JISC/OSI

JOURNAL AUTHORS SURVEY

Report

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CONTENTS

EXECUTIVE SUMMARY

On behalf of the Joint Information Systems Committee (JISC) and the Open Society Institute (OSI) a survey of journal authors has been carried out by Key Perspectives Ltd. The terms of reference were to poll a cohort of authors who had published on an open access basis and another cohort of authors who had published their work in conventional journals without making the article available on open access. The survey's aims were to investigate the authors' awareness of new open access possibilities, the ease of identification of and submission to open access outlets, their experiences of publishing their work in this way, their concerns about any implications open access publishing may have upon their careers, and the reasons why (or not) they chose to publish through an open access outlet.

Awareness of the concept of open access amongst those who had not taken this publishing route was quite high: almost two-thirds of respondents were familiar with the open access concept. Only around a quarter of authors in this group had been made aware of open access initiatives by their institution. The proportion of open access author respondents whose institution had drawn their attention to such outlets was higher, at 42%. The same pattern was seen when authors were asked whether they were aware of any initiatives in their own country to promote open access.

The primary reason for choosing an open access outlet in which to publish is a belief in the principle of free access to research information. Over 90% of open access authors said this is important. These authors also perceive open access journals as being faster than traditional journals, having a larger readership and thus resulting in higher numbers of citations to their work.

In contrast, the non-open access author group perceive open access journals as having slower publication times, a smaller readership and receiving fewer citations. More important reasons, though, for not publishing in open access journals are that they are perceived to be of lower reputation and prestige but, most importantly of all, authors are not familiar enough with the open access journals in their field to submit work to them. The issue of publication fees is only of middling importance to these authors as a reason not to publish in open access journals.

On the subject of publication fees, more than half (55%) of the authors who had published their work in open access journals had not paid a fee. This is almost certainly because a large proportion of this cohort are BioMed Central (BMC) authors and are likely to come from institutions that have taken out membership of BMC. The issue of fees raised debate amongst the respondents about its implications for researchers from developing countries, from disciplines that receive little research funding and on young researchers with no grant support. Authors feel that any publication fees required should come from research grants first and foremost and, failing that, from their institution or its library. In practice, this seems to be largely what is happening, with growing numbers of institutions proving amenable to taking out 'membership' of open access publishing companies like BioMed Central and growing numbers of grant-awarding bodies declaring

that they will support publication fees. Almost all the authors in both groups said that if publishing their work in an open access outlet were a condition of a grant-awarding body they would comply; fewer than ten percent said this condition would make them look elsewhere for funding.

There are concerns about publishing in open access journals. For the author group who had experienced this, none of the expected concerns rated very highly: the greatest concern – that publishing in an open access journal would affect their chance of winning research grants – troubled less than half of them (47%). For the other group of authors who had not published in an open access outlet the figure rose to 55%. Three quarters, though, feel open access publishing may limit the potential impact of their published work, even though published studies on impact of open access publishing actually show the opposite.

Neither group exhibits any great concern about the possible disruption to scholarly communication that development of open access publishing may bring. They value certain aspects of traditional journal publishing carried out by publishers, most critically the peer review process and quality control, along with the bundling of articles into journal packages.

These are not procedures associated with eprint archives, the other main mechanism of open access publishing. Respondents from both groups are poorly informed on these and only small minorities have ever self-archived their articles in an institutional or subject-specific repository. The highest level of activity of this type is posting a copy of published articles on their own website, something less than a quarter of our authors have done. Once again, authors express their willingness to use such archives if they are available, though evidence on this from the experience of those who champion such archives shows that authors are *not* highly motivated to comply.

The results from the surveys are discussed in the light of the studies and experiences of others in this field. There are some cultural and behavioural barriers to overcome, largely on the part of authors but also on the part of institutions, if open access is to flourish.

1. INTRODUCTION

This report is the result of a project funded by the Joint Information Systems Committee (JISC) and the Open Society Institute (OSI). These bodies wished to undertake a survey of authors of academic journal articles, comparing the experience of around 100 of those who publish on an 'open access' basis with the same number of those who do not.

Open access publishing – either in open access journals or by self-archiving – is a significant development in scholarly communication and JISC/OSI wish to study its impact upon authors. In particular, they want to understand such things as:

- The awareness of authors of new open access possibilities
- The reasons authors give for publishing this way, or for avoiding it
- The ease with which new open access outlets can be identified
- The concerns authors may have about the impact upon their careers of using these new outlets
- The ease with which authors are able to submit their work to these outlets
- The feelings of authors about open access after publication
- The experience of authors following open access publication; for example, the amount of feedback they receive on their work

Key Perspectives Ltd were contracted to carry out the research which was done between November 2003 and January 2004. The authors were polled via an online survey, after which we delved deeper into some of the issues that arose in a series of one-to-one interviews.

This report presents the findings of that work. The first part is an introduction to open access and how it has developed. Those who are already familiar with this should move directly to the next part which covers the survey and its results. The final part is a discussion of the main issues concerned with open access publishing in the light of the findings from this study. Things are moving fast and the open access concept is generating some lively debate. The world of scholarly publishing is used to debate, of course, but rarely has it been so vehement nor impassioned. These are, as they say, interesting times.

The results and discussion presented here are a snapshot of the situation at the start of 2004. We expect things to move on rapidly as the year progresses.

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2. BACKGROUND INFORMATION

2. 1 The Open Access movement: reasons behind its development

Open Access – free access to scholarly information – underpins the core tenet of academic endeavour, which is the unfettered sharing of research communication. This core tenet permits the free exchange of ideas, results and discussion and encourages and accelerates scholarly achievement in every field.

Ever since the very first true scholarly journals were started in the mid 1600s (*Philosophical Transactions of the Royal Society* was launched in 1665) academic authors have strived to publish and disseminate the results of their work, primarily for two main reasons – to advance intellectual progress in their subject and to establish rights over any intellectual advances they may themselves have brought about.

Neither of these two imperatives has changed, but there is considerable argument these days about how well they are served by the present system of scholarly communication. Critics argue that, with a body of well over 20,000 peer-reviewed scholarly journals in existence[1], no academic library can come anywhere near stocking even a tiny proportion of titles appropriate to the needs of the research staff in an institution. This being the case, individual scholars cannot get access to some – perhaps much – of the literature that is pertinent to their work with the result that the efficient exchange of scholarly information is impaired.

To exacerbate this problem, over the last two decades the so-called 'serials crisis' has become a more and more acute issue[2]. Journal prices have risen faster than both the rate of inflation and the increases in library budgets, resulting in the cancellation of subscriptions to journals in large numbers. This has happened all over the world and the western economies have been no exception: indeed, it is there that the problem has been seen to be most extreme. Data collected by the Association of Research Libraries show that in the 16 years between 1986 and 2002, inflation rose by 64% (in the US), library materials budgets rose by 184% and serials unit costs rose by 227%[3].

One way in which publishers have reacted to the seriousness of the serials crisis has been by developing the 'Big Deal' whereby parts or all of a publisher's journal list were offered to a library (or a group of libraries within a consortium) at a price that equated to less per journal than the library had originally been paying but which included journals that had not been

subscribed to before. Librarians have been divided on the benefit of such deals: some are pleased to have access to new, additional journal content that had hitherto been out of their reach, and point to usage statistics that show that the new material is used by their research faculty[4]; others argue that much of the additional content that they are able to access as a result of Big Deals is outside the boundaries of their researchers' interests and is therefore immaterial to their institution[5].

Moreover, the pressure on library budgets as a result of the Big Deal has not lessened. Library budgets have continued to see only modest annual increases whilst publishers have negotiated three- or five-year deals with year-on-year increases in charges, tying the libraries into long-term commitments of cash. The benefit to libraries of this sort of deal has been the simplification of the budgeting process and the surety that titles within Big Deal agreements would not need to be cancelled. To publishers, the benefit was guaranteed annual income for the period and the surety that there was no leeway for titles to be cancelled. Inevitably, these Big Deals with the large publishers have resulted in very large proportions of a library's budget being committed in this way, leaving little over for other purchases.

The upshot has been a squeeze on journals from small publishers or scholarly societies who do not have the clout to negotiate Big Deals. There has been some progress in this regard, with 25 scholarly society members of the Association of Learned & Professional Society Publishers banding together to offer libraries a bundle of 250 journals in 2004 as a Big Deal[6]. Similar initiatives have come recently from BioOne[7] which presents a collection of life science journals from society or not-for-profit publishers, and Project Euclid[8] which focuses on mathematics and statistics journals. Indeed, these bundles may have somewhat greater attraction for librarians than the offerings from large publishers in that they are at least focused on certain subject areas. For those small publishers with a few niche journals, however, the situation is difficult and looks set to remain so.

And where does scholarly communication get to in all of this? Some argue that with inter-library loan systems, Big Deals and online publication, access to scholarly literature has never been better. Others counter that despite those things, it is still the case that scholars are fettered in their work by being unable to access large amounts of the literature they should be able to see and that this hampers the progress of scholarship. And it is clear from the information presented above that libraries are struggling to maintain the kind of journals collections that they would wish to achieve, however modest.

Though historically it has been librarians who have had the loudest voices on this issue, increasingly in recent years it has been scholars themselves who

have taken up the banner. Yearly rounds of journal subscription cuts by libraries awoke researchers to the damage being down to their own institution's collections by the serials crisis and at the same time informed those who were interested in the reasons behind it. As a result, some researchers began to voice their indignation at the situation and these pioneers were joined by a growing band of increasingly vociferous supporters.

Voices of dissent, however, would solve nothing, but action might. The seeds of change were sown some years ago when the first public acts of rebellion were carried out by disaffected scholars in protest at what they saw as the unrealistically high pricing of journals. A number of these events deserve mention because they were pioneers that set the scene for what is happening today. In 1989, Eddy van der Maarel, the editor of Vegetatio (published by Kluwer) and his editorial board resigned and set up the rival *Journal of Vegetation Science* in protest at the high subscription price set by Kluwer. In 1998, the editor (Michael Rosenzweig) and the editorial board of a journal called *Evolutionary Ecology Research*, published by Thomson International, resigned *en masse* to set up a competing publication, *Evolutionary Ecology*[9,10]. In the same year most of the editorial board of the *Journal of Academic Librarianship* (published by Elsevier) resigned, again in protest at the journal's price, and set up a rival journal *portal: Libraries and the Academy*[11], to be followed in 1999 by all 50 members of the editorial board of the *Journal of Logic Programming* (published by Elsevier) resigning to set up *Theory & Practice of Logic Programming* (Cambridge University Press). Since then there have been other examples[12].

Protest at the price of journals is one thing, but a parallel development over the same time period meant that things are now happening that would have been impossible only some few years ago, thanks to digital enabling technologies and the 'Internet revolution'. In 1991 Tim Berners-Lee's work resulted in the release of the standard for the World Wide Web by CERN[13]. This was the most significant technological development of all for it set a standard protocol for the exchange of digital information between computers and led to the explosion in electronic information that profoundly affects lives today. The ability to digitise information to a common standard has allowed scholarly research to be made available, theoretically, to anyone in remote locations so long as they have access to a computer linked to the World Wide Web and it is this that has acted as the catalyst in the developments that are now taking place.

Even before this, though, the first shoots of what has now become known as the Open Access movement were sprouting and the early services providing toll-free access to scholarly information were making an appearance (see Peter Suber's Open Access Timeline for a most comprehensive account of the

major developments[14]). For example, Medline – the abstracting and indexing service from the National Library of Medicine in the US – began to allow access to its content without charge in 1997 having been toll-access since its inception in 1966. There was no access to the full-text of articles via Medline, though. Even earlier, three decades ago in 1974, a collaborative effort by the Stanford Linear Accelerator Center and the Deutsches Elektronen Synchrotron established the SPIRES high energy physics database where scientists in this field deposited preprints of their work. Fifteen years later in 1989 the first toll-free (i.e. no subscription price) fully peer-reviewed journal, *Psycoloquy*[15], was launched (edited by Stevan Harnad) and this was followed shortly afterwards by *Surfaces*[16] (edited by Jean-Claude Guedon) and the arXiv database[17] (set up by Paul Ginsparg) a pre- and postprint repository covering various branches of physics at the Los Alamos Laboratory, both launched in 1991.

In May 1999, Harold Varmus, then Director of the US National Institutes of Health founded E-Biomed, a collection of online preprints and postprints in the biomedical sciences, which came to fruition early in 2000 and subsequently changed its name to PubMed Central[18]. This is now a widely-used service containing the abstracts and full-text of over 100 biomedical science journals, the full-text being deposited by the publisher in the main between 6-12 months after publication of the original article, though in some notable cases (for example, the *British Medical Journal*[19]) the full-text articles are available from publication. PubMed Central is maintained by the National Center for Biotechnology Information, a division of the US National Library of Medicine.

Varmus pushed things further, being one of the key movers behind the Public Library of Science (PLoS)[20]. In October 2000, an open letter, signed by 30,000 scientists from 180 countries, was circulated to science publishers asking them to make their journal contents available free online immediately upon publication through publicly-accessible sites like PubMed Central. Some publishers responded positively, but only a few, spurring Varmus and his associates to establish PLoS. A grant of some $9 million from the Gordon and Betty Moore Foundation enabled PLoS to develop and launch its first journal, *PLoS Biology*, in October 2003. *PLoS Medicine* is due to launch in Spring 2004.

We return to Open Access publishers shortly but before we leave the reasons for the rise of the open access movement mention must be made of the concerns of governments around the world about the issue of access to scholarly information. Once again, the nub of the problem is concern that the results of publicly-funded research have to be purchased by yet more public money (via the universities) subsequent to which they reside in collections to

which public access is severely if not totally restricted by publisher licence agreements. Various initiatives are underway: for example, the Government of Canada has recently announced it is providing free online access to fourteen scientific journals published by its National Research Council press[21]. The United Kingdom Government, through its Science & Technology Committee, is currently undertaking an inquiry into access to scientific publications, with especial reference to price and availability[22]. Other governments have also taken action, most notably perhaps the Australian Government's recent announcement of a $12 million programme to enable Australian universities and other research libraries to improve their information management infrastructure[23], including setting up open access repositories, and the payment of institutional membership fees for Australian universities to become members of Biomed Central[24]. And in the US, Congressman Martin Sabo has introduced a bill (currently moving through the legislative process), the Public Access to Science Act, that would make research funded by the US federal government exempt from copyright protection, thus safeguarding its free availability to the public.

2.2 Models and definitions of open access

Scholarly articles can be made *freely* available to potential readers in two main ways – by being published in an open access journal or by being deposited in an electronic repository which is searchable from remote locations without restrictions on access.

2.2.1 Open Access journals

Whilst all open access journals share one characteristic – that of making their content freely available electronically to allcomers – there are various operational models in existence. The simplest model is where a journal is typically set up and run from a university department, published electronically-only using the institution's server space, and edited and administered (including the peer review process) for no fee by interested scholars. There are many examples of such publications in the Directory of Open Access Journals from Lund University Library[25].

A modification of this is where a journal receives some funding, perhaps in the form of grants or sponsorship, which pays something towards editorial or management costs. Examples of this type are D-Lib Magazine[26] which is funded by grants from DARPA (Defense Advanced Research Project Agency) and NSF (National Science Foundation), and the *Journal of Electronic Publishing*[27], published by the University of Michigan Press, whose editor and managing editor are volunteers but which has costs of US$4000 per year for copy editing and web hosting.

The other main model for open access journals is the 'commercial' publishing model. With this model, authors pay a fee to have their article published and the publisher makes the article freely available electronically immediately upon publication. The Public Library of Science is one such publisher (see section 3.1). Another player of great significance, BioMed Central (BMC), launched its open access publishing service in 2000[28]. It now has over 100 journals in its list, all in the area of biomedical sciences. Authors pay a flat fee of $525 per article accepted for publication. BioMed Central operates, in addition to the single author-pays option, an institutional 'membership' whereby institutions may 'join' BioMed central for a fee, from which point all authors in that institution may publish without a fee in any BMC journals. The JISC (Joint Information Systems Committee) has paid for membership for all UK higher education institutions[29]. The Australian Government has recently done the same for Australian universities along with numerous other institutions around the world[24].

The current state of affairs is that there are some 1000 open access journals in publication, only a minority of which levy a publication fee. They span all the disciplines from agriculture to philosophy. The Directory of Open Access Journals is shortly to launch a version with article metadata which will give a reasonably accurate guide to the number of open access articles these journals contain.

2.2.2 The Open Archive Initiative and Institutional Repositories

To facilitate open access, articles do not *have* to be published in open access journals. They can be published in traditional 'toll-access' (i.e. paid for by subscription) journals but archived *as well* in open access repositories. Such repositories may be depots for research from an institution, in which case they are commonly referred to as Institutional Repositories (IRs).

The argument for IRs was put most comprehensively in a paper by Raym Crow on behalf of SPARC (The Scholarly Publishing and Academic Resources Coalition) in 2002[30]. It sets out the rationale for such repositories, looks at their role in the scholarly publishing world, and goes some way towards examining costs associated with their establishment and maintenance. Most importantly, Crow discusses the issue of interoperability which is essential if such repositories are to be for anything over and above purely local use. The metadata must be searchable and exposed so that external search engines can seek out and harvest articles. Specifically, the standard that IRs should comply with is that laid down by the Open Archives Initiative[31] in its Protocol for Metadata Harvesting[32].

Many institutions around the world have set up an institutional repository, commonly using the eprints.org software[33] that was developed at Southampton University and is available free. This creates OIA-compliant archives so that articles of interest can be located and retrieved by search engines such as Google. Early examples of IRs include D-Space[34], created by MIT, and TARDis at Southampton University[35]. Repositories such as the Digital Academic Repository (DARE)[36] of the University of Amsterdam are networked nationally and internationally through library consortia or other collaborative arrangements.

Electronic article repositories may also be subject-specific rather than institution-specific. One of the earliest examples is arXiv[17], set up by Paul Gisparg at the Los Alamos Laboratory, a repository for papers in physics. Another example, CogPrints, set up in 1997, covers psychology, neuroscience, linguistics and related areas of computer science[37].

The current number of eprint archives worldwide is around 130 according to Tim Brody's new directory[38] and OAIster at the University of Michigan currently indexes almost 250 open access archives of all kinds[39]. Brody has also constructed an analyser for archive growth rates[40]. The most recent count by OAIster of the number of full-text articles in the repositories it harvests from (not just eprints but other types of article as well) is over 1.5 million, with the number growing by 23% in the last five months[41].

2.3 The advantages of open access

Open access means a return to the core values of scholarship – the free exchange of scholarly information with the objectives of publicly registering claim to intellectual property and of contributing to the advancement of scholarly endeavour by preventing duplication of effort and establishing a knowledge base on which others can build. In other words, maximising the impact of research effort. After so long in the realm of restricted access, the academy appears to be taking back control in the area of scholarly communication.

But does open access to research information produce any tangible benefits? There is some evidence that the level of readership is cut for electronic journals that have a restricted access policy[42]. There have been few empirical studies carried out so far on true open access journals though more anecdotal evidence suggests that the number of downloads of open access articles is high and growing. Download figures are perplexing, though, because there is no information on what the downloader actually *does* with the article once s/he has it. Do they read it, or not? A more meaningful measure is citation

and Lawrence[43] has been able to show that articles that are freely available online are cited 4.5 times more than those that are not available this way. There is considerable interest in this issue and further studies into the *impact* of open access on research and, as a consequence, the effectiveness of a research institution, can be expected.

2.4 Obstacles to and arguments against open access

2.4.1 Author-related issues

Whilst scholars-as-readers are almost universally in favour of open access to the literature in their field, as authors they tend to present a range of concerns or objections. The counterarguments and suggestions for overcoming these are presented in the Discussion section of this document in the light of the survey findings, but in summary the main concerns voiced by authors are as follows:

Peer review: Authors perceive open access to somehow be associated with peer review of reduced rigor.

Cost: Authors think there is always a cash cost associated with open access publishing

Prestige: Authors perceive open access journals as having a lower prestige than traditional titles

Archiving (permanence of their work): Authors express nervousness that open access articles may be 'lost' in time

Information overload: This is a shorthand way of encompassing author concerns over how they can locate open access articles and their preference for the habitual way in which they seek out information

Academic independence: Authors suggest that open access may somehow provide the means for traditional academic values to be subverted (for example, by commercial companies paying to have research published)

2.4.2 Intellectual property rights and copyright issues

Whilst this issue is one that can be rather simply overcome, it does in some circumstances stand in the way of scholarly work being placed in the freely-accessible public domain. Some publishers still have contracts with authors that allow the publisher to retain copyright on an author's work, thus permitting the publisher to impose restrictions on its dissemination.

2.4.3 Publisher countermoves and arguments

Publishers antagonistic to the aims of open access have reacted to initiatives both defensively and offensively. Their offensive has been to make a strong case for the value that they add to the scholarly communications process. This case includes their experience and expertise in managing the process, including peer review procedures, rights and permissions administration,

subscription management, printing and despatch, finance and accounting, and customer service; their investment and business planning (including risk-taking) skills that have resulted in new products, new technologies and new ideas; the usefulness to researchers of the traditional journal package (the bundling of articles of related interest, for example); their quality-control skills that result in publications of very high quality in terms of reproduction and communication; their marketing expertise that ensures that journals have wide circulations; and their overall appreciation of what authors and readers want from the scholarly communications process.

Defensively, publishers have argued for the advantages of an evolutionary, rather than a revolutionary, change in access models, calling for collaboration between all interested parties to achieve a sustainable solution.

2.4.4 Business modelling issues

Many publishers of 'traditional' journals have expressed interest in making those publications open access, but are concerned about creating a viable business model. Many scholarly societies which do not have any interest in reaping large surpluses from their publications fit into this category, along with some of the mainstream commercial publishers. Assuming, as most do, that the only feasible route is through levying a publication fee on authors, one of the problems is deciding what the level of that fee should be. It needs to be large enough to cover all the publisher's costs, not just marginal ones associated with processing an accepted article.

Different publishers operate with vastly different overhead levels, but some examples serve to illustrate the point. We have already pointed up briefly the *modus operandi* of a couple of the models – where an open access journal is effectively an imprint of a department or institution, the editorial and management work being carried out on a voluntary basis by interested academic staff, or where small amounts of cash are injected into this basic model in the form of sponsorship or from advertising. In these cases, overhead costs are non-existent (in cash terms) or covered by sponsor contributions and publication fees are not required.

Another example comes from the American Physical Society. This organisation, which runs its publishing operations on a breakeven basis, calculates that it has costs of $1000 per submitted article and $1800 per accepted article[44] and would therefore need to levy author charges in this region to maintain publishing viability. This is probably a realistic level of cost for a publishing organisation that operates efficiently and without the requirement to create shareholder value. Where large commercial publishers are concerned, the publication fee would need to be much higher in order to cover the increased overhead levels these businesses operate under and also

contribute to the bottom line. Suggested author fees in the region of $5000 per article have been bandied around anecdotally in the industry.

As well as alighting on a fee level that would facilitate viability, publishers are also wrestling with the mechanism of making the change from restricted access to open access. In particular, scholarly societies appear to be keen to make progress on this issue[45,46,47,48]. There has been much discussion about this and some schemes are emerging that have promise[49,50,51]. The Open Society Institute has also produced some guides for publisher wishing to convert an existing title to an open access journal or launch a new one[52,53,54].

2.5 Open access initiatives

The events leading up to the establishment of an organised open access movement were traced in section 3.1. In the last three years there have been several key events that serve as milestones for the movement. In December 2001, the Open Society Institute organised a meeting in Budapest to assess the state of play on open access and to see how the various initiatives up to that point could be progressed. The outcome of this meeting was the Budapest Open Access Initiative (BOAI)[55,56]. This took the form of a public statement in support of open access for scholarly journal articles. In addition, a website was launched in February 2002 where supporters could add their signatures. The Budapest Initiative formally announced its endorsement of two strategies for open access – the establishment of open access journals (see section 3.2.1) and self-archiving by scholars of their work. The Open Society Institute continues to donate resources to the open access movement[57].

In April 2003, a meeting at the Howard Hughes Medical Institute in Maryland resulted in the Bethesda Statement on Open Access Publishing[58]. It provided a working definition of open access publishing and agreed a set of principles that all parties (scholars, research institutions, publishers and librarians) could adopt to 'promote the rapid and efficient transition to open access publishing'.

Finally, in October of 2003, a conference at the Max Planck Society in Berlin resulted in the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities[59]. This states that progress should be made by encouraging researchers to publish their work according to open access principles, encourage cultural institutions to provide their resources on the Internet, develop means of evaluating open access contributions within the standards of good scientific practice and advocating that open access publications be recognised in promotion and tenure evaluation. The

signatories to this Declaration include all the major German research organisations, CNRS and INSERM in France and a number of other international research organisations.

2.6 Other drivers of open access

As well as the parties to the initiatives above, other influential bodies have signalled their support for open access. We have already seen that various governments have initiated open access developments in their own countries (section 3.1), which is, of course, very important, but arguably the support of research institutions themselves and the funding bodies that finance research is equally critical.

BioMed Central currently has 400 institutional members around the world, institutions that have paid a membership fee so that the scholars in those organisations can publish free in any BMC journal.

Institutional repositories are also on the increase. In the UK, the SHERPA project is setting up and monitoring thirteen such entities over a three year period[60]. There are additional repositories outside this set in the UK. It is difficult to arrive at an accurate figure for the number of such archives in total, but the new directory compiled at Southampton University[38] suggests there are at least 130 eprints archives worldwide. OAIster harvests from 80 eprint archives (almost certainly all within that larger set) and from a further 160-plus open access archives of other kinds[39].

Several funding bodies have now declared themselves to be actively supporting open access by being willing to allow author publication fees to be paid from research grants. One such is the Wellcome Foundation, a major supporter of biomedical research in the UK. It has recently released a position statement in support of open access[61] and will fund publication fees for its supported scientists to publish in open access journals. Other funding agencies that explicitly allow the direct use of their grants to cover article-processing charges are:

Canadian Institutes of Health Research
Cancer Research UK
Deutsche Forschungsgemeinschaft (German Academic Research Council)
Fonds zur Forderung der wissenschaftlichen Forschung (Austrian Science Foundation)
Health Research Board
Howard Hughes Medical Institute
International Human Frontier Science Program Organization
Israel Science Foundation

National Health Service (UK)
National Institutes of Health (USA)
National Science Foundation (USA)
Rockefeller Foundation
Swiss National Science Foundation

In addition, the Medical Research Council in the UK expects article-processing charges to be payable via institutional funds to which it contributes.

3. METHODOLOGY

Two questionnaires were developed in collaboration with the team from JISC and with advice from key figures in the industry, namely Mark Patterson (PLoS), Jan Velterop (BioMed Central), Sally Morris (Association of Learned & Professional Society Publishers - ALPSP) and Desmond Reaney (Institute of Physics Publishing). The first questionnaire was for authors who have already published one or more articles in open access journals; the second was for authors who have not yet done so.

The questionnaires were formatted in our market research software and an HTML version was loaded onto the JISC web server early in January for testing. Once this stage was complete, invitations were sent out by email to authors in each group, explaining the purpose of the survey and asking them to complete the questionnaire online.

3059 invitations were sent to authors who had published in Open Access journals and 5000 to authors from other, traditional journals.

The proportions for each subject area were:

Agriculture & food science	3%
Biomedicine	38%
Chemistry & chemical engineering	6%
Physics & astronomy	7%
Mathematics & statistics	5%
Computer sciences	5%
Engineering	5%
Earth & geographical sciences	4%
Psychology	4%
Social sciences & education	4%
Philosophy & religion	3%
Law & politics	3%
Business & management	3%
Humanities	10%

The high proportion from biomedical sciences is explained by the substantial numbers of Open Access journals in that field. As accurately as possible the two invitation lists matched, except that more invitations were sent out to non-open access authors. We surmised that this would be necessary to achieve roughly the same level of response for this group as for the open access authors, because the response rate is always lower when invitees have little personal interest in the subject of the survey. We assumed that this would be the case for non-open access authors, whereas open access authors

might be expected to have a greater interest in the matter. In the event, this is exactly what transpired (see results section).

The invitations to respond were despatched between 9th and 14th January 2004. The bulk of the responses were received within 3-4 days of the despatch of invitations.

At 6pm on 20 January, when responses had dwindled, we downloaded all the responses received up to that time (154 from open access authors and 157 from non-open access authors). The overall results (i.e. those of the whole populations) are appended to this document and provided in the PDF files accompanying the electronic version of this report. In all tables, figures are the percentage of respondents in that category. Where figures do not exactly add up this is a result of rounding percentage points.

On 20 January, we invited the Public Library of Science (PLoS), BioMed Central, the Association of Learned & Professional Society Publishers (ALPSP) and Open Access News to put a notice of the survey on their websites with links to the questionnaires. By this means we hoped to collect a subsequent set of responses from 'allcomers', that is, individuals who are motivated to complete the questionnaires having learned of their existence during a visit to one of these websites. Because this is an uncontrolled respondent population in the sense that we did not actively invite them and thus have no understanding of the provenance of the responses, we have not mixed their responses with those of the controlled 'experimental population'. Nevertheless if a reasonable number of people respond they will constitute a useful additional pair of databases for JISC's purposes.

4. RESULTS

4.1 Respondent profiles

In the rest of this report authors who have published in Open Access journals are referred to as 'Open Access (or OA) authors/respondents' and those who *have not* published in Open Access journals are referred to as 'non-Open Access (or non-OA) authors/respondents'.

77% of Open Access respondents and 71% of non-Open Access respondents work in a university, 15% and 18% respectively in a non-commercial research institution, 5% (both groups) elsewhere in the public sector and 2% in another kind of organisation. 4% of non-Open Access authors work in the industrial sector. The geographical spread of respondents is shown in Table 1 below. Figures in all tables are percentages of respondents unless stated otherwise.

Country/region	Open Access authors	Non-Open Access authors
Africa	0	1
Australia or New Zealand	3	3
Asia (except China and Japan)	7	3
China	2	2
Japan	2	5
Middle East	0	1
Central or South America	4	2
USA	34	16
Canada	8	1
UK	18	57
European Union (excluding UK)	20	6
Other European countries (excluding UK and EU)	2	2

Table 1: Geographical origin of responses

The spread of respondents by age range is as follows:

Age range (years)	Open Access authors	Non-Open Access authors
18-30	24	27
31-40	48	40
41-50	17	14
51-60	8	12
61+	3	5

Table 2: Age profiles of respondents

The subject areas in which the respondents work are shown in Table 3 below.

Subject area	Open Access authors	Non-Open Access authors
Agriculture & Food Science	1	6
Business & Management	0	3
Chemistry	0	2
Computer Sciences	1	5
Earth & Geographical Sciences	0	1
Engineering & Materials Science	1	3
Humanities	4	3
Law & Politics	0	0
Life Sciences	44	21
Mathematics	1	4
Medical Sciences	42	36
Physics & Astronomy	4	4
Psychology	1	6
Social Sciences & Education	1	4

Table 3: Subject areas of respondents

Finally, in the 'About You' section of the questionnaire the respondents were asked about their behaviour with respect to posting their own research articles electronically, both in preprint and in final, peer-reviewed form. With respect to preprints, the largest proportion (13%) of Open Access respondents had posted an article on their own personal web page, 11% had placed an article in an electronic subject-specific repository, 8% had posted an article on their department's web site and 7% had deposited one in an institutional repository. For non-Open Access authors the figures for these activities are, respectively, 11%, 9%, 3% and 5%.

The figures were raised in the case of depositing a final, peer-reviewed form of articles. In this respect, the figures for OA authors were 24%, 18%, 17% and 8% respectively and those for non-OA authors were 12%, 8%, 9% and 9%. This is discussed again in section 4.8.1.

4.2 Awareness of open access journals

4.2.1 Extent and longevity of awareness of Open Access journals

The next part of the survey explored respondents' awareness of open access journals. Question 7 (Q7) in the Open Access authors' survey asked approximately how many open access journals authors were aware of in their

own field. The largest group of people (38%) were aware of 1-3 journals; 23% knew of 4-7journals and 8% were familiar with 8-10 journals. 29% said they were aware of more than 10 open access journals in their field. We looked at which subject areas these people came from: well over half (63%) were life scientists, 34% were medical scientists and 2% were mathematicians. This reflects the preponderance of biomedical journals in the open access journals list (www.doaj.org) but we think it also reflects the greater awareness of the open access movement in this field, largely due to the marketing activities of BioMedCentral and PLoS and the fact that substantial numbers of institutions are signing up to these services and making their scholars aware of their existence.

Non-OA authors were asked (Q7) whether they are aware of the concept of Open Access journals. 62% said they were and 37% said they were not.

We were keen to know more about respondents' knowledge and understanding of the open access movement. The next few questions in the survey probed this in more detail. Q8 asked respondents how long they had personally been aware of open access publishing. The answers were as follows:

	OA authors	Non-OA authors
Less than one year:	9%	19%
Two years	37%	26%
Three years	34%	9%
More than three years	20%	8%

Again, we looked at this in more detail. Of those OA authors who answered 'more than three years' to this question, there was dominance, unsurprisingly, by life scientists and medical scientists (36% each, of people who gave this answer) but also represented were psychologists (14%), humanities (11%), social scientists (7%), engineers (7%), computer scientists (4%), mathematicians (4%) and physicists (4%).

4.2.2 Open Access publishing initiatives

Q9 asked respondents whether they were aware of any initiatives in their country to promote open access publishing. The intention here was to find out how effectively the open access concept is being promoted and it was explored further in the following question (Q10). In their answer to Q9, Open Access respondents were equally split, with 48% answering yes and 49% answering no, they were not aware of any open access publishing initiatives in their country. Those who answered yes were given an opportunity to add examples of initiatives they knew about. Most of them did this. Their comments are reproduced verbatim below. We have edited the comments only to correct the worst excesses of grammatical and spelling errors.

- PLOS
- public library of science pubmed central
- Biomed central journals which are supported by the major research charities/universities
- BioMed Central
- BioMed Central
- Hughes support
- I am editor of an open access journal
- several universities members of BioMedCentral
- HHMI Wellcome Trust Max-Planck Society
- Pat Brown, open access org
- Utrecht University Library
- UK Universities, Wellcome Trust
- Berlin Ad hoc Symposium: Open Access DFG concept papers
- Biomed Central - NHS subscription
- All UK universities have joined BioMed Central.
- University & NHS subscriptions to Biomed Central
- A joint initiative of the Max Planck Society and Springer Verlag, MPI for Demographic Research publishing
- Participation by many libraries in BioMed central, acknowledgement of value of OA by granting agencies
- National Library of Science
- Pub. Lib. of Sci.
- BioMedCentral PLoS
- Universities support BioMed Central, funding bodies encourage open access publication
- HHMI approves page charges
- Possible legislation at the national level regarding publication of results of government-sponsored research
- Public Library of Science
- Max Planck society supports Open Access
- I think that there is an NIH effort to support this - at least when Varmus was director.
- JISC
- JISC, NHS
- Faculty-initiative at Stanford University
- Biomed central and French CNRS
- JISC
- University/library consortium
- PLoS
- Membership of UK universities in BioMedCentral
- General support from the Research Councils and the Wellcome Trust to enable publication in, eg, BioMed Central
- University/library consortia
- Library initiatives
- Payment of institutional subscription by the CNRS to BMC which allows CNRS scientist to publish in the BMC journals
- Auckland University library would like to join BioMedCentral, but funds not yet available.
- JISC pays publication fee for BiomedCentral papers
- Information went out last week from our head of information at our university
- open access publishing promoted and paid by grant funding bodies (Wellcome Trust, MRC)
- McGill University subscribes to BioMedCentral.
- HHMI, Sabo bill, PLoS, Univ. California Libraries, SPARC, PubMed Central
- UK universities' subscription to BMC
- HHMI

- University library consortia membership of BioMed Central
- ARL

The preponderance of comments that mention BioMed central is expected, given the large proportion of authors from biomedical sciences journals, most of which will be published via that channel. As well as that, though, a number of people mention funding agencies such as the Wellcome Trust in the UK, the Howard Hughes Medical Institute (HHMI) in the USA and the Max Planck organisation in Germany. The Public Library of Science (PLoS) also seems to be doing an effective job of promoting its existence, presumably around the recent launch of its first journal, *PLoS Biology*.

The non-OA authors' responses to Q9 were slightly different. Only 27% said they were aware of initiatives to promote OA publishing in their country and 35% said they were not. The verbatim responses of those who offered them follow below, again edited only for the worst grammar and spelling errors:

- Wellcome Trust support
- Biomed Central
- BMC
- JISC-BiomedCentral contract with UK higher education institutions
- University membership of biomed central
- I think Biomednet supports open access
- JISC
- JISC
- JISC
- Some grant-awarding bodies (Wellcome Trust?) fund fees for publication in open access journals
- Wellcome, JISC
- I am board member of PLoS and advertise the journal personally
- I gather the UK covers publishing costs for PLOS Biology.
- Biomedcentral and Journal of Biology
- I think there are some but I'm not that familiar to know the names of the groups.
- I'm honestly not sure what you mean by Open Access.
- Wellcome Trust
- JISC BiomedCentral
- JISC funding of membership of BioMed Central for UK universities
- Open Access Now BioMed Central
- JISC has bought into one group, there is PubmedCentral
- Library subscription
- BBSRC council deliberations JISC statement BMC initiatives including Journal of Biology
- JISC OAI
- Pub Med Central

Q10 asked whether respondents' own institutions had brought to their attention any open access institutional repository publishing initiatives in the last year. Within the Open Access authors group there were fewer people who answered yes than no – 42% and 55% respectively. Once again, space was provided for those who answered yes to give examples. These are

reproduced verbatim below, again edited only for some spelling and grammar errors.

- J. BIOL. CHEM BIOMED CENTRAL J. CLINICAL INVESTIGATION
- Can't remember the name, but periodically our Office of Research and Sponsored Programs will send out notes about this
- BioMed Central
- I am editor of an open access journal
- McMaster University, Hamilton, Ontario, Canada
- BMC
- BMC PLOS
- BioMedCentral, Public Library of Science
- Biomed Central
- It was me who brought Open Access publishing to the attention of my institution!
- BMC membership
- Biomed Central
- "Demographic Research"
- Not really brought to our attention, so much as needed to reduce library holdings
- PLOS
- Subscription to BioMed Central
- BMC journals My univ. became a member institution
- Max Planck Society institutional repository
- The library now subscribes to Biomed Central, which relieves us from the publishing fee in the journal
- Faculty-initiative at Stanford U. Med School
- Biomed Central
- Public Library of Science BMC journals
- CNRS
- PLoS, BioMed.
- Science Direct
- University of Alberta
- BMC (Institutional member)
- http://www.zim.mpg.de/openaccess-berlin/berlindeclaration.html
- by joining as a member
- see above
- BMC, see above
- BiomedCentral
- see above
- BioMed Central

From the non-OA author group 24% said their institution had brought OA or Institutional Repository initiatives to their attention in the past year. 40% said it had not. A few people offered examples here and they are presented below:

- BMC
- Biomed Central
- BMC
- PLOS, PubMed Central
- Cambridge University has alerted its members to PLoS
- As above
- BiomedCentral
- JISC funding of membership of BioMed Central for UK universities
- BioMed Central

- The JISC funded one.
- PLoS, BMC
- BioMedNet, Journal of Biology
- I have raised the issue at management level and at the Library user group. I have promoted both BMC and PLoS

Once again, BioMed Central and PLoS dominate the answers, but there are also comments that show that individual institutional libraries are promoting other initiatives, too. What may strike readers particularly here is that not many true institutional repositories are mentioned, despite the growing number of them in existence. Part of the explanation for this may be that respondents to this survey were not from the major institutions that have developed such facilities amidst much publicity (e.g. MIT) and partly it may be that promoting institutional repositories effectively – getting over the message to scholars within an institution – may be a difficult task.

4.3 Reasons for publishing in Open Access journals

The results reported in this section (4.3) apply to Open Access authors only. The questionnaire for non-OA authors had slightly different questions and the results for these are reported later (section 4.4)

Q11 presented respondents with a list of putative reasons for publishing work in Open Access journals and asked them to indicate which of these applied in their own case. Respondents were given the choice of scoring any factor as 'very important', 'important', 'not very important' and 'not at all important'.

For the *very important* category, the highest score was for **the principle of free access for all readers** as the reason for publishing in Open Access journals. 71% of respondents said this. A long way behind in second place, with a score of 44% of respondents, came **I perceive OA journals to have faster publication times than other types of journal**. This is interesting because most Open Access journals do not make a major point of claiming to publish especially rapidly. The fact that most are electronic-only may give that impression to authors, though there is no real basis to it. Nevertheless, we know from experience that whenever authors are asked about what makes them choose a particular journal to publish in, rapid publication is very high up the list of factors, usually coming just behind the journal's reputation/impact and it having a wide international readership.

On this latter point, in this present survey, **I perceive the readership to be larger than for a subscription-based journal** does come in third place, with

35% of respondents saying this is a *very important* reason for publishing in an Open Access journal. In fourth place, with 22% of respondents saying it is *very important* is **I think my article will be more frequently cited**. In fifth place (20%) was **I am concerned about the cost to my institution of non-OA journals**, in other words, scholars who have accepted their library's predicament regarding journals budgets.

The data for Q11 reveal more than this and readers will wish to know more about the relative importance of these factors and, indeed, about the factors that are considered of very little importance to authors when publishing in Open Access journals. To present the data in the clearest way, we have constructed Table 4. This shows all the results for the categories in the original Question 11 (*very important*, *important* and so forth) plus two new columns where the scores for *very important* and *important* have been combined together to give an overall measure of importance to authors, and those for *not very important* and *not at all important* have been similarly combined, giving an overall measure of unimportance. This enables the reader to see at a glance what is relatively important and what is relatively unimportant, as well as being able to examine the full results in detail. We also present the factors in rank order for the *very important* category, again aiding the reader to assimilate relative importance at a glance.

Figures are percentages of respondents. On occasions, figures may not add up exactly because of rounding of percentage points.

Reason	*Very important*	*Ranking position*	*Important*	*Very important plus important*	*Not at all important*	*Not very important*	*Not at all important plus not very important*
The principle of free access for all readers	71	1	21	92	1	4	6
I perceive OA journals to have faster publication times than other types of journal	44	2	43	87	1	8	9
I perceive the readership to be larger than for a subscription-based journal	35	3	36	71	4	22	27
I think my article will be more frequently cited	22	4	42	64	7	23	30
I am concerned about the cost to my institution of non-OA journals	20	5	36	56	15	25	39
The OA journal(s) I have published in have a high impact in my field	13	6	33	46	12	35	47
The OA journal(s) I have published in are prestigious in my field	11	7	38	49	9	34	43
My decision to publish in an OA journal was influenced by co-publishing colleagues	11	8=	23	34	42	18	60
I object to publishing with a commercial publisher	11	8=	17	27	29	39	68
I was attracted by the editor/ editorial board	9	10	35	44	21	31	52
The OA journal(s) I have published in are published from my own institution	1	11	5	6	64	21	85
My decision to publish in an OA journal was influenced by my grant-awarding body	0	12=	4	4	69	20	90
My decision to publish in an OA journal was influenced by my institution	1	12=	4	4	70	20	90

Table 4: Authors' reasons for publishing in Open Access journals

There are a number of points for discussion from the results presented in Table 4.

The most important reasons for publishing in Open Access journals have already been briefly considered above, but it is salutary to note what the *least* important reasons are. Influences from these authors' own institutions and from their grant-awarding bodies are at the bottom of the list in importance. Also low is the fact that an Open Access journal may be published by an author's own institution, despite the fact that many OA journals are indeed published by university departments or research groups. And, notwithstanding the case that the principle of free access is the most important reason for the majority of respondents publishing in Open Access journals, *objection to publishing with a commercial publisher* does not feature very high in importance with most authors.

It is also interesting that the two factors concerned with a journal's quality (*high impact; prestigious*) are only middle-ranking in importance here, below those OA-specific factors such as the belief that authors' *articles will be more frequently-cited* and concern over the *cost of traditional journals to authors' institutions*. Normally, the quality of a journal – and authors almost always define this in terms of impact factor – is very high on authors' lists of what is important when they are deciding where to publish their work. The issue of impact factor looms large with respect to Open Access publishing, though, and is discussed at length later in this report.

Finally in this section, Q12 asked respondents whether they would have published in the same journal if it had not been Open Access. This was included to test the premise that people are choosing Open Access journals on a point of principle about Open Access rather than for some other quality of the journal concerned. 20% of respondents said they would still have published in that journal even if it had not been Open Access, a figure that tallies fairly well with the result for Q11 where 71% said they had published in an OA journal on principle. 46% said they would *not* have published in the journal if it had not been Open Access and 31% said they didn't know. This result is a 'good' one for Open Access – it is a real measure of authors' commitment to the concept and the result has substantiated the notion that this group of authors do largely share an ideal about it.

4.4 Reasons for not publishing in Open Access journals

Q11 in the non-OA authors' survey presented a list of possible reasons for authors *not* publishing in Open Access journals and asked them to indicate which applied to themselves. Once again we have presented the data in

tabular form with additional columns to make interpretation of the results easier (Table 5). The most common reason for not publishing in OA journals is that authors *are not familiar enough with OA journals in their field to feel confident about submitting work*. In second place came both of the factors concerned with journal 'quality' – *I perceive the OA journals in my field to have low prestige* and *I perceive the OA journals in my field to have low impact*. It is interesting to note that the factor that got the lowest score for importance was *I perceive the OA journals in my field to have slower publication times than traditional journals*.

Reason	*Very important*	*Ranking position*	*Important*	*Very important plus important*	*Not at all important*	*Not very important*	*Not at all important plus not very important*
I am not familiar enough with OA journals in my field to feel confident about submitting work	35	1	35	70	9	12	21
I perceive the OA journals in my field to have low impact	31	2	38	69	5	13	18
I perceive the OA journals in my field to have low prestige	29	3	40	69	6	13	19
I perceive the readership to be smaller than for a subscription-based journal	28	4	36	64	9	17	26
I could not identify any OA journals to publish in	25	5	31	56	9	20	29
I think articles published in OA journals may be less frequently cited	20	6=	27	59	8	16	24
I cannot find funds to pay the publication fee for OA journals	20	6=	22	43	20	22	42
I object in principle to paying a publication fee to publish in OA journals	19	8	26	45	18	30	48
I am concerned about the archiving of work published in OA journals	15	9	27	42	17	22	39
I perceive the OA journals in my field to have poor peer review procedures in place	9	10	29	37	14	25	39
My decision was influenced by my co-publishing colleagues	8	11	18	26	27	22	49
I always publish my work in the same journals and I am satisfied with this way of working	6	12=	35	41	22	27	49
My decision was influenced by my institution	6	12=	10	16	40	24	64
I was not attracted by the editor/editorial board	5	14=	15	20	22	31	53
My decision was influenced by my grant-awarding body	5	14=	12	18	35	23	58
I perceive the OA journals in my field to have slower publication times than traditional journals	1	16	12	14	27	37	64

Table 5: Authors' reasons for not publishing in Open Access journals

Non-OA authors appear to have strongly opposing opinions to OA authors with respect to the size of the readership and the citation rates for Open Access journals. Whereas OA authors rated these issues as being highly positive reasons for publishing in OA journals, non-OA authors perceive readership- levels and citation levels to be smaller than for traditional journals. Conversely, where OA authors rate the prestige and impact of the OA journals they are familiar with to be high, non-OA authors perceive them to be lower than for traditional journals.

The issue of publication fees as a reason not to publish in OA journals is only of middling importance to non-OA authors and it is interesting to see the issue of habit – that is, routinely publishing in the same set of journals – does not figure strongly.

Q12 in the non-OA authors' survey asked whether they would publish in an OA journal if they could identify one that overcame the reasons they had previously given for Q11 for not publishing in Open Access journals. A large majority (71%) said they would do so: only 2% said they would not and 21% are undecided.

4.5 Authors' experience of publishing in Open Access journals

4.5.1 Authors' patterns of publishing in Open Access journals

Q13 asked how many articles respondents had published in Open Access journals. Most (53%) had published just one; 33% had published 2-3; 8% had published 4-5; 1% had published 6-7; and 2% had published 8 or more.

Some of these people have also been publishing in Open Access journals for some time (Q14). 6% of respondents had published in Open Access journals for *more than four years*. Somewhat more (16%) had published this way for *3-4 years* and larger numbers (38% and 41%) have published in Open Access journals for *1-2 years*, and in the *last year* only, respectively. This result is probably much as expected by most people, since it is clear that Open Access journals are rapidly increasing in number and the ethos of publishing work in them appears to be gathering momentum.

4.5.2 Identification of Open Access journals

We were interested in how difficult authors find the identification of Open Access journals in which to publish. The answer is, apparently, not very (Q15), provided they are aware of open access journals in the first place (non-OA authors had already said that the main reason they had not published in OA journals is that they were not familiar with them). 48% of respondents to this survey claimed it was *very easy* to identify a suitable Open Access

journal in which to publish. A further 36% said it was *easy*. Only 14% said it was *not very easy* and just 1% found it *not at all easy*.

But just how *do* authors find OA journals? Q16 probed this and the greatest number of respondents (47%) said it was on *recommendation from a colleague*. 12% used the Lund University Library's *Directory of Open Access Journals*, while 6% had *consulted a librarian for a recommendation*. 43% of respondents offered their own comments in the space provided in this question and these follow verbatim, edited only for the worst errors of spelling and grammar, in the list below:

- Web search and citation of other papers published in the journal
- Biomed Central, PubMed Central
- internet
- word of mouth
- direct invitation
- Journal's Web Page indicating it is an OA journal.
- knew about the journal through citations in articles and books
- Google
- Internet search - was looking for a site to publish a protocol paper and came acrossBbiomed Central by accident
- http://www.biomedcentral.com/browse/journals
- Just look at the journal titles and other papers published in them
- I had read other paper in the OA journal.
- my own knowledge base
- I collaborate with BioMedCentral
- search the web
- Pub Med
- Scientific press
- Biomed central, pubmed searches
- Internet search
- Direct search of the relevant OA websites
- Through Mathematical Reviews, Zentralblatt fur Mathematik Also there was list maintained at the ams.org and emis.de
- Looking at individual journals
- Searching the internet.
- PubMed
- Many sources.
- Advertising by BioMed Central
- Web searches
- At this stage, it's more word of mouth and rumor, rather than recommendations
- I am generally aware of the field, read open access related news items
- I know the BMC journals, and PLOS from discussions in various journals.
- advertisement in journals
- self help!
- Access to information within NCBI (PubMed)
- News stories in Science or Nature. Also internet releases and Web Sites for Bio Med Central journals.
- email and internet
- internet, news letters, journal articles
- Biomedcentral initiative

- The journal (Breast Cancer Research) contacted me by email and asked for submissions
- biomed central
- Biomed Central did a lot of advertising.
- Pub Med searches
- I don't choose journals on this criterion. I choose journals based on their appropriateness for the manuscript.
- Online search of Open Access journals
- prestige on the field and impact factor were the bases for selection
- Finding out after the event
- advertising
- PubMed Central
- BioMedCentral
- My awareness of the literature
- Personal knowledge
- Internet search
- Reading articles from different OA journals and deciding
- information from journal as referee to a manuscript
- Recommendation from colleague and browsing the journals for similar content.
- Personal research
- advertisements
- Information from the web
- E-mail information.
- BMC website, more recently PLOS
- Online search (eg, via Google) via PubMed Central Recommendation from Publishers
- Citations in MEDLINE

A brief assessment of this list indicates that the most common method of identification of OA journals was as a result of advertising and publicity by BioMed Central (and more recently PLoS). Personal awareness of the OA concept and its progress also counts as a common method, as does individual browsing on the Web or through PubMed entries and locating Open Access journals serendipitously. A couple of the respondents published in OA journals by invitation and a further few chose them because of their prestige or appropriateness for the article in hand. Some people heard of OA journals through word of mouth (see result for main question, above) and, finally, one person found out s/he had published in an Open Access journal after the event!

4.5.3 Payment of publication fees

The issue of paying a fee to publish in Open Access journals was one that needed to be explored in some detail and Q17 does this. Respondents were asked to say who had paid the fee when they last published in an open Access journal. The largest proportion of people (36%) said that *no fee was required*. Presumably most of these, given the preponderance of respondents who are biomedical scientists, are people who have published in a BioMed Central journal and have published from an institution which is a member of BMC. Some may have published in Open Access journals that do not charge a publication fee. 19% said that *the fee was waived by the publisher*, so that in

this survey sample, altogether more than half (55%) of authors have published in an Open Access journal without paying to do so.

For those that did pay, the fee was found from various sources. 25% of the respondents paid the fee from their *research grant*, 8% from departmental *funds* and 9% from *other institutional funds*. 4% paid the fee *themselves*. 1% said that the fee was paid *from other sources* altogether. A few respondents offered free comments in the space provided in this question, as follows:

- No-fee promotion from a start-up
- Fee was waived since institution has joined BioMed Central
- My institution is member of an Open Access initiative with BioMedCen
- Our library is a member of BMC
- I do not know details - submission arranged by collaborators
- My institution has a paid subscription to the BioMed central

It would seem, then, that for this group of authors, the publication fee has not been a major issue, certainly not hampering their use of Open Access journals. Indeed, in the majority of cases no fee was paid at all – at least none that was visible to the author (though in many cases BMC membership will have been paid by their institution).

4.5.4 Feedback from publishing in Open Access journals

Q18 dealt with the feedback that authors received from Open Access articles. It is a central tenet of the Open Access movement that articles made freely available to all over the Web will in the end be cited more frequently than articles in controlled-circulation journals. Empirical evidence to support this notion comes from Lawrence (see section 3.3).

There was little support for this from the results of the present survey. 42% of respondents said that the feedback they had received from readers had been *about the same as expected from a traditional journal*, 15% agreed it had been *more than expected from a traditional* journal. Only 7% said it was less.

With respect to feedback from referees, 77% said the feedback was *about the same as expected from a traditional journal*, 13% said it was *more than expected from a traditional journal* and 7% said it was less. From these results, then, it seems that Open Access journals are operating much as traditional journals do. Over time, quantitative data collected from the citation databases will provide reliable statistical evidence on this matter.

4.5.5 Likelihood of publishing in Open Access journals in the future

Q19 asked respondents whether, given their experience in publishing in Open Access journals, they would be more or less likely to choose one when they

next submit an article for publication. The result was a rather substantial vote for Open Access: 71% said they would be *more likely* to choose to publish in an Open Access vehicle again. Only 6% said they would be *less likely* and 23% *don't know*.

4.5.6 Concerns about publishing in Open Access journals

Despite this level of satisfaction with open Access journals, we needed to know whether these authors have any major concerns about publishing in this way. Discussions about Open Access publishing always raise the issues of impact factor scores (most OA journals do not have an impact factor), career implications of publishing in such journals, archiving worries and concerns about the effect of Open Access on learned societies. These issues were placed before the respondents in Q20 and they were asked to say how important to them each factor was. The results are presented in Tables 6 and 7. Figures are percentages of respondents and again we have created a column for the combined scores for *very important* and *important* and for *not very important* and *not at all important*, to give the reader a quick means of assessing overall importance or overall unimportance of each factor.

The first thing to say is that small numbers of authors gauged any of these factors as *very important* and when the scores for *very important* and *important* were combined, none of them merited more than half the respondents' consideration. The score for the issue of scholarly societies' viability was particularly low for this survey, though it does arise as a greater issue of concern amongst non-OA authors (see later in this report). The non-OA author set of results show only fairly small variances to the OA authors, with the exception of their considerably greater concern that publishing their work in OA journals may limit the potential impact of their work. A number of respondents provided additional comments and these are reproduced verbatim below:

- These concerns are mainly about the impact factor of the OA journals, but I am confident that the journals will keep active and that the free access will give them high potential impact.
- NEED TO BUILD IMPACT FACTOR SO THAT ACADEMIC PROGRAMS ARE CONVINCED.
- At my faculty what counts are exclusively publications listed in www.isinet.com
- The time it takes to review my manuscript. For example, just to try it out, I sent one to Biomed Central and it took more than 8 weeks to get a decision (although it was positive) . By comparison, decisions about my manuscripts from JBC have taken from 1 day to 5 weeks.
- I'm naturally worried about the permanence/impact of OA electronic journals... but I think it's worth taking a risk as the current commercial journals are swamped with articles. I'm hoping that the acceptance of papers will be more to do with academic merit in OA journals, and less to do with what is fashionable
- (regarding the last point) BioMed Central's journals are mirrored in PubMed Central and other repositories around the globe, so there is no reason to doubt the permanence of my published work.
- Current funds for research in most countries (including Brazil) are being cut due to pressures to reduce the government deficit. In the other hand, the number of journal is growing. How these journals will survive with the reduction of the scientific activity?

- I think these concerns likely fictional as well, most academic libraries are creating e-archives
- Since OA journals are mirrored worldwide, there is no question of permanence of the paper! As long as the papers are peer reviewed, OA journals are better than printed/commercial Journals.
- Talking with colleagues and professors, they still look at the rating of a journal (e. g. impact factors). Thus open access publishing will not affect career/grants etc per se, but how they are cited.
- OA journals need higher impact factors to attract authors, but this is a distortion caused by the RAE in the UK.
- The effect on promotion/grants/career is completely dependent on the perceived impact of the journal, regardless of open/closed access.
- I am already a Full Professor, so it is not a big issue for me with regard to promotion.
- Some OA journals do not have impact factors scores yet. I am waiting for these scores to publish again in an OA journal.
- It is important for journals such as BMC Biochemistry, and BMC Cancer, etc to expand their publicity campaigns to solicit a large number of excellent papers. It is very important to obtain impact factors from the ISI that are comparable to other very good journals such as Mol. Cell Biol., J Biol. Chem.
- I have stopped submitting to Breast Cancer Research because they ceased to publish a hard copy and I am concerned that the permanence of the work would be prejudiced.
- The biggest drawback just now is the chance that the work may not be permanent and that graduate students and post-docs cannot afford to have there papers published in non-prestige factor journals.
- A definition of an "open access" journal would have helped with filling out this questionnaire. How about a journal that used to be closed but has now opened all its back content and opens its current issues after a delay of ~6 months?
- Once again, agreement with the statement rather than importance rating would make more sense here. Don't you hate trying to interview epidemiologists?
- Prestige of journal is very important to career, the one I published in happens to have a strong reputation by now -- I probably would not have considered publishing in it if it wasn't well known.
- The wording of this question assumes that publishing in an OA journal is a negative. I don't believe that is necessarily the case.
- Damn the career, I'm 65 years old. But I do want publications to be freely available permanently, accessible to all, and searchable on the Internet.
- Urgent need for ISI impact factors and citation tracking for biomedical open access journals, as well as full MEDLINE indexing (not just PubMed)

Reason	*Very important*	*Important*	*Very important plus important*	*Not at all important*	*Not very important*	*Not at all important plus not very important*
Publishing my work in OA journals may adversely affect my chances of appointment/promotion	9	31	40	20	36	56
Publishing my work in OA journals may adversely affect my chances of winning research grants	12	35	47	18	31	49
Publishing my work in OA journals may adversely affect my career	6	28	34	23	39	62
Publishing my work in OA journals may adversely affect the careers of my co-authors	13	27	40	18	37	55
Publishing my work in OA journals may adversely affect the potential impact of my published work	13	29	42	21	33	54
Publishing my work in OA journals may adversely affect the viability of scholarly societies	1	13	15	40	39	78
I am not confident of the permanence of my published work	8	21	29	32	32	64

Table 6: Importance to OA authors of various concerns about Open Access journals

Reason	*Very important*	*Important*	*Very important plus important*	*Not at all important*	*Not very important*	*Not at all important plus not very important*
Publishing my work in OA journals may adversely affect my chances of appointment/promotion	19	23	42	25	22	57
Publishing my work in OA journals may adversely affect my chances of winning research grants	29	27	55	14	20	34
Publishing my work in OA journals may adversely affect my career	20	21	41	20	27	47
Publishing my work in OA journals may adversely affect the careers of my co-authors	22	27	48	13	27	40
Publishing my work in OA journals may adversely affect the potential impact of my published work	40	34	74	8	12	20
Publishing my work in OA journals may adversely affect the viability of scholarly societies	13	22	35	21	31	52
I am not confident of the permanence of my published work	12	31	43	19	23	42

Table 7: Importance to non-OA authors of various concerns about Open Access journals

4.5.7 Opinions on the number of Open Access journals available

Respondents were asked in Q21 to what extent they agreed with a series of statements about the numbers of OA journals available. Table 8 below shows their responses, again with added columns for combined scores giving a general measure of agreement and disagreement.

Statement	Strongly agree	Agree	Strongly agree plus agree	Strongly disagree	Disagree	Strongly disagree plus Disagree	Don't know
There are too many OA journals in my field	1	4	6	28	49	77	14
There are about the right number of OA journals in my field	1	24	25	15	34	50	20
I would welcome more OA journals in my field	29	43	72	4	12	15	11

Table 8: OA authors' opinions on the number of OA journals in their field

Clearly, there is an overwhelming demand for having more Open Access journals from this group of OA authors.

4.6 The economics of publishing in Open Access journals

4.6.1 Cost-effectiveness of the Open Access model for the academic community

Both groups of authors were asked to respond to the same series of questions about the economic aspects of Open Access publishing.

The first of these questions (Q22 in the OA survey and Q16 in the non-OA survey) asked respondents to say how much they agreed with the contention that the Open Access publishing model will be more cost-effective to the academic research community in the long run than the current subscription-based model.

44% of OA authors and 22% of non-OA authors said they *strongly agree* with this: 34% of OA authors and 30% of non-OA authors said they *agree*. In total, then, 78% of OA authors and 52% of non-OA authors agree in some measure with this contention.

5% of OA authors and 9% of non-OA authors *disagree*: 1% of OA authors and 4% of non-OA authors *strongly disagree.* In total, then 6% of OA authors and 13% of non-OA authors disagree in some measure with the contention. 15% of OA authors and 29% of non-OA authors *don't know* and 1% in each group *don't care*.

This result is very clear-cut: the majority of both types of authors in this survey do agree that Open Access will be a more cost-effective publishing model as far as the academic community is concerned.

The next question (Q23 in the OA survey, Q17 in the non-OA survey) asked why they thought this would be the case. 66% of OA authors and 35% of non-OA authors said it would be because *publishing costs will reduce*. 35% of OA authors and 19% of non-OA authors said it would be because *publishers' profits will reduce*. Respondents from each group offered additional comments and they are reproduced verbatim below:

Open Access authors:

- BioMed Central currently has a waiver to UK academic institutions so I don't pay to get my papers published in BioMed Central.
- Easier access to the developing countries.
- Library costs reduce
- Since there are no real limits to space, ultimately people may publish better, more complete papers, and this could lead to less duplication
- Paper is expensive. 2. Color figures are free. 3. It takes away the power of the publisher
- Actually I think it is the online-only aspect that will have a bigger impact on costs.
- If we go to a pay-per-view model, the Library will only pay for the articles that are read.
- Journal subscription fees will vanish.
- Journal subscriptions are extremely expensive, and are not decreased by electronic publishing, which is surprising since many costs of publishing are due to printing
- Access will be more focused on when and where needed. A model needs to be developed for paying the costs
- Will increase the number of researchers specially from developing countries. Therefore more papers will be published

Non-Open Access authors

- Will reduce the costs to maintain a library
- Information will be more accessible to researchers in developing countries.
- The cost to libraries in terms of journal subscriptions will be reduced, as each article would only be paid for once.
- It seems to be a better system for access, therefore costs for trying to acquire papers will be reduced.
- Although publishing cost are reduced by online publication. The model is cheaper because as a researcher I pay less in total for journal articles
- It is not a question of publishing costs, access will be cheaper for the whole community even if institutions subsidise the publishing costs
- Costs will shift from institutions (in the form of library periodical subscriptions) to individuals who wish to be published.
- Several publishers are ripping off the academic community with outrageous prices.
- The work will reach all potential readers
- People will be able to print out the article they want and it will not be necessary to subscribe to the whole journal
- At the moment the state pays for the research through grant funding and then has to buy back the results through library subscriptions

4.6.2 Effect of the Open Access publishing model on the scholarly publishing process

The next question (Q24 in the OA survey, Q18 in the non-OA survey) probed more deeply into authors' opinions on the economics of publishing. It asked them to comment on how they think possible price-based competition in Open Access publishing – publishers competing for articles on the basis of price as well as journal brands and quality of service – may affect the publishing process.

32% of OA respondents – the largest group – answered *don't know* to this. The next largest group was comprised of people who said publishing would be affected *in a positive* way (26%). 15% said it would be affected *in a negative way* and 23% said it would be affected in *neither positive nor negative* ways.

For the non-OA authors there was a slightly different set of figures. The largest group here (35%) said publishing would be affected *in a negative way*, while 17% said it would be affected *in a positive way*. Only 12% said *neither positive nor negative* and 33% answered *don't know*.

The results here suggest that authors are undecided on this issue. It may be that it is too early for them to weigh up the evidence or it may be that this is something they have not thought about until now and are unprepared to make a judgment. Either way, this is an issue that remains unresolved in their minds and which may be one worth following up over time in order to track opinions on it.

A number of respondents offered additional comments to this question, too, and they are reproduced verbatim below:

Open Access authors:

- Right now some subscription journals have also different prices for publication, and this have not affected strongly the quality of the peer review process
- If you create a Journal, people will publish in it whether it free or subscription-based. There will always be that group of Scientists who would want more exposure of their work and would be willing to pay
- I found that the rejection rate/quality standards are about the same in OA journals. There is higher opportunity for longer articles/"exotic" articles to also get published in OA (compared to traditional)
- We will see. These kind of side effects are already present with traditional journals
- Publishing is "business", but publishers make good advantage of journals that are run by a scientific society.
- Pricing also impacts a journal's economic viability. If I publish in a journal that subsequently fails, I worry about the continued access of that work. In essence, I become the sole remaining person responsible for preserving that work
- Do not understand the question
- I will try to publish in the best rated journal independently of the publishing price

- There have always been and will always be bottom feeders.
- Could go either way- see note above
- The main problem at present with OA is the publication costs. Only laboratories with good funding can afford it. This makes a selection by payment and not by quality. Waiver of fees can only be a minimal
- This is a stupid model, as any reasonable scientist would then seek to publish in low-priced journals read by many.

Non-Open Access authors:

- Competition among OA journals for author submissions would prevent the current monopoly that publishers hold over scientific information, which enables them to charge excessive fees for journal subscriptions
- Price is already a consideration if funds are not available to pay for page charges as it is, therefore it wouldn't make any fundamental difference.
- Work should be published on the basis of quality of science. Not on who can afford to publish in the most prestigious journal.
- It will always be dependent on the "impact factor"
- Prestige journals (oft cited) will be able to maintain a high price. To attract articles and maintain turnover, less prestige journals may cut costs and standards.
- Ideally academics and librarians would be in charge, no need for professional publishers
- I think only time will tell.
- It would concern me that authors would choose to publish based on lowest price rather than reputation of the journal
- I don't really know what you are talking about here, as I don't know the pricing structure. Perhaps I don't fully grasp the OA concept.
- Can't see that OA itself will affect quality, other than by increasing the "sink-size" for papers, which may then lead to a drop off in quality. There is already competition in "standard" journals.
- I think this is too early to say. Nature and Science would have dearly liked to have published some of the JoB and PLoS papers. It will depend on the survival rates of existing
- As time goes on those OA journals that obtain high impact factors may charge ever higher prices to publish and that may discriminate against smaller labs.

Respondents in the two groups showed differing levels of concern about the suggestion that Open Access publishing might disrupt the established system of scholarly publishing (Q25 in the OA survey, Q19 in the non-OA survey). 38% of OA authors were *not at all concerned* about this putative effect and 41% were *not very concerned* giving a total of 79% who do not feel worried about the *status quo* being disrupted. 12% are *concerned* and 2% are *very concerned*. 7% *don't know*.

In contrast, 8% of non-OA authors were *very concerned* and 21% were *concerned* about this. Fewer of this author group, compared to the Open Access authors, are not concerned: 35% said they were *not very concerned* and 20% said they were *not at all concerned*. 14% *don't know*. People who have not published in Open Access journals have a higher level of concern about the disruption of the *status quo* with respect to scholarly publishing.

Individuals from both groups offered additional comments here and they are reproduced verbatim below:

Open Access authors:

- I guess the publishers will move on and develop also OA journals, together with their current subscription ones, so their work will not be greatly disrupted.
- I feel the established system of scholarly publishing needs to be shaken up!
- May devastate poor countries research production and publication
- I think that it is an inevitable force that is naturally destabilizing
- My primary concern is the permanence of the work, but I think this can be handled.
- Cutting trees for producing papers should come down. One should move towards electronic media for that. Also OA publishing will improve the quality of research and also we can avoid duplicating the work of others
- Traditional publishers will have to change.
- Instant easy access to data can only help
- Provided it is peer reviewed the quality should remain. However the charges may inhibit some good articles being published.
- I think it is the way of the future. Since peer review for such publications works well, where is the problem?
- Many of the established journals are likely to lose quality articles due to OAJ
- Somewhat concerned. But I also see the potential for improvements. No one can seriously claim to be against open access to scientific results. One needs to balance that against viable business models.
- I would not be disappointed to see profit oriented groups like Elsevier lose substantial profits. Cost effective society publications like J Biol Chem will probably become open access,
- Commercial publishers have captured the market and prices have dramatically risen. This is forcing libraries to cancel subscriptions
- This is the free market. We don't need the anachronistic, hide-bound publishing houses of yesteryear. If there are losers in this change - so be it.
- Very much welcome such a disruption
- Most of my colleagues publish in the most appropriate place rather than for other reasons.
- Not paid to worry about this
- The current system of publishing is non-sensical in terms of advancing science by building on prior information. Old information is difficult to retrieve, difficult to cross reference and often expensive.
- At the beginning, younger editors will remove the old ones and things will run better. At the end, as all are humans, the same vicious feed back of favoring friends and strongest scientific groups in the business win
- Just the change in itself
- Things have to change with the times -- the "established" system isn't perfect and change might be a good thing.
- The system will adapt to the new opportunity
- Professional editors add value to authors and to readers. Open Access should not be allowed to affect the dedication and professionalism that many of these individuals bring to the table.
- I am concerned that, as the number of such journals proliferates due to economic incentives, the quality of reviews will diminish and commercial interests will come to dominate science as it has medicine.
- Publishing has changed for many reasons. OA is just one of them.
- The actions towards OA are orchestrated behind the screens by a number of political moves by people in important positions in the scientific community.
- Open access publishing is an important modern phenomenon that will certainly continue to grow. I very much regret any inconvenience, loss of jobs, loss of any kind that this modernization causes.

- There is a lot of bias in the present system, any "negative" effects will simply be a different kind of bias
- In addition to publishing, I have also reviewed a number of open access articles. In some ways I hope it does disrupt the status quo.
- The quality has to be high. There's no reason OA will have lower standards, in fact they could have higher standards. It will depend on the journal.
- Not very concerned as I do not feel that the OA system is sufficiently powerful as yet. But it may become more powerful later.
- I think OA adds a new dimension but it will not entirely supplant traditional journals, especially the big, high-impact journals.
- The tactics of greedy and desperate publishers remind me of a failing restaurant that raises its prices to cover costs as patrons become fewer and fewer and finally the restaurant fails.

Most of these comments reveal little regret at the possible passing of the current system for scholarly publishing. One or two mention the value that professional editors add to the process, though in a way that suggests that professional editorial standards must drop in an Open Access system – an unsubstantiated assumption.

Non-Open Access authors:

- Tenure committees are unlikely to give much weight to OA journals, in my opinion.
- The established system is not very effective but has served the academic community well. Any additional ways of disseminating research findings are to be welcomed
- Traditional, peer-reviewed publishing is fair and most importantly is not open to how much you can afford to pay to get your article published. If authors were able to pay more to get their articles published
- I edit a journal, and am concerned for its future.
- Because the present system is far from perfect
- The promotion of OA publishing would force the scientific community to develop better ways of assessing research quality than one based simply on impact factors, it would foster an environment of openness
- If all the major journals in a field decide to go for OA then the standards should remain the same.
- There was a time when publication was to raise debate on an issue of research and present evidence for posterity. Publishers naturally needed to be paid for the work they did, and scholars never have much money.
- Disrupting the established system would be a good thing
- I think the current system has its problems, so changing the system will change the problems. I do not have enough information about the pros and cons of the two systems to comment further.
- If the established journals have a problem, they will be replaced by OA journals.
- Only time will tell.
- The permanence of and ready access to articles after, say, 10 years is essential. What safeguards are there concerning O.A. journals?
- As long as authors are still able to choose the journal to publish in based on academic reputation, quality of peer review etc, I do not think that OA publishing will be detrimental to the distribution of research results
- I would welcome OA as this I think the way to go given the ever rising costs for journals established publishers
- Elsevier etc will survive but what about smaller organisations etc
- Value of scholarly publications could diminish if anyone can do it, basically. It may become difficult to identify quality work and argue for recognition.

- The established system is seriously flawed (subscription prices go up, library funding goes down), so a change may result in a better system, and is unlikely to make a worse system
- The community will adapt quickly to whatever publishing paradigm asserts itself. The 'change-over period' is likely to be short.
- The established system is flawed - OA will be an improvement
- I worry about the quality of peer review and quality of final publications in existing journals and would be even more concerned about the OA review process with its emphasis on speed and perceived impermanence
- I assume that if publishing moves to OA that high quality journals will emerge.
- It will change it, but the one thing academics are used to is change. It should save having to go to the library.
- It may disturb the existing hierarchy of journals in my field. (then I would have to go and check impact factors etc again)
- My concerns revolve around the whole concept of using impact factors & citation indices. We must debunk these crude measures of worth and I worry that OA might encourage more use of them.
- Scholarly publishing models have changed out of all recognition over the last 200 years. Excessive profiteering and the needs of state funded research to be freely accessed by all will mean the system has to change
- I'm sure this could be done but peer review is important and must be maintained.

Not for the first time, the issues of archiving and possible lowering of quality of Open Access journals arise in the comments here. It is interesting that several comments are made about the impact factor metric and its flaws. It is also worth noting that there are a number of comments that show that authors accept change may be possible and that some of the comments offered show support for Open Access.

4.6.3 Publication fees and conditions of publishing

The next issue addressed was that of publication fees for Open Access journals (Q26 in the OA authors survey, Q20 in the non-OA authors survey). The results are presented in Table 9 below. Figures are percentages of respondents.

Publication fee	Authors who would be prepared to pay this level of fee to publish in a journal of their choice	
	Open Access authors	Non-Open Access authors
Nothing	15	26
$500	41	35

$1000	19	12
$1500	10	6
$2500	1	0
$3500	1	1
$4500	0	0
$5000	1	0
More than $5000	0	0
Don't know	12	17

Table 9: What authors would be prepared to pay to publish in open Access journals

The authors who have not published in an Open Access journal show less willingness to pay the suggested sums for publication of an article than those who have already published in Open Access journals. Few authors would be prepared to pay over $1500 per article and most would prefer to pay considerably less than that. The issue of where the money comes from is explored in the next question (see below). Meanwhile, some respondents offered comments about the level of publication fee and these are reproduced verbatim below:

Open Access authors:

- Important research may not be published if researchers cannot afford the OA charges. In addition, researchers may be forced to publish their work in the cheapest OA journals
- We are based in Mexico and the research budgets we have here are quite low, that is why we seek waivers from the publisher, for us, the least the costs, the best.
- It's a barrier to publication. The only barrier should be one of adequate scientific merit
- Publishers should pay authors.
- I'm not required to pay anything in "normal" journals, and I can post my works on my or Faculty's website or any open repository
- Researchers from a developing country need to be treated differently. There money is less of value and they can not afford any of the above
- Coming from developing countries and with no grants the maximum we can pay can be around 100 dollars. We should look at open access models for developing countries
- Should OA became a profitable commercial venture there is no real guaranty that publishers will not change their minds and start charging access fees.
- The acceptable cost would clearly be higher for a higher impact journal, and if all costs were happily covered by the funding body, I wouldn't care too much
- Or less
- Depends on what funding bodies are prepared to pay!
- In my current situation, publishing is considered a private 'pleasure' of mine, so I have to pay from my own pocket. I hope this attitude is going to change.
- I don't think this is an appropriate use of grant money, and I always endeavour to publish in journals with no (or low) page charges. A small fee I could countenance.
- This is entirely dependent upon my budget, which is determined 100% by my granting agencies. The scientific and the lay public have to be aware that nothing is free.
- This is about twice the present page charges for an article in a conventional journal.
- I think the minimal fee is so high for a third world country (U$500,00)
- The costs should be agreed based on sustainability - agreement should be made with those who fund research

- I strongly object to the fact that I have to relinquish copyright of my work to a journal anyway. This is the only area of publication where authors are required to do that
- At present my funders are not yet ready to increase my grants for publishing in OA. In addition, I feel that a publication in OA is still not considered by the community to be as good as in traditional journals
- No source for costs, publication in traditional journals currently carries no direct costs to me.
- Can't afford it Should be paid centrally as in the case of BioMedCentral
- I am not willing to pay anything to have a refereed article published. The model is different for those outside the humanities.
- We do not have grants in our university and I would have to pay for my publication.
- Have never paid publication fees in the past, and rarely have funding levels which would permit me to pay them. An institutional subscription to BioMedCentral results in free publication for authors
- Not unless open access publication becomes the norm and can be underwritten in grant applications. Without such financial support, the typical academic would not have the
- I can publish my own article on the Net in a website that costs $200 per year (or might be free). Why do I need some paper-and-ink publisher to charge me $5000 for maintaining my work?

From these comments – all from authors who have published in Open Access journals – it is clear that many of them (perhaps most) have not been required to pay. We presume that this reflects the fact that most of the authors here are BioMed Central journal authors and probably most of those have benefited from 'free' publication in BMC journals as a result of their institution paying a membership fee. The comments above also disclose a substantial degree of concern about the effect of publication fees on researchers in developing countries who may not be able to afford to pay to have their work published.

Non-Open Access authors:

- I think the current peer-reviewed system is impartial and reliable. It is fairer for those who want to access the work to pay.
- Not all authors have funders, or funders willing to pay these costs. Charging may deter authors from publishing, especially those from developing countries.
- But a max and if it is not the same for all journals, the higher the impact, the lower the fee
- If it is built into grant funding schemes then the cost to the author (on behalf of their funder) should be the real cost of publication whatever that might be. Some form of welfare scheme should also be operated
- The cost of publication should be minimal since there is no paper involved and the authors and reviewers work for no charge. Ideally, the authors and reviewers should be paid
- I have published clinical work in the past and do not have specific grants to cover such expenses - I therefore consider $500 a large sum because it would come from my own pocket or the national health service
- For the reasons given in Q18. When a journal charges, it is usually thought that this is for the fee not the quality of work.
- It benefits mankind
- Authors and institutions should pay a very small fee, much less than 500 dollars. I don't accept that the cost of publication is high, especially since the future is paperless.
- I publish about 16 papers per year, so this could cost a lot. I have refereed over 600 papers for free

- While this figure seems both reasonable and affordable to me, I imagine that opinions will vary widely depending upon levels of funding people are used to. Academics from developing countries may not be able to pay
- It is hard enough getting the funds to do the research, to then have to find significant amounts of money to publish the results would be very difficult.
- These journals need the material more than the authors need this form of publication.
- Less than $500 per paper, surely? If you publish 10 papers a year, 5000 dollars would significantly compete with other resources thus reducing productivity.
- Economic hindrance of the publication of science is unreasonable. Society needs science, society (governments and industry in practice) must pay for the cost of its publication.
- It is extremely difficult to get sufficient funding for publications, particularly if research active.
- Authors should be paid
- There are many established scientists, including me, who have little or no external funding. What is available could be better spent than contributing to publishing costs.
- I think it's a good thing for big institutions to pay, but might make things difficult for some institutions, particularly in developing countries.
- But I am not well informed. Most of the work is done by editors and referees for nothing, so why should the costs be so large?
- Because we don't now. If savings by libraries were transferred to authors then my answer would change.
- It will favour the richer members of the academic community
- Research grants are already minimal and further expenses are not acceptable.
- Discriminates against those fields without big research grants, i.e., most social sciences and humanities. Discriminates against newer researchers and those with more innovative projects. Not fair.
- Many researchers don't have the funds to cover this cost.
- Universities should fund it by dropping the exploitative low quality journals that have little value.
- There should be an institutional rate and a realistic (and affordable) personal rate. The former could be set by a formula related to the number of publications in the previous year.
- Doing my research already causes a drain on my personal finances. I do not have sufficient grant funds to complete basic research activities, and I certainly don't have grant funds for publishing fees.
- Where is some poor new out of work PhD going to find cash to submit a paper on research he has continued to do while searching for work. I did this in my youth.
- Most authors simply do not have the funds to pay more than this to publish a paper. Exorbitant costs will mean that only the wealthy can publish. This would take us back to the days of "gentlemen scientists"
- At least in my field our scholarly work does not generate any money. Fields that are struggling to survive (like Russian literature) do not have those funds.
- Who can afford $500, except with external funding?
- No funds
- It is difficult to see why scientific authors should pay to have their work published - a business model that does not apply to any other sector. We don't get paid to publish as it is
- This is more or less on a par with current real costs of publishing a paper. I predict that better, more substantial papers will be a healthy consequence of the author pays model.
- Publication costs should not exceed cost of "self-publishing" of books
- If we are talking about electronic journals I cannot believe it costs $4500 per article to cover costs. I would be outraged if that was charged.
- Scholars in my position have no funds for that but their own pocket.

There are many comments here about the level of fee and how fees will affect those from developing countries or those who have no research grants or

support money. Conversely, there are some comments that reflect support for the notion of paying to publish.

The issue of where the money comes from to pay publication fees is examined in Q27 (OA survey) and Q21 (non-OA survey). The results are shown in Table 10 below. Figures are percentages of respondents.

Source of publication fees	Authors who think fees should come from each source	
	OA authors	Non-OA authors
Research grant	66	71
Departmental funds	33	33
Library/institutional funds	41	33
Commercial sponsors	13	18
Personal funds	3	4

Table 10: Where authors think Open Access publication fees should come from

The majority of authors think the publication fee should come from their research grant. In fact, in many cases this already happens when page charges are levied by traditional journals (see further discussion later in this report). In many cases, though, grant-awarding bodies specifically will *not* fund publication charges, in which case the money has to be sourced from elsewhere. Often this is from departmental funds and the result above supports this as one potential source of publication fees (33% of authors from each group think this should be the case). Slightly more Open Access authors (41%) think that their library or institution's central budgets should fund Open Access publication. Some authors obviously have access to commercial sponsors and view these as a potential source to tap for publication fees. Hardly any authors are prepared to pay from their own pocket, unsurprisingly.

A few respondents offered additional comments here and these are reproduced verbatim below:

Open Access authors:

- But this does assume that the funding agencies will pay for it!
- JISC
- JISC
- A way has to be found to ensure that researchers from developing countries can also publish
- Matters are difficult in some company setting such as mine
- Libraries are realising substantial savings overall through OA, and On-line publication should be quite cheap
- Sales of the journal.

Non-Open Access authors:

- I don't think publication fees should be charged.

- Not sure
- What is the breakdown of the publication fees? Do the current publishers still get a cut?
- Don't know, don't have any suitable funding stream for this purpose.
- I think the journals need to seek commercial sponsorship to lower the fees. Or find some way of reducing them
- Organisations such as associations and professional bodies.
- I do not think one should have to pay.
- No idea
- As institutes/libraries generally pay for subscription costs to journals currently, I would expect that to continue
- At$2000 per paper my ex-Institute would need to find £100,000 per year for publishing costs.
- If library saves on subscriptions it must be returned to authors to pay for submissions or it won't work
- NOT commercial sponsors. This would create all sorts of conflicts of interest, both real and apparent.
- Multiplying 2000 dollars by the number of papers published annually in my School c 150 gives 300,000 dollars
- The OA journals should be financed directly by governments.
- The answer will vary with the nature of the Institution e.g. BBSRC Institute .v. University. v. Industry.
- Funders want to see their work published so they should pay.

Q29 in the OA survey and Q23 in the non-OA survey carried this line of questioning a stage further and asked whether authors would be prepared to pay a fee to make their articles in traditional journals "open access". Of the Open Access authors, 60% of respondents said yes (19% said *yes, definitely* and 41 said *yes, possibly*), while 39% said no (9% said *no, definitely not* and 30% said *no, probably not*). This answer indicates the level of enthusiasm amongst this group of authors for the principle of open access to their articles.

The non-Open Access authors were equally split on this issue: 48% said yes (6% said *yes,* definitely and 42% said *yes,* possibly) and 48% said no (34% *no, probably* not and 14% *no, definitely* not). The question also provided space for respondents to type in their views if they would not pay for a 'traditional' journal to make their article Open Access. Their comments are reproduced verbatim below:

Open Access authors:

- Limited funds available
- I choose journals which allow me to post preprints on my web page
- Because then they're getting fees from the subscribers and the authors. Doesn't seem like they should
- Because the publisher is already making a profit out of you - and I don't see why you should let them
- Will they still retain the copyrights?
- Should be an obligation for the commercial publishers!!
- Again the problem of funding for developing countries
- But many journal charges are excessive so this would apply to a limited number of journals.

- The publisher makes money with my publication anyway. Why should I pay additional (!) fees for OA?
- The journal should make the paper open access after a suitable time period (e.g. JBC)
- Traditional publishers make huge profits and are propping up an inefficient system that needs to change
- If the funding body paid!
- Commercial journals are already making profit based on our Intellectual Property
- If it were a small fee, maybe. But this is probably not necessary, since I am happy to send a pdf to people
- Only if I would keep the copyright (in the traditional model the copyright is transferred)
- Would depend on how much. Maybe if <$200
- The publisher should bear that cost
- They make too much money already for relatively little effort
- It is an extra expense which should not have to be borne personally by researchers
- Costs should be included in subscription, and therefore spread more widely.
- Because at the moment I do not believe that the advantages from OA are all what is being said.
- My monthly salary is not sufficient for such payments
- After all the hard work in writing an article I do not want to have to pay to be published
- Unlikely to have additional funds for publishing
- I would prefer to publish in a proper open access journal. A mixed journal creates confusion and frustration
- No, I could not afford to do so, but I will try to avoid media that do not make full text available

Non-Open Access authors:

- They make sufficient profit already on the back of my work and charitable funds
- Researchers are responsible to granting agencies to be as careful with grant money as possible.
- Those who cannot get an article usually write asking for a reprint
- Publishers already charge both authors for publishing and readers for accessing articles.
- Provided it was a small amount and approved by the funding bodies
- The "top" Journals currently enjoy too much power and profit.
- The publishers have been exploiting researchers and their institutions for long enough.
- I think the same policy should be followed for all papers published by one journal.
- Publishers should be encouraged to pay this themselves.
- If the fee was affordable.
- No funds available for this purpose.
- I don't believe in subsidising commercial enterprise especially if it drains research grants.
- No money.
- Most people who would want to read my papers would already have access to them.
- Most journals make content free after 6 -12 months.
- I worry about the commercialization of scholarship. Lesser studied subjects cannot fend for themselves
- The traditional access is OK and available broadly enough
- I can just mail them my papers.
- You've paid the publisher once, why pay again?
- Why not use OA publisher?
- Don't want to double the profits of greedy publishers
- Depends on price
- I would rather use a "true" open access publication route.
- Money - most specialists have access to the journals

Several comments are antagonistic to the notion of paying commercial publishers, who are perceived to already make profits, to publish their articles. Note also that the issue of copyright raises its head here. This is discussed further in respect of Q30 below.

Q28 in the OA survey and Q22 in the non-OA survey explored authors' reaction to the situation that a grant-awarding body would require them to publish the results of their research funded by that body with Open Access. Of the Open Access authors, 70% said they would *willingly accept such terms*, 24% would *accept such terms but unwillingly*. Only 5% *would not accept such terms and would look elsewhere for funding*. For the non-Open Access authors, the figures were 53%, 33% and 10% respectively. There is considerably more resistance to this notion, therefore, amongst non-Open Access authors than amongst those who have published that way already.

The issue of copyright is contentious and in a state of flux with respect to scholarly journal publishing. For Open Access authors, the last question in this section asked respondents to say whether the publishing agreement they had with the publisher of their last Open Access article permitted them to post the article online in a variety of forms. 50% said the agreement allowed them to post the article *as a PDF file supplied by the publisher* and 48% said it allowed them to post the article *in final, peer-reviewed and edited form*. 29% said it allowed them to post the article *as a preprint* and 13% said it allowed *none of these*.

For non-Open Access authors, the question asked them the same things about the last article they had published. In this case, 19% said the agreement permitted them to post the article *as a PDF file supplied by the publisher* and 9% said it allowed them to post the article *in final, peer-reviewed and edited form*. 10% said it allowed them to post the article *as a preprint* and 54% said it allowed *none of these*.

These results are best compared in a table (see Table 11) below.

Permitted by publishing agreement	OA authors	Non-OA authors
As a preprint	29	10
In final, peer-reviewed and edited form	48	9
As a PDF supplied by the publisher	50	19
None of these	13	54

Table 11: Permission from publisher of authors' last article to allow authors to post their own article online

The discrepancies between these sets of figures underline the different attitudes between Open Access and traditional publishers with respect to dissemination of research results.

4.7 The publishing process

4.7.1 Importance of journal features

Traditionally, scholarly publishers have performed a set of tasks on behalf of researchers during the process of preparing an article for publication. We knew that many people are under the impression that some of these – notable peer review – may not be carried out in the same way by Open Access journals. Though this is markedly not the true situation, it was still thought advantageous to learn how much authors value the traditional roles that publishers perform and Q31 (Q25 in the non-OA survey) investigated this in some detail.

Authors were asked to say how important they think it is to preserve certain features of scholarly journals. The results for OA authors are presented in Table 12. Figures are percentages of respondents. Once again, for clarity, we have added two new columns that combine the factors measuring importance and those measuring unimportance.

Peer review is the most important thing to authors, with 90% of them saying it is *very important* and 98% saying either this or *important*. In second place is **selection of relevant and quality-controlled content**.
In fact, the authors gave high scores to most of the features listed. The least important in their eyes is **marketing**.

The results for non-OA authors are presented in Table 13.

Reason	*Very important*	*Important*	*Very important plus important*	*Not at all important*	*Not very important*	*Not at all important plus not very important*
Peer review	90	8	98	0	1	1
Selection of relevant and quality-controlled content	51	43	94	0	4	4
Gathering articles together to enable browsing of relevant and quality-controlled content	40	41	81	1	13	15
Content editing and improvement of articles	33	52	85	2	10	12
Checking of citations / adding links	29	48	78	1	18	20
Language or copy editing	28	51	79	2	16	18
Marketing (maximising visibility of journal)	19	43	62	7	29	36

Table 12: Importance to Open Access authors of various features of scholarly journals

Reason	*Very important*	*Important*	*Very important plus important*	*Not at all important*	*Not very important*	*Not at all important plus not very important*
Peer review	80	15	95	0	1	1
Selection of relevant and quality-controlled content	49	37	86	1	5	6
Gathering articles together to enable browsing of relevant and quality-controlled content	42	41	83	2	9	11
Content editing and improvement of articles	35	48	84	0	10	10
Checking of citations / adding links	25	52	78	3	13	16
Language or copy editing	27	48	76	3	15	18
Marketing (maximising visibility of journal)	16	37	52	10	30	40

Table 13: Importance to non-Open Access authors of various features of scholarly journals

4.7.2 Peer review

The next question (Q32 in the OA survey, Q26 in the non-OA survey) probed the issue of peer review in more detail and asked about the importance of various aspects of the process.

Perhaps unsurprisingly, in top place for both groups came *published articles have been peer-reviewed by experts*. The most remarkable thing about the results for this question is that rest of the factors were so far below this in terms of how many respondents thought them important. For example, in second place in the *very important* category was **availability of post-publication public commentary**. Only 14% of OA respondents and 11% of non-OA respondents thought this was *very important*, though combining this with the score for *important* did raise the total to 57% and 52% respectively. Nonetheless, in general, apart from the fact that peer review takes place, none of the other possible facets of the peer review process are considered terribly important by authors. The full results, including columns for combined scores to give general measures of importance and of unimportance, are shown in Tables 14 and 15. Figures are percentages of respondents.

Reason	*Very important*	*Important*	*Very important plus important*	*Not at all important*	*Not very important*	*Not at all important plus not very important*
Published articles have been peer reviewed by experts	88	8	97	0	2	2
Availability of post-publication commentary	14	43	57	9	31	40
The referees' comments are published	13	24	36	14	48	62
There is an option for you to submit comments about someone else's article	12	41	53	9	36	45
The referees are identified	11	20	31	27	39	67
Availability of public commentary on preprints	8	22	30	18	50	67

Table 14: Relative importance to authors of various aspects of the peer review process

Reason	*Very important*	*Important*	*Very important plus important*	*Not at all important*	*Not very important*	*Not at all important plus not very important*
Published articles have been peer reviewed by experts	80	14	95	0	1	1
Availability of post-publication commentary	11	42	52	13	29	42
The referees' comments are published	10	20	31	22	42	64
There is an option for you to submit comments about someone else's article	10	42	52	12	31	43
The referees are identified	9	18	27	29	39	67
Availability of public commentary on preprints	5	18	23	21	48	69

Table 15: Relative importance to authors of various aspects of the peer review process

Q33 asked OA authors about their level of satisfaction with the peer review process in the Open Access journals in which they have published, in particular whether it was of an acceptable standard. 45% pronounced themselves *very satisfied* and 50% *satisfied*. Only 1% were *dissatisfied* and no-one was *very dissatisfied*. These results need no further comments.

The following question (Q34) asked OA respondents to compare the standards of peer review in the Open Access journals in which they had published with those of traditional subscription-based journals. The great majority (76%) said they were *about the same as a traditional subscription-based journal of similar quality*. 13% said they were *better than a traditional subscription-based journal of similar quality* and 6% said they were worse. Four percent of respondents answered *don't know*. Again, these results are very clear-cut and need little additional commentary, save to say that in these authors' experience there is nothing to support the notion that peer review standards somehow slip in Open Access journals.

4.8 Article repositories and archiving

4.8.1 Self-archiving experience to date

The final section of the survey was concerned with archiving of scholarly articles. We wished to understand the behaviour of authors currently with respect to electronic repositories and to explore their views on archiving of articles published in Open Access journals. We had already explored briefly the behaviour of respondents to date with respect to archiving their own articles (see section 4.1). The results are shown in Table 16 below. Figures are percentages of respondents.

Archiving behaviour	Open Access authors		Non-Open Access authors	
	Preprint form	Final peer-reviewed form	Preprint form	Final peer-reviewed form
Posted an article on my personal web page	13	24	11	12
Posted an article on my department's web site	8	17	9	8
Deposited an article in an electronic institutional repository	7	8	3	9
Deposited an article in an electronic subject repository	11	18	5	9

Table 16: Self-archiving behaviour of respondents

These are small percentages of respondents for the most part. It is only a minority who have so far engaged in self archiving their work electronically.

4.8.2 Familiarity with electronic archives

It is possible that the number of people who have archived their work electronically so far is low because most are unaware of the opportunities to do so. Q35 in the OA survey, and Q27 in the non-OA survey, were designed to find out how familiar open Access authors are with the present range of electronic article repositories in existence. It gave respondents a list of types and asked them to say which they were familiar with. Because the terminology may be unfamiliar here we gave the respondents some examples of each type of repository to help them recognise the categories.

Most authors in both groups (71% of the OA authors and 77% of the non-OA authors) were familiar with *none* of them. The type of repository that the greatest number were familiar with was *subject repositories or archives*. Examples of these are arXiv or SPIRES. 15% of OA respondents and 9% of non-OA respondents are familiar with this type of repository. 8% in each group are familiar with institutional repositories, such as D-Space, and 8% are familiar with superarchives such as FirstGov for Science. Finally, 6% of OA authors and 3% of non-OA authors were familiar with networked repositories such as DARE or RLN. The results for this question suggest that to date there is very little awareness in general of repositories archiving scholarly articles even amongst authors who have published in Open Access journals.

4.8.3 Willingness to self-archive

The next question asked authors to say how they would feel if their employer or funding body required them to deposit copies of their published articles in one or more of these repositories.

The vast majority, even of the non-OA author group, said they *would do so willingly*. A small proportion *would do so but unwillingly* and 3% of each group *would not be prepared to do so*. The full results for both groups are shown in Table 17 below. Figures are percentages of respondents.

Attitude	OA authors	Non-OA authors
I would do so willingly	83	69
I would do so, but unwillingly	4	8
I would not be prepared to do so	3	3
Don't know	8	18

Table 17: Willingness of authors to deposit articles in an open repository if required to do so by their funder or employer

4.8.4 Responsibility for archiving of Open Access journal articles

The issue of who should be responsible for the long-term archiving of articles that have been published in Open Access journals was raised in Q37 (Q29 in the non-OA survey). We knew this was an issue for concern and we wished to understand what authors currently feel about it.

The greatest score was for *publishers of Open Access journals* to be responsible for this, a result that will not bring any element of surprise. However, there is clearly some concern here because 48% of OA respondents (and 33% of non-OA respondents) also thought that national libraries should archive these articles and 30% (22%) thought that library consortia should play a role. In addition, small percentages of people thought that scholarly institutions, scholarly societies and national governments should also be involved in this. The full results are presented in Table 18 below. Figures are percentages of respondents.

Archiving body	OA authors	Non-OA authors
Publishers of Open Access journals	80	69
National libraries	48	33
Library consortia	30	22
Scholarly institutions	18	12
Scholarly societies	15	15
National governments	14	6
Authors themselves	12	9

Table 18: Who authors think should archive articles published in Open Access journals

This is an issue that is contentious at the moment, borne out by the results here and from comments from authors reported at other places in this document. It is perhaps one that should be monitored over time. Authors clearly consider it an issue for discussion and it is something that is often discussed by concerned librarians too.

4.8.5 Confidence in the archiving of Open Access journals

Whoever does the archiving, the last question in the survey explored this more deeply by asking authors how confident they were that articles published in Open Access journals would be archived (by someone) so that they are available to future generations of scholars.

Of the Open Access authors, 32% are *very confident and* 49% are *confident* that this will be the case. Only 13% are *not very confident* and 2% are *not at all confident*. Overall, then, scholars in this group have considerable confidence that their work will be archived safely for future use. The situation is not quite so clear-cut when it comes to the non-Open Access authors. In this case fewer of them are confident about this issue and more are concerned. The full results are presented in Table 19 below. Figures are percentages of respondents.

Attitude	OA authors	Non-OA authors
Very confident	32	14
Confident	49	40
Not very confident	13	25
Not at all confident	2	10

Table 19: Authors' confidence that articles published in Open Access journals will be archived so that they are available for future generations of scholars

This question also provided space for respondents to write their own comments about the issue. They follow verbatim here:

OA authors:

- I think that not all the journals should be archived for long periods of time
- I don't know much about it, so that's pretty much just optimism and faith...
- Don't know.
- I never thought about this before. It is an important issue.

Non-OA authors:

- Do not know
- No idea
- I have no idea
- I hadn't realised this was an issue, but I don't see why it should be a problem
- Don't know
- Depends how it is arranged.
- This would have to be decided without any doubt before such a system could be accepted.
- No idea.
- I am afraid there is an unjustified faith in the permanence of magnetic media

4.9 Interviews with journal authors

We also carried out a series of interviews with journal authors to probe in more detail issues that arose in the answers to the questionnaires with regard to open access publishing. These are things that respondents felt moved to offer comments about in response to 'open' questions in the survey.

From the comments offered by Open Access authors we identified a number of such issues which we wished to follow up in interviews as follows:

- The cost of publishing in open access journals
- The quality of open access journals and their lack of impact factor scores
- Archiving of published work
- The impact of open access publishing on learned societies

The authors selected for interview in this group were from the following institutions:

Duke University, USA
Case Western University, USA
University of California at San Francisco, USA
University of New South Wales, Sydney, Australia
University of Rennes, France
Southampton University, UK

From the comments offered by non-Open Access authors we also identified a number of such issues which we wished to follow up in interviews. Most of these were the same as for the Open Access authors but an additional one arose – the attitude of funding bodies towards Open Access publishing

The authors selected for interview in this group were from the following institutions:

University of Wollongong, Australia
University of Leicester, UK
Paterson Institute of Cancer Research, University of Manchester, UK
London School of Hygiene & Tropical Medicine

The points made by interviewees are presented under the headings below. We have amalgamated the comments from the different interviewees.

4.9.1 Open Access publication fees

One non-Open Access author commented that although authors need to find the money to pay for publication in Open Access journals (often) it is not uncommon to pay page charges to publish in traditional journals. A page charge of US$400 is common for a mainstream journal, for which the library also pays after publication. He added that if there were some mechanism that might evolve to formally switch the money from library budgets to authors for publication fees then this would defray the cost of Open Access publishing for the latter. He then reflected that the page charges he currently pays come from his research grant and he thought that Open Access fees could probably come from the same source.

4.9.2 The quality of open access journals and their lack of impact factor scores

Three of the interviewees admitted that they published in an Open Access journal because they would not have had much chance of getting the article they were publishing accepted by the traditional journal of their choice. Two of them said this was not because the science was of low quality but because it was not very fashionable, and the journals they usually publish in accepted only 'frontiers of science' work. They stressed that their work was sound scientifically.

They all said they used the occasion as an opportunity to try out an open Access journal and they all said the experience was very good. The manuscript handling went very smoothly and more importantly, judging by the survey results, peer review was just as rigorously applied as with any mainstream journal.

Others emphasised the importance of publishing in journals with a high impact factor for career reasons. Promotion within their institution, obtaining a new job in another institution or being awarded a new research grant all depend upon a publishing track record in such journals. The UK's Research Assessment Exercise has exacerbated this by encouraging the use of high impact factor journals as a metric to measure an individual's scientific 'worth'. Grant-awarding bodies, too, have until recently used this as a proxy measure of scientific ability, though some are now bucking the trend by deliberately putting in place measures to encourage publication of results in Open Access journals.

4.9.3 Archiving of published work

The fact that almost all the specifically-Open Access journals in existence at the moment are online-only gives rise to some concern amongst authors. People voiced the opinion that they have watched computer systems [standards] come and go and when they go a lot of data go with them. Their concern is what happens to the research if an Open Access [online-only]

publisher goes out of business. Is the content from that publisher's journals archived somewhere other than by that publisher? One interviewee had published previously in an Open Access journal but had now stopped submitting papers to that title because it had ceased publishing in print and he was very worried about the archiving of its content.

4.9.4 The impact of Open Access publishing on learned societies

Several of the interviewees were either editors, on the editorial board, or on the publishing committee of a learned society. All of them had something to say about their society's attitude towards Open Access publishing with respect to that society's journals and all of them reported that the current opinion is that a move in this direction seems very unlikely. Some said that their society makes considerable sums of money from its publishing activities which are used to support other society objectives. One said that his society's publication operated at a very small surplus but that a move to true Open Access was not being considered. All of them said that the subject had been the focus of much discussion for some time now.

The current models adopted by the societies mentioned vary considerably. The journal of one of them is published by a commercial publisher who has so far strongly resisted any blandishments from the society to make the journal content available free electronically after six months or a year. Others have adopted this model, whether the society itself publishes the journal or whether it is published through a commercial publisher. Yet another society makes its journal content available as PDF files on the society's website as soon as articles have been refereed and accepted for publication. This is effectively Open Access publishing, though with no publication fee, because this society's journal content is available to allcomers not just to society members.

4.9.5 The attitude of funding bodies towards Open Access publishing

Some funding bodies have already started to pay for their grantees to publish in Open Access journals. One example is Cancer Research UK, which has paid for many of its units to be members of BioMed Central. Nonetheless, there is still some anxiety on behalf of some grantholders about the implications of publishing in journals without a strong impact factor score. One interviewee told us that even *with* membership of BioMed Central paid for by the granting body, researchers would still strive to publish their work in journals with high impact factors, because this is one of the main things that the granting body looks at each time the grant comes up for renewal. As things stand, this means that those researchers will still continue to publish in traditional non-Open Access journals, at least for the time being.

4.9.6 The issue of 'self publishing' (despite copyright limitations)

Finally, several of the interviewees expressed their views about disseminating their work themselves. These views were unsolicited by us and were expressed spontaneously. The people who referred to this activity said that authors routinely send each other PDF files of their papers when asked for them by other researchers. Little or no account is taken of any standing copyright restrictions on this activity imposed by publishers of the original article. Researchers take the view that it is equivalent to sending out reprints or to photocopying one of their own articles and posting it to someone who asks for it – a practice that has always been commonplace. One interviewee described the activity as "an informal open access movement run by scientists".

One interviewee also said that one of the good things about publishing in a BioMed Central journal is that the author retains the copyright, allowing him or her to disseminate the results by whatever means they wish.

5. DISCUSSION

The overall purpose of this exercise was to examine the experiences of open access authors and to compare their views with those of individuals who had not published their work this way. Whilst we were prepared to find that our non-open access author sample was compiled of people who were not aware of the concept at all (recent studies have shown that a high proportion of authors feel they are not well informed on this[62]) it turned out that our non-open access author sample was reasonably *au fait* with open access – at least with open access journals. Almost two-thirds of them said they were familiar with such publications. This meant that their views were expressed in the light of an understanding of the issues. In the first part of this discussion we concentrate on open access journals rather than open archives, since these are quite different entities operating, in the main, on different principles and they deserve to be considered quite separately.

Why authors publish in open access journals – and why they don't

The crux of the study was to examine why some authors have chosen to publish their work in an open access format and why others have shunned this model to date. With respect to open access journals, mainly it is the open access *principle* that sways the author's decision – the principle of free access for anyone to his or her work. Over ninety percent considered this reason important and almost half of the open access authors would *not* have published in their chosen journal if it had not been open access. Other values that these authors associate with open access publications are that they are faster than the journals they have published in before, that there is a larger readership and, as a consequence, greater citation of their articles. Moreover, they think that the open access journal they have published in has a higher prestige and quality than traditional journals available to them. These are their perceptions.

The perceptions of the non-open access authors turn out to be, interestingly, almost diametrically opposed. They perceive open access journals as having a smaller readership and a lower citation rate, and of generally having a lower quality and prestige than the traditional journals in which they routinely publish. From some of their comments it is apparent that there is also the notion that open access publications are some form of vanity publishing akin to that in the book publishing world, where so long as an author pays up, the publisher will put out work of any quality. There is the perception here, then, that open access means driving down standards, something we return to later. Crucially, though, the *main* reason why these authors have not yet published in open access journals is that they are not familiar with any in their field. Does this suggest that a better selection of OA journals and some

effective promotion of their existence would persuade these people to jump aboard? Perhaps, though they have other reasons for biding their time.

The issue of familiarity deserves some examination. Whenever questioned about open access initiatives that had been brought to their attention respondents (of both types) offered the examples of BioMed Central and PLoS. Clearly, both these entities have had considerable success is promoting themselves to their potential audience, directly to the author, through libraries or by generally garnering publicity. Indeed, the launch of these two services in recent years and the amount of discussion they have generated in the scientific literature can hardly have failed to impinge upon a good proportion of biomedical scientists. Other fields have not received so much attention, despite the fact that biomedicine actually represents a fairly small proportion of the total number of open access journals in publication (about one tenth). Nonetheless, among the non-open access authors, the lack of awareness of open access journals in their field is the primary reason why they have not chosen such a vehicle for publishing their work. There is still a long way to go in terms of promoting open access to scholars.

Concerns about open access journals

The issue about quality – or the perception of quality – of open access journals is also a sticking point at present. New open access journals, such as those from the BioMed Central stable and from PLoS, inevitably have no impact factor assigned to them by ISI. They simply have not been in existence long enough. It will be interesting to see the effect of their achieving an impact factor score, something that is imminent since some of the BMC journals are expected to do so in the next release of the Journal Citation Index[63]. The usefulness of the impact factor rating of journals as a measure of a scholar's 'quality' is a major issue for discussion, raising questions such as how a journal's impact relates to that of individual contributors, how meaningful the impact factor is in different fields since its method of calculation is the same for each despite some major differences in publishing and citation characteristics between fields, and how much small changes in impact factor should matter. There also persists – by authors and publishers alike – the erroneous use of the absolute value of an impact factor as the measure, when there is only meaning in *relative* or *comparable* values. Whatever the logic and persuasiveness of arguments along these lines, however, it remains the most widely-used metric for assessing 'quality' of output in the world of scholarly research and until something better takes its place it will continue to be so.

It is taken very seriously by scholars, for publishing in journals with high impact factors can enhance or accelerate career advancement and weigh positively on the winning of grants to support their work. Conversely, a

publication record predominantly in journals with 'poor' impact factor scores can blight an individual's progress. This used to be most visible in the US, but in recent years the UK's Research Assessment Exercise (RAE) has had a major effect on the use of impact factor scores in Britain. Researchers in the UK are now, in general, highly nervous of publishing in any journal that has a poor or middling impact factor because the metric is used so dominantly in the RAE exercise. In addition, grant-awarding bodies take the measure into account when assessing the 'worth' of the publishing record of applicants.

This may eventually die a natural death, if it is supplanted by the use of a measure of an individual's own impact on his or her field, best done by examining the level of citing of *that individual's* work. High impact is one of the strongest potential advantages of open access – making research results freely available online increases readership and thus citations. This is borne out by at least one published empirical study[43] while another very recent study also supports these findings[42]. Open access authors in our survey appear to accept this as an argument, though they report that their own experience with respect to feedback to their open access articles (not the same as citation rate but a proxy measure) is that it has been much the same as that for articles they have published in traditional journals. Non-open access authors, however, do *not* associate open access publishing with increased readership or citations and unless this perception is changed they will continue to publish in traditional titles. More studies are required on the impact of open access publishing so that the hypothesis that it increases the impact of a piece of work can be fully tested. There would be no more persuasive argument in the eyes of authors than this.

That all said, the open access authors in this study exhibited a fairly low level of concern about the possible negative effect of publishing in an open access journal without an impact factor rating. Far fewer than half of them were concerned about the effect of their open access articles on their career or grant-winning prospects. We thought this may correlate with the age profile of respondents, with older respondents secure in their posts and established in their field and thus less worried about career-related issues, but with more than two-thirds of them under 40 years of age this argument does not apply.

There is another aspect to their concern over journal quality and that is peer review. A fairly common misconception has it that open access journals have lower standards of peer review, if indeed they employ it at all. Whilst we have not checked the situation with every open access journal in publication, this is certainly not the case for *PLoS Biology*, a journal that was set up with the intention of competing head-on with the likes of *Nature, Science* and so forth, nor for the BioMed Central journals. The latter maintain at least a 50% rejection rate and use only reputable reviewers. The experiences

reported by the open access journal authors in this study support the claim that peer review by open access journals is at least as rigorous as that for traditional journals. All our authors, though, rate good peer review as the most important feature of a journal, so it is not surprising that authors will not wish to publish their work in journals which are perceived to have low standards in this regard. How the misconception over peer review with respect to open access journals has arisen is unclear, but many non-open access authors seem to equate publication fees with little or no peer review – a vanity press-type option. This is a perception that must be dispelled where open access interests are at heart.

Neither of the author groups showed any particular concern about the possible disruption of the scholarly communication process that open access may bring. Far from being anxious about changes to the *modus operandi* authors are largely sanguine about any new developments. One (non-open access) author put it this way: "The community will adapt quickly to whatever publishing paradigm asserts itself." This is undoubtedly true: scholarly communication has undergone many quite radical changes over even the last 50 years and the academy has adapted. Why should this not continue to be so?

The exception to the rule here is that some people *are* concerned about the effect of open access on learned societies that publish their own journals. Whilst few respondents indicated in response to the question about it that they view this as a problem, several respondents mentioned it in their comments, as did a number of interviewees. It is a legitimate cause for concern since at the very least the widespread adoption of open access principles will require societies to review the publishing model they use. For societies that require their publishing ventures to do little more than break even, adopting an open access model may be remarkably non-traumatic. For those organisations that use their publishing operations to produce a 'surplus' (known elsewhere as profit), however, the effect of shifting to an open access model may be radical. Many societies plough such surpluses back into other society activities in accordance with their remit of furthering the interests of their subject. In some cases, their publishing activities bring in substantial amounts of money, the reduction of which would have profound effects on how the society functions[64].

Authors sit on both sides of the fence on this: some support a cash-reaping publishing policy because it enables societies to endow scholarships, subsidise travel, sponsor conferences and engage in activities that promote their subject but would otherwise be impossible without the cushion of publishing surpluses. Other authors – and in this context authors equals members – would prefer their society to publish with more moderate revenue ambitions.

As one of our interviewees said: "I don't think much of societies that use journals as major revenue earners. I don't like my money going to [publisher's name], nor do I like it going to a society. The idea is to get the science out there without anyone making a major profit on it."

The archiving of open access articles is another bone of contention. Whilst in principle online open access journals are no different to any other online-only publication, there is still a perception among some authors that their contents are somehow more vulnerable. Authors express the view that if 'something happens' to the publisher of an open access journal the contents of their journals will be lost forever. This is a perception applied to all online-only journals, not just open access ones but it has particular importance in this study. BioMed Central has even felt moved to tackle this issue with a statement on its website. Certainly the largest open access publishers are depositing copies of their content in other publicly-accessible repositories (e.g. PubMed Central) whilst also, presumably, creating backups and contingency plans for all technological eventualities. Digital information is simple to migrate from one format to another so author worries about obsolete digital platforms are unfounded. Nevertheless, this is another message that needs to be made clear to the author body – that this worry has no real basis in reality and should not be a good reason for eschewing open access (indeed, all online-only) journals.

Publication fees

Now we come to the issue of publication fees. This is more complex and perhaps more challenging for open access proponents to deal with. In our open access author sample, more than half had not paid any fees to publish in open access journals themselves. Our assumption, given the preponderance of BioMed Central journal authors in the sample, was that most of them came from organisations that have institutional membership of BMC, in which case individual authors are not charged a publication fee.

Few authors accept that publication fees should be paid by themselves and most think their grant or institution should pay on their behalf. This tallies with what is evolving in reality. Many institutions around the world are willing to pay – at the time of writing over 400 have signed up as members of BioMed Central – and, moreover, some high-profile institutions have agreed to pay open access publishing fees in general. Just one example of this is the Howard Hughes Medical Institute. Grant-awarding bodies are also falling in behind the open access movement in this regard (see, for example, the Wellcome Foundation's statement[61]). Despite all these moves, though, the issue of publication fees still raises heated debate amongst authors. Concerns are stated on behalf of three main groups of people perceived to be disadvantaged by the issue: authors from developing countries where funds

would not be forthcoming for this purpose; authors not in receipt of research grants, either because they are working in disciplines that do not as a rule receive them or because they are not doing the kind of work that wins large grant support; and young researchers who are not funded yet need to publish their findings to help them get a foothold on the career ladder. To some extent these concerns are unfounded, since BioMed Central and PLoS are prepared to waive fees in cases of financial hardship. In this sense there is no difference between fee-financed open access journals and traditional journals that levy page charges on authors. Most of the latter will waive fees if necessary and BioMed Central and PLoS are simply following in that admirable tradition. Presumably this will be the model for any journals that move to the open access model in future. Supporters of open access and eprint archives have long argued that the long term solution is for the cash that would have been allocated to journals-purchase instead to go to pay publishing fees. One estimate is that this switch would consume less than the cash previously used for journals[65], though others have argued that the most prodigious institutions in terms of research output may end up paying out *more* in publication fees than they currently do for toll-access (paid-for) journals, if all the costs of open access publication were to fall on the institution (which is very unlikely).

One final point to make here is that both groups of authors showed substantial enthusiasm for the notion of paying a 'traditional' journal to make their own article open access. This is an interesting model, since it achieves what open access proponents want, enables authors to continue to publish in journals they perceive as being sufficiently prestigious and encourages 'traditional' publishers to embrace open access provision in their business model. Whether this chimera model is really sustainable in the longer term is debatable, but in the short term it may work and will also have the side-effect of promoting the open access concept to the author body.

Eprint archives

This brings us to the other chief mechanism for open access publishing – eprint archives. In some cases these are single institutional repositories (see, for example, the University of California e-scholarship repository[66]) but they can take other forms, too, such as repositories for research output in a particular subject area or those created by a network of institutions.

Whatever the form, apart from the long-established subject archives such as arXiv and CogPrints, they are largely languishing in the doldrums in comparison to the activity level that is possible. That is not to say interest and the deposition of articles is not growing: OAIster, now harvesting from some 80 eprint repositories plus other sources, reports the current numbers of text items linked to from its records as over 1.5 million, and has seen a 23%

increase in the last 5 months. There is a caveat here in that not all of these items will be eprints (i.e. articles from, or destined for, peer-reviewed scholarly journals), though many will. It is to be hoped that future figures from OAIster will help to clarify how eprint numbers are accumulating. Other studies are also measuring archive growth rates, and it will be interesting to monitor this over time.

Growing they may be, but eprint archives are not garnering the volumes of articles they should be if the majority of scholars were depositing copies of their works in such repositories. In this present study, fewer than ten percent of authors in either group have deposited an article in an institutional eprint archive and only a few more have used subject repositories either. Almost certainly this is due largely to ignorance or inertia. We cite ignorance as one factor to blame because so few of our respondents were familiar with the various forms of electronic article archives. Fewer than ten percent of authors know about institutional archives: only a few more of the open access authors are familiar with subject-specific archives. Given numbers like this it is hardly surprising that there are not burgeoning numbers of thriving institutional archives: but to turn that on its head, given the number of institutional archives in existence, why do not more authors know about them? That is one question that must be addressed by the open access movement if it is to move forward.

The other side of this coin is, even if institutions set up archives and even if authors are made aware of them, will they be used? Stevan Harnad argues that the greatest enemy of these archives is author inertia[65]. Harnad has worked for many years to promote the use of institutional repositories and he contends that authors rationalise their inertia by adopting arguments against open access in general – publication fees, poor impact factor scores and so on – none of which have anything to do with depositing a copy of each completed, refereed and accepted article in an institutional archive. What is going on here is not just down to author inertia, however. Stephen Pinfield, whose institution (Nottingham University) is a lead partner in the SHERPA project, has also had considerable experience in this field and raises a number of factors that authors view as potential barriers to depositing their work in institutional archives: these include technical issues (their ability to submit articles in an accepted format such as HTML, the submission process itself which authors may not feel technically competent to carry out), various concerns about preprints (as opposed to postprints) being available as well as other concerns about 'quality', and worries about intellectual property rights and copyright infringement[67]. All of these issues have simple solutions but there is a cultural problem of author resistance that needs to be tackled. The case that institutional archiving is *supplementary* to publishing their articles in journals of their choice needs to be made. In addition, there is the

powerful argument that placing an article in a repository increases its visibility and therefore its potential impact. Around 55% of publishers surveyed by Harnad permit authors to post a copy of their published article in an eprint repository. Whilst this may have some long-term implications for publishers, in the short-term it is the surest way to increase exposure of an article and maximise its impact.

Author resistance is one thing, but it seems it frequently comes coupled with institutional resistance. Research institutions need to be convinced of the worth of institutional repositories. There are two complementary approaches. Pinfield's argument rests mainly upon the case for managing institutional information assets – retaining intellectual property rights and copyright within the institution rather than allowing them to seep away as authors sign them over to publishers[68]. Harnad argues that the most persuasive reasons for an institution to set up and maintain an eprint archive centre around the increased visibility of its faculty output, maximising citations, impact and thus the overall impact and reputation of the institution. A new service, Citebase, makes it possible to correlate downloads with citations and thus with the impact of a particular piece of research[69], an approach that may prove more persuasive to potential institutional champions than any other.

Technically, setting up an institutional archive is simple[70, 71], so why are not more institutions going in this direction? Librarians may be doing their best to lobby for such a thing, but a champion is needed at pro-vice chancellor-for-research (vice provost for research) level. Growing numbers of individuals at this level are signing up to the Budapest Open Access Initiative. Given the will, and the deed in the form of a functioning institutional repository, authors *can* be persuaded to deposit their articles. It needs some coercion[72] – and assistance – on the part of the institution to overcome author inertia, but the vast majority of authors in this study said they would willingly deposit copies of their articles in such as repository if required to by their employer or their funder (only 3% of authors would refuse to comply), so such requirements need to be implemented. This is the 'green' route that Harnad[73] promotes. From the author's circumstance, very little changes except that he or she has to make that commitment to 'self-archive'.

Whither goest?

So what happens now? The principal stakeholders all have their views on how things should develop, but there are a number of possible (or probable) scenarios. Who knows what will transpire? The answer is, nobody. Who would have predicted, for example, that authors, on being given the choice between publishing their work for nothing in an established, tried-and-tested, impact factor-ranked journal and paying to publish it in an untried new

publication with no reputation, prestige or impact, would opt for the latter? But that *is* what is happening, so no-one should be surprised at any other turn of events as this story develops.

This is not the place for a lengthy debate: the purpose of this study has been to gather information on the experiences of authors who have published in open access vehicles and the views of those who have not, with a view to enabling JISC and OSI to raise awareness and initiate further discussion of the development of open access publication outlets. We wish, then, to highlight a number of issues that have arisen which have a bearing on that.

First, there is the issue of author behaviour. Academic authors are generally a conservative group of people, intent only upon establishing a claim on their own advances and disseminating their work as widely as possible. Morris[74] argues that author behaviour is far less likely to be driven by altruism than by 'the normal, human need to make a living through career advancement and research funding'. It follows, then, that they publish their work in journals with as much impact as possible on their peers – a good reputation, an international audience, a high rank against other journals in the field. Authors want their work to be noticed, read and built upon. The most important of these is the first, because the others can only follow from that.

Why then, when presented with new means of increasing the level of notice taken of their work are authors resistant to adopting it? Since we already understand from this study that the *main* reason that authors have not considered publishing in open access journals is that they are not aware of any that they could use one answer is already at hand – increase their awareness. However, we are not referring to open access journals here so much as eprint archives. These entities provide an excellent means of increasing the impact of their work, at negligible cost either cash-wise or time-wise, and with no implications (yet) for the authors' preferred methods of publishing. They may continue to submit their work to traditional (subscription-based) peer-reviewed, quality-controlled journals, but can increase the impact by placing a copy in an institutional eprint archive. And yet, they do not do these things. There is a cultural issue here that open access proponents will need to change.

Second, there is a parallel cultural issue concerning institutional resistance, as we have already pointed out.

The third matter for debate is what effect all this may have on scholarly communication as a whole. The paradigms of academic publishing have been with us for a long time, are entrenched and well-understood[75]. They will be severely tested by these new developments. In a digital age, if scholars and their institutions can carry out the authoring, registering, disseminating and

preserving of academic research, what *is* the role of 'traditional' publishers? All that is left is the validating of research output – the quality-control process of peer review on which, admittedly, the whole edifice stands or falls. Are traditional journals then undermined by the new paradigms? Perhaps, though arXiv has existed for over a decade without any mainstream physics journals (let alone their publishers) becoming defunct.

Nevertheless, there is danger ahead for publishers. They have always acknowledged that the peer review process is the kernel of their service, though since scholars actually do the reviewing it really comes down to the *management* of that process that encapsulates the value added by publishers. They do pay for it, but they charge that cost (and more, of course) back to the academy. Some of the new scenarios in the open access world could mean that publishers may be reduced to peer-review managers then? Not all of them, since adroit publishers will find real value to add in other ways and will find new, promising business models to operate with. But some will fall by the wayside: it is a Darwinian situation and if viewed from that perspective new answers will emerge. New niches will be available for exploitation by those who can develop the right adaptations, perhaps particularly for learned societies. New models of communication altogether may also emerge, unlike the traditional journal 'package' but perhaps centred around new brands such as research communities or collaborations between them and nifty publishers (see, for example, Signaling Gateway[76]). We shall see.

What we do know as a result of this study is that over 70% of authors who have published once in an open access journal will choose do so the next time they publish. That statistic should be the starting point for any new debates.

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