



Academic Social Networks and Open Access: French Researchers at the crossroads

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Abstract

Researchers benefit from an increasing array of tools to enhance direct communication and the dissemination of their research findings. These include Open Access repositories, Open Access journals, or hybrid publishing. For some years, researchers have been using new ways to communicate and share their work by using academic social networks.

In an attempt to foster the development of Open Access in France, the French consortium COUPERIN (Unified Consortium of Higher Education and Research Organizations for Access to Numerical Publications) proposed that academic social networks could be used to convince researchers of becoming more involved in Open Access. To test this hypothesis, a nationwide survey was launched in 2014 to explore whether and how these academic social networks are used to share content, but also how they compare to other Open Access classic tools. Within a month (20 May to 20 June), 1,898 researchers answered this 28-question survey. It was fully completed by 1,698 of them. This provides COUPERIN with considerable data for analysis. The respondents roughly reflect the composition of the French academic community in terms of gender and research fields, with a slight overrepresentation of young researchers/PhD candidates.

This survey does not, however, cover the in-depth opinions of researchers on Open Access and academic social networks. It therefore only presents general tendencies. Nonetheless, the survey gives many indications as to how researchers apply Open Access. In addition, it shows how they feel about the usefulness of these networks compared to repositories when efficiently

disseminating their work. This survey also takes the differences between disciplines into account and characterizes behaviour and opinions according to the different disciplinary communities and their research practices.

Finally, this survey allows us to define the main characteristics of a tool which could meet French researchers' needs for scientific communication. The components of such an ideal tool dedicated to Open Science could include efficient repositories to easily disseminate work and improve visibility, a sharing network and the scientific stamp of peer-review.

Key Words: Open Access; academic social networks; Open Science; researchers; France; perception; exploratory survey

1. Introduction

For many years, the development of scientific communication has been a focal point for researchers, inducing the development of Open Access. As part of this movement specific tools have been created aimed at easily sharing research findings. These have put researchers in touch with one another, have bypassed the sometimes lengthy delays between the initial submission of a paper and its publication, have developed direct peer review, projects, and have improved collaboration within the academic community. An array of possibilities exist online for researchers to disseminate their work such as Open Access repositories, Open Access journals or hybrid publishing.

In France, publishing in Open Access is not (yet) a public requirement for research. Academic assessment neither takes Open Access publishing into account. The Minister for Higher Education and Research Mrs Geneviève Fioraso expressed an official support during the Open Access Days of January 2013.¹ Although she presented a roadmap for Open Access, advocating the benefits of publishing and sharing Open Access to researchers mainly takes place in research and higher education institutions.

Consequently, the Couperin consortium – composed of all French research organizations and universities – has been active for some time in this field. It contains working groups on IPR, technical matters, advocacy (a website dedicated to Open Access for researchers to open in October 2015) and best practices. It also organizes Open Access Days every two years, which

aim to evaluate the progress of Open Access in France. They serve as a platform for debate. Looking for the best way to reach researchers and tell them about Open Access, Couperin decided to organize a survey to better understand their work practices and opinions related to Open Access (Joly, Okret-Manville, & Vignier, 2014). In addition, recent years have seen a significant development in social networks with some dedicated to researchers. Couperin thought that it would be useful to know how these networks were being used by researchers and to evaluate whether an efficient Open Access advocacy policy could be pushed through this channel.

2. Method

To prepare this survey, 3 sources were used: reports dealing with the specific link between research and social networks, discussions on blogs and forums, and discussions with librarians. This content helped define the mood of the academic community about these tools and provided a list of questions, positive and negative remarks that could be used for the questionnaire. At the time of preparation (1st quarter of 2014) not many studies existed on this new subject. The major part of this documentation is in French.

This resulted in a set of 28 questions, which was divided into 3 parts. The first set of questions focused on the usage and practice of social networks (general social networks and then more specifically academic ones), the second one dealt with the perception of Open Access. The third part aimed at pinpointing the academic profile of the respondent (gender, age, research domain, affiliation). Free comments were also welcome.

This questionnaire was available online from the 20th of May to the 20th of June 2014. The link was sent to the Open Access contacts Couperin has in every university and research organization library. Libraries in turn disseminated the questionnaire to their researchers and actively promoted it.

1898 responses were obtained. Among them, 200 answers were incomplete, ending up with 1698 results to exploit, and 700 comments. Given the length of the questionnaire, this can be considered a fairly good outcome.

Our sample can be deemed reliable, as respondents are rather representative of the French academic community. As regards gender, we notice a slight

overrepresentation of female respondents (42.9%, compared with 35% in academia). Two-thirds of our respondents are under 39 years old. This gives an overrepresentation of young researchers, PhD students included, as in France researchers over 39 account for 55% of the research community corpus. A breakdown by disciplines shows the overall correspondence with the French academic landscape, with a slightly stronger representation of life sciences (Table 1).

A large Excel sheet was produced for this analysis where all answers were entered and sorted, particularly to identify possible disciplinary effects. Respondents had to choose their research discipline from 30 possibilities. We chose to cluster these disciplines into larger domains for more efficient analysis. Seven disciplines were consequently used: Economics/Business/Law, Arts and Humanities, Social Sciences, Mathematics/Computer Sciences, Physical Sciences, Engineering Sciences, Life Sciences. We also assume that the clustered disciplines are similar or very close in nature related to the theme of the survey.

3. Results and Discussion

3.1. Researchers and Academic Social Networks: Potentials and Questions

The majority (60%) of our respondents have heard about academic social networks although only 42% use them. They usually choose ResearchGate (by far the most popular (65%)), and then Academia.edu (24%). Other academic tools like Mendeley were mentioned by 2.1% and 1.9% for Google Scholar, with a long tail of other networks following behind. Since no predefined list was used, these answers suggest that some researchers cannot always precisely identify what an academic social network is. They may see them as

Table 1: Proportion of respondents compared with the population of French researchers broken down by macro disciplines.

Macro disciplines	Respondents	French researchers (2013)
Economics/Business/Law	12%	13.5%
Social Sciences (incl. Arts & Humanities)	25%	27%
Hard Sciences (incl. Mathematics/Computer Sciences, Physical Sciences, Engineering Sciences)	44%	45%
Life Sciences	19%	14.5%

generic scientific communication tools, including specialized search engines such as Google Scholar, reference managers such as Mendeley or open access repositories such as ArXiv. For this study, we consider academic online social networks dedicated to researchers where resources and information are shared within the academic community.

The 58% who do not use academic social networks are primarily not convinced of their usefulness ('unuseful' for 41%), don't have time to use them or feel they lack information about them (14%). Some find academic social networks have a too limited offer of services and 4% fear they would lose control over their professional and personal data by engaging with them.

A breakdown by discipline reveals a greater usage of academic social networks in the Social Sciences (48%) and Life Sciences (47%). When researchers were asked about their usage of social networks in general, they do not tend to use social networking without considering their domain of study first. Broadly speaking, Human and Social Sciences have adopted social networks to develop direct communication within their communities: researchers in Social Sciences, Arts & Humanities, Economics/Business/Law report a large use of Facebook, Twitter and LinkedIn. Social Science researchers are the most engaged in social networking here, be it for academic or general reasons. Otherwise, it is Economics/Business/Law and the Engineering Sciences that favour general networks. At the other end of the spectrum, Physical and Natural Sciences use these tools less, having a more balanced usage between the different types of networks (Table 2).

Academic social networks are mainly used in community contexts. A third of the respondents mentioned using them to interact with other communities, shop for new ideas and to stay up-to-date with other subjects other than their core themes of research. This practice seems quite widespread in the Life Sciences (59%) and in the Arts & Humanities (46%) whereas in Mathematics/Computer Sciences (19%) academic social networks is first and foremost an 'internal' channel for research exchanges. The main use researchers assign to networking is to disseminate their publications (70%), especially in the Life Sciences and Social Sciences. We can also observe that sharing data is not negligible, particularly in the Arts & Humanities reporting more than 50%. It is somewhat paradoxical that researchers in this discipline share data via these networks as only 18% admit to knowing about the site's data-sharing policies. This can be interpreted as voicing a concern about the (supposed or

Table 2: By discipline, users of general social networks and users of academic social networks.

	Arts & Humanities	Economics/ Management/ Law	Maths/ Computer Sciences	Physical Sciences	Life Sciences	Engineering Sciences	Social Sciences	All disciplines
Users of general social networks								
Facebook	73%	82%	68%	67%	66%	73%	74%	71%
LinkedIn	64%	62%	47%	54%	52%	58%	64%	56%
Twitter	35%	62%	44%	41%	42%	50%	41%	45%
Users of academic social networks	21%	24%	22%	14%	13%	9%	25%	18%
	33%	33%	41%	40%	47%	37%	48%	42%

real) lack of a local (or national) research infrastructure in these disciplines. This drives researchers to use existing channels to share data, regardless of any future changes to the conditions of access to their data.

Two-thirds of academic social network users are quite satisfied with them, and the degree of satisfaction depends on the discipline. The biggest users, i.e. in the Social and Life Sciences (see Table 2 above) are the most happy with academic social networks. The reverse is also true: Mathematics/Computer Sciences and Engineering Sciences report are most dissatisfied. Two assumptions can be made to account for this fact: 1) bad knowledge of these networks or 2) a lack of acceptance and practice with them in their communities. The second part of this study, which deals with the perception and use of Open Access, may give us further explanations.

Respondents to the survey then indicated what the advantages of academic social networks were by choosing assumptions from a closed list (multiple answers possible). Researchers easily agree on the way academic social tools can serve their goals. As Figure 1 shows, the two main advantages they see in being active in such a network are to 1) share content and 2) to raise their

Fig. 1: Advantages of academic social networks.

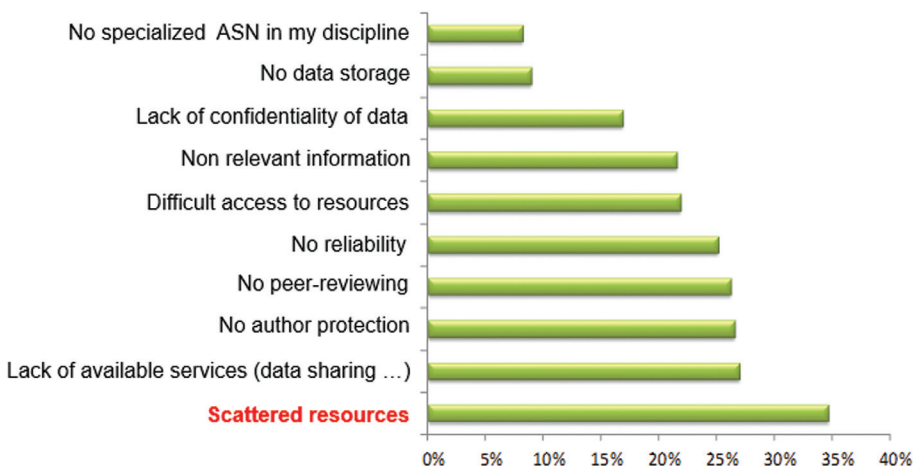


scientific profile and academic reputation (60 to 70% respectively). Then comes collaboration with colleagues: getting in touch with them, doing collaborative research, creating project communities, getting new ideas (15 to 30% respectively). Jordan (2014) has noticed in her study on academics and their online networks that the primary objective of researchers who create a profile in these networks is to bring more visibility to their publications, and to use them as a kind of ‘online business card’.

Limitations mentioned (see Figure 2) suggest a very critical eye, even when researchers are rather satisfied with the networks. The main criticism is a scattering of resources (35% of all responses). Around 25% of answers were critical towards the absence of author protection, no peer reviewing, no reliability, and too few functionalities (i.e. related to data-sharing). Roughly 20% question the relevance of information posted and claim that access to information is difficult. Respondents’ comments confirm these observations.

These opinions reflect a good perception of the social networking side of these tools, but some deficiencies on the side of the academic workflow. To sum up, these networks appear as one among many different channels to make peer interaction easier, being notably used to integrate young researchers (e.g. PhD candidates) in research circles. They are first and foremost expected to boost the visibility of research works on the Internet. They are then appreciated as

Fig. 2: Limits to academic social networks.



collaborative tools. These results qualify the views an analyst of an American media consulting firm expressed about these networks: 'These are tools that people are using to raise their profiles and become more discoverable, not community tools of social interaction.' (Van Noorden, 2014, p. 127) On a darker note, they have general terms of use where the privatization of data is a possibility, and for some they remain complicated to use and insufficiently secure for data storage.

3.2. Researchers and Open Access: Open Access Still has a Long Way to Go

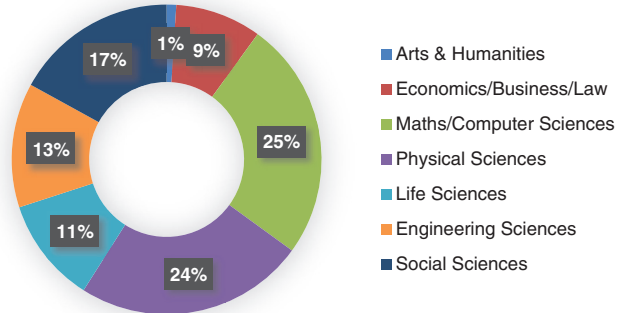
Knowledge of Open Access is reported by 70% of all respondents; it is considered as an important feature of the research landscape today. However, differences exist between disciplines here. Across the spectrum, Mathematics/Computer Science and Life Science researchers have heard of it at a rate of 76% whereas Economics/Business and Law, only 54%.

Yet, depositing publications in Open Access repositories is not commonplace: 29% of all respondents report depositing, 41% do not deposit, and 30% do not answer this question.

The survey provides an overview of the French Open Access repositories landscape. The national repository HAL (Hyper-Article on Line), managed by the National Centre for Scientific Research (CNRS) and with strong political support, is mentioned by 71% of the answers. These answers encompass HAL itself and the sub-portals it has created at the request of many research organisations and universities. ArXiv is the second most important repository cited (19%), although it is impossible here to determine whether ArXiv is directly used by researchers or rather more indirectly using HAL to push data to it. 10% of all responses mention institutional repositories (DSpace, E-Prints, Flora, home-grown software ...) and some subject-based archives such as RePEc. This picture reflects the dominance of HAL, as a specific French answer to enhance Open Access.

Open Access deposit also relates to what is the norm in scientific communities. It is Mathematics and Computer Science communities who particularly engage in depositing their outputs in Open Access as do the Physical Sciences (Figure 3). Creaser et al. (2010) make the same observation and specify that for these disciplines, speed of dissemination is considered a priority. They add

Fig. 3: Based on respondents who deposit in repositories by discipline.



that mandates are not seen as important (p. 156), which suggests that depositing may reflect an adhesion to the principles of Open Access. Regarding Mathematics/Computer Science, a survey conducted in 2006 among French researchers of that domain reached the conclusion that this conviction was widely shared in this community.²

This graph therefore confirms our assumption about the profile of Mathematics/Computer Science scientific communication. It overwhelmingly favours 'traditional' Open Access repositories to disseminate their work and gain visibility. This seems satisfactory enough, so this community does not feel that they have to turn to academic social networks to help them reach this objective more efficiently.

In the Life Sciences, the rate of deposits is quite low (11%), compared with the high rate of respondents in this discipline who know about Open Access (76%). This is despite the fact that pushing publications to PubMed is easy via HAL. There are two explanations for this. Many medical journals have agreed to push publications to PubMed without researchers' intervention (Creaser et al., 2010, p. 155). Similarly, an agreement has been reached between some research institutions and the open access publisher BioMed Central, who automatically sends researcher metadata to HAL where the institution has a HAL sub-portal (Prime-Claverie & Mahé, 2013, 5th part). These automatic workflows make deposits effortless for Life Sciences researchers. A more essential explanation lies in the importance of peer-review in the Life

Sciences, which is considered a crucial part of the academic workflow. This means that as far as dissemination of research outputs is concerned, Green Open Access does not guarantee the scientific value of documents. In the Open Access world, this can only be assured by Gold publishing (Creaser et al., 2010, p. 156; Prime-Claverie & Mahé, 2013, 5th part).

Researchers in Economics/Business/Law do not deposit much in Open Access; this may be linked to their reported poor knowledge of this movement.

As a general result, only 29% of respondents state that they deposit their publications in Open Access. The 71% who do not engage with this movement provided comments to explain their attitudes. These comments have been clustered by theme:

32% referred to a lack of knowledge on Open Access or to its ambiguity for their discipline. Comments often suggest the idea that Open Access 'costs too much'. This may be the sign of a confusion between Green Open Access and Hybrid Open Access where some researchers believe that taking up Open Access publishing is somewhat inescapable. The ambiguity of the notion of Open Access is seen in the Life Sciences (see above). Other comments, however, do indeed help identify a real lack of information about Open Access, its nature, the deposit process, existing repositories, their relationship to social networks or personal webpages, their advantages in terms of visibility and effects on publication accessibility.

A second set of arguments (19%) relates to lack of time. Depositing documents requires an extra-time these researchers are not readily willing to take because it diminishes the time they can dedicate to pure research. This suggests that respondents are satisfied with the traditional ways of promoting their works (through commercial publishing or by giving lectures), seeing depositing as some kind of red tape. The link between open access and citations increase is not obvious to them.

Some researchers (16%) also feel unsure about the legal possibilities of exploiting their work once they have submitted to a journal. They lack information about IPR, and the Sherpa/RoMEO site.

Not depositing a document can also be part of various publication strategies (14%). There is no official incentive to publish in Open Access unless

this would be taken into account in the assessment of their career. Although Open Access journals may offer good quality content, they seldom have a high impact factor. In addition, researchers sometimes get pressure from publishers or from senior researchers (particularly PhD students) to favour commercial publishing.

Publication habits can account for a lack of involvement in Open Access as well (12%). This type of answer shows that these researchers do not ponder about the scientific communication workflow and neither do they question their habits as the whole process of scientific communication is changing around them.

Finally, some perceive the complexity of the deposit process of some repositories as an obstacle for joining the Open Access movement (7%). Those who express this view also oppose 'easy to deposit' sites such as academic social networks.

Many comments also point to the fact that there is no clear political support for Open Access on a national level. These comments show significant support for Open Access. They suggest three levels where a national policy could make headway: strongly encouraging (or mandating) researchers to deposit outputs of publicly-funded research in Open Access, taking into account Open Access journal publishing in career assessments, putting pressure on publishers to promote self-archiving. Comments also argue that universities and research organisations should be mindful to actively foster Open Access in their structure.

As regards other means to freely disseminate research, the survey also shows that the Golden road has not yet made an inroad in the researcher's publishing practice. 71% of respondents did not answer the question relating to this theme. This may mean that they are not familiar with Open Access journals in their discipline and may not be very interested in them as assessment policies *de facto* foster publishing in commercial journals.

All in all, 11% of respondents reported having already deposited in Open Access journals. A breakdown by discipline should be analysed with caution due to the low response rate. However, it can be said that depositing in Open Access journals seems to make particular sense in the Life and Physical Sciences. This concurs with these disciplinary practices (see above) where some know about APCs and pay them.

Mentioning Open Access journals brought up many critical remarks about publishers' position in the academic workflow with, again, a confusion between Gold and Hybrid. Some comments also expressed worries about the scientific quality of these journals.

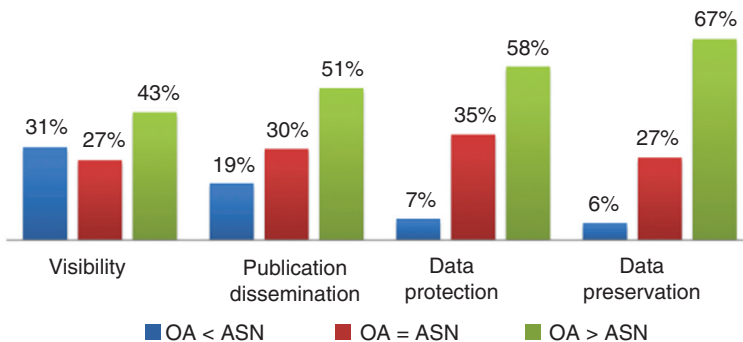
Beyond sharing publications, sharing data is becoming a relevant issue for researchers. Asked about the storage of their data, 83% of respondents keep them on their hard drive, and 40% use this as their sole storage solution. 22% mention data sharing sites (few cited sites: ArXiv, HAL, Github ...); It was the Social Sciences and Arts & Humanities who mentioned sharing their data most (at around 20%).

3.3. Academic Social Networks Versus Open Access? A Comparison of Perceptions

In the third part of this study we compare the perceptions of academic social networks and open access regarding four criteria: visibility, publication dissemination, data protection and data preservation. Figure 4 illustrates general results.

For all areas, Open Access sees the more positive responses. Open Access repositories seem to fulfil a legacy role, keeping access to data secure and preserved for the future. This long-term position is their main strength. For publication dissemination, Open Access is at an advantage. But as far as visibility

Fig. 4: General comparison of perceptions of academic social networks and open access repositories.

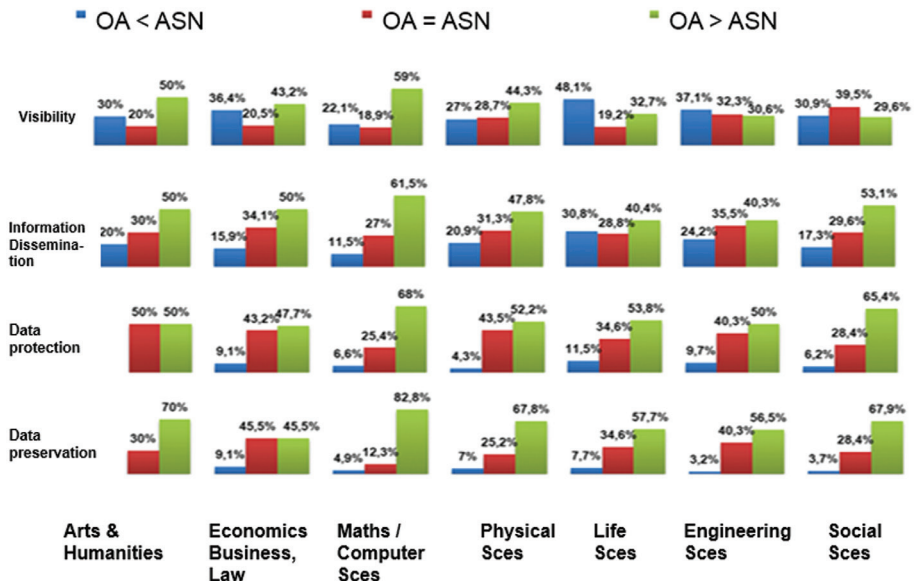


is concerned, Open Access is challenged by academic social networks in researchers' minds.

Breaking down these results by discipline, academic social networks already take the lead role on this issue in Life Sciences and Engineering Sciences, and are even with Open Access repositories in the Social Sciences (Figure 5). Apart from this, Open Access remains seen as more efficient than academic social networks.

The degree of conviction varies according to discipline: in Mathematics/Computer Sciences Open Access unquestionably outperforms networks, but in other disciplines, this perception is more mixed or differs in relation to the different criteria. In the Arts & Humanities and Economics/Business/Law, confidence in academic social networks for data protection and data preservation remains surprising given the lack of knowledge researchers in these domains have reported here about the policy of data usage for these networks.

Fig. 5 Comparison of perceptions of academic social networks and Open Access repositories by discipline.



Using the data of this study, we can divide researchers' perceptions into two main groups. The first one includes the disciplines that rely on Open Access processes to disseminate and freely share scientific output making complementary use of academic social networks. Mathematics and Computer Sciences concur exactly with this description, as do Physical Sciences though with a little less enthusiasm. Engineering Sciences are a step behind: even though they use Open Access, they use academic social networks to boost the visibility of their outputs. Life Sciences stay true to the practice of peer-review. This makes them pay more attention to the Golden road although they use networks for dissemination and to shop for new ideas.

The second group tends to make a larger use of academic social networks, i.e. for the Social Sciences, or in the Arts & Humanities. These groups use them to get updated about different subjects or to share data.

Economics/Business/Law find themselves in between these groups.

Accounting for this difference in perception is difficult today and would require complementary in-depth studies. However, as far as raising awareness about scientific outputs is concerned, it looks as though there have been two waves of involvement in Open Access. The earliest wave includes researchers from the Natural and Physical Sciences who have adopted Open Access repositories and it seems that these continue suiting globally their need for direct scientific communication. The development of new dedicated social tools does not seem, at least today, to seriously question this workflow. The latter group, generally made up of the Humanities and Social Sciences, report a clear interest in new ways of disseminating their work using academic social networks. They question the ability that Open Access repositories have to give their output the maximum visibility.

In answering this survey, researchers have left a hundred comments which allow us to conclude on what their dream tool for Open Science could be. These very comments show that for many researchers neither repositories nor academic social networks are completely satisfactory ways for promoting or sharing research. The ideal tool should be: national but also open to international usage, not used for assessment, using open technologies, user-friendly, covering the whole publishing process including peer-review, providing access to publications and data, offering various services (calendars of events, calls for papers, secure storage for research, forums, videoconferencing tools, etc.).

4. Conclusions

For the Couperin consortium, this survey has established a set of issues that librarians have to work on to locally increase awareness about Open Access among researchers. It is therefore important to push information about Open Access and particularly issues such as publishers' policies and IPR. Academic social networks could help reach those who favour the use of these tools. We must then support researchers by tailoring services designed to help them increase their visibility without infringing too much on their research time, by mediating deposit in multiple relevant repositories. For example, young researchers and PhD students must be targeted first to give them the keys to an easy navigation in a radically changing academic world and to draw a picture of what awaits. Even though we did not single out PhD students among the researchers, many of them answered this survey. It has been observed that junior researchers (under 39) deposit in Open Access and use academic social networks less than senior researchers.

Supporting Open Access in France would certainly be more efficient if action was taken on a national level. Researchers have expressed their views about this. A law on digital issues is currently being prepared by the Government, and it is hoped that it will include a clear policy in favour of the open and free dissemination of French research output.

The second lesson learnt from this survey is the clear complementarity between Open Access and academic social networks. The dream tool for Open Science described by researchers confirms this. Testimonies and thoughts shared on blogs or in conferences highlight the 'winning combination' of academic social media and research (Shepherd, 2014). Academic social media echoes research of the academic world more powerfully. This gives much food for thought to elaborate local strategies to help increase researchers' visibility.

However, this is an exploratory study, which produces an overview of the perception of researchers about academic social networks and Open Access. It would require further studies to gain a more precise insight on disciplinary bias. Differences were identified between disciplinary communities despite clustering them to make our analysis easier.³ It could also be interesting to make this survey again in a few years from now to trace possible evolutions,

as a result of the ever-changing landscape of communication and dissemination tools and perhaps as a mark of the effort made to promote the free dissemination of scientific French output on the Internet.

5. Acknowledgement

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Notes

¹ Geneviève Fioraso talk: <http://www.enseignementsup-recherche.gouv.fr/cid66992/discours-de-genevieve-fioraso-lors-des-5e-journees-open-access.html>. Retrieved August 4, 2015.

² Wojciechowska, A. (2006), p. 296. From 75% who reported depositing their publications in Open Access, 55% did it out of principle, whereas 25% due to the existence of self-archiving facilities.

³ Graziotin, D. (2014) conducted a local survey among Computer Science researchers and found that 'at least half of the participants never self-archived any paper in any possible form'. It is not clear whether this statement relates to a purely local situation or if it is more generally valid.