Open Research at the University of Bath: Awareness, Use, and Pathways to Engagement

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1. Executive Summary

Open Research (also known as Open Science or Open Scholarship[1]) is a movement underpinned by a set of principles of transparency and openness to make research accessible to broader audiences, including the public, and increase trust in research. Encouraging certain Open Research (OR) practices has been a key focus of the UK government in the last decade to spur innovation and economic growth (Department for Business, Innovation and Skills, 2012) as well as of research funding bodies such as UK Research and Innovation (UKRI).

The University of Bath survey on OR practices ran through November and December 2022 for a period of three weeks. It was distributed to all academic staff and postgraduate research students (PGRs). Questions aimed to assess current levels of awareness and use of OR practices as well as researcher concerns about engaging in OR. Researchers were also asked how the university can help to bridge the gap between awareness and use.

The survey was split in two sections. The first part investigated awareness and use of OR practices more generally, and the second – optional – section asked questions about specific OR practices: (i) preregistration, (ii) open materials and code, (iii) open data, (iv) preprints and (v) open access publication.

A total of 232 respondents completed the survey. The optional part of the survey received a total of 118 responses.

Key Findings

- A total of 141 respondents (60.9%) were aware of OR practices.
- A small majority of respondents (N = 126, 54.3%) stated that they had used OR practices previously, 41 (17.7%) stated that they had not, and 65 (28%) were not sure.
- A quarter of respondents (N= 58, 25%), considered open access publication to be more important than any other OR practices. Only 2 respondents (2.2%) said open access was not applicable to their research.
- Seventy-three (31.5%) respondents were “very much” interested in the topic of OR and 82 (35.3%) thought it was “extremely” relevant to their research field.
- A small majority of respondents (N = 124, 53.4%) were interested in being involved in OR initiatives at Bath.
- Respondents identified a variety of actions that can be taken to encourage OR culture at the university. The respondents were presented with a range of actions and asked to select which ones they agreed would help encourage them to engage with OR. The

[1] These terms tend to be used interchangeably. However Open Research and Open Scholarship tends to be more inclusive of the arts and humanities than Open Science. We use Open Research (OR) to be consistent throughout the report as well as inclusive of all disciplines.

three priority areas were: 1) incentives from institutions & funders (N = 125, 53.9%), 2) more training (N = 124, 53.4%), and 3) dedicated funding (N = 123, 53%).

- In the optional section, 42 respondents (35.3%) reported that they would be "extremely" likely to engage with OR practices in the future, and 24 (20.6%) said they would be "very likely" to engage.
- This is the first university-wide survey at Bath to investigate awareness and use of OR practices. A large proportion of the sample was made up of PGR students (N = 101, 43.5%). Thirty-one per cent of responses were from psychology and health researchers.

Recommendations

- Identifying and developing staff and student-specific incentives for engaging with OR; academic staff were relatively more motivated by promotion, funding and workload whereas PGRs by training and support from senior staff.
- Developing information awareness interventions that are relevant to staff and PGR students and tailor these to particular disciplines and career stages.
- Developing more case studies showcasing OR engagement in Bath-led research projects.
- Continuing to provide and explore workshop-led training opportunities for PGRs and early-career researchers in collaboration with the Doctoral College and Library Research Services.
- Exploring opportunities to socialise OR through providing training to more senior staff (e.g., DREOs and PGR supervisors) on OR practices, enabling them to champion OR at a more local level and provide support and encouragement for PGRs and early-career researchers.
- Including OR practices in the induction for new lecturers.
- Identifying opportunities to communicate with staff and PGR students about OR practices and opportunities e.g., via existing newsletters and research ethics 'open house' sessions.
- Promoting and signposting colleagues to resources provided by UKRN[2] and Library Research Services[3].
- Creating a bank of information with FAQs and details of journals who mandate the use of OR practices in their publications in collaboration with Library Open Access.
- Liaising with relevant colleagues in human resources and senior leadership to explore opportunities for including engagement with OR within promotion and hiring criteria in line with proposed research culture action plan around responsible research assessment practices.

[2] https://www.ukrn.org/open-research-resources/
[3] https://library.bath.ac.uk/research-services

- Running the Bath OR survey again in 2025-2026 to track and monitor any changes and progress in this area.

2. Introduction and background to the survey

The term Open Research (also referred to as Open Science or Open Scholarship) refers to a movement and set of principles that encapsulate a desire and commitment to make scientific and academic knowledge more accessible to broader audiences, including the public, and to increase transparency and trust in research. The key principles of Open Research (OR) can be summarised in the acronym FAIR, meaning that academic research should be Findable, Accessible, Interoperable and Reusable (UKRI, 2023).

Table 1 outlines the key OR practices that are discussed within this report. It should be noted that Open Access (OA) publication has received substantially more attention in comparison with other OR practices. The UK Government has strategically invested in OA publication since 2012 in order to spur innovation and economic growth (Department for Business, Innovation and Skills, 2012). Universities are also increasingly being measured on their OR performance e.g., via the REF (Research Excellence Framework, 2020). In the past, this has focused mostly on OA publication but REF OR criteria may well be expanded for REF 2029. Whilst OA compliance will be required for the "contributions to knowledge and understanding" component of REF, a new element titled "people, culture and environment" is very likely to take a broader view of the actions an institution is taking to support and encourage open research (Vitae, 2024). Beyond OA publication, funding bodies and academic journals are increasingly encouraging and requiring more engagement with OR practices more broadly (Berg *et al.*, 2016; Wellcome Trust, 2020; University of Bath, 2022a; Nature Portfolio, 2024) e.g., there was a clear push towards pre-printed medical research during and since the Covid-19 pandemic.

There are theoretical advantages to adopting OR practices for individuals, groups, and institutions, although the costs and benefits of specific OR practices are not always clear to individual researchers (Logg and Dorison, 2021; Ni and Waltman, 2024). OR practices are also disproportionately popularised in certain disciplines e.g., pre-printing is more commonly practiced in physics, astronomy, mathematics and computer science where it is consequently seen as improving research dissemination compared with other fields (Ni and Waltman, 2024). The fundamental values behind adopting OR practices relate to increasing the value and usefulness of research for the wider public good, making publicly funded research more accessible, making research more transparent and hence, where relevant, reproducible (Albert, 2006; Nosek, 2012). However, there are several challenges to OR that make the wider cultural transition more difficult such as a lack of knowledge on best practice, concerns about increased scrutiny from the research community, hindering career progression, and insufficient incentives for individuals to engage with OR practices in everyday academic life (Heise and Pearce, 2020; Gomes *et al.*, 2022). Additionally, despite theoretical interest in OR being high, it has been noted that uptake is particularly low in the humanities due to the STEM and social science fields leading the conversation, which means that best practices do not

always translate to other fields (Heise and Pearce, 2020). For example, arts & humanities research tends to work with copyrighted archival data and its output focuses on long-form publications compared with shorter journal articles (Gilby *et al.*, 2022). With the increased relevance of OR in research excellence, it is in the university's interest to actively develop their OR culture across its faculties and school.

The University of Bath joined the UK Reproducibility Network (UKRN[4]) in May 2022, with the strategic objective "to encourage the adoption of OR Practices at the University of Bath through communication and engagement with the research community, and by providing services and training." (University of Bath, 2022b). In doing so, the University made a commitment to establish and monitor awareness and use of OR practices at the institution. This survey was the first attempt to do this, with the aim of establishing a baseline of awareness and use at Bath from which further research and policy guidelines can be developed.

The University of Bath OR survey was informed by surveys carried out by the UKRN (Norris *et al.*, 2022) and the University of Surrey (Farran *et al.*, 2020). We chose not to carry out the official UKRN survey, in order to allow us to establish a Bath OR baseline. The survey[5] was split into two sections:

1. awareness and use of OR, support for OR, and respondent characteristics.
2. perceived importance, previous experience, likelihood of use in the future and confidence using five specific OR practices; (i) preregistration, (ii) open materials and code, (iii) open data, (iv) preprints and (v) open access publication.

The survey was distributed university-wide as an anonymous online questionnaire using e-mail distribution lists. The survey was open for three weeks from November 21st 2022, with a reminder sent following the initial invitation. The survey was open to all staff – including professional services and technical staff – and postgraduate research students (PGRs) conducting research at the University of Bath. The survey received a favourable ethical opinion from the Psychology Research Ethics Committee (Reference 22-130).

This report presents the results from this survey which will be used as evidence to understand the current baseline of OR awareness and use at the University of Bath and inform future action plans to improve OR culture at our institution.

[4] At the time the survey was conducted Professor Julie Barnett was the Institutional Lead and Professor David Ellis was the Local Network Lead.
[5] See Appendix for a copy of survey materials.

Table 1: OR practice definitions adapted from UKRN and University of Surrey survey materials

OR Practice	Definition
Open Access Publishing	Publications that are freely available online, for anyone to access and re-use. There are two basic models for Open Access Publishing: 1) paying your publisher a fee or 2) depositing the final accepted manuscript in an online repository e.g., arXiv, bioRxiv, PsyArxiv or SocArxiv (aka self-archiving).
Pre-Print Archiving	Pre-print archiving (also known as pre-publication archiving) refers to making a manuscript openly available before it undergoes peer review in an academic journal or other outlet. Generally, this is achieved by uploading the manuscript to an online repository e.g., arXiv, bioRxiv, PsyArxiv or SocArxiv.
Open Data	Open data is data freely available to anyone to access and re-use. Data sharing is the process of making data available for wider dissemination to other scholars and/or the public, by making data available through a data repository, project website, or supplementary materials.
Open Hardware	Open hardware is a movement that promotes the sharing of hardware designs free-of-charge, so that anyone can build or modify devices. This can be done by releasing the designs under a free or open-source license, or by making the designs available online for anyone to download.
Pre-Registration	Pre-registration refers to the practice of documenting and submitting to a journal or public repository the research questions, methodological design, and analysis plan prior to collecting and/or analysing the data. This time-stamped document is made openly available by the time the research is published so that any deviation from the original research plan is visible to the scientific community.
Open Materials & Code	Open Materials and/or Code refers to researcher-created resources used while collecting or analysing data (e.g., survey questions, video stimuli, vignettes, algorithms, coding schemes, analytic code, etc.) that are made openly available to the research community.
Open Peer Review	This refers to the practice of both the researcher and paper/grant reviewer(s) being aware of each other's identities, replacing the double-blind peer review approach.

3. Survey Respondents

A total of 232 participants completed the main survey, and 118 (50.9%) of those chose to also answer the optional section on specific OR practices. Table 2 on the next page outlines the respondent demographics including their job role, faculty, department, and primary research methods used. In considering Table 2 it is important to bear in mind the following distribution of Departments/Divisions within Faculties and the School as whilst uptake of OR practices can be very high in departments such as psychology or health, this does not necessarily reflect engagement in other parts of the wider faculty.

1) **Faculty of Humanities and Social Sciences:** Economics, Education, Health, Politics, Languages & International Studies, Psychology and Social & Policy Sciences.
2) **Faculty of Engineering & Design:** Architecture & Civil Engineering, Chemical Engineering, Electronic & Electrical Engineering and Mechanical Engineering.
3) **Faculty of Science:** Chemistry, Computer Science, Life Sciences, Mathematical Sciences, Natural Sciences and Physics.
4) **School of Management:** Accounting, Finance & Law, Marketing, Business & Society, Information, Decisions & Operations and Strategy & Organisation.

Table 2: Respondent Demographics

Variables	Main Survey		Additional Questions	
Job Role	%	N	%	N
PGR	43.5%	101	40.7%	48
Lecturer	8.2%	19	10.2%	12
Senior Lecturer	11.6%	27	16.9%	20
Professor	12.9%	30	11.9%	14
Reader	5.2%	12	2.5%	3
Research Assistant	3.0%	7	3.4%	4
Research Associate	6.9%	16	6.8%	8
Research Technician	1.3%	3	2.5%	3
Professional Services Staff	1.7%	4	1.7%	2
Research Fellow	1.3%	3	1.7%	2
Other	4.3%	10	1.7%	2
Faculty	%	N	%	N
Faculty of Humanities & Social Sciences	44.4%	103	43.2%	51
Faculty of Science	22.0%	51	28.8%	34
Faculty of Engineering & Design	19.8%	46	16.9%	20
School of Management	10.3%	24	6.8%	8
Other	3.4%	8	4.2%	5
Department	%	N	%	N
Psychology	22.8%	53	21.2%	25
Health	8.2%	19	10.2%	12
Education	4.3%	10	3.4%	4
Social & Policy Sciences	4.3%	10	4.2%	5
Politics, Languages & International Studies	3.0%	7	3.4%	4
Pharmacy & Pharmacology	2.2%	5	3.4%	4
Economics	1.7%	4	0.8%	1
Mathematical Sciences	5.2%	12	5.9%	7
Physics	4.7%	11	7.6%	9
Chemistry	3.9%	9	4.2%	5
Biology & Biochemistry	3.0%	7	2.5%	3
Computer Science	3.0%	7	5.1%	6
Mechanical Engineering	5.2%	12	5.1%	6
Electronic & Electrical Engineering	5.2%	12	5.1%	6
Chemical Engineering	5.2%	12	4.2%	5
Architecture & Civil Engineering	4.3%	10	2.5%	3
Strategy & Organisation	4.3%	10	1.7%	2
Information, Decisions & Operations	3.9%	9	2.5%	3
Marketing, Business & Society	1.7%	4	1.7%	2
Accounting, Finance & Law	0.4%	1	0.8%	1
Other	2.6%	6	3.4%	4
Prefer not to say	0.9%	2	0.8%	1
Primary Methods	%	N	%	N
Quantitative	44.8%	104	32.0%	58
Qualitative	17.2%	40	9.4%	17
Mixed Methods	33.6%	78	21.0%	38
Other	2.6%	6	2.2%	4
Prefer not to say	1.3%	3	0.6%	1
No response	0.4%	1	0.0%	0

4. Open Research awareness and engagement

This section discusses awareness and use of OR practices at the University of Bath. One hundred twenty-six (54.3%) respondents stated that they had used OR practices previously, 41 (17.7%) said that they had not and 65 (28%) were not sure.

Seventy-three (31.5%) said they were "very much" interested in the topic of OR and 108 (46.6%) were "somewhat" interested in the topic. A further 34 (14.7%) felt neutral, with only a small percentage non-interested or unsure. When asked how relevant respondents think OR is to their field, 82 (35.3%) said it was "extremely" relevant, with a further 70 (30.2%) saying it is "very" relevant and another 35 (15.1%) saying it was only "somewhat" relevant. One hundred twenty-four (54.4%) were interested in being involved in OR initiatives at Bath although only 55 respondents (23.7%) were aware of the UKRN[6], even though Bath is a member.

Table 3 shows which specific OR practices respondents were using and which ones they were aware of. Respondents were also able to mark some practices as "not applicable" to their research field. According to this survey, registered reports (30.6%), and study pre-registration (34.9%) were considered as the least applicable practices. These options were primarily selected by respondents from the Faculties of Science and Engineering & Design.

Table 3: Awareness and use of Open Research practices

Practice	Used %	Used N	Aware %	Aware N	N/A %	N/A N
Open Access Publication	57.8%	134	59.5%	138	2.2%	5
Open Data	35.8%	83	66.8%	155	7.8%	18
Preprints	35.3%	82	65.9%	153	7.3%	17
Open Materials	33.6%	78	63.4%	147	14.2%	33
Open Code	24.6%	57	62.9%	146	18.1%	42
Research Co-Production	24.6%	57	61.6%	143	11.6%	27
Study Pre-registration	23.7%	55	44.8%	104	34.9%	81
Open Peer Review	22.8%	53	62.5%	145	7.3%	17
Replication Studies	8.6%	20	71.6%	166	12.1%	28
Registered Reports	8.2%	19	50.0%	116	30.6%	71

We asked respondents to report which of these practices they considered to be most important in rank order from 1 to 10 (Figure 1). Open Access Publication was ranked as most important by 58 respondents (25%), and 27 people (11.6%) considered Open Data to be the most important practice. This is aligned with higher awareness and usage of these practices;

[6] The UK Reproducibility Network (UKRN) "seeks to understand the factors that contribute to poor research reproducibility and replicability, and develop approaches to counter these, in order to improve the trustworthiness and quality of research". See more: https://www.ukrn.org/.

perhaps unsurprising considering the University-wide Open Access mandate, and the research data policy, which mandates data sharing and preservation (University of Bath, 2023). Open Peer Review was seen as least important, with only 4 people (1.7%) selecting it as 'most important'.

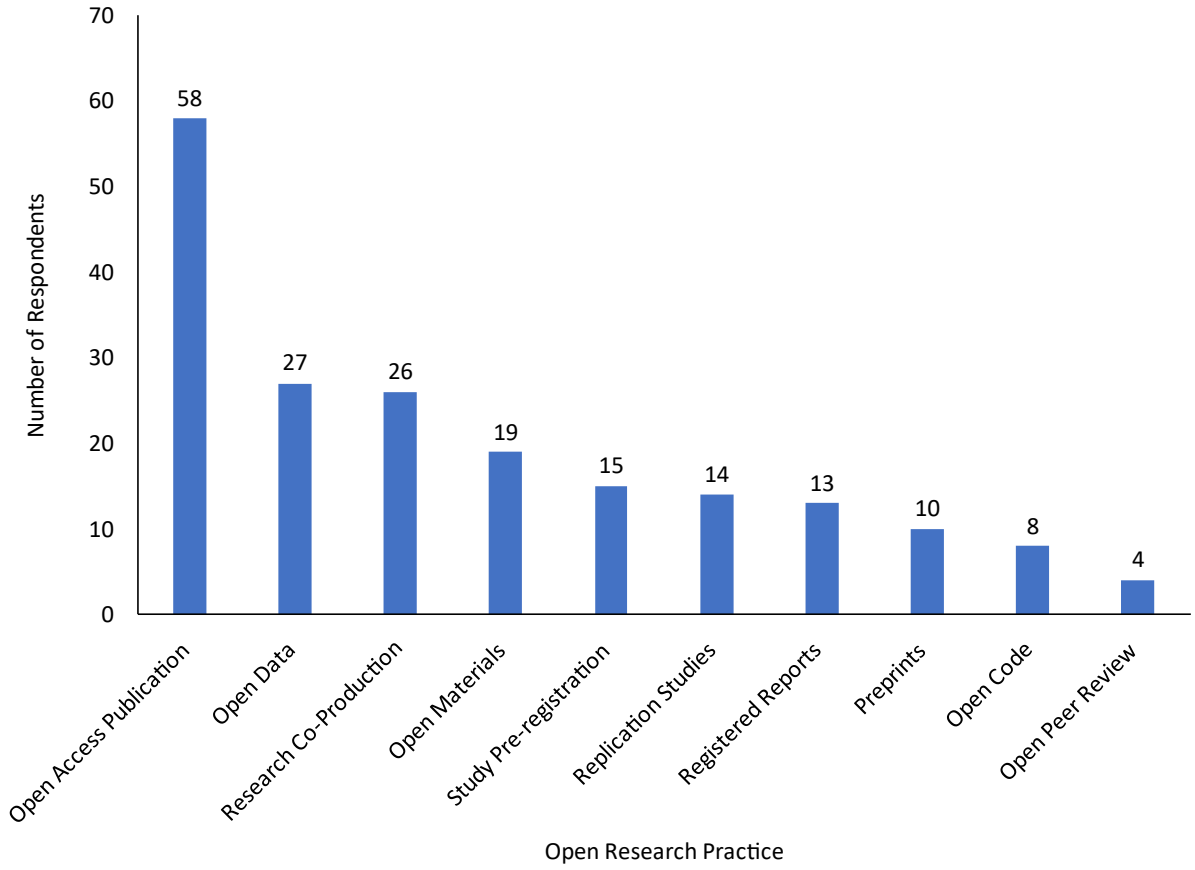

Figure 1: Open Research practices in order of importance

5. How can we bridge the gap between awareness and use of Open Research?

We were interested to understand what the staff and postgraduate researchers in our sample thought would help to bridge the gap between awareness and use. Research indicates that knowledge gaps, data sharing concerns and misaligned incentives pose barriers to the uptake of OR practices by university researchers across multiple disciplines (Gomes *et al.*, 2022). Our results suggest that there are several supportive actions that can encourage researchers to overcome the barriers. Over 50% of respondents stated incentives, training, and funding would encourage OR; over 40% said more support from senior researchers, more information, and a greater understanding of ethics; and over 30% stated dedicated workload, recognition in promotions, and a more supportive infrastructure would help to encourage OR practices at Bath. Table 4 further breaks down these beliefs between staff and postgraduate researchers to assist consideration of developing more targeted support. It shows that academic staff were relatively more motivated by promotion, funding and workload whereas PGRs by training and support from senior staff.

Table 4: *S*upportive actions respondents believed would encourage them to engage with Open Research practices

Action	Total %	Total N	PGRs %	PGRs N	Staff %	Staff N
Incentives from funders/institutions	53.9%	125	52.5%	53	55.0%	72
More training	53.4%	124	69.3%	70	41.2%	54
Dedicated funding	53.0%	123	50.5%	51	55.0%	72
More information	49.1%	114	59.4%	60	41.2%	54
Support from senior researchers	43.5%	101	63.4%	64	28.2%	37
Greater understanding of ethics	41.8%	97	45.5%	46	38.9%	51
Dedicated workload	39.2%	91	32.7%	33	44.3%	58
More supportive infrastructure	38.4%	89	40.6%	41	36.6%	48
Recognition in promotion and recruitment	36.6%	85	30.7%	31	41.2%	54
More positive beliefs	26.7%	62	25.7%	26	27.5%	36
Support from junior researchers	12.5%	29	18.8%	19	7.6%	10
Other	8.2%	19	3.0%	3	12.2%	16
Nothing	3.0%	7	2.0%	2	3.8%	5
No plan to take up Open Research practices	2.6%	6	3.0%	3	2.3%	3

More specifically, 91 respondents (39.2%) agreed that the use of OR practices should be factored into staff workload and 85 (36.6%) said that OR engagement should be recognised in promotion and recruitment criteria.

A small majority (N=154, 53.4%) said that “more training” would help them to engage with OR. This training could be provided in the form of written guidance and workshop-style sessions. Therefore, we asked which OR practices respondents wanted training on specifically, and which kind of training would be most beneficial, or whether no training was required for particular OR practices.

Figure 2 shows the responses to this question. Generally, written guidance was preferred to workshop-led across all training areas, with 47% and 21% selecting it on average, respectively. We also included a ‘no information or training required’ option, which was chosen on average by 32%.

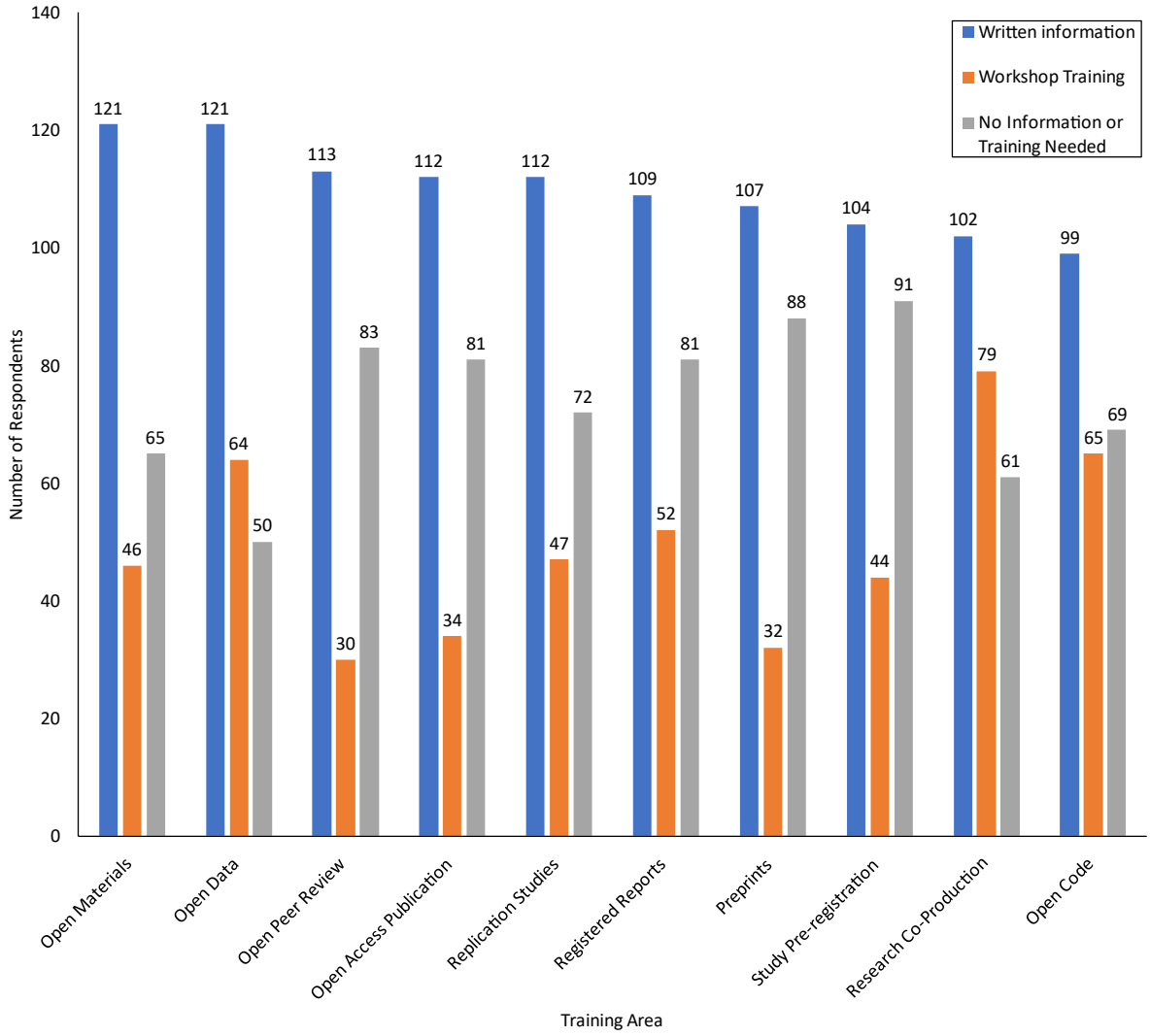

Figure 2: Clustered bar chart showing training requirements across specific OR practices

We note that the university already has some OR advice for staff and PGR students on practices that are mandated e.g., Open Access Publication and Open Data sharing. Figure 3 illustrates the level of awareness and use of current resources for OR at the university. On average, 37.3% were aware that these resources exist, and 23.2% had used them.

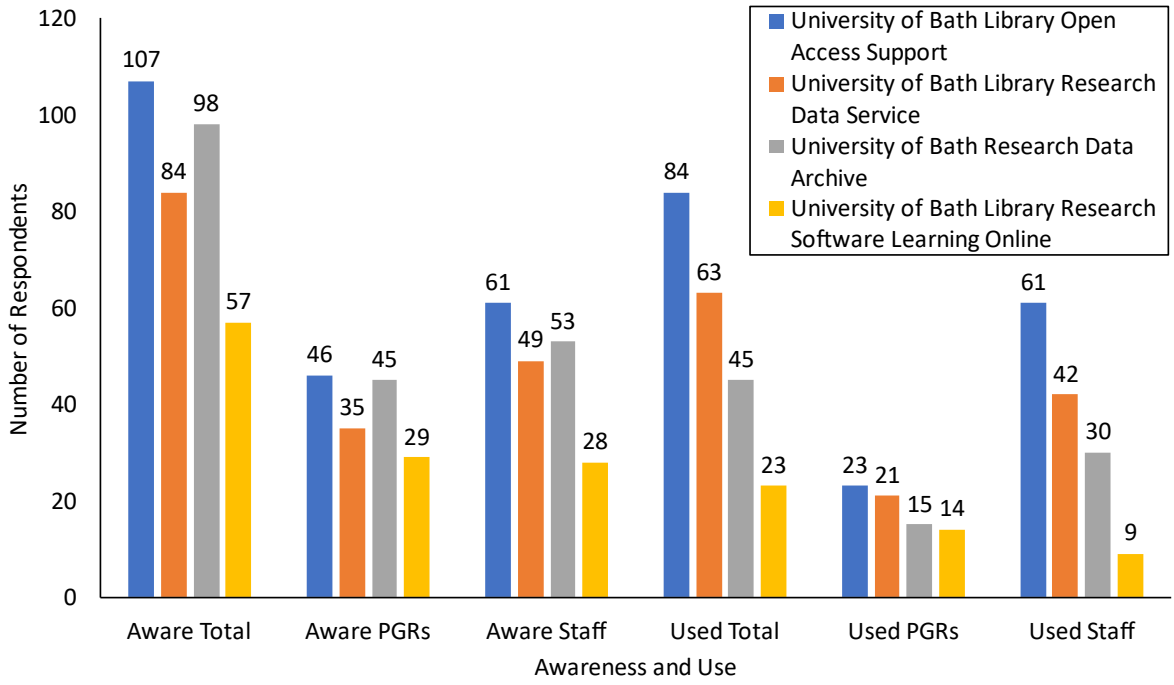

Figure 3: Awareness and use amongst PGRs and staff of different OR resources offered by the university

We included an open-text option to allow participants to comment about other resources they had used. The responses referred to (1) funding for OR, (2) the Bath hosted GitHub platform (infrastructure), (3) library training workshops and (4) library website outlining which funders have open access agreements.

We also included some open questions about training and information requirements. Whilst only 10 out of the 25 responses provided meaningful information, these responses highlighted a desire for further information around 1) pitfalls, risks and concerns with OR practice, 2) culture change required to encourage OR, and 3) specific use of open hardware and software.

> *"Open Peer Review requires an institutional change in many disciplines, and they are far from this change."*
>
> *"How to anticipate and deal with Open Research pitfalls / things you might regret afterwards."*

6. What are researchers' concerns relating to specific Open Research practices?

As noted earlier, the survey was split into two sections, with the second - optional - section asking questions related to specific OR practices. This chapter of the report presents findings from the optional section of the survey which was answered by 118 of the original respondents (50.9% retention). Table 2 earlier in the report outlines the participant demographics for the additional section alongside those from the original survey.

The additional questions related to five common OR practices: (i) preregistration, (ii) open materials and code, (iii) open data, (iv) preprints and (v) open access publication. For each practice, we surveyed respondents' perceptions of importance, levels of current use and intentions to use in the future. Open response questions were used to understand Bath researchers' concerns with each practice and inform how we might address barriers to increased use.

6.1 Open Access Publishing

Open access (OA) publication refers to publications that are freely available online, for anyone to access and re-use. There are two basic models for Open Access Publishing[7]:

1. Pay your publisher a fee (an Article Processing Charge) to make the final version open access in a peer-reviewed journal. This is known as "Gold Open Access Publishing".
2. Publish on a normal contract in a peer-reviewed journal, and deposit the final accepted version of your manuscript (peer-reviewed but not journal-formatted) in an open access repository such as an institutional repository e.g., Pure, or an external subject repository such as arXiv, bioRxiv, PsyArxiv or SocArxiv. This is known as "Green Open Access" or "self-archiving".

Ninety-two (71.8%) respondents thought that open access publishing was "extremely" important and 27 (23.1%) thought it was "somewhat" important.

Seventy-one (60.2%) of respondents had engaged in this practice for "two or more studies" and 73 (62.4%) said they were "extremely" likely to publish OA in future and a further 25 (21.4%) said they would be "very" likely to do so. Forty-six (39.3%) respondents also felt "extremely" confident in their ability to publish open access, and a further 29 (24.8%) felt "very" confident.

[7] See here https://authorservices.taylorandfrancis.com/choose-open/publishing-open-access/oa-green-gold/ for more details

Where respondents did raise concerns, these largely related to expenses and funding as highlighted in the example quotes below and Table 5:

> *"Open access fees are simply ridiculous. I believe everyone should publish open access, but this is a very privileged view in the current state of how journals work."*

> *"Funding for open access has become available to me through the university, which makes this viable; but what if the policy changes?"*

Table 5: Concerns with Open Access Publication

Concerns with Open Access Publishing	%	N
It is too expensive	62.7%	74
I don't have funding available	59.3%	70
Open access publication fees may reinforce hierarchies	52.5%	62
It restricts the journals that I can publish in	38.1%	45
I do not understand open access licensing	16.9%	20
I might inadvertently publish in a predatory journal	16.1%	19
It uses too many resources	8.5%	10
It is too time-consuming	5.9%	7

6.2 Pre-Print Archiving

Pre-print archiving (also known as pre-publication archiving) refers to making a manuscript openly available before it undergoes peer review in an academic journal or other outlet. Generally, this is achieved by uploading the manuscript to an archive such as arXiv (physics, maths), bioRxiv (biology), PsyArxiv (psychology), SocArxiv (sociology), etc.

Forty (34.5%) respondents thought pre-printing was "somewhat" important and a further 20 (17.2%) thought it was "extremely" important. Thirty-nine (32.8%) had archived pre-prints for "two or more studies". Twenty-five (21.2%) stated that they would be "not at all likely" to engage in this practice and 26 (21.9%) felt "not at all confident" in their ability to archive a pre-print.

Table 6 shows the key concerns that the sample had with pre-prints. These concerns mostly related to implications for the peer review process, and difficulties with publishing work that has been pre-printed.

Table 6: Concerns with pre-print archiving

Pre-Print Concerns	%	N
Non-peer-reviewed findings may add noise to the literature	47%	55
Some journals may not publish studies that are uploaded to pre-print archives	46%	54
Non-peer-reviewed findings may be misleading to the public	39%	46
Other people might copy my research and publish it before I do	31%	37
Making my work available pre-publication might reduce the number of citations to the ultimately published work	25%	29
Archiving the pre-print might highlight differences between my original manuscript and the ultimately published work	19%	22
It is too time-consuming	17%	20
I might receive negative comments on my archived pre-prints	11%	13
It uses too many resources	6%	7
There are no incentives	0%	0

Some of these concerns were also exemplified in the open text responses below, as well as some additional comments or reflections on pre-printing:

> **Peer review related concerns:** *"I don't like when preprints are mentioned as one and the same class of things as preregistration etc. because they are not peer-reviewed, an[d] as a reviewer I have felt that authors are trying to pressure you into accepting their paper because of the attention it got on Twitter. Flawed as it is, I still believe in the peer review process as necessary before you go public with your findings."*
>
> *"We have a serious problem with famous researchers + companies, i.e., they release a paper on arXiv and because of their fame double blind review is now compromised and people are citing/discussing it before peer review. It can create an ordering absurdity: you can have your paper rejected because it doesn't cite a follow up paper that builds on a paper you archived. When this combines with the above it can be extremely toxic, and I know of cases where this has happened. This should not be considered the same as the other forms of Open Research: unlike the others it causes harm (this could be fixed, but genies and bottles...), which is sometimes very damaging to both the individuals and the scientific process - I avoid it but am often forced to do it anyway by what can only be described as "social expectations."*
>
> **Journals not publishing archived studies:** *"The statement "some journals may not publish studies..." is too weak; some specific journals absolutely will not publish archived studies. They are completely clear about this, so I will happily archive some articles and definitely not archive others."*

One open text response reflected on the **cultural differences** between fields and how they may interpret pre-printed work: *"I have chosen not to answer the questions in this section because the question does not reflect the full use of pre-print archives. The use of such archives - whether pre or post-peer review and acceptance for publication - depends on the research field. The field also determines how seriously a reader will take a paper on the archive. E.g. in my field, I will glance at a paper that has not yet been accepted through peer review, but I am unlikely to cite it or take it seriously until it has been accepted for publication in a reputable journal. That said, my field has a very long-standing tradition of posting accepted pre-prints (even by paper post before the online version existed) and this has been a great driver of open-source publication and equitable global access to world leading research in my field."*

Pre-Prints as an alternative to Gold Open Access publishing: *"Pre-prints of published papers are useful if there is no final publication, or if the final publication is not open access. Where the material is actually published it can cause confusion of what is a version of record. Lead times to publication in my field are not so long that there is need to get the information out early."*

Backlash from archiving pre-prints: *"While I understand the role of pre-prints in some fields, I do believe that these often end up being used in the media for example, while no peer review has been conducted. This can lead to very misleading communications to peers and to the public either from researchers with unclear motivations or simply due to a mistake that may be picked up in the peer review process. This does also highlight differences in original and peer reviewed versions. Again, if everyone would be open to mistakes being made, this would probably not be such an issue, but if any mistake corrected or other change made during the peer review process will be seen as an intentional attempt at fraud, the value of pre-prints is quite unclear to me. If there was an option to add comments for example (maybe there is, I am not familiar with pre-prints as these are very uncommon in my field) to explain the changes that have happened, that might already be a good step. However, my first concern about the findings being misused does remain."*

6.3 Open Data Sharing

Open data is data that is freely available for anyone to access and re-use. Data sharing is the process of making data available for wider dissemination to other researchers and/or the public, by making data available through a data repository, project website, or supplementary materials.

Sixty-Four (55.2%) respondents considered this practice to be "extremely" important, and 41 (35.3%) considered it to be "somewhat" important. Fifty-Six (47%) had engaged in this practice in their own research. Forty-Four (38.9%) respondents said they were "extremely" likely to make their data openly available in the future and a further 28 (24.8%) said they were "very" likely to do so. Twenty-Two (19.5%) felt "extremely" and 26 (23%) "very" confident in their ability to do so in the future. Table 7 shows the respondents' concerns about sharing data openly.

Table 7: Concerns with open data sharing

Concerns with Open Data	%	N
I am unsure about copyright/licensing	37.3%	44
It is too time-consuming	27.1%	32
Gaining ethical approval to publish data is too difficult	25.4%	30
My data contains sensitive and/or personal information	22.0%	26
Lack of recognition/acknowledgement if others use my data	21.2%	25
Non-experts will have difficulty understanding my data and may mis-interpret it	21.2%	25
It is not possible to make my data fully anonymous	20.3%	24
There are no incentives	17.8%	21
Others may find errors in my data	17.8%	21
My datasets are too large or complex	15.3%	18
It uses too many resources	13.6%	16
I don't know where to publish my data	9.3%	11

The open-text responses shed more light on these concerns:

> **Issues gaining ethical approval for sharing data openly:** *"My main concern with sharing data is gaining ethics. SSREC*[8] *is already incredibly cumbersome and this would o[n]ly make it harder."*

> **It depends on the type of data:** *"It depends on the data. If someone runs a survey (with anonymous replies) that data should be made publicly accessible. If someone is using elite interviews (contingent on privacy) then no, it should not be made available."*

[8] Social Science Research Ethics Committee

Lack of time to prepare data for open sharing: *"Time is a real issue - especially if research assistants have already left."*

"The data has to be prepared by young researchers on limited time contracts and this consumes huge amounts of their time with no incentive. Time they don't have much of when they could be generating more data for other/future publications."

"I would really like to make this happen, but there always seems to be a good reason not to do this, whether it's proprietary data or confidential or there isn't time. The studies where it is feasible seem to be the ones where the data wouldn't be useful to others, except for checking the results. Having said that, I thank my lucky stars that there's so much data available over the internet from other (large) studies for secondary analysis."

"Concerns with not just making my data available but accessible to non-experts – what formats would they need or want (i.e., raw data in excel or a software that allows pre-manipulation of the data).

6.4 What are the levels of awareness about Open Hardware?

Open hardware is a movement that promotes the sharing of hardware designs free-of-charge, so that anyone can build or modify devices. This can be done by releasing the designs under a free or open-source license, or by making the designs available online for anyone to download.

A pertinent example of this is the work is the OpenFlexure project[9], which is an open-source microscope that can be built by anyone with access to a 3D printer. This work was led by Dr. Richard Bowman and is now maintained by the Bath Open INstrumentation Group. Despite this, only 21 (17.8%) respondents knew anything about open hardware.

We asked for open-text responses asking for examples of open hardware at Bath. The majority of responses mentioned Dr. Bowman's Open Flexure as well as the RepRap project, which aimed to create a self-replicating 3D printer (Bowyer, 2016).

We also asked for known examples of open hardware projects used outside of Bath. These included mentions of 'at Bath' projects that have gained national/global attention e.g., RepRap, and external projects:

[9] See https://openflexure.org/ for more information on the OpenFlexure project.

"Open hardware is becoming more prevalent in astronomy for building lower cost observatories."

"There are two journals for open hardware, HardwareX (Elsevier) and the Journal of Open Hardware. There is a dedicated unit at TU Delft, and an online training program (openhardware.space) that has recently featured all science projects funded by the Wellcome Trust."

One response also mentioned Arduino[10], an open-source electronics platform based on easy-to-use hardware and software, being used at other universities.

6.5 Open Materials and Code

Open Materials and/or Code refers to researcher-created resources used while collecting or analysing data (e.g., survey questions, video stimuli, vignettes, algorithms, coding schemes, analytic code) that are made openly available to the research community.

Fifty-eight (50%) respondents considered this practice to be "extremely" important and 46 (39.7%) said it was "somewhat" important. Fifty-Six (48.7%) had shared their materials or code openly in at least one study. Thirty-Nine (33.9%) said they were "extremely" likely to share their materials/code in future and a further 34 (29.6%) said they were "very" likely to do so. Twenty-One (18.3%) felt "extremely" confident in their abilities to do and a further 27 (23.5%) felt "very" confident.

In terms of concerns with sharing materials or code, these mostly related to licencing and copyright knowledge, not receiving appropriate acknowledgement as well as a lack of time to tackle the additional workload. Table 8 shows the concerns that respondents held with sharing materials and code openly.

[10] See https://www.arduino.cc/ for more information.

Table 8: Concerns with open materials and code

Concerns with open materials/code	%	N
I do not understand the licensing/copyright of my materials/code	37.3%	44
I might not receive appropriate credit/acknowledgement	34.7%	41
It is too time-consuming	29.7%	35
Other researchers might find errors in my materials/code	28.8%	34
I might lose control over how my materials/code are used	25.4%	30
Other researchers might criticise my materials/code	25.4%	30
Other researchers might find it difficult to understand my materials/code	23.7%	28
I don't know where to publish my materials/code	21.2%	25
There are no incentives	19.5%	23
It uses too many resources	7.6%	9
I do not want other researchers to reuse my materials/code	6.8%	8

We also allowed respondents to leave open-text responses to expand on their concerns:

> **A lack of incentive/reward for the additional workload involved in preparing materials/code to be shared openly:** *"I think sharing questionnaire materials is essential to the field, so I do that. I'd like to share my code, but it is 'messy' and there's no 'brownie points' in me cleaning it up for sharing - it's hard enough just getting research to market."*
>
> **Lack of credit/acknowledgement:** *"There is a strong tradition of making code open source (generally under a GNU licence) in my field, so that others can test it and help develop it. However, this process usually starts with a peer-reviewed publication on the code and its core algorithms. I would not want to release anything before this step, because citation of the publication is the only meaningful way that credit will be given."*
>
> **Additional funding/assistance needed:** *"I do find that organizing and labelling data files in a way that is truly understandable and useful for others takes a lot of time. Having funding for research assistance on this would be extremely helpful."*
>
> **Fear of criticism:** *"My research field is currently going through a big change in open research, which has led to certain groups going through publications to find errors. The*

purpose is to find fraudulent research, but I am not sure enough acknowledgment is being given to the fact that people also make mistakes, we are human after all. These groups publicise such articles with big headers and blaming authors for fraud, which does make me hesitant about publishing my data. I am absolutely not knowingly using fraudulent practices in my research, but there is certainly a possibility that there may for example be other ways of analysing the data that I have not considered. The negative focus on "exposing fraud" in my field is also leading to more hesitation towards being open about data from researchers who very much would like to be transparent, just do not want to be attacked."

Training and support: *"Lack of support of the university to provide training in reproducible coding (e.g., R, GitHub etc.). For example, I have taken the GitHub course provided by the university, but this was only partially helpful. More support would be good to integrate these workflows permanently."*

6.6 Pre-Registration

Pre-registration refers to the practice of documenting and submitting the research questions, methodological design, and analysis plan to a journal or public repository prior to collecting and/or analysing the data[11]. This time-stamped document is made openly available by the time the research is published so that any deviation from the original research plan is visible to the scientific community. Researchers are also able to comment on their pre-registration to explain and document deviations to further enhance transparency.

Twenty-Four (20.3%) respondents said that it was "extremely" important for researchers to pre-register studies and a further 43 (36.4%) said it was "somewhat" important. Thirty (25.4%) did not consider this practice to be applicable to their research. The majority who selected this response (N = 24) were from the Faculty of Science or Faculty of Engineering & Design. The open-text responses shed some light on why some may not consider this practice applicable to their field:

"It is clearly valuable to reduce the p-hacking in medical trials, or other work where finding a 'significant' result has a huge stakeholder value attached. In the heritage material sector, with small datasets and the need to respond to site findings, it is less critical."

"Not applicable to most of my research: I do proof and algorithm development. Most data are standard data sets being used to demonstrate an idea works where the data itself is irrelevant. But it is occasionally applicable and while it would be good in those

[11] Ideally prior to collecting the data.

cases you just don't see such studies in my field - nobody would know what to do with it."

"This sounds like a complete waste of time. I have never needed to do it and I can't see the point now. I am guessing that the range of recipients of this survey is far too wide. Preregistration may be a good thing in some fields, but certainly not in all. I really get annoyed when evangelists go on and on about something that really just isn't relevant and which, if imposed, with waste time and yield no benefit."

Eighty-one (70.4%) respondents said that they had not pre-registered any studies. Meanwhile 22 (19.1%) had pre-registered "two or more studies". Twenty of those were from social science backgrounds.

One open text response said: "*I'm a little concerned getting a survey from my university in 2022 that presents these things as crazy new ideas that no-one does yet (max possibility for preregistered studies is 2?*[12]*). The list of things that are holding me back doesn't even include the options "nothing is holding me back; I routinely pre-register all or most of my studies" (which should be the standard response)."*

The results show that 22 (19.3%) of respondents were "extremely" likely to pre-register a study in the future and a further 14 (12.3%) reported being "very" likely to do so. Forty-Eight participants (42.5%) felt "not at all confident" about engaging in this practice themselves.

We surveyed the concerns that respondents had about pre-registering their studies, as shown in Table 9. The key concerns largely related to a lack of time and pre-registration being inappropriate for research that requires flexibility e.g., exploratory research.

[12] Comment in reference to the maximum response to survey question being "two or more studies". N.B. there was an 'other' option included to allow people to insert their own response.

Table 9: Concerns with pre-registration

Concerns with preregistration	%	N
It is too time-consuming	36.4%	43
It prevents me from deviating from my original plan where needed	36.4%	43
It prevents exploratory research	36.4%	43
There are no incentives	32.2%	38
I do not feel confident deciding how to analyse the data before I see it	31.4%	37
It slows down my research	25.4%	30
It stifles creativity or flexibility	22.0%	26
It uses too many resources	11.0%	13
It makes it more difficult to publish	8.5%	10
It makes it more difficult to find statistically significant results	5.9%	7

These concerns were further illustrated in open-text responses:

> **It is too time-consuming:** *"It's a lot of work, which would be okay if not for the observation that in the end, plans change anyway, often for the most bizarre reasons (co-authors, often more senior, pressure project leads into changing plans; PhD students feel 'entitled' to handle their project any way they like; reviewers don't care about pre-registered plans.)"*
>
> **Lack of understanding from reviewers:** *"I am looking to pre-register all my studies in the future, so I am convinced that it is the way to go. It does, however, take more time and does make deviating from the plan possibly more difficult. This depends on having reviewers who are also open about data: I have just submitted a paper where we have pre-registered analyses with control variables, which we found out actually mitigate our effect where not expected to. Through additional analyses we do find a reason for this (these variables were not all independents of the DV), but I am looking forward to seeing whether reviewers will be open to this type of exploration or will simply reject the findings because of the role the control variables play in it. Because my field is only starting to use more pre-registration, it is somewhat risky to be very open about the data, analyses and findings because not all reviewers are open to not perfect results.*
>
> **Conflation of pre-registered studies with good quality studies: "***An additional concern I have is that researchers use pre-registration to imply that the study is a good quality one. It is possible to also pre-register very poorly designed studies / analyses: this should not be taken to imply higher quality of research design."*
>
> **Not applicable to their field:** *"I don't do studies in that sense. Not everybody is an experimental scientist, but openness still applies to the rest of us."*

6.7 Summaries of Current and Future Use

Figures 4 and 5 provide a visual summary of the above section in terms of current usage of OR practices, and future intentions.

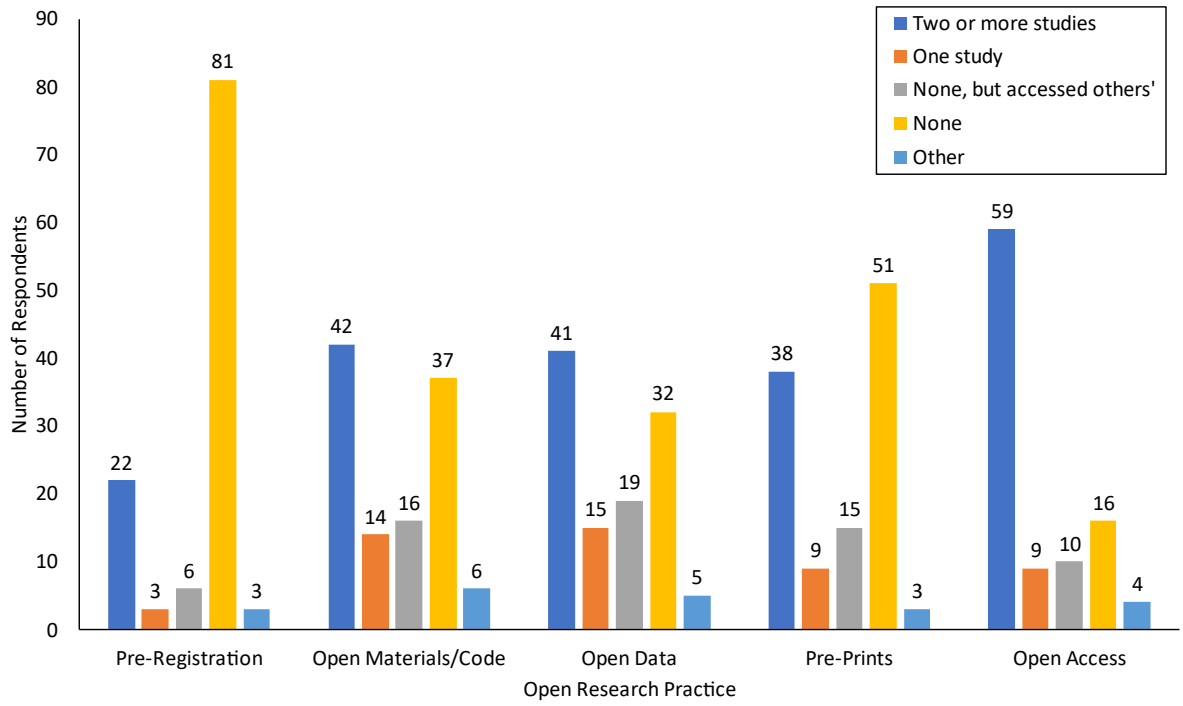

Figure 4: Summary of current usage of the open research practices surveyed

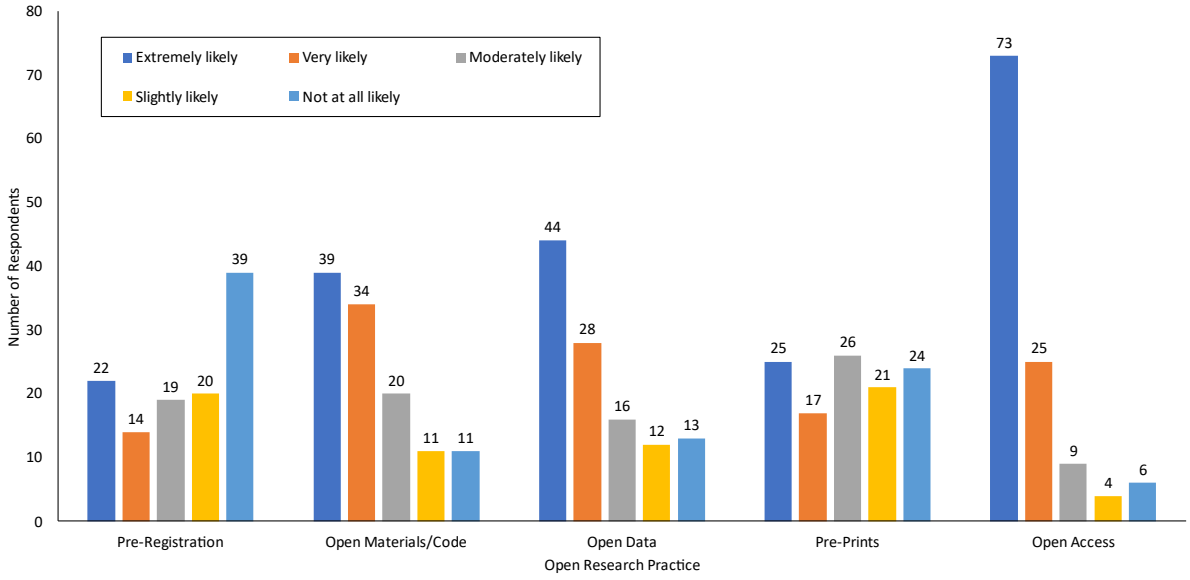

Figure 5: Summary of future use intentions of open research practices surveyed

7. What are some examples of good practices in the university and outside of it?

We asked Bath researchers, staff and PGR students, for examples of good OR practices both at our university as well as at other institutions. These questions included open-text responses to allow participants to expand on examples. The 'at Bath' responses related to:

> **Research group meetings dedicated to OR practices**: *"I know of some PhD students using registered reports and have heard of Open Research practices, especially in the AIM*[13] *research group (e.g., they have also previously had research meeting groups devoted to this topic). Recently, PGRs have started a Bath Open Research Group."*
>
> **Colleagues sharing examples with one another:** *"I have seen the pre-registrations, registered reports and OSF repositories of several members of staff that have been very helpful in my own learning."*
>
> **OR practice being part of formal PGR training:** *"It was taught as part of my CDT (Cybersecurity, TIPS-at-Scale)."*
>
> **Including OR practice in Data Management Plans:** *"Data management plans emphasising storing all research data for a set period and making it available to others."*
>
> **PGR students being encouraged by supervisors:** *"On my current course we were encouraged to pre-register our research and my supervisor encourages me to make my study materials available via open science framework."*

Examples of good practice at institutions (universities, journal publishers, conference organisers) outside of Bath related to:

> **Using open datasets for teaching purposes:** *"Some datasets available from other universities and research institutions which are really helpful in making teaching examples to use in classes."*
>
> **Engaging in/organising OR groups/networks:** *"I frequently attend meeting from ReproducibiliTEA (e.g., ReproducibiliTEA UCL) as well as online meetings from other Open Research groups (found through Twitter)."*

[13] Addiction and Mental Health Group (AIM) https://www.bath.ac.uk/research-groups/addiction-and-mental-health-group-aim/

Using popular platforms such as GitHub for sharing code/data: *"Comp Sci researchers actually taking the time to publish their code and data to GitHub repositories."*

Conference organisers incorporating OR discussions/workshops in their programmes: *"The Association for Consumer Research for example has started organising more open research related sessions and workshops in their annual conference."*

Requirements for data sharing from journals: *"Many academic journals now require more open data, which I think generally is great (though the guidelines are still quite vague)."*

Contracts between universities and journals to enable smoother Open Access publishing: *"I have been contacted several times, stating that one of my previous publications can now be made open access due to a new agreement either with one of my previous universities, or from the publisher themselves. This would be useful for Bath to start doing as well if they are not already."*

8. Limitations

This survey was designed to understand the level of awareness and engagement with OR practices, amongst staff and PGR students, at the University of Bath. The survey was voluntary and distributed by e-mail to staff – including research, technical and professional services – and PGR students. It is plausible that those who responded to the survey did so because they already had a view on OR. Our data shows that most respondents were based in the Faculty of Humanities and Social Sciences which houses the Departments of Psychology and Health where OR practices are more established. Additionally, we note that PGRs accounted for 43.5% of the respondents and that we did not have sufficient data from other staff categories to enable robust conclusions about levels of engagement across career stages. However, we note that all departments engaged, albeit at different levels, with the survey. On balance, we believe that, based on the results from this survey, there is sufficient data to help inform the OR agenda for the institution, and prioritise actions appropriate for our research community.

9. Recommendations and concluding remarks

In light of these results, we will prioritise the improvement of literacy in this area by providing the necessary knowledge, developing relevant skills and improving attitudes by:

- Identifying and developing staff and student-specific incentives for engaging with OR; academic staff were relatively more motivated by promotion, funding and workload whereas PGRs by training and support from senior staff.
- Developing information awareness interventions that are relevant to staff and PGR students and tailor these to particular disciplines and career stages.
- Developing more case studies showcasing OR engagement in Bath-led research projects.
- Continuing to provide and explore workshop-led training opportunities for PGRs and early-career researchers in collaboration with the Doctoral College and Library Research Services.
- Exploring opportunities to socialise OR through providing training to more senior staff (e.g., DREOs and PGR supervisors) on OR practices, enabling them to champion OR at a more local level and provide support and encouragement for PGRs and early-career researchers.
- Including OR practices in the induction for new lecturers.
- Identifying opportunities to communicate with staff and PGR students about OR practices and opportunities e.g., via existing newsletters and research ethics 'open house' sessions.
- Promoting and signposting colleagues to resources provided by UKRN[14] and Library Research Services[15].
- Creating a bank of information with FAQs and details of journals who mandate the use of OR practices in their publications in collaboration with Library Open Access.
- Liaising with relevant colleagues in human resources and senior leadership to explore opportunities for including engagement with OR within promotion and hiring criteria in line with proposed research culture action plan around responsible research assessment practices.
- Running the University of Bath OR survey again in 2025-2026 to track and monitor any changes and progress in this area.

[14] https://www.ukrn.org/open-research-resources/
[15] https://library.bath.ac.uk/research-services

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11. CRediT Author Statement

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13. Appendix

Bath Open Science Survey Autumn 2022

Start of Block: Intro and Consent

Open Research Survey, University of Bath

You are invited to participate in an anonymous survey examining how researchers at the University of Bath perceive and use open research practices (also known as open science or open scholarship). We are interested in gaining everyone's experiences whether or not you are currently aware of open research, or if you hold positive or negative perceptions of open research. Your response will help inform the University's approach to open research practices.

What does participation involve?
We are inviting you to complete a 10-20 minute survey on your current awareness of open research practices. We will first ask you some general questions about (1) your awareness of and use of open research practices, (2) how we can support the use of open research practices, and (3) the type of research that you conduct. This will take approximately 10 minutes. After completing the main questions we will invite you to complete some additional, more detailed questions which will take approximately another 10 minutes. This is completely optional and you can just complete the main questions if you would prefer.

Am I eligible to take part?
In order to take part, you should be a staff member or postgraduate research student conducting research at the University of Bath and be aged 18 years and over.

Do I have to take part?
Participation is voluntary. You do not have to take part in this survey if you don't want to. You can choose to withdraw from the survey at any time by closing your browser. You can also choose not to answer any specific questions.

Will I be reimbursed for participating?
At the end of the survey you will be given the option to enter your email address to be entered into a prize draw for one of 3 x £50 shopping vouchers of your choice. This is optional and you do not have to provide your email if you do not want to do so. If you indicate that you would like to be entered into the prize draw we will redirect you to a new survey to provide your email address. It will not be possible to link your responses to this survey on open research practices to your email address. We will delete all email addresses after the prizes have been allocated. Prize allocation will take place immediately after the survey has been closed.

What will happen with my data?
When the study has been completed we will analyse the findings and use these to inform the University of Bath's open research action plan. We will also publish anonymised data from this study as open data. Open data means that data are made available, free of charge, to anyone interested in the research, or who wishes to conduct their own analysis of the data. We will therefore have no control over how these data are used. However, all data will be fully anonymised before it is made available and therefore there will be no way to identify you from the research data.

What should I do if I have any questions or concerns?
This survey has been reviewed and approved by the University of Bath Psychological Research Ethics Committee (Reference No. 22-130). If you have any questions or concerns during in, or after, the survey you can contact the main researcher (c.hobbs@bath.ac.uk). If there are any further issues please direct them to the Department of Psychology Research Ethics Committee (psychology-ethics@bath.ac.uk).

Further information
If you would like any further information about the project you can contact the research team via email (Catherine Hobbs: c.hobbs@bath.ac.uk, Katherine Button: k.s.button@bath.ac.uk, Julie Barnett: J.C.Barnett@bath.ac.uk, Filipa Vance: fdfldm20@bath.ac.uk, David Ellis: dae30@bath.ac.uk).

Please read the following statements and indicate whether you agree or disagree:

	Agree	Disagree
I have read the survey information	○	○
I voluntarily agree to participate in this survey	○	○
I understand that I can withdraw from the survey without having to give a reason for my withdrawal by closing my browser	○	○
I understand that the data will be made 'open data'. I understand that this means anonymised data will be publicly available and may be used for purposes not related to this study. I understand that it will not be possible to identify me from these data.	○	○

End of Block: Intro and Consent

Start of Block: No Consent

Display This Question:

If Please read the following statements and indicate whether you agree or disagree: [Agree] (Count) != 4

JS

Thank you for your interest in our survey. As you have not consented to complete the survey please close your browser. You can also press the back arrow to restart the survey.

End of Block: No Consent

Start of Block: Open Science Awareness

Are you aware of the concept of open research (sometimes referred to as Open Scholarship or, in a more narrow application, Open Science)?

- ○ Yes
- ○ No
- ○ Not sure

Have you used any open research practices?

- ○ Yes
- ○ No
- ○ Not sure

How relevant do you think open research is to your field?

- ○ Extremely
- ○ Very
- ○ Somewhat
- ○ Slightly
- ○ Not at all
- ○ Not sure

Does the topic of this survey interest you?

- ○ Yes, very much
- ○ Yes, somewhat
- ○ I am neutral
- ○ Not really
- ○ Not at all
- ○ I am unsure

Page Break

We will now ask you some questions about specific open research practices.

Which of the following open research practices **are you aware of, and which have you used**? Please also indicate if you feel that the practice is not applicable to your research.

Please tick the relevant boxes to indicate if you are aware of the practice, if you have used

the practice, or if you feel that the practice is not applicable to your research. You can tick multiple boxes per statement. If none apply please leave unticked.

	I am **aware** of this	I have **used** this	**Not applicable** to my research
Study Pre-registration *(e.g., pre-analysis plan, prospective registration)*	☐	☐	☐
Registered Reports *(format of empirical article where a study proposal is reviewed before the research is undertaken)*	☐	☐	☐
Open Materials *(making research materials publicly available e.g., experiments, questionnaires, intervention materials)*	☐	☐	☐
Open Data *(making research data publicly available, e.g., FAIR data)*	☐	☐	☐
Open Code *(making analysis code publicly available)*	☐	☐	☐
Preprints *(making research papers available prior to journal peer-review in an online repository)*	☐	☐	☐
Open Peer Review *(journal or grant peer review where authors and reviewers are aware of each other's identity)*	☐	☐	☐
Open Access Publication *(making peer-reviewed papers or other publications publicly available)*	☐	☐	☐

Replication Studies *(research attempting to reproduce the methods and findings of prior research)*	☐	☐	☐
Research Co-Production *(researchers, public and practitioners working together in research, sharing responsibility throughout a project)*	☐	☐	☐

Display This Question:

If Which of the following open research practices are you aware of, and which have you used? Please... [I am aware of this] (Count) > 1

Carry Forward Selected Choices from "Which of the following open research practices are you aware of, and which have you used? Please also indicate if you feel that the practice is not applicable to your research. Please tick the relevant boxes to indicate if you are aware of the practice, if you have used the practice, or if you feel that the practice is not applicable to your research. You can tick multiple boxes per statement. If none apply please leave unticked."

Please rank the research practices you are aware of in order of how important you think they are when conducting research in your field.

Please drag and drop the practices to reflect how important you think they are.

_____ Study Pre-registration *(e.g., pre-analysis plan, prospective registration)*

_____ Registered Reports *(format of empirical article where a study proposal is reviewed before the research is undertaken)*

_____ Open Materials *(making research materials publicly available e.g., experiments, questionnaires, intervention materials)*

_____ Open Data *(making research data publicly available, e.g., FAIR data)*

_____ Open Code *(making analysis code publicly available)*

_____ Preprints *(making research papers available prior to journal peer-review in an online repository)*

_____ Open Peer Review *(journal or grant peer review where authors and reviewers are aware of each other's identity)*

_____ Open Access Publication *(making peer-reviewed papers or other publications publicly available)*

_____ Replication Studies *(research attempting to reproduce the methods and findings of prior research)*

_____ Research Co-Production *(researchers, public and practitioners working together in research, sharing responsibility throughout a project)*

End of Block: Open Science Awareness

Start of Block: Encourage Open Science

What would **help you to use more Open Research practices**?

Please select any statements that apply.

- [ ] More information on Open Research practices
- [ ] More training on Open Research practices
- [ ] Greater understanding of ethical issues (e.g., issues around data sharing)
- [ ] More supportive infrastructure (e.g., sufficient storage for open data)
- [ ] Workload dedicated to Open Research
- [ ] Dedicated funding for Open Research
- [ ] Incentives from funders, institutions, or other regulators
- [ ] Recognition of Open Research in promotion and recruitment criteria
- [ ] Support from senior researchers (e.g., supervisors and principal investigators)
- [ ] Support from junior researchers (e.g., PhD students, early career researchers)
- [ ] More positive beliefs about Open Research in my field
- [ ] I do not plan to take up Open Research practices
- [ ] Nothing
- [ ] Other (please tell us more in the text box below)

_____

Display This Question:

If What would help you to use more Open Research practices?Please select any statements that apply. = More information on Open Research practices

Or What would help you to use more Open Research practices?Please select any statements that apply. = More training on Open Research practices

Or What would help you to use more Open Research practices?Please select any statements that apply. = Greater understanding of ethical issues (e.g., issues around data sharing)

Or What would help you to use more Open Research practices?Please select any statements that apply. = More supportive infrastructure (e.g., sufficient storage for open data)

Or What would help you to use more Open Research practices?Please select any statements that apply. = Workload dedicated to Open Research

Or What would help you to use more Open Research practices?Please select any statements that apply. = Dedicated funding for Open Research

Or What would help you to use more Open Research practices?Please select any statements that apply. = Incentives from funders, institutions, or other regulators

Or What would help you to use more Open Research practices?Please select any statements that apply. = Recognition of Open Research in promotion and recruitment criteria

Or What would help you to use more Open Research practices?Please select any statements that apply. = Support from senior researchers (e.g., supervisors and principal investigators)

Or What would help you to use more Open Research practices?Please select any statements that apply. = Support from junior researchers (e.g., PhD students, early career researchers)

Or What would help you to use more Open Research practices?Please select any statements that apply. = More positive beliefs about Open Research in my field

Or What would help you to use more Open Research practices?Please select any statements that apply. = Other (please tell us more in the text box below)

And If

If What would help you to use more Open Research practices? Please select any statements that apply. q://QID5/SelectedChoicesCount Is Greater Than 1

Carry Forward Selected Choices from "What would help you to use more Open Research practices? Please select any statements that apply."

Of the options you have selected, which would be the **most helpful**?

- ○ More information on Open Research practices
- ○ More training on Open Research practices
- ○ Greater understanding of ethical issues (e.g., issues around data sharing)
- ○ More supportive infrastructure (e.g., sufficient storage for open data)
- ○ Workload dedicated to Open Research
- ○ Dedicated funding for Open Research
- ○ Incentives from funders, institutions, or other regulators
- ○ Recognition of Open Research in promotion and recruitment criteria
- ○ Support from senior researchers (e.g., supervisors and principal investigators)
- ○ Support from junior researchers (e.g., PhD students, early career researchers)
- ○ More positive beliefs about Open Research in my field
- ○ I do not plan to take up Open Research practices
- ○ Nothing
- ○ Other (please tell us more in the text box below)

_____

End of Block: Encourage Open Science

Start of Block: Training

Which of the following research practices, if any, **would you like more information or training about**?

Please tick all that apply

	No information/training wanted	Written information	Workshop led-training
Study Pre-registration *(e.g., pre-analysis plan, prospective registration)*	☐	☐	☐
Registered Reports *(format of empirical article where a study proposal is reviewed before the research is undertaken)*	☐	☐	☐
Open Materials *(making research materials publicly available e.g., experiments, questionnaires, intervention materials)*	☐	☐	☐
Open Data *(making research data publicly available, e.g., FAIR data)*	☐	☐	☐
Open Code *(making analysis code publicly available)*	☐	☐	☐
Preprints *(making research papers available prior to journal peer-review in an online repository)*	☐	☐	☐
Open Peer Review *(journal or grant peer review where authors and reviewers are aware of each other's identity)*	☐	☐	☐
Open Access Publication *(making peer-reviewed papers or other publications publicly available)*	☐	☐	☐

Replication Studies *(research attempting to reproduce the methods and findings of prior research)*	☐	☐	☐
Research Co-Production *(researchers, public and practitioners working together in research, sharing responsibility throughout a project)*	☐	☐	☐

Are there any other open research practices that you would like more information or training about?

_____

_____

_____

_____

_____

Are you aware of, and have you used any of the following current university resources?

	I am **aware** of this	I have **used** this	**Not applicable** to my research	Unsure
University of Bath Library Open Access Support	☐	☐	☐	☐
University of Bath Library Research Data Service	☐	☐	☐	☐
University of Bath Research Data Archive	☐	☐	☐	☐
University of Bath Library Research Software Learning Online	☐	☐	☐	☐

Are there any other university resources that you have used relating to open research practices?

_____

_____

_____

_____

_____

End of Block: Training

Start of Block: working group & networks

Would you be interested in being involved in Open Research initiatives at the University of Bath?

- ○ Yes
- ○ No
- ○ Other (please specify) _____

If you are interested in getting involved in open research initiatives you can contact the research team via email (Catherine Hobbs: c.hobbs@bath.ac.uk, Katherine Button: k.s.button@bath.ac.uk, Julie Barnett: J.C.Barnett@bath.ac.uk, Filipa Vance: fdfldm20@bath.ac.uk, David Ellis: dae30@bath.ac.uk).

Are you aware of the UK Reproducibility Network?

- ○ Yes
- ○ No

End of Block: working group & networks

Start of Block: Demographics

What department at the University of Bath are you based at?

If you belong to multiple departments please select your primary department.

- ○ Architecture
- ○ Chemical Engineering
- ○ Electronic & Electrical Engineering
- ○ Mechanical Engineering
- ○ Economics
- ○ Education
- ○ Health
- ○ Politics, Languages & International Studies
- ○ Psychology
- ○ Social & Policy Sciences
- ○ Biology & Biochemistry
- ○ Chemistry
- ○ Computer Science
- ○ Mathematical Sciences
- ○ Natural Sciences
- ○ Pharmacy & Pharmacology
- ○ Physics
- ○ Accounting, Finance & Law
- ○ Information, Decisions & Operations
- ○ Marketing, Business & Society
- ○ Strategy & Organisation

- ○ Prefer not to say
- ○ Other

How would you best describe the research methods you use?

- ○ Quantitative
- ○ Qualitative
- ○ Mixed Methods
- ○ Other (please specify) _____
- ○ Prefer not to say

What is your current role at the University?

- ○ Professor
- ○ Reader
- ○ Senior Lecturer
- ○ Lecturer
- ○ Senior Research Fellow
- ○ Research Fellow
- ○ Research Technician
- ○ Research Associate
- ○ Research Assistant
- ○ Postgraduate Research Student
- ○ Professional Services Staff
- ○ Prefer not to say
- ○ Other (please specify) _____

End of Block: Demographics

Start of Block: Additional_Questions

Would you like to answer some additional questions about specific open research practices? This will take approximately 10 minutes.

This is completely optional and you can just complete the main questions if you would prefer.

- ○ Yes, I am happy to answer further questions
- ○ No, I would prefer not to answer further questions

End of Block: Additional_Questions

Start of Block: pre_reg

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following questions are about **preregistration**.

Preregistration means documenting and submitting to a journal or public repository one's research questions, methodological design, and analysis plan prior to analysing the data. This time-stamped document is made openly available by the time the research is published so that any deviation from the original research plan is visible to the scientific community.

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

In your opinion, how important is it that researchers preregister their studies?

- ○ Extremely important
- ○ Somewhat important
- ○ Somewhat unimportant
- ○ Not at all important
- ○ No opinion
- ○ I feel that this is not applicable to my field

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How many studies have you preregistered?

- ○ None
- ○ None, but I have accessed others' preregistrations
- ○ One study
- ○ Two or more studies
- ○ Other (please specify) _____

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How likely are you to preregister a study in the future?

- ○ Extremely likely
- ○ Very likely
- ○ Moderately likely
- ○ Slightly likely
- ○ Not at all likely

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How confident would you be in preregistering a study?

- ○ Extremely confident
- ○ Very confident
- ○ Moderately confident
- ○ Slightly confident
- ○ Not at all confident

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following are possible concerns that researchers may have about preregistering their studies. Please select any concerns that you share.

- [ ] It slows down my research
- [ ] I do not feel confident deciding how to analyse the data before I see it
- [ ] It prevents exploratory research
- [ ] It stifles creativity or flexibility
- [ ] It might lead other researchers to copy my research before I can publish it (e.g. my idea might be 'scooped')
- [ ] It makes it more difficult to find statistically significant results
- [ ] It makes it more difficult to publish
- [ ] It prevents me from deviating from my original plan where needed
- [ ] It is too time-consuming
- [ ] It uses too many resources
- [ ] There are no incentives to preregistering

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

Do you have any other concerns about preregistering?

_____

_____

_____

_____

_____

End of Block: pre_reg

Start of Block: open_materials

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following questions are about **Open Materials and/or Code**.

Open Materials and/or Code refers to researcher-created resources used while collecting or analyzing data (e.g., survey questions, video stimuli, vignettes, algorithms, coding schemes, analytic code, etc.) that are made openly available to the research community.

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

In your opinion, how important is it that researchers make their study materials and/or code openly available?

- ○ Extremely important
- ○ Somewhat important
- ○ Somewhat unimportant
- ○ Not at all important
- ○ No opinion
- ○ I feel that this is not applicable to my field

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

In how many studies have you made materials and/or code openly available?

- ○ None
- ○ None, but I have accessed others' open materials and/or code
- ○ One study
- ○ Two or more studies
- ○ Other (please specify) _____

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How likely are you to make your study materials and/or code openly available in the future?

- ○ Extremely likely
- ○ Very likely
- ○ Moderately likely
- ○ Slightly likely
- ○ Not at all likely

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How confident would you be in making your study materials and/or code openly available?

- ○ Extremely confident
- ○ Very confident
- ○ Moderately confident
- ○ Slightly confident
- ○ Not at all confident

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following are possible concerns that researchers may have about making study materials and/or code openly available. Please tick any concerns that you share.

- ☐ Other researchers might criticise my materials/code
- ☐ Other researchers might find errors in my materials/code
- ☐ Other researchers might find it difficult to understand my materials/code
- ☐ I might lose control over how my materials/code are used
- ☐ I might not receive appropriate credit/acknowledgement
- ☐ I do not want other researchers to reuse my materials/code
- ☐ I don't know where to publish my materials/code
- ☐ I do not understand the licensing/copyright of my materials/code
- ☐ It is too time-consuming
- ☐ It uses too many resources
- ☐ There are no incentives
- ☐ I have no concerns

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

Do you have any other concerns about making your study materials and/or code openly available?

_____

_____

_____

_____

_____

End of Block: open_materials

Start of Block: open_data

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following questions are about **Open Data.**

Open data is data freely available to anyone to access and re-use. Data sharing is the process of making data available for wider dissemination to other scholars and/or the public, by making data available through a data repository, project website, or supplementary materials

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

In your opinion, how important is it that researchers make data openly available?

- ○ Extremely important
- ○ Somewhat important
- ○ Somewhat unimportant
- ○ Not at all important
- ○ No opinion
- ○ I feel that this is not applicable to my field

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

In how many studies have you made data openly available?

- ○ None
- ○ None, but I have accessed others' open data
- ○ One study
- ○ Two or more studies
- ○ Other (please specify) _____

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How likely are you to make your data openly available in the future?

- ○ Extremely likely
- ○ Very likely
- ○ Moderately likely
- ○ Slightly likely
- ○ Not at all likely

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How confident would you be in making your data openly available?

- ○ Extremely confident
- ○ Very confident
- ○ Moderately confident
- ○ Slightly confident
- ○ Not at all confident

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following are possible concerns that researchers may have about making their data openly available. Please tick any concerns that you share.

- [ ] Others may find errors in my data
- [ ] Non-experts will have difficulty understanding my data and may mis-interpret it
- [ ] My datasets are too large or complex
- [ ] There are not suitable repositories for my data (e.g., not enough capacity)
- [ ] Lack of recognition/acknowledgement if others use my data
- [ ] Gaining ethical approval to publish data is too difficult
- [ ] I am unsure about copyright/licensing
- [ ] It is not possible to make my data fully anonymous
- [ ] My data contains sensitive and/or personal information
- [ ] I don't know where to publish my data
- [ ] Open data principles are too complex (e.g., FAIR data, metadata)
- [ ] It is too time-consuming
- [ ] It uses too many resources
- [ ] There are no incentives
- [ ] I have no concerns

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

Do you have any other concerns about making your data openly available?

_____

_____

_____

_____

_____

End of Block: open_data

Start of Block: preprints

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following questions are about **pre-print archiving.**

Pre-print archiving (also known as pre-publication archiving) refers to making a manuscript openly available before it undergoes peer review in an academic journal or other outlet. Generally, this is achieved by uploading the manuscript to an archive such as arXiv (physics, maths), bioRxiv (biology), PsyArxiv (psychology), SocArxiv (sociology), etc.

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

In your opinion, how important is it that researchers archive pre-prints?

- ○ Extremely important
- ○ Somewhat important
- ○ Somewhat unimportant
- ○ Not at all important
- ○ No opinion
- ○ I feel that this is not applicable to my field

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

In how many studies have you archived pre-prints?

- ○ None
- ○ None, but I have accessed others' pre-prints
- ○ One study
- ○ Two or more studies
- ○ Other (please specify) _____

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How likely are you to archive pre-prints in the future?

- ○ Extremely likely
- ○ Very likely
- ○ Moderately likely
- ○ Slightly likely
- ○ Not at all likely

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How confident would you be in archiving pre-prints?

- ○ Extremely confident
- ○ Very confident
- ○ Moderately confident
- ○ Slightly confident
- ○ Not at all confident

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following are possible concerns that researchers may have about archiving pre-prints. Please tick any concerns that you share.

- ☐ Some journals may not publish studies that are uploaded to pre-print archives
- ☐ Other people might copy my research and publish it before I do
- ☐ Non-peer-reviewed findings may add noise to the literature
- ☐ Non-peer-reviewed findings may be misleading to the public
- ☐ Making my work available pre-publication might reduce the number of citations to the ultimately published work
- ☐ Archiving the pre-print might highlight differences between my original manuscript and the ultimately published work
- ☐ I might receive negative comments on my archived pre-prints
- ☐ It is too time-consuming
- ☐ It uses too many resources
- ☐ There are no incentives
- ☐ I have no concerns

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

Do you have any other concerns about archiving pre-prints?

_____

_____

_____

_____

_____

End of Block: preprints

Start of Block: open_access_publication

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following questions are about **Open Access publication**.

Open access publication refers to publications that are freely available online, for anyone to access and re-use.

There are two basic models for Open Access publishing:
1. Pay your publisher a fee (an Article Processing Charge) to make the final version open access in a peer-reviewed journal.
2. Publish on a normal contract in a peer-reviewed journal, and deposit the final accepted version of your manuscript (peer-reviewed but not journal-formatted) in an open access repository such as an institutional repository (e.g. Pure), or an external subject repository such as arXiv, bioRxiv, PsyArxiv SocArxiv, etc. This is known as Green Open Access or self-archiving.

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

In your opinion, how important is it that researchers publish open access?

- ○ Extremely important
- ○ Somewhat important
- ○ Somewhat unimportant
- ○ Not at all important
- ○ No opinion
- ○ I feel that this is not applicable to my field

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

For how many studies have you published open access?

- ○ None
- ○ None, but I have accessed others' open access publications
- ○ One study
- ○ Two or more studies
- ○ Other (please specify) _____

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How likely are you to publish open access in the future?

- ○ Extremely likely
- ○ Very likely
- ○ Moderately likely
- ○ Slightly likely
- ○ Not at all likely

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

How confident would you be in publishing open access?

- ○ Extremely confident
- ○ Very confident
- ○ Moderately confident
- ○ Slightly confident
- ○ Not at all confident

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

The following are possible concerns that researchers may have about open access publication. Please tick any concerns that you share.

- [ ] I don't have funding available
- [ ] It is too expensive
- [ ] It restricts the journals that I can publish in
- [ ] I have concerns about copyright if I deposit the final accepted version of my manuscript in an open access archive (e.g., green open access, self-archiving)
- [ ] I do not understand open access licensing
- [ ] I might inadvertently publish in a predatory journal
- [ ] Open access publication fees may reinforce hierarchies by excluding authors from publishing in prestigious journals
- [ ] It is too time-consuming
- [ ] It uses too many resources
- [ ] There are no incentives
- [ ] I have no concerns

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

Do you have any other concerns about open access publication?

_____

_____

_____

_____

_____

End of Block: open_access_publication

Start of Block: open_hardware

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

Do you know anything about open hardware?

- Yes
- No
- Unsure

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

And Do you know anything about open hardware? = Yes

Have you heard anything about open hardware being used at the University of Bath? If so, would you be able to provide us with some details?

_____

_____

_____

_____

_____

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

And Do you know anything about open hardware? = Yes

Have you heard anything about open hardware being used **outside** of the University of Bath? If so, would you be able to provide us with some details?

_____

_____

_____

_____

_____

End of Block: open_hardware

Start of Block: best_practices

Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

Have you seen any examples of good Open Research practices at the University of Bath? If so, would you be able to provide us with some details?

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Display This Question:

If Would you like to answer some additional questions about specific open research practices? This w... = Yes, I am happy to answer further questions

Have you seen any examples of good Open Research practices **outside** of the University of Bath? If so, would you be able to provide us with some details?

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End of Block: best_practices

Start of Block: comments

Have we missed any open research practices? Please let us know if you use any open research practices not covered within this survey.

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Do you have any final thoughts or comments?

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End of Block: comments

Start of Block: Debrief

Thank you for completing this survey, we are very grateful for your participation.

Your response will help inform how we can best support open research practices at the University of Bath.

If you would like any further information about the project or are interested in getting involved in open research initiatives you can contact the research team via email (Catherine Hobbs: c.hobbs@bath.ac.uk, Katherine Button: k.s.button@bath.ac.uk, Julie Barnett: J.C.Barnett@bath.ac.uk, Filipa Vance: fdfldm20@bath.ac.uk, David Ellis: dae30@bath.ac.uk).

Please press 'submit' to submit your survey response. You will then be given the option to enter the prize draw for one of 3 x £50 shopping vouchers of your choice.

End of Block: Debrief

Start of Block: Prize

Would you like to be entered into the prize draw to win one of 3 x £50 shopping vouchers of your choice?

If yes, you will be redirected to a separate survey after pressing the next arrow where you can enter your email address. Your responses to this survey will remain anonymous and it will not be possible to link your response to the email address you provide.

- ○ Yes, I would like to enter the prize draw
- ○ No, I would not like to enter the prize draw

End of Block: Prize