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# Researcher Perspectives on Obstacles and Facilitators of Open Scholarship at a Canadian University

## Les perspectives des chercheurs sur les obstacles et les facilitateurs de l'érudition ouverte dans une université canadienne

Melissa A. Rothfus , Lachlan MacLeod, Louise Gillis and Erin MacPherson

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### Article abstract

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During the three-week period the survey was active, 131 surveys were begun. As incomplete surveys were excluded from data analysis, the total analyzed sample size was 98. Descriptive analysis was conducted, as the number of responses was not representative of the Dalhousie University population.

Most responses were from faculty, specifically in the Faculty of Medicine, followed by the Faculties of Science and Health. The majority of respondents reported sharing some type of scholarly output, though this varied by discipline and by material type. Informal sharing mechanisms were reported more frequently than formal repositories or publisher sites. Obstacles to open scholarship practices that were identified included concerns about investments of time, money, and education as well as concerns about institutional support and recognition. While many supports for open scholarship are available, there is a need to increase awareness.

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Melissa A. Rothfus  
Scholarly Communications Librarian  
Dalhousie University  
[melissa.rothfus@dal.ca](mailto:melissa.rothfus@dal.ca)

Lachlan MacLeod  
Intellectual Property Officer  
Dalhousie University  
[lachlan.macleod@dal.ca](mailto:lachlan.macleod@dal.ca)

Louise Gillis  
Research Data Management Librarian  
Dalhousie University  
[louise.gillis@dal.ca](mailto:louise.gillis@dal.ca)

Erin MacPherson  
Research & Instruction Librarian  
Dalhousie University  
[erin.macpherson@dal.ca](mailto:erin.macpherson@dal.ca)

### ***Abstract / Résumé***

In 2022, researchers at Dalhousie University were surveyed to assess their understanding and practice of open scholarship. The survey was designed to answer these primary questions: what are Dalhousie University researchers' existing practices and levels of knowledge regarding open scholarship, and what is their awareness and

perception of institutional support for open practices? Participants were recruited through direct email, blog posts, and newsletters from the Dalhousie Libraries, Faculty of Graduate Studies, Office of Research Services, and offices of the Associate Deans of Research.

During the three-week period the survey was active, 131 surveys were begun. As incomplete surveys were excluded from data analysis, the total analyzed sample size was 98. Descriptive analysis was conducted, as the number of responses was not representative of the Dalhousie University population.

Most responses were from faculty, specifically in the Faculty of Medicine, followed by the Faculties of Science and Health. The majority of respondents reported sharing some type of scholarly output, though this varied by discipline and by material type. Informal sharing mechanisms were reported more frequently than formal repositories or publisher sites. Obstacles to open scholarship practices that were identified included concerns about investments of time, money, and education as well as concerns about institutional support and recognition. While many supports for open scholarship are available, there is a need to increase awareness.

En 2022, les chercheurs de l'Université Dalhousie ont été sondés pour évaluer leur compréhension et leurs pratiques quant à l'érudition ouverte. Le sondage était développé pour répondre à ces questions principales : quelles sont les pratiques courantes et le niveau de connaissance des chercheurs de l'Université Dalhousie concernant l'érudition ouverte et quelles sont leur prise de conscience et leur perception du soutien institutionnel pour les pratiques ouvertes? Les participants ont été recrutés par courriel, via des billets de blogue et des bulletins d'information provenant des Bibliothèques Dalhousie, de la Faculté des études supérieures, du Bureau des services à la recherche et des bureaux des vice-doyens à la recherche.

Au cours de la période de trois semaines pendant laquelle le sondage était disponible, 131 sondages ont été commencés. Parce que les sondages incomplets ont été exclus de l'analyse des données, l'échantillon total analysé comptait 98. Une analyse descriptive a été faite, car le nombre de réponses n'était pas représentatif de la population de l'Université Dalhousie.

La plupart des réponses provenaient des chercheurs, particulièrement ceux de la Faculté de médecine, suivi des facultés de sciences et de santé. La majorité des répondants ont déclaré partager un certain type de résultats de recherche, bien que cela varie en fonction de la discipline et du type de matériel. Les mécanismes de partage informels ont été signalés plus fréquemment que les dépôts formels ou les sites de maisons d'édition. Des obstacles quant aux pratiques d'érudition ouverte qui ont été identifiés comprennent des enjeux liés à l'investissement du temps, de l'argent et de l'éducation ainsi que des enjeux liés au soutien et à la reconnaissance institutionnels. Quoique plusieurs soutiens pour l'érudition ouverte soient disponibles, il y a un besoin de sensibiliser davantage.

## **Keywords / Mots-clés**

open scholarship, open access, open research, open data, journal publishing, researcher attitudes; érudition ouverte, libre accès, recherche ouverte, données ouvertes, publication savante, attitudes des chercheurs

## **Introduction**

In 2021, the United Nations Educational, Scientific and Cultural Organization (UNESCO) released their Recommendation on Open Science, with the aims of “reducing the digital, technological and knowledge divides existing between and within countries” (p. 6). Toward a similar purpose, the Government of Canada and its three major research funding bodies, the Tri-Agency, have open access (OA) and research data management (RDM) policies for their funding (Government of Canada, 2016, 2021). These actions are part of worldwide initiatives supporting open scholarship practices and promoting them in new, formal ways.

Open scholarship, as defined by the University of British Columbia’s Program for Open Scholarship and Education (2020) is “an umbrella term which encompasses open access, open research, open science, open data, open education, open pedagogy and all other forms of openness in the scholarly and research environment” (para. 3). Open scholarship can contribute to lower academic resource costs, higher dissemination of research outputs such as publications and data, improved access, long-term preservation, and improved reproducibility with reduced duplication, among other benefits (Burgos & Tlili, 2020; Chawinga & Zinn, 2019; Government of Canada, 2022; Mischo & Schlembach, 2011; Siler, 2017; Tan, 2016; Toribio-Flórez et al., 2021; van Gend & Zuiderwijk, 2022).

However, while libraries energetically promote open scholarship practices, academic authors work in an environment and system of rewards that does not necessarily prioritize them (McDonald et al., 2016; Nicholas et al., 2019). Are researchers practicing open scholarship? How do they perceive openness? Where are researchers running into stumbling blocks, and what training is needed to help them? To provide useful user focused training and support, librarians must understand current practices and the factors that influence researchers’ decision-making with respect to open scholarship.

With an eye towards obtaining updated data in a Canadian context and addressing a gap in understanding at our specific institution, our research focused on Dalhousie University researchers. Dalhousie is located in Atlantic Canada and is a U15 institution with 13 academic faculties offering more than 200 degree programs (Dalhousie University, n.d.). Dalhousie provides a range of services to researchers related to open scholarship practices. These services include access and support for a data repository ([Borealis: The Canadian Dataverse Repository](#)) and an institutional repository ([DalSpace](#)). They also include information resources such as Research Guides on a variety of topics including OA ([Dalhousie Libraries Open Access Guide](#)) and RDM ([Dalhousie Libraries Research Data Management Guide](#)) as well as education and

guidance on open scholarship topics through consultations, in-class guest lectures, and library-hosted events and presentations for the community at large. To gain better understanding of their current state of knowledge and perceived support around open scholarship practices, we conducted an online survey of Dalhousie researchers in February 2022. The survey was designed to address two primary research questions: 1) what are Dalhousie University researchers' existing practices and levels of knowledge regarding open scholarship; and 2) what is their awareness and perception of institutional support for open practices?

Because open scholarship is such a broad concept, we narrowed our focus to topics and issues of particular interest to us and our circumstances as librarians providing researcher support. These are a) OA publication; b) RDM and data sharing; c) preprint sharing; and d) training and supports. These issues were selected because they align with existing library services and can provide depth of data on issues related to policies from Canada's biggest funding body, the Tri-Agency, while keeping the survey a reasonable length (projected to take 15-20 minutes, based on testing). This research proceeded with the objectives of providing data on open scholarship, including identifying gaps in infrastructure and education; providing support for strategic direction and policy development; and providing information to the broader Canadian and International academic community on general open scholarship attitudes and practices and potential directions for future investigation. Existing literature largely focuses on specific disciplines and fields of study, singular forms of open scholarship, or non-Canadian institutions. Our paper contributes to the body of evidence by providing an updated look into issues related to two Canadian federal funder policies from a broad range of disciplines within a single university community. This paper presents the key results from the survey. A fully cleaned and de-identified dataset for the survey is available in Borealis, the Canadian data repository: <https://doi.org/10.5683/SP3/VWDVSB>.

## ***Literature Review***

### **Understanding and Practice of Open Scholarship**

#### ***Open Access***

A relatively early international survey that specifically considered author attitudes towards OA publishing found that in addition to considerable differences in beliefs and practice across disciplines, there were also gaps in knowledge and understanding, even among experienced authors (Nicholas et al., 2005). Given the efforts to provide education, incentives, and support for open scholarship in general and OA in particular, one might anticipate growing understanding and changed practices, but it is not clear how successful these efforts have been. Though awareness of OA among other areas of open scholarship appears to be growing, investigation of faculty understanding of OA reveals ongoing misconceptions and gaps of understanding (Halevi & Walsh, 2021; Lusk et al., 2022). Arthur et al. (2021) identified several points of misunderstanding as barriers to open scholarship, including lack of awareness of the FAIR (Findable,

Accessible, Interoperable, and Reusable) Guiding Principles for Scientific Data Management and Stewardship (Wilkinson et al., 2016) and possible platforms for open publication. Even in studies where self-reported awareness was high, responses revealed that this awareness lacked detailed knowledge and included mistaken beliefs (Coonin, 2011; Gaines, 2015; Rodriguez, 2014; Yang, Z. E. & Li, Y., 2015). Previous studies have also identified differences between reported attitudes and actual practices, with researchers more likely to indicate an appreciation of the value of OA than to act on OA practices, highlighting the presence of external factors in decision-making (Lwoga & Questier, 2015; McDonald et al., 2016).

There are multiple paths to OA of publications, with some coming at considerable financial cost to researchers in the form of high article/author processing charges (APCs), while others, such as green open access or self-archiving in repositories, come at no charge. However, awareness and understanding of these options is uneven. Previous studies have found low interest in depositing work in repositories, even among faculty who are supportive of OA in principle (Msomphora, 2019; Tmava, 2023). Awareness of repositories or institutional policies that promote repository deposits does not necessarily correlate with use (Serrano-Vicente et al., 2016). Reasons for not depositing in an institutional repository include ignorance of editorial policies, time constraints, and not knowing how to make the deposit (Serrano-Vicente et al., 2016). Lack of understanding of the benefits of open scholarship can mean that self-archiving “has often been perceived as a cumbersome administrative requirement rather than a way of making...work freely available online” (Arthur et al., 2021, p. 805). At the same time, researchers do sometimes choose to engage in social media to upload and share research products (Berezko et al., 2021).

Several challenges to publishing in OA journals have been identified, such as the cost of APCs, fear of predatory journals, and potential for greater criticism or plagiarism from a broader readership (Nicholas et al., 2019; Togia & Korobili, 2014). The relative impact of these challenges can vary considerably according to local circumstances. While an appreciation for the visibility, shareability, and accessibility of published work has been identified as an incentive to publish OA for authors, other concerns may trump an inclination to make work OA, such as the impact factor (Berezko et al., 2021), perceived quality or prestige of a journal, appropriate fit for the study type and subject matter, and speed of publication (Dalton et al., 2020; Elsevier Connect, 2022; Nature Research, 2015; Research & Analytics, Taylor & Francis, 2019).

In Canada, a 2015 survey of two Ontario universities on OA publishing found that attitudes and practices varied across disciplines. Additionally, the survey demonstrated that while researchers may accept the idea that broad access is a good idea, it is not a priority when making publishing decisions. Instead, a theme that emerged was “the endurance of disciplinary culture and publishing traditions that influence tenure, funding decisions and other career rewards” (McDonald et al., 2016, p. 16). Concern about the perceived value of OA publications is validated by Alperin et al. (2019), whose survey of tenure and promotion guidelines from North American institutions found very few that mentioned OA, and those which did contained words of caution. At best, this survey

suggests indifference to the benefits of OA publishing and at worst, conflation of OA and predatory publishing with diminished value attached to those works.

### ***Research Data Management and Data Sharing***

Interest in RDM and data sharing practices have emerged more recently than OA publishing, though the RDM and data sharing literature has expanded rapidly (Yun et al., 2018). Previous studies, including a broadly focused 2019 systematic review by Chawinga & Zinn (2019) have shown that researchers have a number of reservations about data sharing. A key theme among these is lack of time for data management practices (Chawinga & Zinn, 2019; Nicholas et al., 2019). Additional concerns include intentions to use the data for further study and publication or fear of seeing someone else benefit from the data at their expense (Ali-Khan et al., 2017; Borghi & Van Gulick, 2018; Milewska et al., 2022; Nicholas et al., 2019; Stieglitz et al., 2020). Researchers also have concerns about misuse or misinterpretation of data by those without sufficient background (Chawinga & Zinn, 2019; Nicholas et al., 2019). Data sharing comes with logistical considerations that researchers identified as obstacles, including determining the legality of sharing or obtaining appropriate permission, finding appropriate media or platforms for sharing, and preparation of data for sharing (Milewska et al., 2022).

Nevertheless, there is recognition of the benefits of RDM and data sharing. Stieglitz et al. (2020) reported from their survey of German researchers that a majority appreciate open data so long as the perceived advantages outweigh the perceived disadvantages. A Polish study found that medical researchers identified many possible benefits to data sharing, though they also reported a lack of sharing their own data (Milewska et al., 2022). A Canadian study based on one institution found that researchers believed data sharing had the potential to help advance their careers if it was shared once they no longer expected to use it (Ali-Khan et al., 2017). A study of the data sharing practices of ecology and evolution faculty at twenty Canadian universities found that reported benefits of sharing data exceeded reported costs, which suggests that researchers' perceived disadvantages or disincentives to share data that were reported in previous literature may lack foundation (Soeharjono & Roche, 2021).

### ***Preprints***

Researchers may engage in open scholarship in a variety of ways beyond OA publishing and data sharing—forms of open scholarship that are most often covered by policies and mandates from academic institutions or funders. One practice that has gained attention recently is the posting of preprints or manuscripts intended for formal publication that have not yet undergone peer review. In the wake of the Covid-19 pandemic, knowledge and use of preprints and preprint repositories expanded greatly, particularly in the fields of medicine and health (Kodvanj et al., 2022; Rzayeva et al., 2023; Sarkis-Onofre et al., 2023). This is not to say the sharing of preprints is new; some smaller disciplines, such as high-energy physics, which has a deeply established culture of international collaboration, have been sharing preprints for decades (Kreitz et al., 1997).

A significant appeal of sharing preprints is the speed at which preprints can disseminate information for more immediate impact on the research community and beyond. Preprints can also provide researchers with the opportunity to increase the accessibility of their work and to gain feedback on their work prior to formal publication (Chiarelli et al., 2019; Ide & Nakayama, 2023; Rzayeva et al., 2023; Sarkis-Onofre et al., 2023). Nevertheless, there are questions as to whether preprint sharing is advisable. Concerns about the reliability of information in preprints and the potential harm that could be caused by widespread distribution of poor research and misinformation stifles some interest in participating in the practice (Chiarelli et al., 2019; Ide & Nakayama, 2023). Another obstacle noted in the literature is a lack of knowledge about the process (Sarkis-Onofre et al., 2023).

## **Training and Supports**

An obstacle to participation in many open scholarship practices is lack of full understanding on why or how to engage in them. For example, some of the challenges associated with data sharing, such as the legality of sharing, indicate a lack of knowledge or investment in RDM. Though sound RDM does not require sharing of data, appropriate sharing of data cannot happen without careful RDM. Yet, the literature indicates that training in data management is often informal, and researchers may have minimal knowledge of and interaction with their institutional supports (Borghini & Van Gulick, 2018). A recent American study reports that graduate students identify self-learning as their primary means of RDM training while library services, though available, were among the lowest-ranked resources (Pasek & Mayer, 2019).

Formal training or education on open scholarship is rare, particularly instances that consider the full spectrum of open scholarship principles and practices in a holistic way. One recent and novel example comes from the University of British Columbia with a series of open science modules in an undergraduate course on open science. The course includes scholarly communications elements integrated into open science more broadly (Hanna et al., 2021). Another recent example, also Canadian, is a curriculum developed by a librarian for integration into an undergraduate course (Read et al., 2022). Without well-established curricula in place, education and training has tended to be informal, partial, and/or ad hoc (Borghini & Van Gulick, 2018; Pasek & Mayer, 2019).

Despite challenges, real or perceived, one key take-away from the existing literature is that academic libraries are well positioned to serve as the primary locus for the implementation, training, and support for open scholarship initiatives (Mack, 2020; Reinsfelder & Anderson, 2013). Certainly, that has been the case with respect to OA publishing specifically, where librarians are “seen as having the greatest decision-making influence when it comes to implementing open access, [while] Publishers [are] the only group perceived as having a negative influence on the adoption of open access” (Reinsfelder & Anderson, 2013, p. 484). A recent study of the publishing habits of librarians at fifteen Canadian universities found robust evidence of commitment to OA publishing principles and practices, demonstrating that librarians are practicing what they preach and are positioned to lead by example (Tummon & Desmeules, 2022). With



respect to RDM, library supports have been spurred by policies requiring data management plans and data deposit, though the degree to which libraries bear responsibility varies from institution to institution (Tzanova et al., 2020). In all cases, these supports, however robust, can be hampered by a lack of integration with policies and sufficient funding (Arthur et al., 2021).

## **Methods**

This research project employed a survey as the primary research instrument, drawing on related surveys developed in other contexts. These include the Beprexit survey from the University of Pennsylvania that focused on scholarly communications practices (Wipperman, 2017) and the Swinburne Open Science Survey (Beaudry et al., 2019). The survey was administered using Opinio Survey software. Cleaning, analysis, and de-identification of data was conducted in SPSS statistical software.

Prior to administering the survey, approval was obtained from the Dalhousie University Social Sciences and Humanities Research Ethics Board (REB # 2021-5866). The draft survey was reviewed and tested by researchers from multiple faculties to identify points of confusion or errors. The full survey instrument is available in Appendix A.

The target population was faculty and graduate students at Dalhousie University who conduct research. Recruitment was sought through a variety of means. Promotional assistance through direct email was provided by the offices of the Associate Deans of Research of all academic units and liaison librarians. Blog posts and newsletters from Dalhousie University, Dalhousie Libraries, the Office of Research Services and the Faculty of Graduate Studies Office were also used to advertise the survey and share the link. Survey respondents were not asked to provide identifying information, though filtering questions at the beginning of the survey ensured collected data came from our population of interest. Data collection continued for a period of three weeks. Per the participation consent form that was approved by the Research Ethics Board, respondents could withdraw from the survey by closing it at any point before completion, and incomplete surveys were not included in the data analysis.

The definition of open scholarship provided in the survey was, “practices that facilitate the accessibility of materials that are created as part of the process or outcome of research. This means such materials can be openly found on the internet and copied or used with no or minimal restriction. Open Scholarship can be understood as a broad, umbrella term that encompasses other ‘open’ practices or tools, including but not limited to OA publishing or open data sharing.” The authors included in the definition “no or minimal restriction” for the sake of inclusivity, to acknowledge knowledge seekers with limited technological access. Because we were uncertain about the state of survey respondents’ knowledge and were interested in respondents’ practices, the survey included options for sharing that would not fall under a formal definition of open scholarship. For example, sharing by email on request or using ResearchGate could also facilitate accessibility while not being formally recognized open scholarship channels. ResearchGate, a social media site that requires registration to post content

and offers no promise of stable access, is a popular platform among researchers in general, so we were interested in understanding how it is used compared with truly open platforms.

## **Results**

### **Demographics**

One hundred thirty-one respondents responded to the survey invitations. Six respondents were filtered out after the second question, “Please choose one of the following to indicate your affiliation at Dalhousie University.” This question was intended to identify members of the Dalhousie community who conduct research as part of their professional activities. It was mandatory, and non-responses ended the survey. In total, 98 completed surveys were included in the analysis; incomplete surveys and failure to submit the survey after the final question constituted withdrawal of consent.

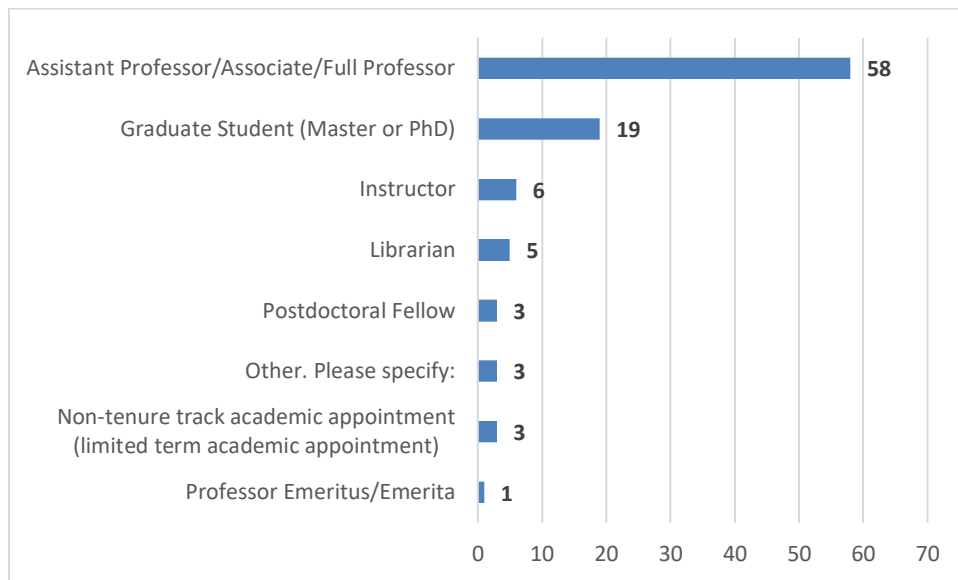
The number of responses combined with the convenience sampling method mean that this sample is not representative of the broader Dalhousie University population, so analysis has been limited to descriptive methods over inferential statistics.

It is difficult to know the exact research population of Dalhousie University. At the time of the survey, Dalhousie University had roughly 2,200 regular faculty, including unionized faculty, part-time faculty, and medicine faculty associated with the local hospitals (but not in the faculty union). Dalhousie University also had roughly 3,800 graduate students in 2022. However, not all these potential participants conduct research.

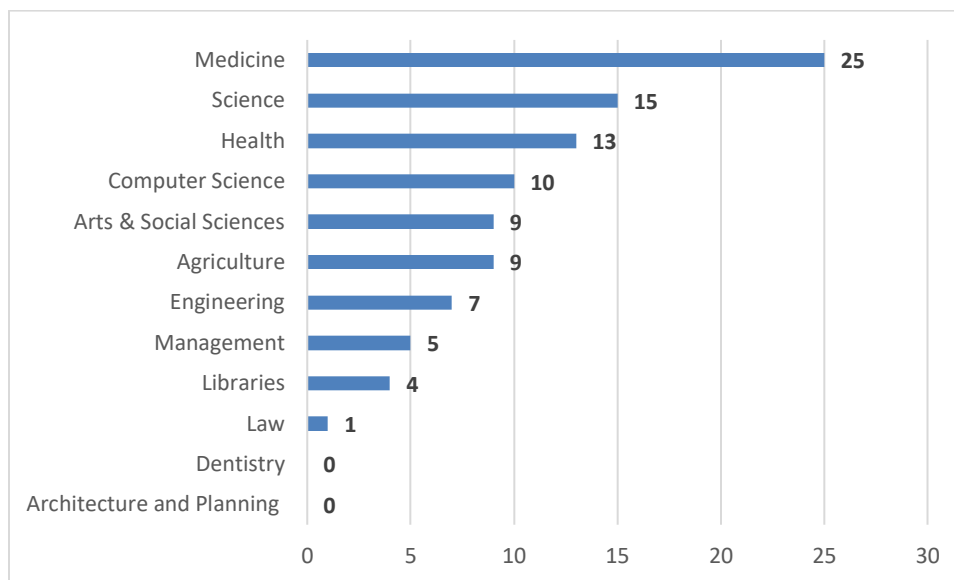
Figure 1 illustrates the distribution of survey respondents by role. Our sample of respondents was skewed towards faculty (58/98 respondents), and likely under-represented graduate student and post-doctoral researchers. Most respondents were professors of any rank, with graduate students as the next largest group.

## Figure 1

*Number of Respondents by Role*



The Faculty of Medicine had the highest number of respondents with 25 followed by Science (15) and Health (13). Medicine, Science and Health were also the top three faculties by number of principal investigators (PIs) in the overall sample as seen in Figure 2.

**Figure 2***Number of Respondents by Faculty***Researchers' Understanding and Practice of Open Scholarship**

Almost every survey respondent reported sharing some output of their work, except two respondents from Medicine and one from Engineering. Figure 3 illustrates the scholarly sharing by type of material, with any type of journal articles (including post-prints or pre-prints) being created by 94 of 98 respondents and shared the most frequently (95%). Of the respondents who stated they wrote articles, 18 shared preprints (19%) and 17 shared post-prints (18%). For the next-most frequent type of scholarship, 52 respondents created reports and 28 (52%) of these respondents shared their reports openly. Some output, like creative works, were produced infrequently but shared at a high rate (86% of 7 ( $n = 6$ ) of respondents shared their creative works).

**Figure 3**

*Types of Scholarly Works Produced and Whether Shared*

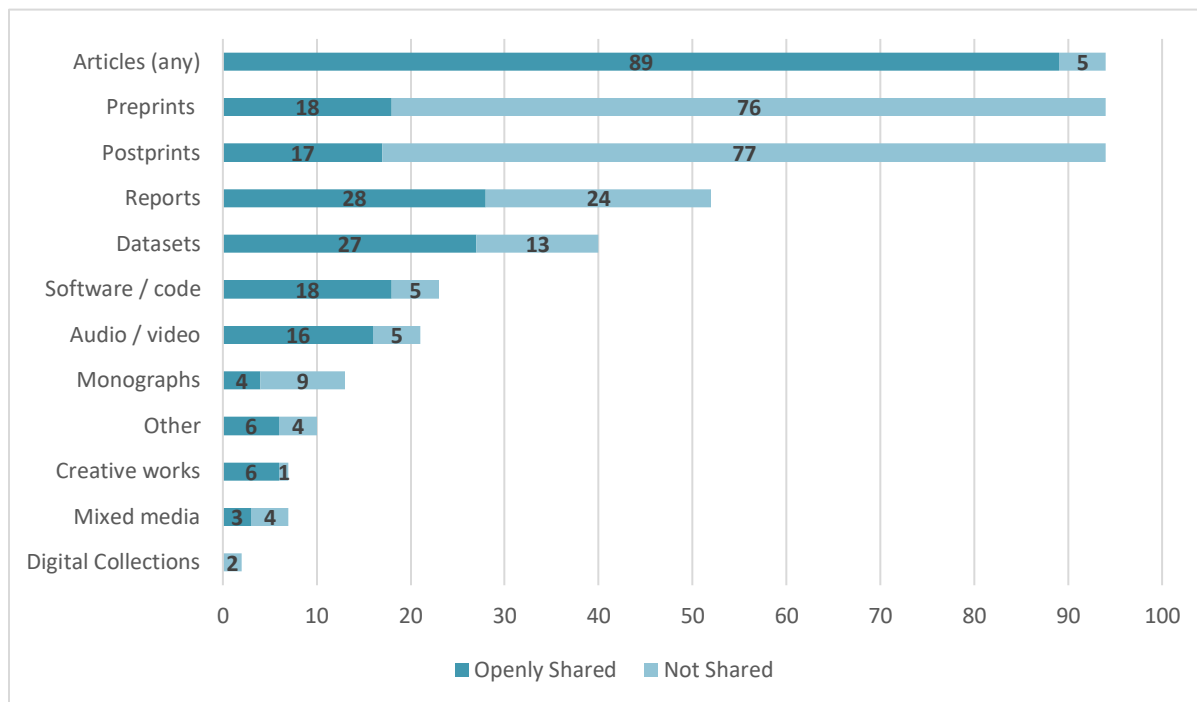


Figure 4 illustrates the level of importance for respondents' work to be available to various groups. Of 98 respondents, the highest number (88) indicated it was very important for their work to be openly available to researchers in their field, followed by practitioners/professionals (50) and policy makers (47). Conversely, the highest number of respondents indicated it was not important for work to be openly available to students who are in grade 12 and under (43).

**Figure 4**

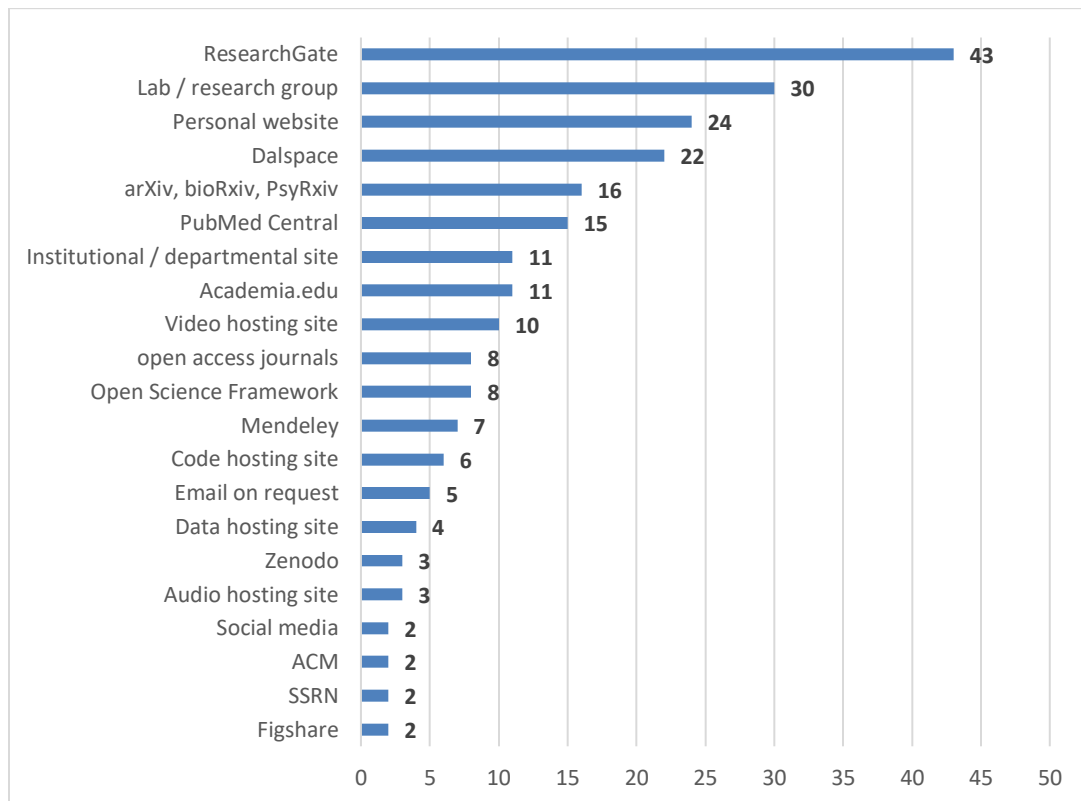
*Intended Audience for Open Scholarship*

| How important is it for your work to be openly available to... | Very important | Moderately important | Somewhat important | Not important |
|--|----------------|----------------------|--------------------|---------------|
| Researchers in your field                                      | 88             | 7                    | 1                  | 1             |
| Practitioners / professionals                                  | 50             | 27                   | 14                 | 6             |
| Policy makers  | 47             | 26                   | 16                 | 8             |
| Students - higher education                                    | 45             | 34                   | 12                 | 6             |
| Researchers in other fields                                    | 39             | 42                   | 13                 | 2             |
| General public   | 30             | 36                   | 21                 | 10            |
| Journalists / media  | 28             | 30                   | 30                 | 9             |
| Students - grade 12 and younger                                | 15             | 9                    | 30                 | 43            |

The most popular platform for sharing work was ResearchGate, a commercial, academic-social media platform that, though it does not meet the criteria to fulfill the principles of open scholarship, was used by 43 respondents. The next most common methods of sharing were sharing within a lab/research group or through a personal website, followed by DalSpace, the Dalhousie University institutional repository. Figure 5 illustrates platforms used to share scholarship, regardless of whether they meet a formal definition of open scholarship.

## Figure 5

### *Platforms Used to Share Scholarship*

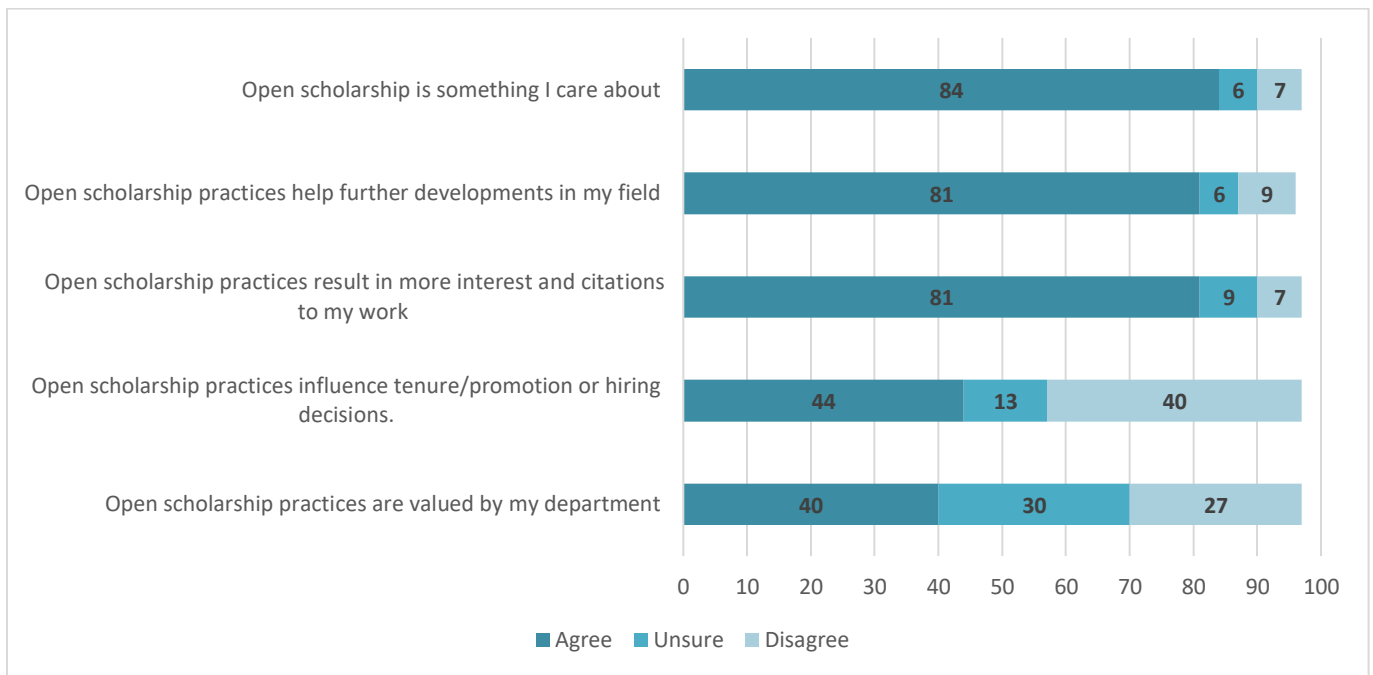


Note. Categories with one or no responses are excluded from the figure.

Eighty-four ( $n = 97$ ) respondents (87%) reported open scholarship was something they cared about. Eighty-one ( $n = 96$ ) respondents (84%) also felt open scholarship helped developments in their field and result in more interest and citations for their work (Figure 6).

**Figure 6**

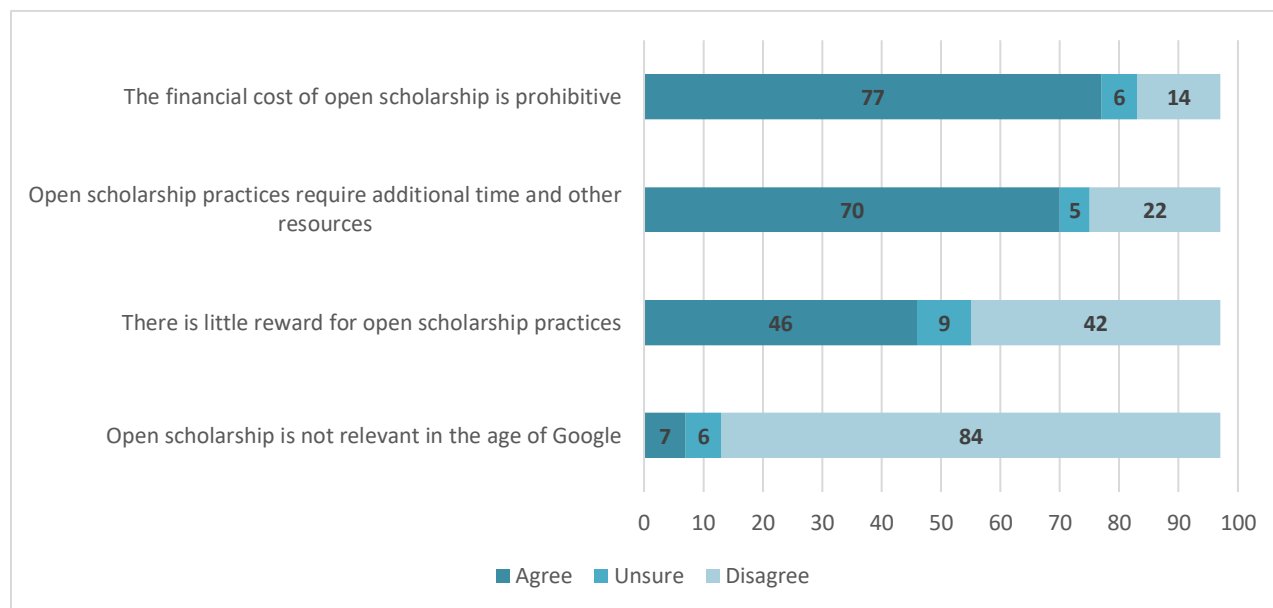
*Perceptions of Open Scholarship*



Time and cost were major issues with open scholarship for respondents. Seventy-seven ( $n = 97$ ) respondents (79%) felt the financial cost of open scholarship is prohibitive and 70 ( $n = 97$ ) respondents (72%) found open scholarship takes additional time and resources (Figure 7).

## Figure 7

### *Disincentives to Open Scholarship*



### **Open Access**

As shown in Figure 5, responses suggest that informal platforms that do not offer long-term stability of access are used more frequently than formal repositories or publisher sites. This gap is likely larger than this estimate, as respondents selecting options like “audio-hosting site” or “video-hosting site” may be using unstable, private platforms like YouTube or similar.

When asked, “How much do you agree that the following are barriers to the uptake of open scholarship practices,” 78 ( $n = 96$ ) respondents (81%) agreed that APCs were a barrier to OA publication as they do not have the funds to pay (Figure 8). The burden of APCs was also mentioned in free text responses:

If I published a paper in an open-access journal, I would be spending precious grant money that could otherwise be spent on student support, research materials, etc. That would shortchange our trainees as well as our funding agencies who entrusted us with the funding to do the research. Right now, spending research funds wisely means publishing in regular paywall (closed-access) journals, as they assume the full cost of publishing. That way, we can support more students, do more research and deliver better value overall.

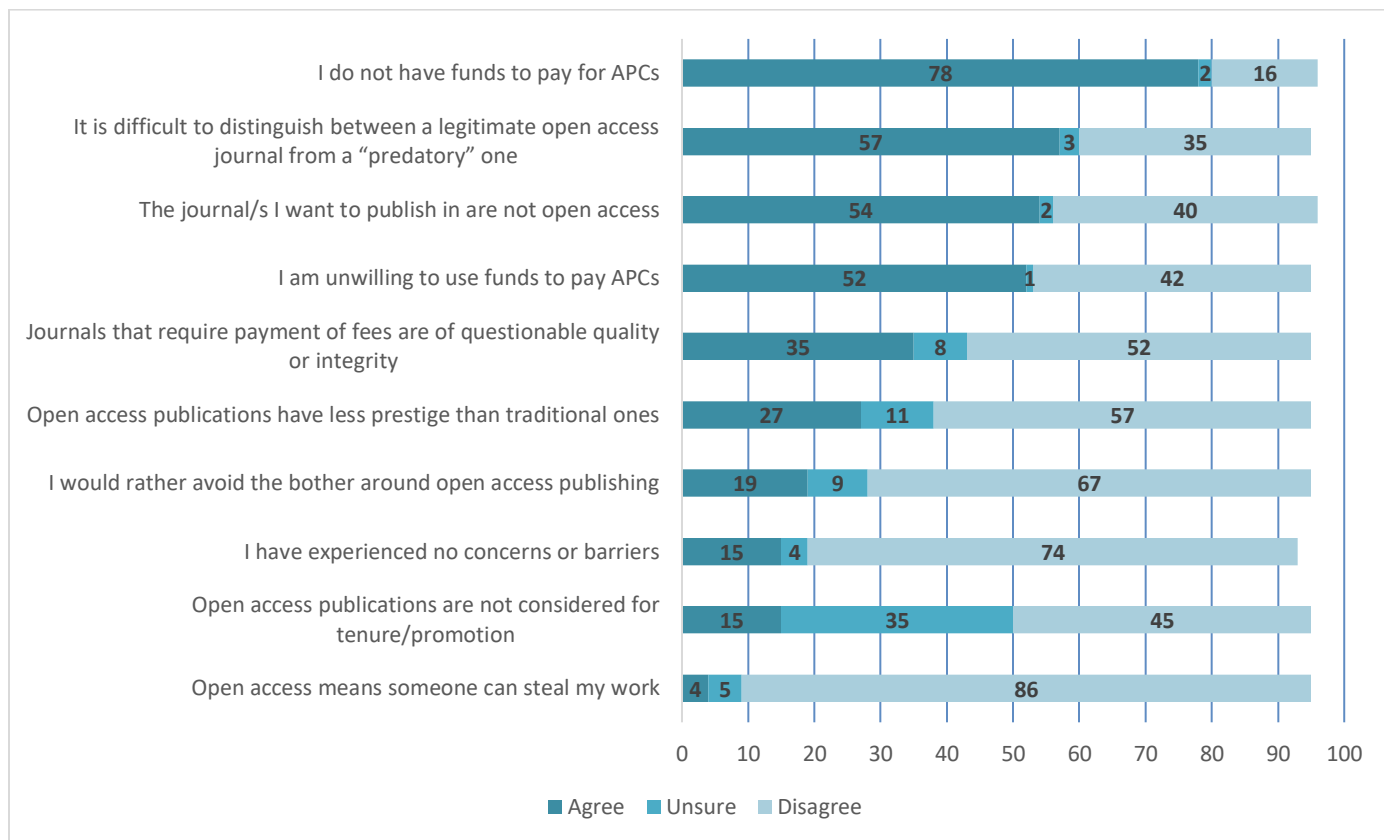
Distinguishing predatory journals and journal selection were the next most-limiting barriers for OA publishing. Fifty-seven ( $n = 95$ ) respondents (60%) found predatory journals were a barrier to OA publishing and 54 ( $n = 96$ ) respondents (56%) found that the choice of a journal without an OA option was a barrier to OA publishing.



Tenure and promotion considerations were not rated highly as a barrier to OA publishing. Only 15 ( $n = 95$ ) respondents (16%) indicated agreement with the statement, “Open access publications are not considered for tenure/promotion.” Forty-five respondents (47%) disagreed and 35 respondents (37%) were unsure if this was an issue.

**Figure 8**

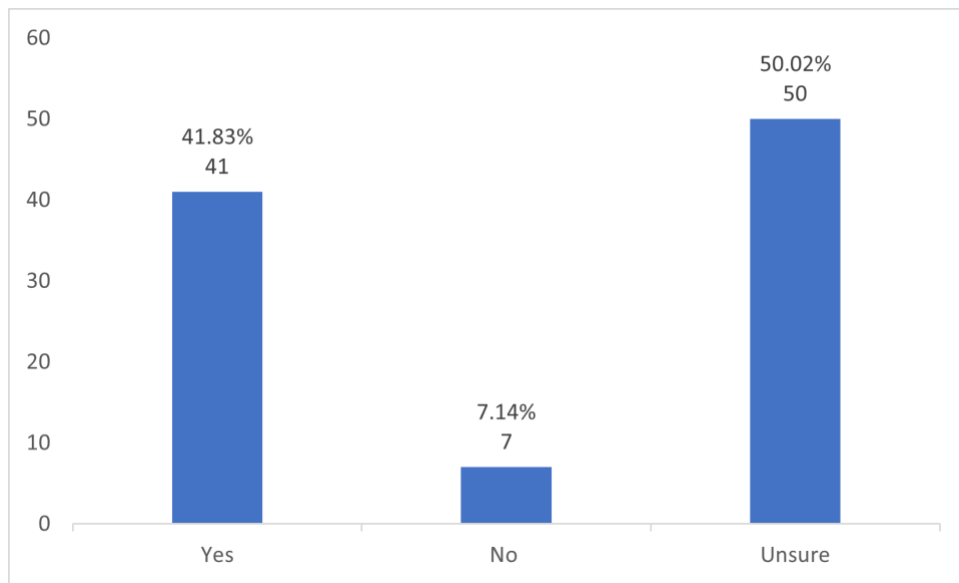
*Barriers to Open Access Publishing*



While respondents reported a lack of funds to pay for APCs, they also revealed a lack a familiarity with the capacity of the no-cost option, green OA (the deposit of a manuscript’s post-print, or author’s final version after peer review, into a disciplinary or institutional repository), to fulfill Canada’s federal Tri-Agency Policy on Open Access requirements. As seen in Figure 9, half of the respondents ( $n = 98$ ) were unsure if green OA fulfilled the policy. Only 41 correctly responded that green OA fulfills that OA requirement.

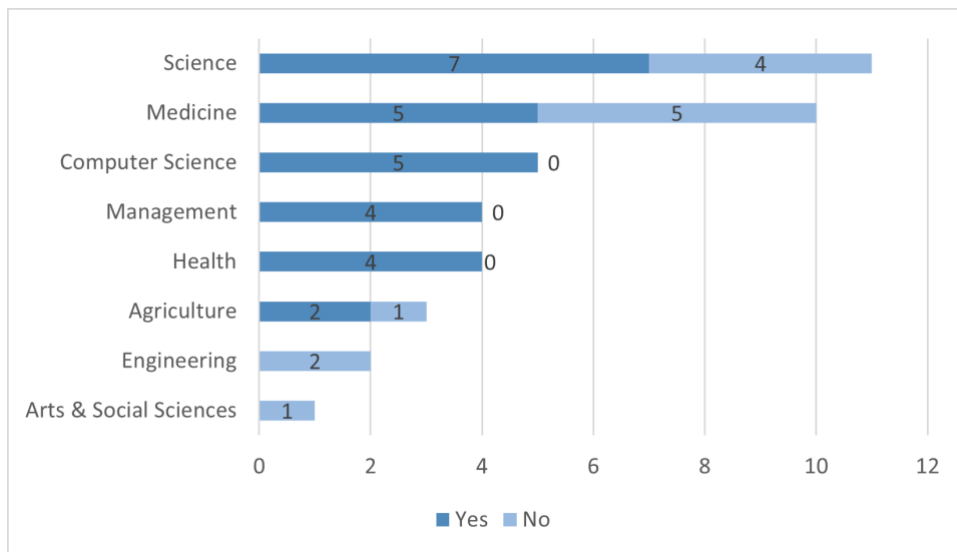
### Figure 9

*Do You Believe that “Green Open Access” Fulfills the Tri-Agency Policy on OA?*



### ***Research Data Management and Data Sharing***

Figure 3 shows that 40 ( $n = 98$ ) respondents reported producing datasets. These represented eight faculties as can be seen in Figure 10. Respondents from computer science, management (which included the School of Information Management), and health shared all the datasets that they reported making. Respondents from the Faculty of Medicine were evenly divided between sharing and not sharing. Respondents from other faculties were less likely to share their datasets.

**Figure 10***Production of Datasets by Faculty and Whether They are Shared*

Note: Filtered by respondents who stated they created datasets. Faculties without respondents who create datasets are omitted (Libraries and Law).

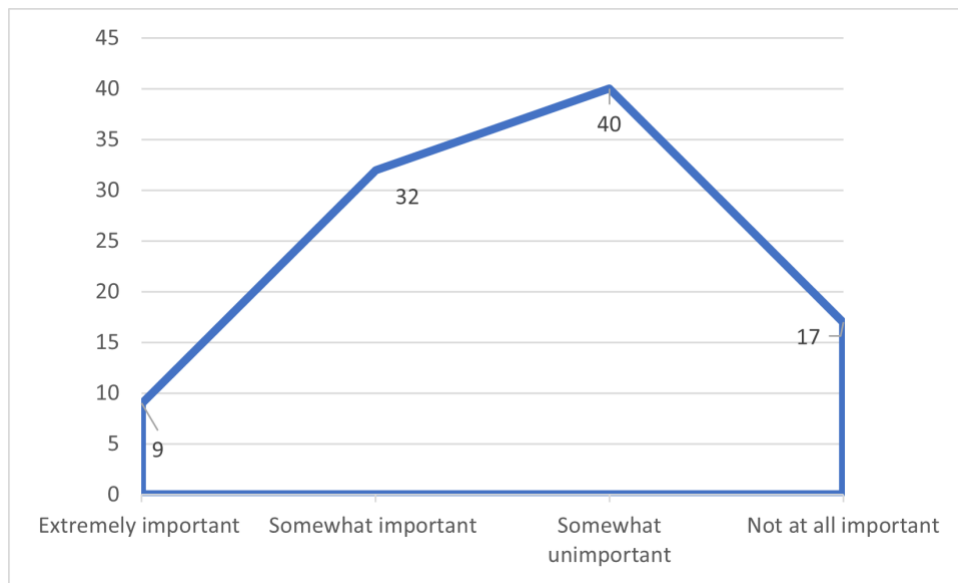
Several respondents shared ethical concerns about data sharing, with one respondent writing, “If I was required to publicly share these [qualitative] data, then I would likely switch methods or leave academia.” Other respondents shared concerns about Indigenous data sovereignty, intellectual property, industry collaborations, and loss of control. With respect to data repository options, one respondent wrote, “I am not comfortable making qualitative social/cultural data freely open as I do not believe the current open data systems have done enough to safeguard my data.” In another instance, a respondent indicated a willingness to share, but suggested any interested parties must ask.

***Preprints***

Pre-publication archiving or deposit of preprints was among the less frequently reported practices and varied in popularity by discipline as seen in Figure 3 (above). Respondents were divided with respect to the importance of preprints. Figure 11 shows respondents’ perceptions of their importance in their own fields with more than half (57 of  $n = 98$ ) reporting that preprints were not at all important or somewhat unimportant.

**Figure 11**

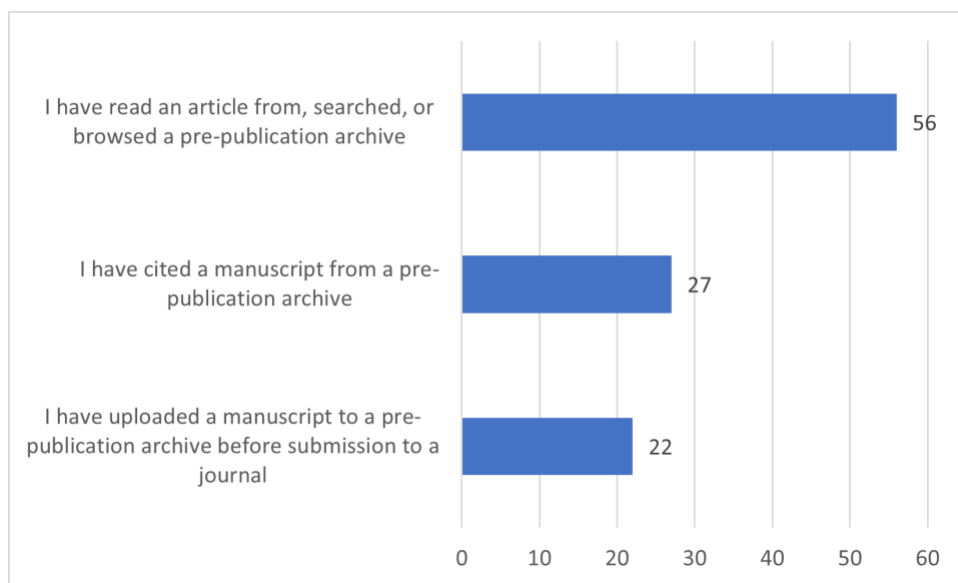
*The Importance of Pre-Publication Archiving (Preprints) in Respondents' Fields*



Respondents also indicated a greater willingness to read and even cite preprints than to post their own. The number of respondents who reported at least some basic interaction with preprints as a consumer 56 ( $n = 98$ ) was more than double the number who reported uploading a preprint themselves (Figure 12).

**Figure 12**

*Experiences with Pre-Publication Archiving*



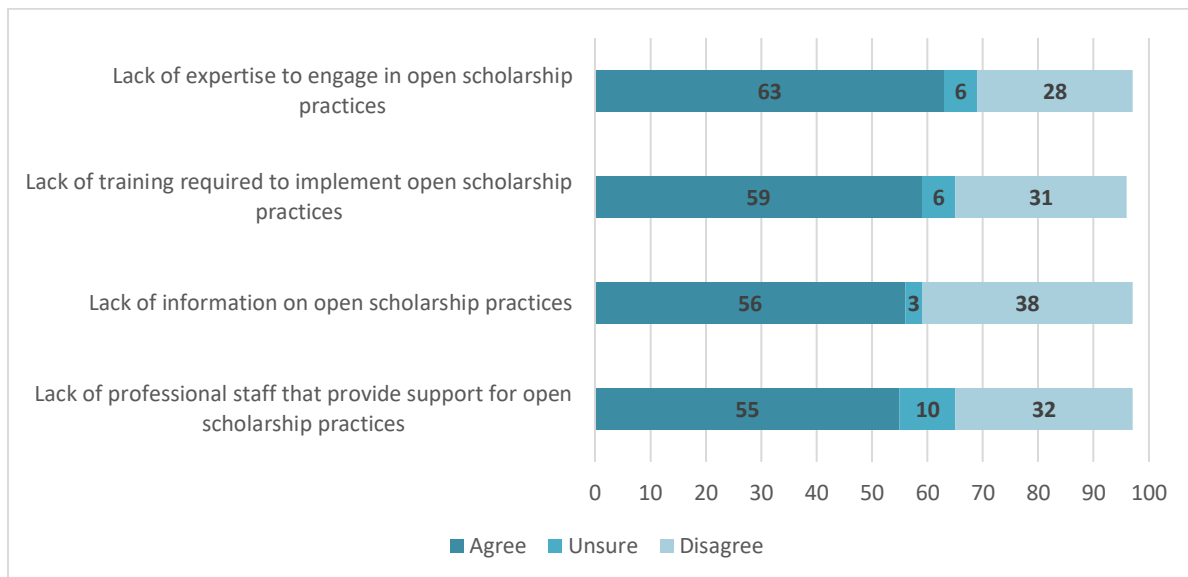
The free text responses identified a disincentive to engage in preprint sharing by stating that availability of preprints posed a danger in making unvalidated claims open to influence the public and erode trust in science. One respondent shared: “I strongly dislike the publication of preprints for materials that are ultimately rejected in peer review. These cloud the air with bad studies.” Another respondent commented on the sheer volume of available work, and the value of peer-review in focusing attention on quality research. Preprints were further described in free text responses as “misinformation,” “noise,” and “terrible.”

## Training and Supports

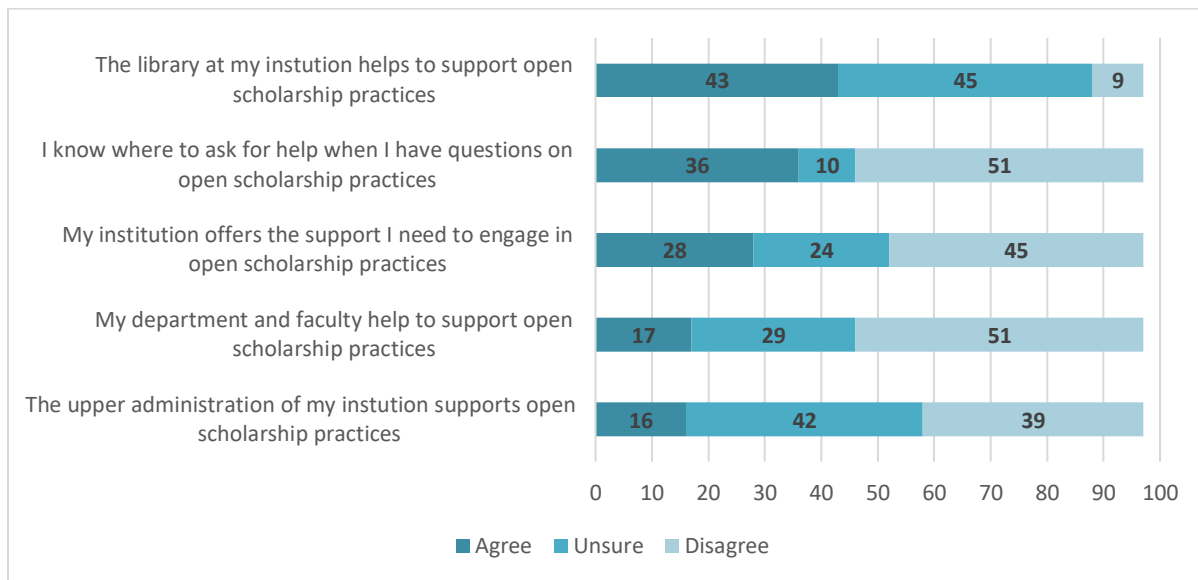
The majority of respondents identified lack of expertise, training, information, and staffing issues as barriers to open scholarship across all related questions (Figure 13). Sixty-three ( $n = 97$ ) respondents (65%) identified “lack of expertise” as a barrier to open scholarship, and 59 ( $n = 96$ ) respondents (61%) identified “lack of training” as a barrier to embracing open scholarship practices.

**Figure 13**

### *Training and Education Barriers*



When asked about institutional support, the library was identified as the most supportive unit for open scholarship at Dalhousie University, though it was still identified as such by fewer than half of respondents: 43 ( $n = 97$ ) respondents (44%) agreed or somewhat agreed that the library helps to support open scholarship practices, with another 45 (46%) reporting that they were unsure (Figure 14). Lack of departmental and upper administrative support were seen as the greatest institution barriers to open scholarship.

**Figure 14***Institutional Support of Open Scholarship*

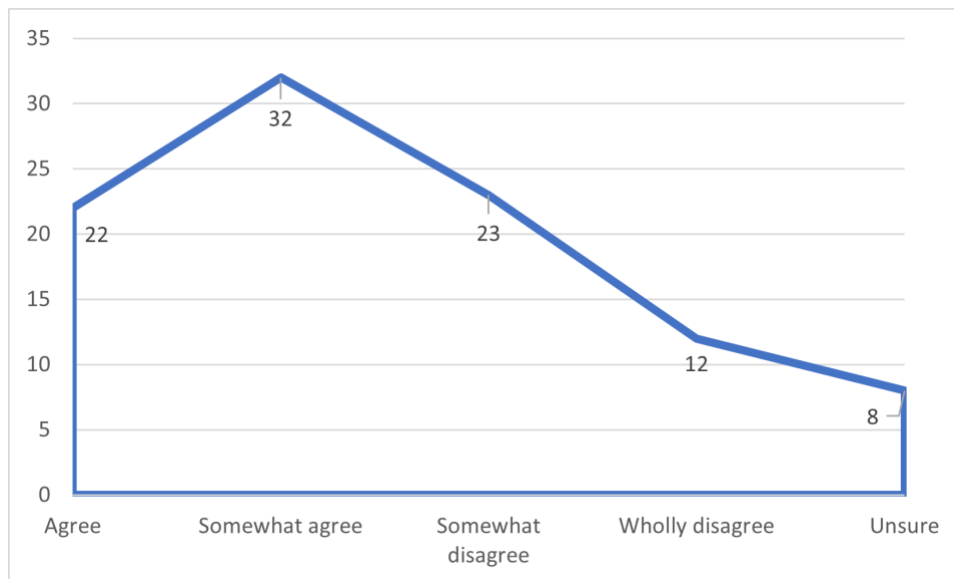
In their free text responses, several respondents provided feedback on supports they would like to see the university provide. These supports included guidance on addressing intellectual property and privacy concerns to allow for open scholarship.

Several respondents indicated that they did not have funding or resource support and that none was available. One respondent wrote in a free text response that “it is so expensive to publish OA, and I am not aware of any financial supports from the university for it.” Another noted that “institutional mandates without funds attached only place additional financial and time burdens on researchers.” A third pointed out that resources are finite, and any investment in open scholarship takes away from investment in other areas of research: “There are no supports in terms of the time and effort it will take away from research to set this up. With any drop in productivity, researchers risk losing funding and having to stop research altogether.”

Despite these barriers, in response to the statement, “I feel confident that I am aware of, and able to comply with, open scholarship practices required by funders, journals, and other potential stakeholders in my research,” more than half, 54 ( $n = 97$ ), agreed wholly or somewhat (Figure 15).

**Figure 15**

*Respondents' Belief in Their Knowledge and Ability to Comply with Open Scholarship Policies*



## ***Discussion***

### **Researcher's Understanding and Practice of Open Scholarship**

Respondents reported engaging in various open practices, and their responses suggest an appreciation for open scholarship and recognition of its value. Given that the researchers in this pool were generally motivated, gaps in knowledge on open scholarship or non-open practices were particularly interesting.

Respondents largely reported that open scholarship practices brought advantages in the form of professional recognition and interest and citations to their work. More broadly, they also saw benefit through developments in their fields. While respondents generally reported that open scholarship, particularly OA publication, was worthwhile and something they tried to do, they also reported that it was taxing to resources and not entirely supported or appreciated.

Results from this survey show that researchers are often choosing to share their material through methods like ResearchGate, Academia.edu, or via e-mail. These methods do not meet the definition of open scholarship as they do not offer stable, barrier-free access to content. We have instead defined these as informal sharing methods. Lab/research group and personal websites were other common platforms for sharing, again leaving open questions of sustainability. While institutional repositories are resourced to provide long-term access and preservation, engage with permanent identifiers, and manage web indexing, lab websites lack that support. This jeopardizes

the stability of discoverability and access over time. This is noteworthy given that researchers report valuing audiences that include journalists/media, policy makers, and the general public. Despite these limitations, these informal platforms were favoured over formal repositories like DalSpace, OSF, Dataverse, and Zenodo that offer open, stable, barrier-free, long-term preservation and access. It would be interesting to know more about what materials are shared in these informal ways, if researchers recognize that this practice does not constitute open scholarship, and whether publishing agreements allow for it.

Survey respondents identified researchers in their field as the most important audience of their work, followed by practitioners and policy makers. While fellow researchers at well-supported institutions may have access to paywalled content, practitioners and policy makers may not. Increasing reach and readership is a point that may resonate with researchers and provide a compelling argument to consider more open scholarship.

In addition to OA publications, data, and preprints discussed in greater detail, other frequently shared outputs were audio/video materials and software/code. No national funder or institutional policy applies directly to these products of research, suggesting sharing is driven by other factors. Further investigation could provide insight.

### ***Open Access***

Of the practices addressed by the survey, OA publishing was the most common, and articles were reported as the most frequently shared output, though not necessarily through a truly OA platform. These findings could be due to the implementation schedule of funder requirements. Projects funded by Canadian Institutes of Health Research (CIHR) have been subject to OA requirements since 2008, and the Tri-Agency OA policy was announced in 2015. The Tri-Agency policy does not cover book chapters, which may explain in part why they are shared less frequently than articles, though other variables around publishing models for books would also undoubtedly factor into this. A major gap in understanding revealed by the survey was that few respondents were aware that Canada's Tri-Agency policy on OA could be fulfilled at no financial cost through green OA.

While the literature indicates that concerns about tenure and promotion might make researchers wary of open access publishing (Alperin et al., 2019), the results of this survey indicate they were not a considerable barrier to open practices, with only 15 respondents (16%) saying they considered tenure considerations a barrier to OA publishing (Figure 8). Further investigation should clarify whether the obstacle was prejudice against OA journals on the part of either the researcher or evaluator or the perception of appropriately prestigious OA options. Even so, there was a broad mix of responses in reporting whether open scholarship practices were valued by the respondents' department. In particular, graduate students reported that they were unsure whether open scholarship practices influence tenure/promotion/hiring decisions. Based on this uncertainty, there is opportunity for clearer communication and direction



from departments and from the university. If open access and other open scholarship practices are considered valuable contributions to scholarly conversations, that value needs to be clearly communicated. To determine if volatility or change in department policies have led to unsure responses, further study may be warranted.

Respondents expressed concern about recognizing predatory journals as well as some conflation of journals that charge APCs with those of questionable integrity. This is a source of potential frustration that could stymie intentions to work more openly and points to the need for both ongoing education and support from within libraries. Librarians have the expertise and experience required to identify predatory publishers and help researchers more efficiently navigate the complicated system of scholarly publishing. As predatory journals can be highly sophisticated and polished in appearance, a high degree of scholarly publishing literacy is needed to make assessments, rendering the guidance of librarians highly valuable (Zhao, 2014).

Respondents not only expressed concern about predatory publishing, they also objected to the financial drain of APCs. Consistent with the literature, survey respondents identified cost of APCs as a major obstacle to OA (Nicholas et al., 2019). An unwillingness to spend money on these fees was clearly expressed in the data, even by those researchers who had the funds to do so. Respondents expressed frustration with APCs through free text responses, blaming them for draining grant funding away from research activities and costing researchers from their personal pockets. This points to two interesting observations: First, researchers have limited resources. Without a budget line specifically for OA, they feel the need to make tough decisions about priorities. Second, some supports exist and researchers are simply unaware. Although Dalhousie Libraries fund transformative agreements that offer waivers or discounts on APCs and provide repository access for no-cost OA, researchers report feeling unsupported.

While respondents were generally positive in reporting their own habits and attitudes to OA publication, the results indicate that there was low familiarity with a potentially easy and no-cost option, green OA. Few respondents were aware that Canada's Tri-Agency OA Policy could be fulfilled through green OA. Combined with the reports of a lack of funds to pay for making works OA in gold or hybrid journals and confusion between informal and unstable platforms like ResearchGate and true OA, this finding suggests there is potential to significantly increase the open availability of scholarly outputs with greater education on the benefits of Dalhousie's institutional repository. At the same time, the majority of respondents reported themselves as somewhat or fully confident of their awareness and ability to comply with institutional, publisher, and funder requirements (Figure 15). This confidence may be a challenge when conveying the message that additional options exist.

### ***Research Data Management and Data Sharing***

Tri-Agency Research Data Management Policy was released in 2021 and was in the process of being implemented at the time of the survey. While it is not an open data

policy, it is probable that its rollout will lead to greater levels of data sharing, as researchers will be required to deposit data in trusted repositories and demonstrate responsible data stewardship. Data sharing will be encouraged when appropriate.

In the survey, data sharing varied widely by respondents, likely related to factors specific to different fields of research. This finding aligns with existing work (McDonald et al., 2016; Nicholas et al., 2019). Two faculties (law and university libraries) represented by respondents in the survey were not included for analysis as they did not report making datasets. One faculty with an expressed interest in open scholarship on the whole but a mixed record with respect to data sharing is medicine (Figure 10). This is perhaps explained by the added ethical and privacy considerations surrounding human data. Considering the interest in supporting open scholarship, it may be worth exploring factors that might inhibit data sharing, whether sharing of metadata for data sets is practiced, and what supports could enable increased data sharing.

In terms of data sharing, respondents indicated a lack of trust in data repositories and the systems used to secure their data. While some data are sensitive and unsuitable for deposit in open repositories, highlighting the security features of Borealis and other repository options could mitigate researcher concerns. Concerns about data misuse were also shared, a result consistent with findings of Chawing & Zinn (2019).

### ***Preprints***

Results indicate that preprints were shared less frequently than other research outputs. Respondents had a lot to say on the matter, describing preprints in free text responses as “unvalidated”, sources of “misinformation,” and as being responsible for an erosion of trust in the scientific process. Respondents also identified a practical concern: peer-review provides a validated process of filtering research reports down to manageable numbers. Benefits of sharing preprints mentioned in the literature, such as early and wide dissemination of research, were not noted. This is interesting, especially when compared to the findings of Chiarelli et al. (2019), whose qualitative research uncovered some of the same concerns but in tandem with a recognition of advantages offered by preprints.

### **Training and Supports**

Of direct interest to libraries, respondents reported a need for greater education and training to support them in open scholarship endeavors. With respect to the finer points of access, preservation, and long-term accessibility, there is room for librarians to further educate researchers, especially given the confusion surrounding the definition of open (versus informal or casual sharing) and the no-cost platforms available with through the libraries.

Libraries have several options to address concerns around APCs and the desire to translate knowledge outside of academia and make scholarly work openly available. They can continue to educate and further promote green OA, provide guidance on

writing costs into grant applications, and continue to work with publishers on transformative agreements, particularly as members of consortia. They will also need to be agile and continue to respond to changing circumstances. In June 2023, the Tri-Agency announced plans to update their OA Policy by the end of 2025. The effects of the policy changes are unknown but will undoubtedly influence both researchers' understanding of OA and librarians' outreach strategies.

The solution is not simply to offer more supports, however, as over half of respondents were unaware of existing library supports (Figure 14). Communicating these, even to an interested audience, is both a priority and a challenge. Identifying means of improving communication, possibly through cooperation with other institutional units that provide open scholarship supports, is worth exploring to improve understanding of and participation in open publishing and data sharing.

### ***Limitations***

This study has several limitations related to the respondent sample. As is often the case, the response for this online sample was low. The response rate was further reduced by the fact that only completed surveys were included for analysis (failure to complete the survey was considered withdrawal of consent to participate).

The convenience nature of the sampling also meant there was no way to ensure representative subsamples of different faculties and disciplines, and we did find greater participation from those disciplines previously shown to have greater investment in open scholarship practices. The subject matter of the survey undoubtedly led to bias among those interested in responding. In general, we would anticipate those completing the survey to have a greater interest, experience, and knowledge in issues surrounding open scholarship practices than in the total population of eligible researchers.

Finally, to encourage participation, the link to the survey was shared freely in multiple email messages and posts. There was no mechanism to ensure that respondents only participated once. However, the risk of multiple responses from a single individual was believed to be small as there was no direct reward for participation, such as entry into a prize draw.

### ***Conclusions***

The responses to this survey provide insights into the attitudes and practices around open scholarship and the challenges of supporting them at one Canadian research university. The uneven response rates across the university make it difficult to make conclusions across the institution and for less well-represented faculties. Many findings about attitudes and practices were consistent with the existing literature, including OA article publishing as the most common way of engaging in open scholarship, frustration with the cost of APCs, and the greater interest exhibited by medicine, science, and health faculties.

Though OA was not identified as a potential barrier to tenure and promotion as has been suggested by past studies, the responses indicated uncertainty and the need for clearer and more consistent messaging around departmental and institutional value in OA and other open scholarship practices. For the Canadian context specifically, it was clear that respondents were not familiar with the full range of possibilities for fulfilling the Tri-Agency policy on OA, particularly green OA. As green OA is a no-cost option, the policy may appear more burdensome than it needs to be.

The survey also revealed that respondents perceive significant barriers to sharing data, including the time needed for proper RDM and the legality and ethics of sharing. Educational supports can help to address all of these, focusing not just on how to deposit or share data appropriately, but also on why RDM is worth the investment of researchers' time and energy. The advisability of sharing preprints and other kinds of research products may vary considerably by discipline, but increased awareness of the benefits as well as the risks may be useful in allowing researchers to make informed decisions.

By considering a wide range of possible researcher practices, this survey also revealed that many of the sharing behaviours reported by respondents are not those that meet a formal definition of open scholarship by librarians. Librarians and others who provide guidance and support on open scholarship tools and practices would be well advised to be wary of loose understandings or misunderstandings about the nature of open scholarship and of platforms commonly used for sharing.

Some of the barriers to open scholarship illuminated by the survey can be alleviated by existing library supports; the challenge is in raising awareness of their existence and the benefits of using them. These include use of the institutional repository (DalSpace) and data repository (Dalhousie Dataverse @ Borealis) to provide no-cost, funder-approved open scholarship options and transformative agreements to address the problem of high APC charges. Other library supports include guidance on the full spectrum of issues related to open scholarship. The data from the survey suggest that at this time, supporting researchers in their participation of open scholarship is less a question of adding new supports than it is of facilitating use of services that already exist. Future research might consider how this challenge may be best addressed.

## ***Acknowledgements***

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## Appendix A

### Open Scholarship Survey Instrument

#### Section 1. Demographics.

In this section, we will find out about you, your role at your institution and your involvement in research.

1. Do you engage in research (either as part of normal duties or outside of them)?  
[required]
  - a. Yes
  - b. No [*If no, survey branches to final thank you page.*]
  
2. Please choose one of the following to indicate your affiliation at Dalhousie University:  
[required]
  - a. Faculty of Agriculture
  - b. Faculty of Architecture and Planning
  - c. Faculty of Arts & Social Sciences
  - d. Faculty of Computer Science
  - e. Faculty of Dentistry
  - f. Faculty of Engineering
  - g. Faculty of Health
  - h. Faculty of Law
  - i. Faculty of Management
  - j. Faculty of Medicine
  - k. Faculty of Open Learning & Career Development
  - l. Faculty of Science
  - m. Dalhousie Libraries
  
3. Please indicate your role. Choose only one option that best describes your primary role:  
[required]
  - a. Graduate Student (Master or PhD)
  - b. Postdoctoral Fellow
  - c. Lecturer
  - d. Instructor
  - e. Librarian
  - f. Non-tenure track academic appointment (limited term academic appointment)
  - g. Assistant Professor/Associate/Full Professor
  - h. Resident
  - i. Professor Emeritus/Emerita
  - j. Other. Please specify:

4. Please indicate the type of appointment you hold:
  - a. Tenure-track or continuing appointment
  - b. Contractually limited term
  - c. Non-applicable
  
5. Is research a requirement for tenure/promotion/advancement in your position?
  - a. Yes
  - b. No

## Section 2: Open Scholarship.

This section will ask you about some of your habits and familiarity with open scholarship practices in general.

“Open Scholarship” refers to practices that facilitate the accessibility of materials that are created as part of the process or outcome of research. This means such materials can be openly found on the internet and copied or used with no or minimal restriction. Open Scholarship can be understood as a broad, umbrella term that encompasses other “open” practices or tools, including but not limited to open access publishing or open data sharing.

“Openly available” refers to work that can be found on the internet without having to pay money, create an account, or otherwise supply information.

6. What sorts of scholarship do you produce? Check as many as apply.
  - a. Articles
  - b. Book chapters
  - c. Creative works
  - d. Monographs/books
  - e. Mixed media projects
  - f. Software/code
  - g. Datasets
  - h. Digital collections
  - i. Reports
  - j. Video/audio
  - k. Other(s)
  
7. What sorts of scholarship do you make openly available (through publication, posting online, sharing upon request, etc.)? Check as many as apply.
  - a. Articles
  - b. Book chapters
  - c. Creative works
  - d. Monographs/books
  - e. Mixed media projects
  - f. Software/code

- g. Datasets
  - h. Preprints (articles that have not been peer reviewed)
  - i. Post-prints (peer reviewed articles not copyedited or formatted by a journal)
  - j. Digital collections
  - k. Reports
  - l. Video/audio
  - m. Other(s)
  - n. I do not make any of my work openly available [skip to question 11]
8. Where do you post the scholarly works that you make openly available? Check as many as apply.
- a. Academia.edu
  - b. arXiv
  - c. Audio hosting site (Soundcloud, Youtube, etc.)
  - d. bioRxiv
  - e. Code hosting site (GitHub, BitBucket, GitLab, etc.)
  - f. DaSpace
  - g. Data hosting site (Dryad, ICPSR, etc.)
  - h. F1000
  - i. Figshare
  - j. Humanities Commons
  - k. Image hosting site (Flickr, Shared Shelf, etc.)
  - l. Institutional/Departmental website
  - m. Lab/Research group website
  - n. Mendeley
  - o. Open Science Framework (OSF)
  - p. Personal website
  - q. PubMed Central
  - r. RePEc (Research Papers in Economics)
  - s. ResearchGate
  - t. socArXiv
  - u. SSRN (Social Science Research Network)
  - v. Video hosting site (Youtube, Vimeo, etc.)
  - w. Zenodo
  - x. Other(s)
  - y. I don't make my work openly available

9. How important is it to you for your work to be openly available to the following groups?

|  |                |                      |                    |               |
|--|----------------|----------------------|--------------------|---------------|
|  | Very important | Moderately important | Somewhat important | Not important |
|--|----------------|----------------------|--------------------|---------------|

|   |  |  |  |  |
|---|--|--|--|--|
| Students (grade 12 and younger)   |  |  |  |  |
| Students (higher education)   |  |  |  |  |
| Researchers in my field   |  |  |  |  |
| Researchers in other fields   |  |  |  |  |
| Journalists, media  |  |  |  |  |
| Policy makers   |  |  |  |  |
| General public  |  |  |  |  |
| Practitioners/professionals (e.g., health professionals, educators, social workers, etc.) |  |  |  |  |

10. How much do you agree with the following statements?

|  | Agree | Somewhat agree | Somewhat disagree | Wholly disagree | Unsure |
|--|-------|----------------|-------------------|-----------------|--------|
| Open scholarship practices influence tenure/promotion or hiring decisions.   |       |                |                   |                 |        |
| Open scholarship practices help raise professional profiles.                 |       |                |                   |                 |        |
| Open scholarship practices result in more interest and citations to my work. |       |                |                   |                 |        |
| Open scholarship practices help further developments in my field.            |       |                |                   |                 |        |
| Open scholarship practices require additional time and other resources.      |       |                |                   |                 |        |
| There is little reward for open scholarship practices.                       |       |                |                   |                 |        |
| Open scholarship is something I care about.                                  |       |                |                   |                 |        |
| Open scholarship practices are valued by my department.                      |       |                |                   |                 |        |
| The financial cost of open scholarship is prohibitive.                       |       |                |                   |                 |        |
| Open scholarship is not relevant in the age of Google.                       |       |                |                   |                 |        |

## 11. How much do you agree with the following statements?

|  | Agree | Somewhat agree | Somewhat disagree | Wholly disagree | Unsure |
|--|-------|----------------|-------------------|-----------------|--------|
| I engage in open scholarship practices as much as possible.  |       |                |                   |                 |        |
| I am interested in making my scholarship practices more open.  |       |                |                   |                 |        |
| I need help to make my scholarship practices more open.  |       |                |                   |                 |        |
| Open scholarship practices are not appropriate for my discipline.  |       |                |                   |                 |        |
| I feel confident that I am aware of, and able to comply with, open scholarship practices required by funders, journals, and other potential stakeholders in my research. |       |                |                   |                 |        |

## 12. How much do you agree that the following are barriers to the uptake of open scholarship practices based on your own experience:

|   | Agree | Somewhat agree | Somewhat disagree | Wholly disagree | Unsure |
|---|-------|----------------|-------------------|-----------------|--------|
| Lack of funding for open access publishing  |       |                |                   |                 |        |
| Lack of credit in my institution for engaging in open scholarship                       |       |                |                   |                 |        |
| Lack of recognition in my field about the value of open scholarship                     |       |                |                   |                 |        |
| Lack of mandates from funders, institutions, or other regulators                        |       |                |                   |                 |        |
| Lack of information on open scholarship practices                                       |       |                |                   |                 |        |
| Lack of professional staff that provide support for open scholarship practices          |       |                |                   |                 |        |
| Lack of research funding to support open scholarship practices (other than open access) |       |                |                   |                 |        |
| Lack of training required to implement open scholarship practices                       |       |                |                   |                 |        |
| Lack of supporting infrastructure (e.g. open data platforms)                            |       |                |                   |                 |        |
| Lack of time to engage in open scholarship practices                                    |       |                |                   |                 |        |

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| Lack of expertise to engage in open scholarship practices (e.g. assignment of metadata) |  |  |  |  |  |
| I am discouraged from engaging in open scholarship practices by my colleagues           |  |  |  |  |  |
| The open research community is intimidating   |  |  |  |  |  |
| I don't want to be told how to do my research   |  |  |  |  |  |
| I am not interested in open scholarship   |  |  |  |  |  |
| I do not perceive any barriers  |  |  |  |  |  |

### Section 3. Open Access

Open Access (OA) publishing refers to multiple models for allowing published materials to be available openly without cost for access, redistribution, or use. The two basic models are:

- 1) "Gold Open Access" in which the final version of record is published in an open access journal. There is often an Article/Author Processing Charge (APC) charged to the author.
- 2) "Green Open Access" in which the authors publish with a traditional journal, and deposit the final, accepted version (peer reviewed but not copy-edited or formatted, also called the post-print) in an institutional repository such as DalSpace or a subject specific one such as arXiv.

13. Approximately what proportion of your publications from the last 5 years are open access?

- a. All
- b. More than half
- c. Half
- d. Less than half
- e. None
- f. I don't know

14. Many open access journals charge an APC (Author/Article Processing Charge) for publication. How have you handled these fees?

- a. My open access publications did not involve fees
- b. I paid the fees from my own research income
- c. My centre/department paid the fees
- d. My school/faculty paid the fees
- e. A collaborator from another institution paid the fees
- f. I paid the fees with my personal money
- g. I could not afford to pay the fees and withdrew the manuscript



- h. I received a fee waiver from the journal
- i. Other \_\_\_\_\_
- j. Not applicable

15. How much do you agree that the following are concerns or barriers that you have experienced with open access publication:

|  | Agree | Somewhat agree | Somewhat disagree | Wholly disagree | Unsure |
|--|-------|----------------|-------------------|-----------------|--------|
| The journal/s I want to publish in are not open access   |       |                |                   |                 |        |
| I do not have funds to pay for APCs  |       |                |                   |                 |        |
| I am unwilling to use funds to pay APCs  |       |                |                   |                 |        |
| Journals that require payment of fees are of questionable quality or integrity   |       |                |                   |                 |        |
| Open access publications are not considered for tenure/promotion   |       |                |                   |                 |        |
| Open access publications have less prestige than traditional ones  |       |                |                   |                 |        |
| Open access means someone can steal my work  |       |                |                   |                 |        |
| It is difficult to distinguish between a legitimate open access journal from a “predatory” one i.e. a journal lacking integrity and/or consistent quality control practices of sufficient rigor. |       |                |                   |                 |        |
| I would rather avoid the bother around open access publishing  |       |                |                   |                 |        |
| I have experienced no concerns or barriers   |       |                |                   |                 |        |

16. As an author, it is important that I retain the following rights to my work after publication: [check all that apply]

- a. The right to share wherever and however I like
- b. The right to deposit in a repository (Like DalSpace)
- c. The right to send a PDF to colleagues or fellow researchers who request it
- d. The right to post a PDF on Brightspace (Dal)
- e. The right to share it on an academic social media platform (i.e. Academia.edu or ResearchGate)

17. “Green open access” is the depositing of a version (either the final published version or the post-print – the last published version submitted for publication after peer review) into an institutional repository like Dalspace.

Do you believe that “Green open access” fulfills the Tri-Agency requirement that publications based on funded research must be open access?

- a. Yes
- b. No
- c. Unsure

18. How much do you agree with the following statements about institutional repositories such as DalSpace?

|  | Agree | Somewhat agree | Somewhat disagree | Wholly disagree | Unsure |
|--|-------|----------------|-------------------|-----------------|--------|
| I am not familiar with my institution’s repository and have no interest in using it                                  |       |                |                   |                 |        |
| I am not familiar with my institution’s repository, but I would like to know more about it.                          |       |                |                   |                 |        |
| I routinely deposit work (including articles, presentations, posters, abstracts, etc) in my institutional repository |       |                |                   |                 |        |
| I do not typically deposit my work in my institutional repository but I might in the future                          |       |                |                   |                 |        |
| I find my institutional repository difficult to use  |       |                |                   |                 |        |

## Section 4. Preprints

“Preprint” refers to the first, complete version of a manuscript *before it has undergone peer review*. They can be deposited in repositories and available prior to or after publication. This is known as **pre-publication archiving**.

19. In your opinion, how important is pre-publication archiving for your field?

- a. Extremely important
- b. Somewhat important
- c. Somewhat unimportant
- d. Not at all important

20. In what ways have you used pre-publication archiving? (check all that apply)

- a. I have uploaded a manuscript to a pre-publication archive before submission to a journal
- b. I have cited a manuscript from a pre-publication archive
- c. I have read an article from, searched, or browsed a pre-publication archive
- d. Other \_\_\_\_\_

21. How much do you agree with the following concerns about uploading a manuscript to a pre-publication archive before submitting it for peer review:

|  | Agree | Somewhat agree | Somewhat disagree | Wholly disagree | Unsure |
|--|-------|----------------|-------------------|-----------------|--------|
| Some journals might not publish findings that are uploaded to a pre-publication archive  |       |                |                   |                 |        |
| Other people might copy my research and publish it before I do   |       |                |                   |                 |        |
| Non-peer-reviewed findings might add noise to the literature   |       |                |                   |                 |        |
| Making my work available pre-publication might reduce the number of citations to the ultimately published work   |       |                |                   |                 |        |
| Availability of the pre-publication manuscript might highlight differences (e.g., errors in analysis; revisions to hypotheses) between the original conception of the research and the ultimately published work |       |                |                   |                 |        |
| I do not share any of these concerns   |       |                |                   |                 |        |

## Section 5 Research Data Management (RDM) and Open Data

Research Data Management (RDM) refers to the thoughtful and deliberate collection, organization, and storage of data. RDM practices ensure long term utility of data within a project and can also facilitate use or re-use of data outside of the original project, either by the original data collectors or others. RDM does not necessitate that data be openly available; however, good RDM practices enable data reuse.

In this survey, “open data” refers to data freely and openly available on the internet and available for reuse with no or minimal restriction.

22. In your opinion, how important for your field is it that data from published research are openly available?

- a. Extremely important
- b. Somewhat important
- c. Somewhat unimportant
- d. Not at all important
- e. Research publications in my field are not based on data

23. What is your experience with using open data (that is, using data in your research that has been collected and made available by someone unconnected to your project)?

- a. Until now, I was unaware of open data
- b. I am aware of open data, but have not used this in my research

- c. I have some experience using open data, but do not use them regularly
- d. I regularly use open data

24. Do you share your data? (check all that apply)

- a. I do not ever share my data
- b. Share by personal request only
- c. Share online with restricted access
- d. Openly available on an institutional or personal website
- e. Openly available in an institutional data repository such as Scholars Portal Dataverse
- f. Openly available in a general or discipline-specific repository
- g. Include as a part of a supplementary material files to a journal publisher
- h. Other: \_\_\_\_\_

25. How much do you agree with the following concerns about making data openly available:

|  | Agree | Somewhat agree | Somewhat disagree | Wholly disagree | Unsure |
|--|-------|----------------|-------------------|-----------------|--------|
| Other researchers might criticize my data and/or research practices  |       |                |                   |                 |        |
| There could be issues related to intellectual property   |       |                |                   |                 |        |
| There could be issues related to ethics  |       |                |                   |                 |        |
| There could be issues related to privacy   |       |                |                   |                 |        |
| I think it is unfair for researchers beyond the original team to benefit (e.g. through future publication, career advancement) from my data collection |       |                |                   |                 |        |
| I might not receive appropriate credit for my data collection  |       |                |                   |                 |        |
| I might lose control over how my data are being used   |       |                |                   |                 |        |
| Other researchers could use my data for another study that I intended to conduct in the future   |       |                |                   |                 |        |
| It will take too much time or effort to share research data  |       |                |                   |                 |        |
| I do not have any concerns with making data openly available.  |       |                |                   |                 |        |

26. Does your research involve working with Indigenous data (that is, data from or about Indigenous communities and lands)?

- a. Yes, I do work, have worked, or plan to work with Indigenous data
- b. No, I do not work with Indigenous data, but I may in the future
- c. No, I do not work with Indigenous data
- d. I don't know

## Section 6. Institutional supports.

To what extent do you agree with the following statements?

|   | Agree | Somewhat agree | Somewhat disagree | Wholly disagree | Unsure |
|---|-------|----------------|-------------------|-----------------|--------|
| My institution offers the support I need to engage in open scholarship practices. |       |                |                   |                 |        |
| I know where to ask for help when I have questions on open scholarship practices. |       |                |                   |                 |        |
| The library at my institution helps to support open scholarship practices.        |       |                |                   |                 |        |
| My department and faculty help to support open scholarship practices.             |       |                |                   |                 |        |
| The upper administration of my institution supports open scholarship practices.   |       |                |                   |                 |        |

## Final thoughts?

Please tell us anything you would like to share about open scholarship practices to help us better understand the facilitators and barriers from your perspective.

[Open text field]