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Open access journals – what publishers offer, what researchers want

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Abstract. The SOAP (Study of Open Access Publishing) project has analyzed the current supply and demand situation in the open access journal landscape. Starting from the Directory of Open Access Journals, several sources of data were considered, including journal websites and direct inquiries within the publishing industry to comprehensively map the present *supply* of online peer-reviewed OA journals. The *demand* for open access publishing is summarised, as assessed through a large-scale survey of researchers' opinions and attitudes. Some forty thousand answers were collected across disciplines and around the world, reflecting major support for the idea of open access, while highlighting drivers of and barriers to open access publishing.

Keywords: Open access, gold open access, open access journals, Study of Open Access Publishing

1. Context

Researchers, publishers, libraries, funding agencies and the European Commission are all actively debating open access publishing. Opinions abound, and often diverge, on costs and benefits as well as on risks and opportunities. At the same time, open access journals are maturing after several years of experimentation and in many cases enjoying impressive rates of growth.

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The main aim of the Study of Open Access Publishing (SOAP)[1] is to provide a foundation of evidence to substantiate the open access publishing debate and help all stakeholders, and in particular funding bodies and publishers of all sizes, to make informed decisions about their next crucial strategic steps in this arena.

The project examined the product range of open access publishing outlets through a detailed investigation of the landscape of open access journals today. It further analyzed the demand for open access publishing through an unprecedented large-scale survey of researchers' opinions of and attitudes on open access and compared supply and demand by highlighting the drivers of and barriers to open access.

2. The landscape of open access publishing today

The SOAP project performed a detailed study of the range of products and services offered by open access publishing outlets today along with their performance, starting from the authoritative DOAJ (Directory of Open Access Journals[2]).

A key fact found in this process is that in 2008 there were at least 120,000 open access articles published in fully open access journals[3] or hybrid journals.[4] Considering that the yearly volume of published scholarly articles is estimated at around 1.5 million,[5] in 2008 open access articles accounted for a significant fraction of the total, on the order of 8%.

The distribution of open access journals by publisher is extremely skewed: on the one hand, a dozen "large publishers" (mostly commercial companies, with a minority of exceptions, such as the Public Library of Science and the International Union of Crystallography) publish a large number of journals and articles, predominantly in the STM (science, technology and medicine) sector. On the other hand, the vast majority of "small publishers" publishes only one journal, and SSH (social sciences and humanities) journals largely belong to this group. Large publishers are more likely to rely on article processing charges (as well as membership fees and advertising) for their revenues, whereas the small publishers base their business to a greater degree on sponsorship and income from subscriptions, possibly to print versions, in addition to article processing charges.

Surprisingly, only around 70% of the articles published by the large publishers use some version of a Creative Commons license, allowing substantial re-use of the articles, which is one of the supposed advantages of open access publishing. Other large publishers request a transfer of copyright, as it appears most of the smaller publishers also do.

[1] The project was financed by the European Commission under the Seventh Framework Programme, and ran from March 2009 to February 2011. The project was coordinated by CERN, the European Organization for Nuclear Research, and was a joint effort of publishers (Springer, Sage, BioMed Central), libraries (the Max Planck Digital Library of the Max Planck Society) and funding agencies (the UK Science and Technology Facilities Council). For further information: http://soap-fp7.eu.

[2] http://doaj.org.

[3] That is, journals which only publish open access content. At the time of the study, in 2009, the DOAJ listed 4032 unique journals from 2588 unique publishers. Out of those, 2838 journals by 1809 publishers were published in English. Two thirds of the journals and three quarters of the articles were on the STM field.

[4] That is, journals which publish open access articles alongside non-open access content, usually charging a fee to authors who opt for open access publication. SOAP found that, across all journals offering this option, an average of 2% of the articles are published in this model.

[5] http://www.stm-assoc.org/2009_10_13_MWC_STM_Report.pdf.

In recent years and in many disciplines, open access journals have risen to the top of their particular fields in terms of the Impact Factor.[6] Several of those journals are only relevant to a given sub-field within a discipline. However, in some disciplines an important trend towards an increasing number of broader coverage journals catering to several sub-fields within a discipline is observable; some journals are among those with the highest Impact Factors in the fields of Medicine and Life Sciences.

3. Researchers' opinions on open access publishing

Over a period of several months in 2010 the SOAP project undertook a large-scale online survey of scientists across disciplines and around the world, aiming to uncover the attitudes and experiences of researchers with regard to open access publishing. The survey was mainly distributed using mailing lists of the publishers participating in the consortium. The fourth largest mailing was run through Thomson Reuters and went to 70,000 authors in fields where, after the first three months of the survey live-time, a relatively low response rate was observed. Further dissemination was achieved through smaller mailings via members of OASPA (Open Access Scholarly Publishing Association), public mailing lists, and newsletters in specific research fields where the response rate was relatively low, or other outlets concerned with scholarly communication. Commission Services further alerted around 13,000 project co-ordinators and Marie Curie alumni. In total, between 1.2 and 1.5 million individuals are estimated to have received the survey. The survey was "live" for almost seven months, from April 28th, 2010 to November 17th, 2010, although the vast majority of the responses were collected by August 10th, 2010; it is the data set extracted on that date which formed the basis of the project's analysis and which is referred to in the following discussion.

Out of a total of 53,890 respondents, 46,006 identified themselves as active researchers. Out of those, the answers of 38,358 who had published at least one peer-reviewed research article in the last five years were retained for the analysis. Responses came from 162 countries, with a large representation from research-intensive nations. The distribution of respondents per high-level discipline is presented in Fig. 1.

One of the key questions posed in the survey is whether respondents considered open access publishing beneficial for their research field. In total, 89% of published researchers answered in the positive. When analysed by discipline, this fraction was higher than 90% in most of the Social Sciences and Humanities, and around 80% in Chemistry, Astronomy, Physics and Engineering. Respondents had the opportunity to elaborate on their answer, an option chosen by 17,852 published researchers, contributing a staggering $1/2$ million words on the subject. These answers were scrutinized and the reasons respondents adduced for their views were found to cluster in a few large categories. These are presented in Fig. 2 for those who believed open access journals beneficial for their field. The most commonly-held belief is that the scientific community as a whole would benefit from open access journals. The cost to access information was the second most frequently cited motivation, closely followed by general ethical arguments for the global benefit of access to scientific information. Direct benefit to the single individual (in terms of ease of dissemination of one's work or citation advantage) came in only fourth overall.

Many other questions were asked in the survey and particular sub-sets of responses can be studied according to discipline, demographics, or a combination of factors. In order to allow full re-use of this

[6]The Impact Factor of a journal in a given year, as published in the Thomson Reuters Journal Citation Reports, is the average number of citations received per paper published in that journal during the two preceding years.

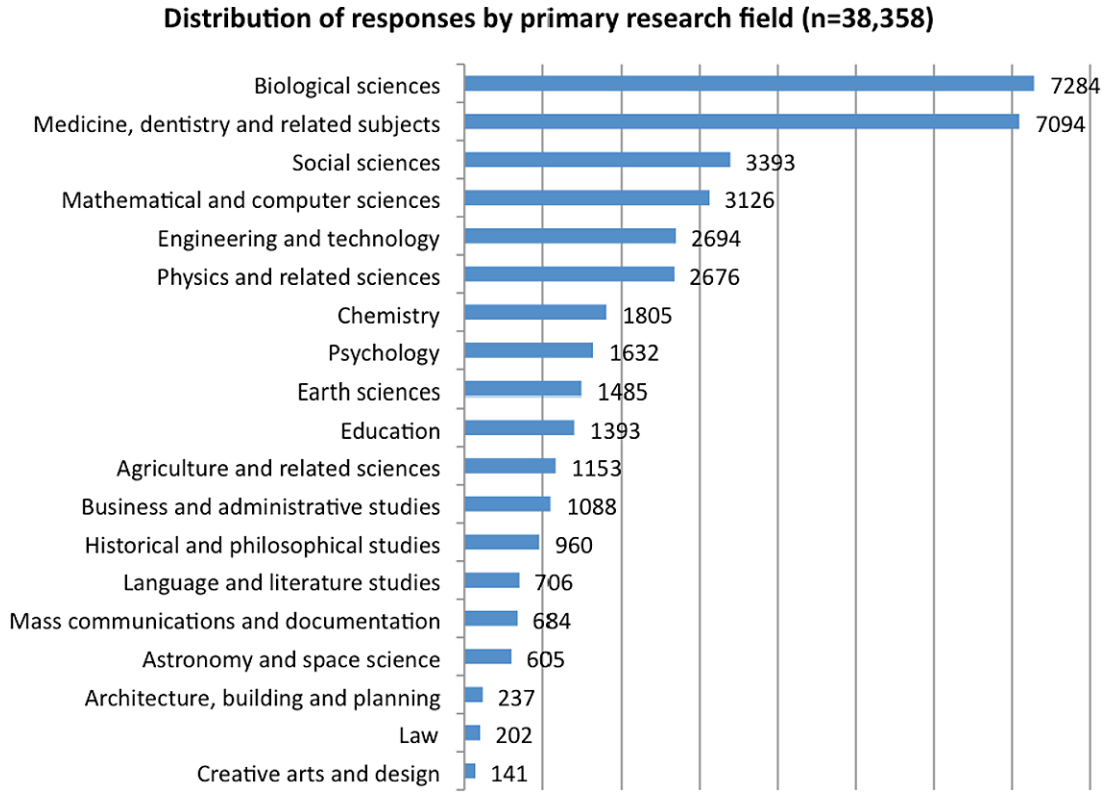

Fig. 1. Distribution of analysed responses per research field. (Colors are visible in the online version of the article; http://dx.doi.org/10.3233/ISU-2011-0624.)

valuable data set, the data was released under a Creative Commons CC0[7] waiver, with the aim of maximizing the scientific return on European Commission research investment by facilitating future academic investigations and by providing small and large publishing enterprises access to important market intelligence on equal footing.

4. Drivers for and barriers to the adoption of open access publishing

The project performed a follow-up study after its large-scale survey. Respondents to the survey were asked whether they would be willing to be contacted again, and over 17,000 e-mail addresses were collected in this way. A targeted series of questions was then sent to different demographic groups. One of these consisted of published authors with a track record in using open access journals. A series of statements aiming to understand their main drivers as authors (rather than readers) was presented, with respondents asked to rate their importance. The results are presented in Fig. 3. The four most important drivers are: the accessibility of content to readers, the perceived quality of the journal, the journal's Impact Factor and the absence of fees.

There is a striking gap between the opinions of researchers worldwide and across disciplines in favour of open access journals (89%), as determined in the SOAP large-scale survey, and the relatively low

[7] See http://creativecommons.org/about/cc0.

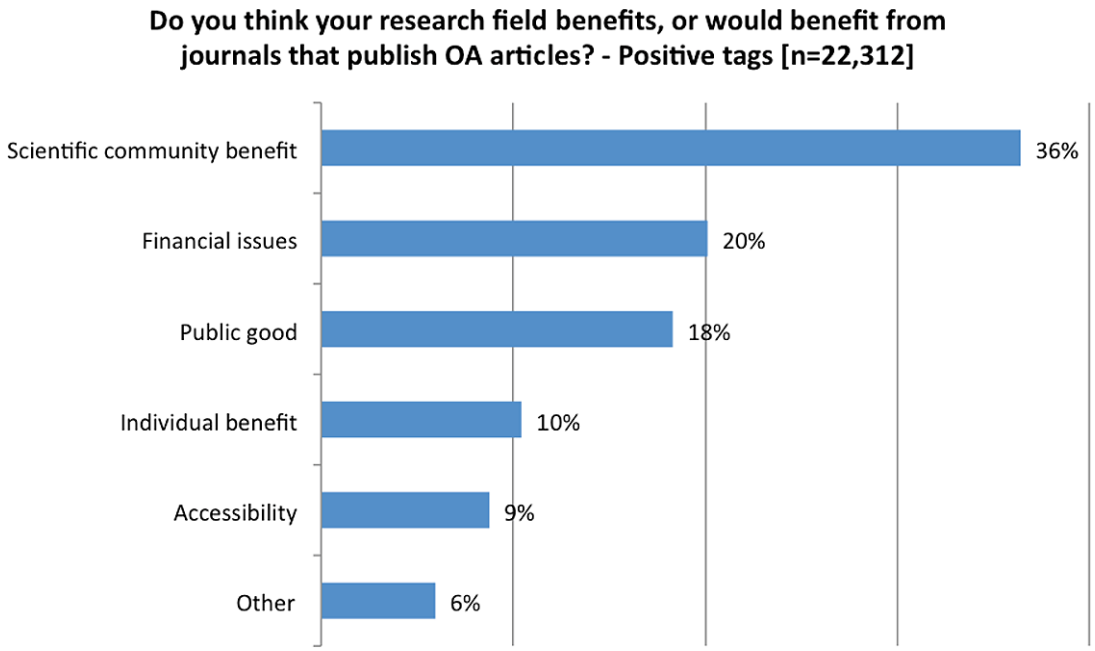

Fig. 2. Why would open access journals be beneficial? Distribution of 22,312 tags for the answers of 16,734 respondents. (Colors are visible in the online version of the article; http://dx.doi.org/10.3233/ISU-2011-0624.)

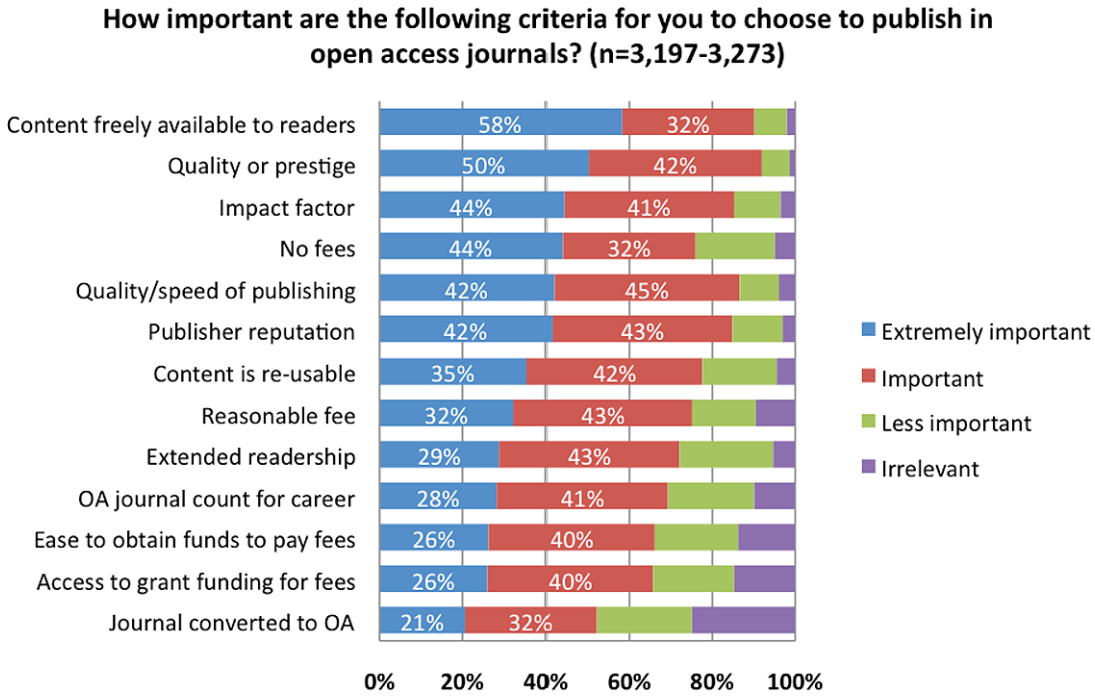

Fig. 3. Main drivers for researchers to publish in open access journals. (Colors are visible in the online version of the article; http://dx.doi.org/10.3233/ISU-2011-0624.)

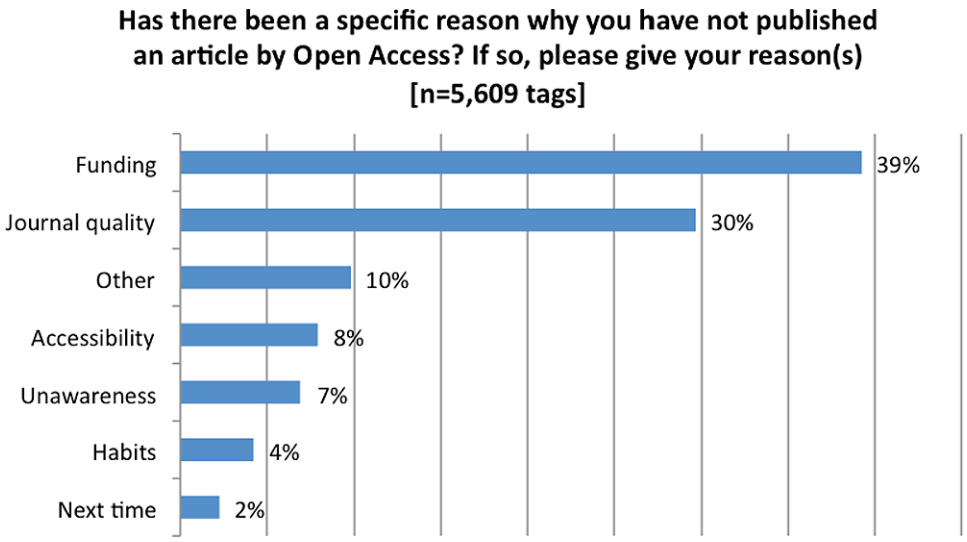

Fig. 4. Specific reasons not to publish in open access journals. (Colors are visible in the online version of the article; http://dx.doi.org/10.3233/ISU-2011-0624.)

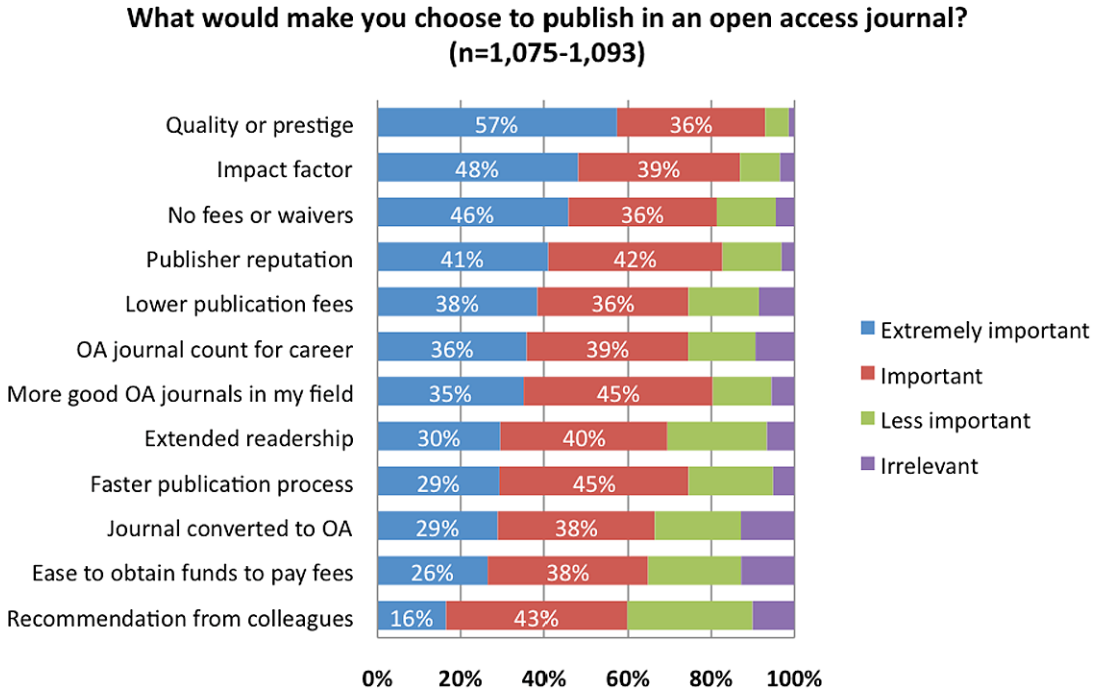

Fig. 5. Factors which would make researchers who have never published in open access journals start doing so. (Colors are visible in the online version of the article; http://dx.doi.org/10.3233/ISU-2011-0624.)

fraction of the yearly scholarly output published in open access journals (8%), which these drivers do not fully elucidate. The large-scale SOAP survey comprised questions which help further understand this gap. The survey inquired whether published researchers who had not published any open access

articles (29% of the sample) had a reason for not doing so. In total, 42% admitted to having a specific reason, and 4976 respondents provided an explanation in a text box. These answers were all scrutinized and tagged, and the most recurring reasons are presented in Fig. 4, with the lack of funding streams, or the necessity to pay fees, being a barrier for 39% of respondents, and the lack of suitable quality journals in their field being a barrier for 30%.

These results were further validated in a follow-up study of a particular demographic sub-group among those respondents who left their e-mail address as part of the large-scale survey. Researchers who had never published in open access journals were asked what changes in the scholarly communication system would encourage them to adopt this publishing paradigm. Fourteen possibilities were presented and respondents could rank their importance. The results are presented in Fig. 5. Out of the five most important factors, three concern the quality or prestige of journals, and two either the absence or the amount of fees required to publish.