific” as possible in their reviewing, in terms of their goals as well as the process of review.

Scientific Goals of Manuscript Review

In terms of the goal of scientific quality control, reviewers and editors spoke of their deep commitment to being honest and critical so that substandard material was not published and a filtering function was carried out on behalf of busy researchers and clinicians. This was seen to be particularly important in the biomedical context where the health of patients and communities were seen to be at stake.

Brian (full-time editor of general medical journal): We need peer review because the last thing we want to do is (publish) some information that doctors then change their clinical practice on that hasn't been properly vetted. So maybe in physics ... that's a good way of doing it. But in medicine we do need some kind of oversight, some kind of quality-control measure, and peer review is I guess as good a way of doing that as any.

Frank (full-time specialty journal editor): It's going back to medicine. It's ultimately about patients, and so being sure that what gets out there is as solid as it can be, whether it's here or some(where) else.

It was in the context of these discussions about the importance of honest criticism in the name of scientific quality control that the issue of reviewer anonymity was raised. Cherie, a full-time senior editor of a general medical journal explained her policy as follows:

Because it was such a small community, it was probably important to protect reviewers by de-identifying both ends of the process, so as to enable a reviewer if they were relatively junior to be able to say, “This paper is crap and for these reasons.”

This need to be honest was also discussed by one participant as the reason why, allowed the option, she might not choose to sign her reviews of academic manuscripts. Celia, a relatively junior researcher (and one of the two participants who had never edited a journal) described her need for anonymity when giving a strongly negative review.

Although I always very deliberately take a very constructive tone, if I think a paper is seriously crap I do sometimes review it anonymously. ... It's kind of protecting myself from that very virtual interaction with these people that I probably will never meet.

Not everyone, however, agreed that the ability to be critical should be tied to anonymity. Max, a part-time senior scientist and speciality journal editor, described his “philosophical” problem with the idea that honest criticism requires anonymity.

I guess the philosophical problem I've always had with [reviewers remaining anonymous] is that it seems to rely on the argument that you will only get truth from a referee if the referee can remain anonymous. ... I have a philosophical problem with that, because if you write a letter to the newspaper or a letter to your mother, or anything of that sort, you can't remain anonymous. And yet here we are with grown-up people apparently and the argument seems to me to be, “Well, you know, they can't be relied on to tell the truth if they can't remain anonymous.”

In terms of the goal of dissemination, both reviewers and editors stressed the importance of making an effort to improve manuscripts and of ensuring that their “gatekeeping” role did not completely stifle their capacity to facilitate scientific communication. Again, this publishing goal was tied closely to the goals of medicine, with the needs of patients sometimes justifying an adventurous approach.

Penny (full-time editor of general medical journal): If there's something so cutting-edge, like the first vaccine that works in HIV, and it's only a tiny number of patients or something, then we'll take a chance with it.

There was a general awareness among participants that these two goals were often in conflict, in which case most privileged quality control over dissemination, frequently citing the particular dangers of publishing substandard research in the biomedical context.

Whether focused on quality control, dissemination, or a combination of the two, the act of reviewing or editing was often portrayed as an expression of altruism aimed at facilitating biomedical science. Participants frequently described manuscript review as something intrinsically worth doing and worth taking seriously, even though it was recognised that there is no immediate or material reward.

Scientific Judgment

In their descriptions of their process of judgment, both reviewers and editors conformed to values classically held to be “scientific.” An ideal review in these accounts was objective or at least honest about biases and conflicts of interest. Cherie emphasised the importance of “total transparency”:

The thing is that it's not a competing interest that's a problem, because we all have them. What we want is total transparency.

The ideal review was also methodical, involving the application of explicit principles, Frank, a full-time senior editor of a general medical journal, described his ideal reviewer as being not unlike a mechanic.

What I really want to see is: Is this reviewer opening up the hood, getting in there, getting his or her fingers dirty, looking at that paper, drilling down into every aspect of the paper?

Editors also agreed that a degree of cynicism was important, particularly in order to detect undeclared authorial biases.

Brian (full-time editor of general medical journal): I am cynical, I wouldn't say that I trust authors completely, I'm on the lookout.

And a good review was productive of claims that could be explained and justified. Karin, a full-time senior editor of a general medical journal, described her ideal review:

Back up your statements, if you say a paper is not novel then you should give me why it is not novel.

This scientific ideal appeared to persist even in the face of recognised challenges. Reviewers and editors were, for example, conscious of numerous threats to disinterestedness, but despite these challenges, "scientific" manuscript review seemed to persist as an ideal toward which reviewers and editors were expected to strive.

Valuing the Social

While "scientific" values were strongly held, evidence that reviewers and editors valued the social dimensions of review also emerged clearly, both in terms of the stated goals of reviewing and in the descriptions of the review process. Within discussions of the social dimensions of review, three key findings suggested that editors and reviewers might value greater interaction and openness in peer review. First, a number of participants emphasised the importance of nurturing their colleagues and supporting their communities as well as ensuring the scientific quality and/or dissemination of published research. Second, there was extensive talk about the ongoing moral responsibilities that reviewers and editors felt toward authors. Finally, participants spoke at length about their enjoyment of social interactions and of the value of collective, rather than isolated, reasoning processes.

Social Reasons for Participating in Manuscript Review

While the wish to contribute to scientific quality control and dissemination was clearly at the heart of manuscript review for our participants, both editors and reviewers made it clear that participation in the process served a number of social, as well as scientific, functions.

Participating in peer review or editing a journal was observed to be an important means of encouraging one's colleagues. Celia, a relatively junior researcher (who had not acted as an editor), described the pain of receiving unkind reviews and emphasised the importance of reviewers nurturing authors.

It should be about nurturing existing researchers, nurturing your colleagues, assisting your colleagues to contribute more effectively to the community of which we are all a part.

Several participants emphasised that even negative reviews could help authors and provide them with valuable criticism or insights that may assist them with writing a particular paper or in their careers more generally. Frank, a senior full-time editor of a general medical journal, spoke of his academic responsibility to provide a kind of consultative service to authors.

I think that's part of the academic responsibility ... sort of a teaching aspect. We think we do a service to authors and to the scientific community at large by providing basically a consult.

Louis, a senior scientist and part-time specialty journal editor, described the pleasure that he derived from helping authors develop their ideas and successfully publish their work.

I kind of redid the analysis, pointing out that a number of [the authors'] claims couldn't be made. So I encouraged a rewrite, and they rewrote it, and you could see that they'd taken on board all of this material, although they didn't contact me directly. That's a reward, that's a good feeling,

Manuscript review was also seen as a strongly communal activity. Max, a senior researcher, saw himself as participating in a community of scholars by being a part-time specialty journal editor.

It's part of being a member of what's always been an international community of scholars.

Several editors described the missions of their journals in terms of serving particular communities. Louis saw his editorial role as one of facilitating publication of work from disadvantaged members of the scientific community and realising the value hidden in even poorly written work.

I think it was just nice to be able to publish some of the Chinese work, the enormous studies that people did with an Apple II computer and 140 little floppy disks. ... That was, that was probably one of the most rewarding things of that time.

And Hugh, an editor-in-chief of a prestigious general medical journal, argued that the entire manuscript review process should be aimed at creating social movements and contributing to the goals of public health.

I want to use peer review to create a social movement around particular issues. ... I think it should be harnessed into creating these mini-campaigns, these mini-efforts that you're trying to change the way people think about an issue, change practice, change public health ... a dialogue in a community that didn't exist before.

Closely related to descriptions of manuscript review as a communal obligation were portrayals of reviewing as an act of social reciprocity. It was recognised that a reviewer's sense of obligation may arise from his or her sense that he or she has benefited, as an author, from the review process and

that he or she therefore needs or wants to reciprocate. Simon, a relatively junior full-time editor of a general medical journal, described how beneficial it had been to receive reviews when he was a scientist:

[As an author] it was nice to have other interpretations, 'cause when you went to a meeting, somebody else could come up with this argument and you've rehearsed the answer. That was the value of peer review to me as an author. And as a reviewer I saw my role doing much the same sort of thing.

The obligation or desire to review appeared to stem also from a reviewer's expectation that he or she would benefit in the future when others reciprocated. The importance of such reciprocity—both retrospective and prospective—was the basis of James's argument that scientists should be generous about "giving back to the community" from which they themselves "benefit." He described his frustration when people refused to act as reviewers.

James (part-time speciality journal editor): People can see fit to publish their own papers in the journal, but when I ask them to review a paper for somebody else, they don't. I have a real problem with that. Because that's not giving back to the community.

Even full-time salaried editors demonstrated a strong sense that they had entered a worthwhile and exciting profession in which one had the opportunity to be paid to do something special and to fulfil important communal expectations. Perhaps unique to biomedical publishing was the close relationship that Frank saw between his editorial work and his previous work as a clinician.

Frank (full-time editor of general medical journal): It's a very humbling job to know that what papers we choose to publish are responsible for how doctors are really going to take care of patients. ... Any editor that is in it for anything else besides that I think is in the wrong job. That's why we all went into medicine. If you stray from that primary purpose, that core competency, you miss the boat.

Ongoing Moral Responsibilities

The sense of manuscript review as a moral enterprise did not stop once a reviewer had agreed to participate, and reviewers and editors considered themselves as having a number of ongoing moral responsibilities to authors. For the most part, these responsibilities did not appear to be imposed by regulatory bodies. Almost without exception, responsibilities were portrayed as moral obligations that were willingly assumed and that both modulated reviewers' and editors' power and demanded that the treatment of authors be taken at least as seriously as the scientific goals of quality control and dissemination. Participants described several specific obligations, the main ones being: 1) to communicate consistently and in a timely manner; 2) to treat all authors equally (procedural fairness); 3) to fulfil pre-existing obligations to authors; and 4) to affirm authors and their efforts.\

Communicating Consistently

While participants made it clear that they were aware that new information may be "uncovered" during the course of the review process, and that reviewers and editors may need to change their minds for good editorial or scientific reasons, it was seen as important to avoid unwarranted inconsistency. Participants spoke of their efforts, wherever possible, to give authors consistent messages and to avoid misleading authors into believing that their manuscript would be accepted

when this was not guaranteed. This was seen to be particularly important when manuscripts were commissioned or when revisions were invited.

Gavin (full-time editor of general medical journal): It's essential that the letters inviting revision make it clear that submitting a revision does not guarantee acceptance. That's the main thing, because you don't want to mislead authors. ... The expectations have to be clear.

Also recognising the importance of communication, Brian, a full-time editor of a general medical journal, argued that the manuscript review process might be better accepted if authors understood and could observe the process, seeing that it is, in fact, complex, fair, and thoughtful, rather than biased or arbitrary.

I don't think many of our authors have the slightest idea of what we actually do, of what [the] peer review process is. In an ideal world, what we would do is have a webcast of our [editorial] meeting, but of course we can't because everything's anonymous.

While admitting that such moral concerns cannot override the need to ensure scientific quality, editors also spoke at length of struggles they face when these moral obligations are in conflict as, for example, when an article slated for acceptance needs to be rejected at a late stage.

Procedural Fairness

Participants emphasised the need to be fair and consistent not only in their communications with a single author, but also in their treatment of different authors, whether the author was the editor's "best friend" or "worst enemy" and "regardless of what they have to say." In order to promote equal treatment of authors, Leslie, a senior clinician and editor-in-chief of a specialty journal, described himself as engaging in a "common law"-like process.

Anytime we get an irregular manuscript that does not fit nicely into the rules of engagement, we recognise that our decision on that manuscript will set the tone for all future manuscripts that are of a similar genre or have a similar property.

Several editors acknowledged, however, that complete equality was not always possible.

Belinda (full-time editor of general medical journal): You definitely find that we have meetings where we say, "Oh, it's a paper by Doctor Blogs," and that doesn't necessarily mean it will be accepted. In fact, it in no way means it would be accepted. But it does mean it's got, I would say, a higher chance of at least getting to our [editorial] meeting for discussion and getting peer-reviewed rather than rejected out of hand.

Fulfilling Pre-Existing Obligations to Authors

One reason that complete equality could not be guaranteed was that editors saw themselves as having longer-term relationships with particular authors, which might warrant special treatment. Such pre-existing obligations were seen to arise in situations in which the author had published frequently in the journal in the past or when a submitting author had acted previously as a reviewer for the journal and showed him- or herself to be expert and thoughtful. Although these obligations

were acknowledged by editors to be a source of “bias” or “conflict,” they also were seen as being “only fair.” Belinda, a full-time editor of a general medical journal, justified her (very prestigious) journal’s special treatment of regular reviewers when they submitted manuscripts.

To be honest, I think that’s fair. If we use somebody and rely on people to do turnaround on reviews in 48 hours... if we have someone that comes to our meetings and [whom we] can rely on every time there’s a diabetes paper or something. If they can rely on someone to always do that review within 24 hours for them whenever they ask, then it’s only fair that we review their paper, really.

Affirming Authors and Their Efforts

Whether a manuscript was to be accepted or rejected, it was seen to be crucial that authors were recognised for their efforts and provided with constructive criticism and encouragement. Interestingly, several participants described themselves as having become kinder and more constructive over the course of their reviewing career, often as a result of having themselves been on the receiving end of non-constructive and unkind criticism.

Celia (reviewer): So the first couple of reviews that I wrote were just like [my supervisor], and I hadn’t been reviewed yet. And then I submitted a couple of papers and I got some reviews that were in a similar vein and I realised what a crushing experience it was ... and then I slowly trained myself to review in a constructive way.

In addition to being gentle, reviewers were seen to need to criticise manuscripts on their own terms or on their merit rather than demanding that authors write a completely different paper on a different topic. James, a part-time editor of a bioethics journal, emphasised the importance of not asking authors to write a different paper.

People choose to write a paper on a topic and you’ve kind of got to accept the paper up to a point. So telling somebody that they should’ve written a paper on a different topic is a very unhelpful piece of criticism. They have written a paper on a topic and it has to be criticised in those terms.

Openness to ongoing communication was also emphasised, and some editors spoke of personally telephoning or e-mailing authors to explain their decision or making themselves available for authors who may want further personal clarification of a decision or who may simply want to “vent.”

Valuing of Social Interactions

Enjoyment of Social Interactions

It appeared that this sense of moral responsibility described above stemmed from a strong sense of relatedness among reviewers, editors, and authors. Participants spoke of having a strong investment in their “engagements” with authors—with one participant even considering the review process to be about such relationships.

Celia (reviewer): I think the review process is about, it’s an interaction. In a lot of ways I think it is about the direct relationship between the reviewer and the author.

Editors, too, appeared to be aware of the “camaraderie” that could develop between reviewers and authors, and one senior editor spoke of her efforts to facilitate such relationships through, for example, passing on e-mail addresses (with consent)—despite the system at their journal being set up deliberately to avoid such interactions.

Yvonne (full-time editor of general medical journal): Now that we include e-mail addresses, it's remarkable the feedback that my authors get from people they don't know who are saying, "This is great." I think you're going to get a feeling here of a little camaraderie going on. What happened was, these two started up an e-mail conversation, and they did it all themselves. Even though they're not supposed to break confidentiality, the reviewer asked me first. I said, "Sure," because it was getting real close and personal with these two. And he helped her rewrite [and] she resubmitted.

Many journal editors made it clear that they too derive personal meaning from their relationships with authors and reviewers. Even full-time editors described forming close relationships with the researchers who submit to their journals. Editors appeared also to particularly value their more informal relationships with authors and reviewers in which they “talk to them” and “ring them up” and “interact in various ways.” Loss of these relationships was seen as one of the downsides of electronic submission systems.

Brian (full-time editor of general medical journal): I think the problem with our online submission is that it's very impersonal. I think what I miss is having that e-mail discussion with people. ... I've had feedback from authors saying that as well, that it's a bit faceless. You know, they like to know that there's a person there behind the machine that is [journal name].

It was, however, acknowledged by one senior editor that such communication could be a burden. Cherie, a full-time editor of a general medical journal, described the outcome of her journal's attempts to make its review processes more discursive.

Reviewers complained because they felt obliged to put in a lot more work. It was a sort of dialogue thing. Whereas at the moment it's very much a process with set phases. And in theory that's really nice to have that sort of dialogue, but we live in a world where we're so stressed out about time and other duties and all the rest of it, and it was really becoming quite burdensome for our reviewers.

Valuing of Shared Decision-Making

In addition to being a source of considerable enjoyment, social interactions were perceived to have significant epistemic value, with both journal editors and external peer reviewers, emphasising the extent to which they value the input of their colleagues when making decisions.

Despite being expected to review in isolation, one participant, reflecting on his reviewing practices, admitted to the practice of involving his colleagues, in what might sometimes be an informal “bouncing off” of ideas or even a more formal meeting. And several reviewers expressed their gratitude for being given access to other reviews of the same manuscript.

David (part-time speciality journal editor): I also find it interesting to read what the other guy's saying, I really like to see that ... it's a sort of a learning, you know, comparative thing, how am I travelling, am I up to the standards? That's fun and important.

Editors too spoke of strengthening their decision-making by invoking the authority of their editorial colleagues at all stages of the process. This consisted primarily of formal editorial meetings but also involved informal interactions.

Yvonne (full-time editor of general medical journal): That's another part of peer review that goes on here. We're constantly reviewing over each other's shoulders. It's just really constant, constant.

The consideration of other editors' comments was seen as an important means of showing editors that there are many good ways of interpreting manuscripts and reviews, and that these interpretations may differ from their original impressions. Indeed, it was seen as likely that, unless the original editor was an expert on the subject, his or her decision would almost certainly be influenced by other editors' arguments.

Belinda (full-time editor of general medical journal): It's also very interesting to see at the meeting, say, Editor A writes his comments and then all the other editors over the course of the day write their own, and everyone disagrees with Editor A. By the time it gets to the meeting, Editor A has changed their mind about what they wrote. And partly that's perfectly understandable, because everyone else has now made arguments that they hadn't thought of and they've completely convinced them.

This process of involving more than one editor (or of involving editorial board members) was seen as an important part of being fair to and protective of an author, and was also seen as useful for justifying to authors a difficult editorial decision, such as the need to reject a commissioned manuscript or the need to reject, on editorial grounds, a manuscript that has received good reviews or that has been revised several times.

Penny (full-time editor of general medical journal): My strategy [for handling complaints]: "It's the editors, not me." We all do that. "It's an editorial, joint decision at the manuscript meeting." And it is.

Indeed, several editors argued that it is collective reasoning that is the main strength of the editorial process, and junior editors spoke of using their option of invoking the expertise of their colleagues to justify their very right to edit a prestigious journal. Amy, a full-time junior editor of a prestigious medical journal, described her strategy as follows:

People have said to me before: "God, who are you to judge a [prestigious journal name] paper?" ... But we do have people who are a lot more qualified than me who have been working in it for a very long time. They probably know more about epidemiology, as far as research techniques go, than the people writing the papers. So they are absolutely qualified.

Interestingly, editors spoke of deferring to their editorial colleagues, not just because they could provide expert advice as knowledgeable individuals, but also because editorial decision-making needed to occur at the level of the collective. Editors argued that the views of the group were important, partly because they represent a "microcosm" of readers and partly because of the need for group consensus. This kind of editorial decision-making process was described as a "team decision" or a "group decision." It was seen to be ultimately the "editors as a body" or "the whole

editorial committee” that came to a decision about a manuscript. Various illuminating metaphors were used to describe this collective reasoning, such as a “common brain” or a single clinician assessing a patient.

Gabrielle (full-time editor of general medical journal): We all have our sort of specialties. But it’s funny, we’ve all got almost like a common brain in terms of what we do and don’t send out. ... We think like [journal name] editors.

Karin (full-time editor of general medical journal): Each paper is like a patient. You get information from outside, you do your lab test, you do your X-ray, whatever. We are, as a collective, the person like the clinician who makes an assessment.

Interestingly, the very practice of using external peer reviewers to assist with editorial decision-making (i.e., the very practice of journal “peer review”) was justified on the basis that collaborative reasoning—in this case, invoking external expertise—was necessary for fairness and objectivity and for instilling confidence in authors. “Letting peer review work” was seen as an important protective mechanism against claims of editorial prejudice.

Leslie (editor-in-chief of specialty journal): We let peer review work, we don’t sway manuscripts because of sensational appeal, ability to sell reprints, ability to garner advertisements. We just don’t do that. We’ve set up checks and balances in our system, and whatever happens downstream from that just happens.

Discussion

Summary

Both editors and peer reviewers spoke at length of their efforts to be as “scientific” as possible in their reviewing, in terms of their goals as well as the process of review. At the same time, it was clear that manuscript review fulfilled a number of social purposes in the context of academic communities and reviewer-author interactions, and that the review process itself was infused with perceived moral obligations, inter-subjective bonds, and negotiations of shared epistemic authority. Taken together, these results demonstrate that, for journal editors and reviewers, the social—both communal and inter-subjective—dimensions of manuscript review were at least as salient as its more “scientific” dimensions.

Resonance with Other Research

This research extends the qualitative study of journal peer review beyond the examination of the language or standards of review, and provides more context for, and detail about, the attitudes and opinions expressed in surveys of editors, reviewers, and authors. In so doing, our research provides a greater understanding of why people might hold particular views about anonymity and why they might be amenable to a more open, interactive process. While there are no similar published studies, our findings have resonance with unpublished work by Callaham and Tercier, who found that, while it was important for peer reviewers to objectively ensure that only high-quality research was published, reviewers also were concerned about stifling innovation, wished to be part of a collaborative dialogue, and expressed a strong sense of duty toward their author peers (Tercier and Callaham 2007a, b).

Practical Implications

Our results suggest that the social aspects of manuscript review need to be seriously addressed in codes of publication ethics, in the establishment of journal policies, and in the management of biomedical journals. First, these findings provide additional reasons (beyond reducing bias and other abuses of power) for allowing reviewers and authors to form direct personal relationships, for allowing reviewers to discuss their reviews with their colleagues, or for opening up the review process to broader participation. While this does not demand compulsory identification or public dissemination, we would argue that reviewers and authors should at least be given this option. And at the very least, reviewers who find themselves unwilling to sign their review or to have it made publicly available should be asked to reflect on their capacity to make an unbiased assessment—information that may also be useful for journal editors.

In this regard, it is worth noting that some biomedical journals now identify authors and/or reviewers, and/or have developed forums for prepublication open review or for open discourse on published manuscripts (Dayton 2006; Judson 1994). While such approaches have merit, they are unlikely to become widespread until manuscript review—both before and after publication—becomes a more genuinely valued and rewarded academic activity. Altruism alone—whether focused on science or on people—is unlikely to sustain prolonged interactions and conversations, as shown by previous efforts to make manuscript review more open and discursive (e.g., Bingham and van der Weyden 1998; Smith 2003; Altman 1996; Bingham 2003; Ginsparg 2003; Godlee 2002).

Even if such structural changes were not financially or technically feasible, there are conceptual ways in which the social dimensions of the manuscript review process might be recognised and encouraged. Indeed, all that might be needed is a reworking of the training, guidance, and feedback given to reviewers to show that all of their values and concerns—both scientific and social—are worthy of serious consideration and to provide them with ways of thinking about, managing, and talking about these social elements. Reviewers could, for example, be asked to reflect upon why they have agreed to participate and how this might be shaping their priorities (including nurturing colleagues and building communities). In recognition of their moral concerns, reviewers and editors could be encouraged to think about and make explicit any moral dilemmas they face. And in recognition of the value of collective reasoning, reviewers and editors could include descriptions of their collective reasoning processes in their reviews and letters to authors, respectively.

It is worth emphasising that such an approach is likely to be controversial because it flies in the face of existing wisdom as to how manuscript review should be conducted (in particular, the view that manuscript review should be an objective, anonymous process carried out by atomised individuals). It would be crucial, therefore, to emphasise that the goal of such an approach is to enrich the review process and not to do away with its “scientific” dimensions. Moreover, while reviewers’ and editors’ values need to be considered, one should not forget that the ultimate goal of manuscript review is to ensure the quality and dissemination of manuscripts. Efforts would therefore need to continue to ensure that reviewers and editors retain the ability to carry out a critical appraisal of science. In practice, this would require that existing training and guidance for reviewers and editors retain “scientific” components, while at the same time taking a more critically informed approach to “science” (as outlined in innumerable existing guidelines on the critique of scientific research) and taking account of the social values of those engaged in the review process.

Limitations and Future Directions

The sampling in this study was aimed at achieving maximum variation and theory development. As such, our sample size was too small for us to make fine distinctions between our sub-groups. It would, therefore, be important to conduct a larger study to enable the identification of differences between, for example, senior and junior reviewers and editors, reviewers and editors of different

kinds of journals, and reviewers who have and have not also acted as editors (and vice versa). It also would be important to determine which of these findings are unique to biomedical publication and which are generalisable to academic publishing more generally. There were several instances in which our participants made specific reference to medicine—emphasising the particular importance of both quality control and timely dissemination in a medical context. Participation in review of biomedical manuscripts was, in many ways, seen as a direct extension of patient care, and the review process was not unlike the clinical assessment of a patient. By comparing and contrasting the values of biomedical journal editors with those from other academic disciplines, we might be able to more finely elucidate the issues of most significance to biomedicine and bioethics. It would also be important to study the biomedical publishing process in non-English-speaking countries—especially given the well-known tendency of scientists in the English-speaking world to ignore research published elsewhere. Finally, it would also be important to explore, more directly and in more depth, reviewers', editors', and authors' attitudes toward anonymisation.

From a practical perspective, the results of this research could inform a broad consultation process involving journal editors, policy-makers, publishing companies, scientists, clinicians, academic organisations, and anyone else with an interest in the ethics of biomedical publications, aimed at developing strategies—both conceptual and structural—that could actualise the values that ground the various roles that peer review plays in biomedical publishing.

Ultimately, of course, it would be important to assess whether the suggestions in this paper actually improve the quality of manuscript review. For while it makes intuitive sense for policy to be congruent with stakeholder values, the ultimate test will be whether our suggestions improve the quality and richness of the biomedical literature.

Disclosures

The work described here has not been published before, is not under consideration for publication anywhere else, and has been approved by all co-authors. All authors contributed to the conception and design of the study, to data interpretation, and to the writing of the article. The authors declare no competing interests.

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Supplementary material

See next page

Characteristics of research participants

Pseudonym	Gender (and approximate age)	Current editorial and peer review role/s (and approximate length of time in role)	Past editorial and peer review roles	Other current roles	Other past roles
Anna	Female (40-50 years old)	Full-time editor of general medical journal (10-20 years)			Primary care clinician Medical journalist
Belinda	Female (30-40 years old)	Full-time editor of general medical journal (5-10 years)	Full-time editor of on-line open access journal		Basic biomedical scientist with a few publications
Brian	Male (30-40 years old)	Full-time editor of general medical journal (5-10 years)	Peer reviewer		Basic biomedical scientist with a few publications Commercial medical writer and medical journalist
Celia	Female (30-40 years old)	Peer reviewer (5-10 years)		Early career health social science researcher with a growing publication record	Specialist clinician
Cherie	Female (40-50 years old)	Full-time editor of general medical journal (10-20 years)	Peer reviewer		Primary care clinician Clinical researcher with a few publications
Christian	Male (50-60 years old)		Full-time editor of "review" journal Peer reviewer	Head of patient/public advocacy organisation	
David	Male (50-60 years old)	Peer reviewer (30-40 years)	Editor/editorial board member of several clinical specialty journals	Senior specialist clinician (30-40 years) Basic science clinical and social researcher with extensive publication record	

Eric	Male (50-60 years old)	Peer reviewer (30-40 years)	Editorial board member of several clinical and basic science specialty journals	Specialist clinician Basic biomedical science, clinical and humanities researcher with extensive publication record	
Francine	Female (40-50 years old)	Full-time editor of general medical journal (10-20 years)	Part-time editor-in-chief of clinical specialty journal Peer reviewer		Specialist clinician
Frank	Male (40-50 years old)	Full-time editor of general medical journal (10-20 years)	Editor-in-chief of "review" journal Peer reviewer		Specialist clinician Clinical and basic science researcher with a few publications
Gavin	Male (40-50 years old)	Part-time editor of general medical journal (10-20 years)	Part-time editor of clinical specialty journal Peer reviewer	Part-time specialist clinician	Clinical researcher
Georgia	Female (40-50 years old)	Full-time editor of general medical journal (10-20 years)	Editor of non-peer-reviewed medical journal		Primary care clinician Medical journalist
Gina	Female (40-50 years old)	Full-time editor-in-chief of general medical journal (10-20 years)	Peer reviewer		Primary care clinician
Glen	Male (40-50 years old)	Part-time editor of general medical journal (0-5 years)	Peer reviewer	Part-time teaching academic	Clinical/policy researcher with a few publications
Hugh	Male (40-50 years)	Editor-in-Chief of general medical journal (10-20 years)	Peer reviewer		Specialist clinician
Ivan	Male (50-60 years old)	Peer reviewer (30-40 years)		Senior public health researcher, with an extensive	

				publication record	
James	Male (40-50 years old)	Peer reviewer (10-20 years)	Part-time editor-in-chief of medical humanities journal	Early/Mid-career health social science researcher, with growing publication record	
Karin	Female (40-50 years old)	Full-time editor of general medical journal (10-20 years)	Peer reviewer		Specialist clinician Clinical researcher with a few publications
Leonard	Male (50-60 years old)	Peer reviewer (30-40 years)	Chairman of editorial board of specialty journal	Senior public health/ health policy researcher with an extensive publication record	Various medical education roles
Leslie	Male (40-50 years old)	Part-time editor-in-chief of clinical specialty journal (10-20 years)	Peer reviewer	Specialist clinician	Laboratory researcher with a few publications
Liam	Male (70-80 years old)	Retired (10-20 years)	Editor-in-Chief of general medical journal		
Louis	Male (70-80 years old)	Peer reviewer (40-50 years)	Part-time editor of several clinical specialty journals	Health social science/bioethics researcher with extensive publication record	Specialist clinician
Marcus	Male (50-60 years)	Full-time editor of general medical journal (5-10 years)	Peer reviewer		Basic science researcher
Max	Male (50-60 years old)	Editorial board member of several basic science specialty journals (30-40 years) Peer reviewer (30-40 years)		Senior basic biomedical scientist with extensive publication record	
Mia	Female (20-30 years old)	Full-time editor of general medical journal	Editor of non-peer-reviewed medical journal		Basic science researcher with limited personal

		(5-10 years)			publishing experience
Olivia	Female (40-50 years old)	Full-time editor of general medical journal (20-30 years)			Basic science researcher with limited personal publishing experience
Penny	Female (50-60 years old)	Full-time editor of general medical journal (10-20 years)	Technical/copy-editor		
Rob	Male (40-50 years old)	Part-time editor of "review" journal (10-20 years) Peer reviewer (10-20 years)		Public health researcher	
Sam	Male (40-50 years)	Full-time editor of general medical journal (20-30 years)			
Sarah	Female (50-60 years old)	Part-time editor of medical specialty journal (10-20 years)		Clinical researcher with strong publication record Specialist clinician	
Saul	Male (40-50 years old)	Full-time editor of general medical journal (0-5 years)	Peer reviewer		Primary care clinician
Simon	Male (50-60 years)	Full-time editor of general medical journal (5-10 years)	Peer reviewer		Basic science researcher with a few publications
Tom	Male (30-40 years old)	Full-time editor of general medical journal (10-20 years)	Peer reviewer		Basic science researcher with a few publications
Whitney	Female (40-50 years)	Full-time editor of general medical journal (10-20 years)	Peer reviewer		Specialist clinician
Yvonne	Female (50-60 years)	Full-time editor of general medical journal (20-30 years)	Technical/copy editor		

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