

Social Sciences Committee Opinion Paper



The Need for 'Diamond Engagement' around
Open Access to High Quality Research Output

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**SCIENCE
EUROPE**
Social Sciences
Committee



Making research output available to society is an integral part of the research process and directly benefits important stakeholders who are best placed to foster the widest access possible.

Introduction

In this Opinion Paper, the Science Europe Scientific Committee for the Social Sciences recognises the Open Access (OA) efforts that have been made to date by research funders, managers of digital repositories, researchers and end users of research and invites them to undertake a co-ordinated cultural shift in their engagement with access to resources in order to make peer-reviewed articles available to a wider audience.

This Paper addresses two audiences: scientists, especially those who have been traditionally more resistant to the OA approach, and policy makers. The Scientific Committee is well aware of the difficulties that some research communities face in engaging with the OA approach and would like to offer a way forward to address the current *status quo*. Social scientists in particular have been struggling with the discussion on OA, given the length of time that the current quality standards and good practice for publication took to set up. The community of researchers perceives that these standards are now guarded by the peer-reviewed ranked journals which do not offer OA for either articles or books, a situation that is certain to persist for some time. The other important aspect is that payment of Article Processing Charges (APCs) to journals for OA publication is often unaffordable given the limited resources available to the social sciences disciplines. In this context, this paper illustrates how the deposition of articles in public repositories can be beneficial to the research community.

At the same time, this Paper encourages policy makers to better invest in the harmonisation of research information metadata standards across Europe using existing public infrastructures, and to ensure good quality of records, interoperability and discoverability. It also links the discussion of OA with an issue that is crucial in both research and policy agendas: demonstration of the impact of publicly-funded research.

The proposals outlined here do not replay the current debate surrounding OA policies; the ‘Diamond Engagement’ concept, which the Committee proposes here, can exist in parallel with, but also enhance well-established practices of publishing. The recommendations proposed for ‘Diamond Engagement’ are based on the following three principles:

- 1. Partnership:** It is recommended that policy makers encourage researchers to deposit their research output generated by funded projects in local repositories and support repositories' efforts to guarantee rigour, quality standards and analytics. The Committee encourages publishers to standardise publishing contracts to allow the deposition of approved versions of papers and books in public repositories.
- 2. Standardisation and Interoperability:** It is recommended that policy makers harmonise research information metadata standards and identifiers across Europe, in order to improve discoverability and traceability and to reduce duplication, thereby ensuring a high level of interoperability.
- 3. Enabling Structures:** It is recommended that the existing European Open Access repository infrastructure is used to achieve and monitor compliance with OA policies and Science Europe's Open Access Principles. Policy makers across Europe might explore ways to engage with OpenAIRE to harness the benefits and opportunities offered by this network and environment, and help to support its further development.

Setting the Scene

Public research funding programmes are under increasing pressure to ensure that large-scale investments deliver clear benefits to society. In more recent years the belief has grown that access to research results and publications will increase the 'space for innovation'.¹ Research policy makers are encouraging research producers to become more engaged with potential users of research. Alongside the innovation argument in favour of OA policies, the Committee also recognises that results and publications, which derive from this research, are public assets. As such, they ought to be easily discoverable and freely accessible, not only by the academic community but also by a broader public.

Access to published, high-quality research today is no longer confined to ensuring that publications are easily available to academic peers. OA is becoming much more synonymous for wider and public access to high-quality research output, which is relevant to a broader audience of public and private research stakeholders.

The same pressures that are driving the move towards the adoption of OA policies also demand evidence of the use and influence of research output. While the traditional model of using commercial publishing can provide a measure of academic impact, it constrains the ability of funders and research institutions to track and analyse the use of their funded research by industry, government and society at large. This is because the data are locked within the proprietorial databases owned by parties with competing commercial interests. Tracking or tracing the influence of outputs through this fragmented landscape is time consuming and produces piecemeal evidence at best.

OA repositories have the potential to provide access to all forms of research output. However, there is a danger that this approach may create a yet more fragmented landscape, where output is hosted in many repositories managed differently, and where its contents may not be labelled

and catalogued in a systematic way that clearly identifies the type of output that is deposited. The proposal outlined in this paper suggests moving beyond a focus on OA policy per se to a deeper and more active ‘Diamond Engagement’ of stakeholders, so that all parties obtain the best possible value from publicly-run digital repositories in terms of access (discoverability) and impact (traceability) of scholarly and peer-reviewed research output. The proposal can also be applied to any other kind of innovative publication or digital material.

Promoting Researchers

The primary focus of ‘Diamond Engagement’ is to encourage researchers in social science, and beyond, to exercise their rights to deposit the publisher’s accepted version of the author’s manuscript in a repository after peer review but before editing and formatting; this is sometimes called the ‘author-accepted manuscript’ (AAM).²

In academic publishing, a post-print is a digital draft of a research journal article after it has been peer reviewed, but before it has been formatted for publication. Since the advent of the Open Archives Initiative, post-prints have been deposited in institutional repositories, which are interoperable because they comply with the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH).³ In spite of the sometimes mixed messages, institutional libraries and repositories can legally host peer-reviewed articles which are in the final stage of publication (post-print) as long as they are not yet formatted according to the destination journal’s specifications. For several publishers, depositing PDF versions of peer-reviewed articles, books and working papers does not violate their contracts; for others, contracts could be agreed upon under these terms, given that publishers are now far more sensitive to the debate surrounding OA. Once the paper becomes OA in a public resource it can have a formal citation that is similar to the one in the actual journal where it is about to be published.⁴ At the same time, once published, the same output can have a life beyond the paywall of a journal. Depositing the post-print in a repository fulfils the obligation to make research outputs ‘open access’ but without the need to pay OA fees or be subject to periods of embargo.

Are there other benefits to depositing the post-print of a paper in a professionally-run digital repository? As mentioned above, the OAI-PMH is used to enable harvesting and collecting the metadata⁵ descriptions of the records in an archive. The repository is populated with both post-prints and rich metadata, managed by professional librarians. The rich metadata and identifications ensure that the paper is easily discoverable through author, title and keyword searches on web as a service. Research has shown clear download and citation dividends to researchers when post-prints of the paper are hosted on publicly-run and OA repositories, even if their paper is freely available on a journal website.

OA repositories receive a scholarly citation dividend by ensuring the hosted post-print is available beyond any paywall or payment to a journal by authors, funders or universities. Recently, researchers have been encouraged to engage mainly with OA journals and to include fees requested for immediate access (APC) in grant applications, imposing on funders the costs of these charges. However, in some disciplines, such as the social sciences and humanities, this practice is often not considered a viable option since it substantially reduces the already limited funding available for research. Furthermore, junior researchers may find the payment of

publishers' charges to be a barrier for their submissions and therefore the dissemination of their ideas; publication is a vital element of establishing a researcher's credentials. Particularly junior researchers at the start of their career have a strong interest in circulating their peer-reviewed articles, as their research interests could lead to a career beyond academia.⁶ Depositing the final draft of a peer-reviewed article into a public repository is therefore highly relevant. The two forms of dissemination of the research paper, namely through the journal website and through a repository, operate in parallel and thereby enable the research findings to reach a broader audience.

It is worth noting that new principles on OA publisher services, adopted by Science Europe Member Organisations in April 2015, stipulate that the following minimum services from publishers should be applicable when providing payments/subsidies for OA: indexing, copyright and re-use, sustainable archiving and machine readability.⁷

The Committee does not intend to engage in the OA debate directly, but rather to encourage discussion of some value-added opportunities that a repository can provide. Indeed, the co-existence of different distribution models is assumed.

Publicly-run Digital Repositories

Europe has highly evolved and extensive OA infrastructures, the result of more than a decade of investment by individual governments, universities, research institutes, research libraries and funders. Well over one thousand European repositories are registered in OpenDOAR and every European country, large or small, is represented. Many European countries have developed national OA portals, harvesting records from their country's institutional repositories and showcasing the results at the national level. Other successful European OA portals selectively harvest and present specific types of content, clearly labelled, such as research theses in the case of DART Europe. Subject-specific repositories, such as Europe PubMed Central, have been developed. Some OA portals, for example Ireland's RIAN, already facilitate searching and browsing by funder. Other countries have highly evolved systems which integrate repositories and research information systems as well as repositories and e-publishing systems at the local and national levels (see for example Portugal's Repositório Científico de Acesso Aberto de Portugal, RCAAP).⁸

Currently, publicly-run repositories function on the basis of distributed systems; in other words, they are a collection of data comprising multiple autonomous components. These components are not shared by all users; the resources may not be accessible; software runs in concurrent processes on different processors; and there are multiple points of control and, potentially, multiple points of failure. This means that because these repositories were created in the absence of common standards and practices, we are now facing a 'jungle' of publicly-run repositories, which are quite independent from each other. This fragmentation causes a reduction in ease of access to research outputs, which is the opposite effect for what the repositories were designed. Furthermore, maintenance and expansion of this process remains a costly effort and requires a significant investment in resources and infrastructure to support a growing quantity of scholarly literature.

There is a need to capitalise on the advantages that European diversity and local approaches can bring, while minimising the problems outlined above. Locally-based repositories are capable of capturing research outputs from a given geographical area and identifying high-quality research wherever this originates. They also allow access to peer-review journal outputs and connection to the full scholarly production and background of a researcher (see the next section on traceability). It is important to remember that research in Europe is still mainly publicly funded at the national level, and that in spite of trends of convergence or the 'challenge'-based research approach at the European level, a wide variety of research topics is encouraged by national funders and private foundations. High-ranking journals, especially those from large publishing houses, tend to favour topics and areas of interest that they consider particularly relevant for attracting a high number of readers. These are commercial organisations that are necessarily driven by economic viability.

There is also a need to address the growing problem of duplication of data. Researchers have a range of choices, once their output is reviewed and accepted for publication: they could deposit the accepted version in their institution's publicly-run repository at no cost. They could pay the higher rate of APC and have the journal make it freely available immediately on the journal's own website, or they could pay a lower rate of APC, whereupon the research output would become freely available following a period of embargo. If a funder has its own repository, the researcher can also deposit the article there. Quite often, researchers tend to use their own institutional repository (at no cost) and, when possible, also pay for publication on the journal website. In reality, this is unnecessary as the journal would publish the article anyway and keep it on their website, accessible only through payment of a fee. Some funders are addressing the challenge of fragmentation by requiring the deposition of their funded publications in a single, designated OA subject repository (such as Europe PubMed Central or ArXiv, although both have a strong bias towards the physical and life sciences). Although this is welcome at the European level, some of these repositories have limitations, for example disciplinary focus or lack of exhaustiveness. In particular, the social sciences and humanities have relatively limited representation in these more centralised publicly-run repositories and therefore several scientific disciplines are being denied the required levels of access.

The requirements of researchers, funders, universities and other research institutions for all science disciplines must be brought together in order to prevent researchers from having to deposit the same publication in different OA repositories to comply with different policies. While a certain amount of technical functionality is available from Europe to assist with this effort, some common standards need to be established.

Connecting the Dots: The 'Diamond Engagement' Proposal

On the basis of what has been outlined above, the Scientific Committee for the Social Sciences would like to encourage research funders, managers of digital repositories, researchers and end users of research to combine forces to foster a culture that aims to ensure that all research outputs are available in an open, traceable and interoperable manner. The publishing industry is changing and opening up possibilities of creating broader access – as long as somebody

pays: funder, researcher or user. The 'Diamond Engagement' approach uses existing publicly-funded infrastructure, available globally. This infrastructure is used to help change the culture of academic publication where it is to be expected that first publication of research will be in OA digital repositories. The Committee argues for a future where work is 'born digital' and 'born open access', with no publication fees, no paywalls and no embargoes.

Adopting these recommendations will encourage and promote policies which will build on the network of existing European repositories and OA infrastructure – the organisational, technical and cultural nexus required to fully realise the potential of OA and strengthen the impact of publicly-funded research and its social, economic and scholarly benefits. This approach will underpin the development of Open Science for Europe.

The 'Diamond Engagement' proposal is based on three key principles:

- 1. Partnerships:** The Scientific Committee for the Social Sciences proposes that a protocol should be established regarding the development of OA partnerships between universities and other research institutions, scholars, research libraries, university publishers and other agencies to work together to educate researchers on the value of populating OA repositories to ensure access to high quality and peer-reviewed articles, as well as other types of research outputs as long as they are clearly labelled and identified.
- 2. Standardisation and Interoperability:** There needs to be harmonisation of OA standards and policies via funder/institution partnerships, recognising that while the technical infrastructures are designed to be interoperable, the research community across the European Union is not. The requirements of the research community need to be integrated into the infrastructure in order for it to become genuinely useful. By engaging in this area, policy makers can accelerate progress and bring about cohesive action. This point is not just about the use of infrastructures but rather about a philosophical approach to existing infrastructures that needs to be inspired by the OA debate. The Committee advocates harmonisation of research information, such as metadata standards and identifiers across Europe, in order to improve interoperability, discoverability and traceability and to reduce duplication.

A growing number of agencies are working throughout Europe and the world to agree on standardised ways of identifying key elements in support of research information exchange. National policy makers are well placed to adopt and drive forward consistent practices and requirements for identifying funders and research project information. It is important to reinforce standardised usage by researchers, research institutions, publishers and the various repository communities, thereby improving interoperability and discoverability and reducing duplication through the deposition of the same article in different places.⁹

- 3. Enabling Structures:** Systems need to be developed to incentivise, capture, measure and promote the impact and societal value of European research using the existing infrastructures hosted mainly by public libraries. The Committee proposes using the existing European OA repository infrastructure, for example, to achieve and monitor compliance with OA policies and Science Europe's Open Access Principles. Guidelines would also have to be created around the analytical tools of such infrastructures to embrace the objective of traceability.

Funding agencies and research institutions also have a responsibility to reduce the burden of bureaucracy on researchers and to save them time by minimising duplication and the effort involved in meeting requirements for reporting and dissemination. Harnessing the technological infrastructure, driving standardisation and incentivising deposition at the institutional level is key to achieving a streamlined approach that is embedded in the researcher's workflow as far as possible.

National and international funding agencies, including the European Commission, are also addressing many of the issues identified in this proposal. However, the considerable collective strength of Science Europe could be a vital force for the co-ordination of change and can support the initiatives of other agencies, where appropriate. The existing European network of OA repositories offers a certain degree of exchange of information across Europe and creates some links between the macro level of Europe and the national level ('micro- to macro- interoperability'). This is still missing from the plethora of small, publicly-funded repositories emerging in response to different conditions and OA requirements. However, the issue can be addressed through proposed partnerships with research institutions and other entities. In this way the potential of the existing technical infrastructure can be harnessed and developed.

The Committee suggests that this approach should be built on existing initiatives such as OpenAIRE,¹⁰ a pan-European infrastructure and support network for enabling open access to European-funded research outputs, harvesting content from the distributed network of institutional repositories across Europe. OpenAIRE also provides Zenodo,¹¹ a free repository for researchers who lack a local repository, which also links publications and research data. OpenAIRE is now entering its third stage of implementation which will see it mainstreamed as an OA service provider (offering aggregation, hosting, impact analysis, reporting and monitoring services). Uniquely, OpenAIRE harvests records from repositories using the funder's grant number as a key identifier and has been extended to harvest publications from funders other than the European Commission. Underpinning the harvesting process, national and pan-European standards for metadata harvesting have been agreed upon at the European level and are widely implemented, notably the OpenAIRE Guidelines.¹² This set of guidelines provides orientation for public repository managers to expose their contents (metadata) in a way that is compatible with the OpenAIRE infrastructure. By implementing the guidelines, managers in public repositories support the inclusion and therefore the re-use of metadata in their systems within the OpenAIRE infrastructure.¹³

Publicly-run Digital Repositories and Traceability: Who Accesses High-Quality Research?

As the physical and human infrastructures are developed, publicly-run digital repositories can offer an increasingly broad range of services. As mentioned above, repositories can link peer-reviewed articles with the wider activity of researchers. Researchers today are increasingly engaging widely with the public, which is crucial for their own work, but more importantly achieves a greater impact on society at large. One of the most relevant achievements of our society is that the stakeholders of research are no longer limited to a researcher's academic peers, but include a much wider audience in both public and private circles.

In this respect, researchers are increasingly keen to monitor and display how their research interests and ideas can be traced to identify users of the research. As NGOs, civil society, governments, think tanks and industry are increasingly involved in the process of co-creation of data, researchers undoubtedly benefit from identifying their prime audience and the opportunity to apply their analytical skills to a wider range of datasets. Today, technology allows one to trace the web origin of download requests to government departments, companies, civil society organisations and education institutions of all levels and why it has been requested. Technology interfaces could translate this information into 'user capture' and give rise to different types of citation indices. Such analysis of downloads can be done on e-prints and on any form of digital resource (data sets, research reports, pictures, videos). Social sciences researchers are supporting this approach and increasingly advocating the replacement of journal impact rankings with institution-based reputation systems.

Scholars today understand the importance for papers to appear at the top of search engine pages, such as Google or Google Scholar, as well as to be harvested by multiple portals to achieve the same (or better) results in terms of attracting citations to the paper's published version. In addition, discoverability via search engines is one of the keys to increase the impact on society of research output. This discoverability can be traced back and metadata can be developed on end-users to truly understand the impact of research on broader society.

Currently, further development is required to trace the societal benefit of European research. It is not easy, for example, for funders to track the usage of their published research outputs by industry, the charitable and public sectors or by the general public. Encouraging the deposition of post-prints in a standard format provides a wider range of metadata, which improves discoverability and the opportunity to track the use of outputs, without trying to renegotiate private providers' formats and criteria. The real advantage of such a resource is that web search engines can easily find papers due to the extremely rich metadata. Introducing the changes proposed in this paper will benefit institutions as well as research funders. Institutions are doing more to showcase how high-quality research output and peer-reviewed articles that emanate from their institutions demonstrate wider engagement of their researchers within and outside of the academic community. Institutions would have the opportunity to link the single e-print of peer-

reviewed articles in the repository to other research and other outputs of the same researchers in more comprehensive ways. This can be done via links to researcher profiles, websites of departments, research institutes, and university-level profiling of research. Furthermore, for many disciplines, many relevant outputs extend beyond text articles. For example in some of the social science and humanities disciplines, an important part of the research output is in a non-textual form, for example archaeological excavations, exhibitions, artefacts and performances, or digital output, photographic evidence, videos, and so forth.¹⁴ This type of output can be part of the wider portfolio of a researcher, hosted on a repository.

Conclusions

As the pressure for understanding the societal impact of research is growing, the evaluation of researchers is increasingly based on their full engagement in the public domain, which extends far beyond peer-reviewed articles and teaching assessments. As such, frameworks on strategic partnerships with research institutions, fronted by professionally-run public digital repositories, should be included in all OA policies and be promoted to funded researchers. In turn, this will address the lack of incentives for researchers to engage positively with OA infrastructures and policies, for example through new approaches to research evaluation.

The Science Europe Scientific Committee for the Social Sciences proposes a leadership role that policy makers in Europe can play to promote OA and traceability of the impact of European scholarly research on industry, the charitable and public sectors, individual professionals, and the general public. The Committee believes that co-ordinated action on a number of practical initiatives related to OA and traceability could be a game-changer. It would immediately incentivise funded researchers and the institutions in which they work to embrace OA and traceability infrastructures in a way that will enhance the influence of research funding on scholarship and offer significant social and economic benefits to potential users outside of academia.

Notes and References

1. Marc Scheufen, *Copyright versus Open Access*, Springer (2015), see p. 39 and particularly the scholarship cited at footnotes 124-125: (...) economists have come to realize the importance of science for the advancement of technologies and hence for economic growth. In fact, modern growth theory emphasizes the role of science and technological innovations for productivity. Especially the works by Romer (1986, 1990) increased the attention to science as the major factor for technological innovations. In particular, economists in this field have analysed the relationship between science and technology as well as the role of knowledge spill-overs from science for economic growth. Also the role of scientists in the industry has been addressed to understand the scientist's input for creating the capacity of firms in the development of innovations. As such, Cohen and Levinthal (1989) highlight that scientific knowledge is crucial for both the production of new knowledge and the adoption of external knowledge developed outside of the firm—so-called absorptive capacity.
2. Rebecca Darley, Daniel Reynolds and Chris Wickham. *Open Access Journals in Humanities and Social Science*, The British Academy, 2014 (<http://www.britac.ac.uk/openaccess/>).
3. The Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) is a protocol developed by the Open Archives Initiative. It is used to harvest (or collect) the metadata descriptions of the records in an archive so that services can be built using metadata from many archives.
4. Similar because the post-print article has not yet been formatted by the journal and therefore the page numbers, for example, can be different from those in the published version.
5. Metadata (metacontent) is defined as the data providing information about one or more aspects of other data (e.g. means of creation of the data, purpose of the data, time and date of creation, creator or author of the data, location on a computer network where the data was created, standards used). Metadata was traditionally contained in the card catalogues of libraries.
6. POCARIM data show that, for example, out of all the PhD and postdoctoral graduates in social sciences, the vast majority will eventually work in government or business rather than academia (http://www.salford.ac.uk/__data/assets/pdf_file/0005/399596/Data_review_WP3.pdf).
7. http://www.scienceeurope.org/uploads/PressReleases/270415_Open_Access_New_Principles.pdf
8. <http://www.rcaap.pt/>
9. Important research information elements requiring standardisation include:
 - Author names plus numeric identifiers (for example, ORCID).
 - Organisational/institutional names (and subordinate body names) plus numeric identifiers (In the UK a CASRAI working group is working in this area).
 - Funder names plus numeric identifiers.
 - Grant number/s: co-ordinated and agreed methods of description and exposure for harvesting. OpenAIRE uses the project grant number to identify open access papers linked to funded projects. Further coordination will be required to achieve full interoperability.
 - Subject/field: selective harvesting and/or reporting of research outputs (and their impact) based on fields, disciplines and thematic areas are currently complicated by the lack of application of research classification/taxonomies such as those used by EuroSTAT, OECD and national statistical agencies. Policy makers should consider advocating the application of taxonomies to funded research outputs such as the OECD fields of Science, NACE Classification etc. Research outputs (both 'traditional' published outputs and non-traditional).
10. OpenAIRE has over 41 partners representing OA networks in every European country and major European research institutes such as CERN and the Max Planck Institute (<https://www.openaire.eu/>).
11. <http://zenodo.org/>
12. https://guidelines.openaire.eu/wiki/Main_Page
13. For developers of Current Research Information System (CRIS) platforms, the Guidelines provide guidance to add supportive functionalities for CRIS managers and users. Exchange of information between individual CRIS systems and the OpenAIRE infrastructure is an example of point-to-point data exchange between CRIS systems, since the OpenAIRE infrastructure is itself a CRIS system (<http://dSPACECRIS.eurocris.org/>).
14. Open Access Opportunities for the Humanities: Opinion Paper of the Scientific Committee for the Humanities in Science Europe (<http://www.scienceeurope.org/urls/human-oa>).

This Opinion Paper has been produced by the Science Europe Scientific Committee for the Social Sciences

► About the Scientific Committee for the Social Sciences

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Colophon

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