

# CONCORDIA OPEN SCIENCE WORKING GROUP

## RECOMMENDATIONS FOR FOSTERING OPEN SCIENCE AT CONCORDIA UNIVERSITY. APPENDIX: WORKSHOP METHODOLOGY AND UNABRIDGED ACCOUNT OF THE RESULTS

**DATE:** April 21, 2023

**Contributors:** Nicolás Alessandroni\*, Krista Byers-Heinlein\*, Zaki Alasmar, Ji Yae Bong, Joshua Chalifour, Danielle Dennie, Mathieu Dugré, Laia Fibla-Reixachs, Tristan Glatard, Rachel Harris, Aaron Johnson, Rassim Khelifa, Gregor Kos, Charlotte Moore, Pedro Peres-Neto, Melanie López Pérez, Erin Quirk, Andrea Sander-Montant, Paul Savary, Christopher Steele, Brian Vermeire, Madison Williams.

\*Nicolás Alessandroni and Krista Byers-Heinlein lead the Concordia Open Science Working Group.

### Table of contents

<b>Workshop Methodology</b> .....	<b>1</b>
<b>Unabridged Account of the Results</b> .....	<b>2</b>
Small-Group Discussions.....	2
Q1: How Would You Describe the Institutional Appetite and Readiness for Open Science Implementation and Research Assessment Reform at Concordia University?.....	2
Q2: What Are the Biggest Barriers to Implementing Open Science Practices and Building Research Assessment Capabilities? What Institutional Strengths Might You Build On?...	4
Q3: What New Reform Efforts or Goals Do You Think Will Have the Strongest Impact or Urgency?.....	8
Q4: What Are Concrete, Small, and Achievable Next Steps You Might Take To Promote Open Science and Research Assessment Reform at Concordia University?.....	9

## Workshop Methodology

On September 30, 2022, the Concordia Open Science Working Group held its first workshop, bringing together more than 20 faculty members, trainees, and students from 8 different units, including Psychology, Computer Science and Software Engineering, Chemistry and Biochemistry, Biology, Mechanical, Industrial, and Aerospace Engineering, Education, Communication Studies, and the Library. During the 4-hour workshop, participants shared a convivial lunch and worked in small groups to explore the challenges and opportunities of promoting open science at Concordia University. Using an adapted version of the [SPACE rubric workshop kit](#), a tool created by [DORA](#) to facilitate discussions about research assessment and open science practices at the institutional level<sup>1</sup>, participants were divided into small groups, each with one or two facilitators who were tasked with fostering the debate, keeping track of time, and capturing the most critical points of the discussion in an online document. The facilitators posed four key questions to the participants, guiding them toward a comprehensive understanding of the challenges and opportunities in promoting open science at Concordia:

- Q1: How would you describe the institutional appetite and readiness for open science implementation and research assessment reform at Concordia University?
- Q2: What are the biggest barriers to implementing open science practices and building research assessment capabilities? What institutional strengths might you build on?
- Q3: What new reform efforts or goals do you think will have the strongest impact or urgency?
- Q4: What are concrete, small, and achievable next steps you might take to promote open science and research assessment reform at Concordia University? (e.g., who needs to be involved; where are ideas already present and ready to test?)

Participants debated for 20 minutes on each of these questions. Small group discussions were followed by a plenary session in which each group shared its conclusions. This brought to light points of agreement and dissent among the groups and revealed a more accurate panorama of the state of open science at Concordia University. Finally, attendees were asked to complete an online survey indicating the current stage of development of open science at Concordia (i.e., foundation, expansion, and scaling) in each of the five dimensions covered by the SPACE rubric (i.e., standards for scholarship, process mechanics, accountability, institutional culture, and evaluation).

---

<sup>1</sup> Hatch, A., & Schmidt, R. (2021) *Rethinking research assessment: SPACE to evolve academic assessment*. DORA.

## Unabridged Account of the Results

### Small-Group Discussions

#### *Q1: How Would You Describe the Institutional Appetite and Readiness for Open Science Implementation and Research Assessment Reform at Concordia University?*

**Status of Open Science implementation at Concordia University.** Participants perceive Concordia University as taking its first steps in systematically implementing open science practices (see Figure 1). For instance, at the university, there are cases of researchers applying open science practices in their daily workflows. However, these are relatively few, and before the Open Science Working Group was formed, no place at the university gathered those interested in open science. Currently, there are some pockets of open science at Concordia that remain largely disconnected. Workshop participants agreed that there are at least two main reasons why raising awareness about the benefits of open science is urgent.

On the one hand, although national and local institutions (e.g., Tri-Agency; FRQ) are implementing open science mandates and policies, not all researchers are aware of open science. On the other hand, the concept of "open science" usually continues to be conflated with "open access," which does not capture the full breadth of open science practices. It is necessary to convey the multiple sides of open science and the practices each involves. Generating such open research culture will require the joint effort of students, faculty members, staff, and the administration team.

	FOUNDATION	EXPANSION	SCALING
<b>STANDARDS FOR SCHOLARSHIP</b> How are new definitions of “quality scholarship” formulated and applied? Do they take into account open science practices?	<b>ALIGNMENT</b> on values and goals	<b>DIVERSIFICATION</b> of standards	<b>ADOPTION</b> of new practices
<b>PROCESS MECHANICS / POLICIES</b> How are open science practices incorporated into review structures, processes, and institutional policies?	<b>DEBIASING</b> deliberative judgements	<b>CAPACITY</b> to support new activities	<b>INTEGRATION</b> into existing structures
<b>ACCOUNTABILITY</b> How are individuals held liable for executing open science practices and new research assessment standards?	<b>TRANSPARENCY</b> and clarity of goals	<b>ADHERENCE</b> through commitment	<b>PROACTIVITY</b> in engagement
<b>INSTITUTIONAL CULTURE</b> How are open science practices perceived and adopted within and outside of formal evaluation activities?	<b>INCLUSION</b> and access	<b>ADVOCACY</b> at institutional levels	<b>REFLEXIVITY</b> through reflection
<b>EVALUATION</b> How are intervention outcomes and progress toward institutional values captured and continually improved upon?	<b>ARTICULATION</b> of diverse indicators	<b>SYSTEMATIZATION</b> to gain consistency	<b>IMPROVEMENT</b> using feedback loops

Figure 1. Current status of open science implementation at Concordia University, as perceived by workshop participants.

**The Fundamental Role of the Library.** Participants agree that the Library has historically played an important role in raising awareness of open science and promoting some types of open science practices. In particular, the Library helps researchers better understand open access, preprint publishing, open licensing, open educational resources, and using open repositories. The Library has also been involved in developing open science solutions. For example, Spectrum—Concordia University's open repository—was an innovative project when created between 2006-2010. However, the repository has lost relevance over time because it remains unlinked to new infrastructures for implementing open science practices.

**Open Science at the Departmental Level.** On the departmental level, participants report that there has been no noticeable appetite for open science. As far as the participants recall, there have yet to be formal discussions on open science within their departments. This suggests that there may be a need for the administration to foster discussions. This seems particularly important in the current context, where students and postdocs have become increasingly interested in open science. Conversely, senior researchers may be relatively less interested in embracing open science practices due to the shift in mindset that open science demands,

although there has been increased discussion due to recent mandates from granting agencies. Open science is a cultural and behavioral change, implying a high cost in terms of time and effort on the part of the researchers.

**Differences Across Disciplines.** Participants report differences in how open science is conceived and implemented in different disciplines. For example, in computer science, the open-source software movement has had a considerable impact, so those researching the area are familiar with a tradition of sharing openly. This is only sometimes the case in other disciplines, such as psychology. Another case is people working in the humanities and arts, who do not always agree with being categorized as "scientists." A more inclusive term, such as "open scholarship" or "open research," is likely beneficial. The university must convey that an open scholarship culture benefits all, regardless of the discipline. Relatedly, there is no one-size-fits-all definition of open science. Concordia University should support spaces for researchers in different areas to define open science and find ways to implement open science practices according to, for example, the methods they use or the types of data they work with. For instance, people conducting research with humans are likely to hold unique concerns about data anonymity, and people working in the arts are likely to have questions about what, why, and how to share openly.

**Potential Challenges.** Participants are aware of researchers who hold concerns about specific open science practices. For example, some researchers fear being scooped when publishing open data, have concerns about sharing sensitive data, and are uncomfortable sharing publications as pre-prints before they are accepted for publication in journals. Building an open science community and discussing specific cases of open science implementation can be instrumental in alleviating fears and concerns.

***Q2: What Are the Biggest Barriers to Implementing Open Science Practices and Building Research Assessment Capabilities? What Institutional Strengths Might You Build On?***

**Barriers.** Workshop participants identified a set of barriers to implementing open science at Concordia University:

- There are currently no metrics to assess progress in implementing open science at the institution. As a result, the university has no systematic record of who is practicing open science and how they are doing it.
- Open science does not appear to be, at present, a key item on the agenda of the Office of Research or Provost Office. Many decisions about how science is done, including budget-related ones, are made in those offices.
- At the university, tenure and promotion policies do not routinely consider open science practices. This is not a Concordia-specific problem, but a large-scale one, associated with a much-needed change in research assessment. Nevertheless, other institutions have

begun to work towards evaluation guidelines that align with open science principles. That discussion has yet to start at Concordia.

- The university must develop systematic criteria for evaluating researchers' engagement with open science during the hiring process (e.g., how dissemination articles included in research dossiers will be considered), in line with open science policies being enacted by local and national institutions (e.g., [FRQ](#), [Tri-Agency](#)).
- Concordia University needs to invest more in the infrastructure that researchers need to implement open science sustainably, such as IITS. A clear example is long-term data storage. Open data (i.e., making raw data available and accessible to all) requires specific repositories to be developed or partnerships with existing solutions from third parties. Infrastructure requirements also vary from discipline to discipline. So far, there has been no survey of the infrastructure needs of the different departments. Another issue that requires more attention is the handling of sensitive data.
- Similarly, Concordia has yet to make a substantial investment in open science training. This is essential for all individuals to feel motivated and confident in adopting open workflows and open tools with which they are often unfamiliar (e.g., tools for creating data management plans or managing metadata). The lack of training results in open science implementation being a personal decision rather than an institutional commitment.
- Students at all levels usually show a marked interest in open science. However, they do not actively participate in open science advocacy efforts. This may be because they do not feel sufficiently empowered. There is a gap between students and administration that needs to be addressed. For example, students should sit at every table where decisions are made.
- One related problem is that students and trainees (e.g., postdoctoral fellows) who are strong open science advocates are not retained by the institution and leave Concordia upon completion of their studies or temporary contracts. The university should develop strategies to retain individuals with the knowledge and ability to drive change at the institution. In particular, the university does not currently support postdoctoral fellows sufficiently. This may be because Concordia was traditionally a teaching-oriented university. However, excellent research is now being done at the university, which must be accompanied by consistent practices and initiatives.
- Some aspects of open science are difficult to evaluate. For example, a researcher who shares hundreds of short and unchecked pieces of open software is not necessarily making a more valuable contribution than another researcher who shares a single open-source application that is extensively peer-validated. The same is true when considering preprints. One person may publish many preprints, a few of which are ultimately published in scientific journals. These cases show that adopting a quantitative approach to academic evaluation is inconvenient and that developing qualitative indicators is needed. Similarly, "open" does not always equal "good." For example, the

fact that a dataset or code script is openly available does not imply that it has been quality checked. One problem with open resources is that they are only sometimes curated or evaluated. This can negatively impact the quality of the research derived from such open resources.

- Researchers may have fears and concerns associated with open science. For instance, open science may be perceived as a hindrance to commercial research. Also, researchers may want to avoid going the open route for fear that others will discover errors in their work or because they prefer not to share their data and methods for fear of being scooped. In addition, practices such as pre-registration can be perceived as limiting research flexibility and possibilities for data analysis. Finally, other particular cases need to be considered. For instance, graduate students' involvement with open science might be severely limited if their supervisors disagree with open science.
- Concordia University is part of an ecosystem with other universities and institutions, among which there is some mobility. For example, researchers at Concordia may move to a position at another institution, where they will expect their academic achievements to be fully recognized. Thus, the development of open science at Concordia University will depend, in part, on the development of open science at other institutions. Currently, there is no local network of people interested in open science that brings together people from different institutions. This could penalize students and trainees who spend time engaging in open science practices without getting recognition outside Concordia.
- At Concordia University, there are little or no rewards for practicing open science. The university must develop and put into effect clear incentive structures that encourage researchers to devote their time and effort to open science.

**Strengths.** Despite barriers, participants agreed that Concordia University is poised to become a local leader in the implementation of open science due to a number of strengths:

- Concordia self-identifies as a [\*next-generation institution\*](#). Open science represents a substantial cultural shift in how research is done that is increasingly taking root in institutions in Canada and abroad. For example, discussions are no longer about the definition of open science or whether it is worth adopting but about how to implement it concretely. It is clear that open science is here to stay and will become increasingly important to scientific practice. Concordia can stay one step ahead of this change and be exemplary by developing open science policies today.
- Concordia University houses researchers knowledgeable in open science who currently implement open science and are linked to open science communities both locally and abroad (e.g., [The Neuro](#), [Douglas Research Centre](#), [DORA](#), [The Turing Way](#), [eLife](#)). These researchers can help drive change in the institution. Further adding to Concordia's capacity is that Dr. Krista Byers-Heinlein, professor in the Psychology department, holds the Concordia University Research Chair in Bilingualism and Open Science. Similarly,

Dr. Nicolas Alessandroni is a Concordia Horizon Postdoctoral Fellow specializing in "Open Science practice in infant research."

- Change in research practices will be achieved through a combination of top-down efforts, such as mandates and institutional policies, and bottom-up initiatives, such as building an open science grassroots community. The [Open Science @Concordia](#) conference in May 2022 and the subsequent establishment of the Concordia Open Science Working Group led by Dr. Byers-Heinlein and Dr. Alessandroni are essential steps toward building a comprehensive open science community at Concordia. The university should support the Open Science Working Group both politically and financially to spur the practice of open science further.
- Concordia is carrying out projects aligned with open science. These should be supported and amplified. For example, the Department of Psychology publishes the student-run and diamond open-access [Concordia Journal of Accessible Psychology](#) and [Concordia Journal of Psychology and Neuroscience](#), which publish student research papers. The Library also supports the creation of open educational resources, including [grant-funded open textbook projects](#), organizes events related to open science (e.g., [Open Access Week 2022](#)), and offers a repertoire of [digital scholarship resources](#) essential to open workflows (e.g., research data management and open data). The university should expand its support for Library-led initiatives.
- Departments at Concordia enjoy some autonomy in developing criteria for evaluating researchers and candidates during the hiring process. Although there is past experience with EDI (Equity, Diversity, and Inclusion), the same cannot be said for open science. Departments have a budget that can support open science initiatives (e.g., student awards, events, mini-grants).
- Concordia University is deeply interested in [experiential learning](#). The implementation of open science involves experiential learning (i.e., exploring open tools and workflows) and thus aligns well with previous efforts. Relatedly, open-science skills are increasingly in demand, both in academia and industry. Acquiring open-science know-how would provide students with better employment opportunities and allow them to lead change by example.
- Other institutions in Montréal, Québec, and Canada are actively working on developing open science communities. Now is the perfect time to strengthen ties with other institutions and foster collaboration. This could help secure funding to sustain the long-term implementation of open science.
- Local organizations such as [Calcul Québec](#) or the [Digital Research Alliance of Canada](#) offer services to researchers to help them transition to open science (e.g., storage and cloud services). Researchers at Concordia can leverage these resources.



***Q3: What New Reform Efforts or Goals Do You Think Will Have the Strongest Impact or Urgency?***

The initiatives that could have the greatest impact, according to workshop participants, are the following:

- Generate broad interest in open science across all offices and all levels at the institution. Create awareness of the benefits of open science, both generally and for different disciplines. Convey a clear message that open research workflows are becoming a requirement for funding by many institutions in Canada and worldwide. Researchers can rise to the challenge by embracing open science now.
- Support the Concordia Open Science Working Group to amplify advocacy for open science. Promote open science champions and mentors across departments and career levels.
- Create specific positions in open science. This could be done, for example, through a cluster hire. The university should also hire supporting staff to accompany researchers in their transition to open science.
- Create an open science observatory to describe, evaluate, and foster the development of an open culture at Concordia University.
- Incorporate open science in the criteria used for hiring, tenure, and promotion at the university. Discuss at length the concepts of "reputation" and "prestige", developing new incentive structures and guidelines for academic assessment. Include open science in the Concordia collective agreement.
- Concordia should recognize researchers who implement open science practices with funding or by reducing other workloads (i.e., teaching credits). This would signal that open science is a priority for the university.
- Publicize more widely what is happening at Concordia University concerning open science. This involves showcasing specific cases of open science implementation and the work the Open Science Working Group carries out.
- Provide researchers with financial support to publish in open-access journals charging APCs. While several Canadian institutions, including Concordia, can benefit from the [agreement signed by the Canadian Research Knowledge Network](#), the journals covered by this agreement are limited and may not meet the needs of researchers in all disciplines or include the journals in which researchers intend to publish.
- The university currently spends vast amounts of money on licenses for software that students will not be able to use once they finish their studies. Concordia should incentivize faculty members to enact the switch to open software by allocating them the money the university would otherwise spend on licenses so that they can use it for other purposes.
- Build open science into the curriculum to allow students to experiment with open workflows directly. For example, in Winter 2020, the Department of Psychology decided

to move away from the SPSS proprietary software and adopt JASP, an open-source statistics program. Similarly, Dr. Gregor Kos decided to use R for a statistical modeling course, even though Matlab was perceived as the standard for some people. Departments and faculty members can make similar decisions to gradually introduce open-science practices and tools (e.g., pre-registration). Additionally, Concordia should facilitate a specific course on open science.

- Create opportunities to expand the implementation of citizen science. This links to previous initiatives such as "[Embrace the city, embrace the world](#)" or the work of the [engAGE Living Lab Créatif](#) based on the community-defined evidence framework (e.g., "[Meet me at the mall](#)" project).

***Q4: What Are Concrete, Small, and Achievable Next Steps You Might Take To Promote Open Science and Research Assessment Reform at Concordia University?***

Participants identified the following concrete actions that can be taken immediately:

- Raise awareness of open science. Contact faculty members to communicate the urgency of implementing open science. Incorporate them into the Open Science Working Group. Generate more open science events (i.e., workshops and meetings) and produce new reports with concrete recommendations to expand open science policies in the institution.
- Generate more open science training possibilities (e.g., moodle learning module, seminar series). Contact [GradProSkills](#)—Concordia's Graduate & Professional Skills program—to collaborate with this task.
- Create a communication channel to disseminate open science news and provide quick support to researchers (e.g., how to implement a particular open science practice).
- Write a letter to the Vice President of Research requesting a meeting to express the need to develop strategies in favor of open science.
- Contact departments to designate a liaison person to facilitate access to information and support people when they have questions or concerns related to open science.
- Contact potential donors who wish to support Concordia's transition to being a fully open institution (e.g., through [Concordia University Advancement](#)).
- Discuss with relevant authorities the need for hiring people to work permanently in open science. Evaluate the plausibility of a cluster hire of at least four people (e.g., three faculty and one librarian).
- Create a communication strategy to showcase the work of researchers who apply open science in their daily workflows—for example, designating the open science person of the month/year.
- Generate a survey to understand what infrastructure Concordia needs to implement open science practices. Contact institutions that offer infrastructure solutions. Estimate a budget to create or contract the required infrastructure.

- Generate opportunities to discuss new hiring, tenure, and promotion policies within departments and the Concordia University Faculty Association. These policies should value open science contributions (e.g., open datasets, open materials, delivering open science workshops and courses) on par with other scientific outcomes (e.g., articles in indexed journals).
- Incentivize faculty members to introduce open science in the courses they teach. Doing this will help students realize that implementing open science practices is necessary and urgent in the current context.
- Discuss with the people in charge of IT solutions at the university how to transition to open-source software to reduce costs in expensive licenses. Develop guidelines for using open-source software, which can sometimes be less intuitive than their proprietary counterparts.
- Extend the use of renewable assignments, a strategy already being implemented at Concordia University by [Dr. Ji Yae Bong and her students](#). Renewable assignments are resources students produce during a course that are useful beyond the classroom. Renewable assignments are openly licensed and can be reused by anyone. In this way, renewable assignments achieve a broader social impact. For example, students taking an Instructional Design/Human Performance Technology course can develop a learning program as their semester-long course project. We could invite students to create open educational resources about open science that can be shared widely with the Concordia University community.