

Awareness and Use of Open Research Practices: An International Survey of Researchers Across Disciplines

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Abstract

Background: Growing concerns about replicability, reproducibility, and transparency have led to the adoption of several open research practices aimed at reforming the academic ecosystem. The current study explores international researcher's awareness and use of open research practice and variations across regions, disciplines, methodologies, and career level. **Methods:** A total of 3,017 researchers (45 countries; 24 disciplines) completed the Brief Open Research Survey, reporting their awareness and use of eleven common open research practices and factors that would support their adoption. **Results:** Respondents reported high awareness of Open Access Publishing, Preprints, and Open Data and awareness only fell below 50% for Research Co-production and Registered Reports. Use was high for Open Access Publishing, but fell below 50% for Preprints, Open Data, Open Research [term], Open Materials, Open Peer Review, Open Code, Preregistration, Research Co-production, Replication, and Registered Reports. Awareness and use varied across the sampled regions (e.g., Europe vs. Asia), disciplines (e.g., Psychology vs. General & Others in Sciences), methodologies (e.g., quantitative vs. qualitative), and career stages (e.g., PhD students vs. Professors). Respondents reported that the top five supportive strategies of open research were incentives from funders, institutions and regulators; dedicated funding; recognition in promotion and recruitment criteria; more training; and more information. **Conclusions:** Awareness is uniformly higher than use across open research practices and there are important variations between regions, methodologies, and career stages, as well as discipline-specific practices.

Key words: open research; open science; regional differences; discipline differences; methodology; research reform; meta-research; research policy

Introduction

Concerns regarding the replicability, reproducibility, and transparency of research are not new (Lakens, [2025](#)) but have reached a critical point owing to large-scale replication and reproducibility ‘failures’ (e.g., Baker, [2016](#); Camerer et al., [2016](#); Errington et al., [2021](#); Open Science Collaboration, [2015](#)), identification of questionable research practices (QRPs) (Lakens, [2022](#); Nagy et al., [2025](#)), cases of academic misconduct (e.g., Fanelli, [2009](#); Stapel, [2012](#)), and the low prevalence of data sharing (Gabelica et al., [2022](#); Hardwicke et al., [2024](#); Hussey, 2025). As we discuss herein, some of these issues may be more relevant for certain methodologies (e.g., quantitative vs. qualitative research) and even in different disciplines and countries (e.g., for ‘high stakes’ research or hyper-competitive environments), but there is consensus that institutional and cultural factors shape the norms of research practice and improvements are necessary (Balafoutas et al., [2025](#); Bradley et al., [2020](#); Munafò et al., [2017](#); Nosek et al., [2022](#); Pennington, [2023](#)). Open research has been leveraged as one potential improvement to this so-called ‘replication/reproducibility crisis’, sparking procedural, community, and structural change (Korbmacher et al., [2023](#)).

Open research reflects the notion that knowledge of all kinds, where appropriate, should be openly accessible, transparent, rigorous, reproducible, replicable, cumulative, and inclusive (Parsons et al., [2022](#)). This term has broadened from ‘open science’ to encompass *all* research disciplines, and ‘open scholarship’ is used in the context of teaching and pedagogy. Open research encompasses a set of practices and behaviours with the goal of improving the research ecosystem (Norris & O’Connor, [2019](#); Pennington, [2023](#)). Focusing on practices, there has been critical discussion of how preregistration (Nosek et al., [2018](#); van den Akker et al., [2024](#)), Registered Reports (Chambers & Tzavella, [2022](#); Nosek & Lakens, [2014](#)), open materials, code and data (Gillmore et al., [2018](#); Easterbrook, [2014](#); Wilkinson et al., [2016](#)), preprints (Moshontz et al., [2021](#)), and Open Access (OA) publication (Ahmed et al., [2023](#)) can bolster research integrity and widen access (see Coleman & Devezer, [2024](#); Devezer et al., [2021](#); Rubin, [2025](#) for critical perspectives). These have been accompanied by various guides (e.g., Henderson & Chambers, [2022](#); Kathawalla et al., [2021](#); Pennington, [2024a](#), [2024b](#)), supported by large-scale infrastructures (e.g., [Open Science Framework](#), Foster & Deardorff, [2017](#)), and strengthened by community-led networks (e.g., ReproducibiliTEA journal clubs, Orben, [2019](#); Framework for Open & Reproducible Research Training, Azevedo et al., [2019](#)). It is also important to note that wider behaviours have been discussed to improve accessibility, inclusion, diversity, equality and representation in research (see Ghai et al., [2025](#); Ledgerwood et al., [2022](#)).

In recent years, open research has been advanced by major organisations and consortia through global policies and recommendations, mainly from developed countries (e.g., <https://reproducibility.global/global-network>, see Skubera et al., 2025). Many of these began with specific recommendations to support Open Access (OA) publishing and open data (e.g., 2001 Budapest Open Access Initiative; see Gong, 2022 for a timeline), which have since broadened to encompass a wider range of practices. For example, in 2021 UNESCO developed their '*Recommendation on Open Science*', providing an internationally agreed definition, set of shared values, and guiding principles for open research. Similarly, the European University Association (EUA, 2022) has developed an [Open Science Agenda for 2025](#) and beyond, which defines priorities and describes the current context, challenges and developments. Open research is now a legal obligation under Horizon Europe – the EU's key funding programme for research and innovation (European Union, 2021; [European Commission](#), n.d.). Initiatives have also been implemented by publishers and funders, such as open research badges (Kidwell et al., 2016), the Transparency & Openness Promotion (TOP) guidelines (Grant et al., 2025; Nosek et al., 2015), community journals and peer review (e.g., [Peer Community In](#)), Registered Reports funding partnerships (Munafò, 2017), as well as changes to research assessment exercises (e.g., [San Francisco Declaration on Research Assessment](#), American Society for Cell Biology, 2012; [Coalition for Advancing Research Assessment](#)) and funding for meta-research (e.g., UKRI; UK Metascience Unit, 2025, [German Research Foundation](#); Skubera et al., 2025).

Engaging in open research requires behaviour change (Norris & O'Connor, 2019) and empirical studies have begun to assess researchers' awareness, use, and perceptions of such practices (e.g., Alter et al., 2025; Chakravorti et al., 2025; Ferguson et al., 2024; Fessinger et al., 2025, Hughes-Noehrer et al., 2024; Norris et al., 2022; Silverstein et al., 2024). Norris et al. (2022) developed the Brief Open Research Survey (BORS) to assess awareness and use of eleven common open research practices as well as strategies that support their adoption. Across a sample of 1,274 multi-disciplinary UK researchers, over half were aware of OA publications, preprints, open materials, code and data, open peer review, open research, replication studies, research co-production and preregistration, but less than half were aware of Registered Reports. However, only OA publishing, preprints, and open data reached >50% use, consistent with other studies suggesting a disconnect between (mainly positive) perceptions of open research and their implementation (Alter et al., 2025; Fessinger et al., 2025). Respondents reported that incentives from funders, institutions and other regulators, dedicated funding, and recognition in promotion and recruitment criteria would support them most in adopting open research. Ferguson et al. (2024) surveyed European researchers selected from the top 10 most-cited journals in the social sciences

and found substantially higher estimates, with greater engagement with open data and code than preregistration and an increase in lifetime prevalence over a decade. Some research has investigated variation in these practices based on region, discipline, and methodology: in a sample of 452 Professors, Chakravorti et al. ([2025](#)) found greater self-reported use of preregistration in the social sciences compared to engineering as well as regional variation in this practice between the USA and India (the only two disciplines and regions sampled). In a sample of 602 psychology researchers from the UK and Ireland, Silverstein et al. ([2024](#)) found higher engagement for those whose primary methodology was quantitative compared to qualitative and those with institutional support for open research. Despite providing important insights, these studies are limited by their focus on specific countries, regions, or disciplines, and/or selective sampling.

There is therefore a need to estimate awareness and use of open research across researchers from different regions, disciplines, and methodologies. This is particularly important because access to participation may not be equal and may even create new inequalities. Researchers across different world regions face unique challenges that – although not exclusive to open research – can limit participation (Chuan-Peng et al., [2025](#); UNESCO, [2023](#); Zhang et al., [2022](#)). Chuan-Peng et al. (2025) discuss several micro-level barriers that can specifically impact researchers from lower-middle income countries to engage in open research, such as limited institutional support, time constraints, poor working conditions, inadequate infrastructure and training, as well as a lack of incentive, visibility and sustainability. This is supported by empirical data, with a recent white paper indicating disparities in research integrity training between high and lower-middle income countries (Springer Nature, [2025](#)). Participation in some open research practices may be impacted more than others; researchers may have limited or no funding to cover OA publishing costs, with only few journals offering waivers or discounts on large Article Processing Charges (APCs), and some have specific application criteria. Some scholars have also argued that, due to current incentive structures, there are indirect costs associated with the adoption of preregistration, Registered Reports and code/data sharing, such as time, labour, and recognition (Allen & Mehler, [2019](#); Ghai et al., [2025](#); Hostler, [2023](#)). This may be particularly challenging for researchers on temporary contracts or under significant funding time restraint: for example, researchers perceive that a key barrier to implementing Registered Reports is their extended timeline for peer review (Spitzer & Mueller, [2023](#)), although journal initiatives have now been implemented to resolve this (Chambers & Tzavella, [2022](#); Oshiro et al., [2024](#)). Furthermore, in some countries and disciplines, and at different career stages, there may be cultural barriers to engaging in open research; access to infrastructure is not globally equitable, regulatory frameworks surrounding open data differ, competitive rather

than collaborative modes of research are common, and researchers at early career stages may fear persecution (Neuchterlein et al., [2023](#); UNESCO, [2023](#)).

Recent discussions have also highlighted that engaging with open research may not be appropriate for all types of research, suggesting differences between disciplines, methodologies, epistemologies, and specific research studies (Leonelli, [2018](#); Pownall, [2024](#), [2025](#), Ursić et al., [2025](#)). It has been argued that open research practices predominantly focus on quantitative, confirmatory research (Pownall, [2025](#)) where practices such as replication, preregistration and open data aim to limit undisclosed, post-hoc analytical flexibility (Frank et al., [2025](#); Kyriazos & Poga, [2026](#)). Moreover, several issues that have driven the reproducibility crisis, such as publication incentives centering on statistically significant findings (Nosek et al., [2012](#)), do not apply to qualitative research (Kyriazos & Poga, [2026](#); Pownall, [2025](#)). Open data is constrained by sensitive topics where participants could be easily identified (e.g., clinical populations; see Hobson et al., [2025](#)) or in disciplines where open knowledge could be misused (e.g., synthetic biology, nuclear physics, Hagendorff, [2019](#); National Academies of Sciences, Engineering, and Medicine, [2018](#); Henderson et al., [2025](#)). This aligns with the European Commission's ethos of "as open as possible, as closed as necessary" (European Union, [2021](#); [European Commission](#), n.d.). Figure 1 visualises these potential barriers.

Research Overview

Few studies have assessed awareness and use of common open research practices across international regions, methodological approaches, and disciplines. We therefore utilised the BORS (Norris et al., [2022](#)) to conduct a mixed-methods study in a large, international multidisciplinary sample. Drawing on the COM-B model of behaviour change (Michie et al., [2011](#)), we also explored what support would help researchers to use more open research practices. In this context, Psychological **C**apability refers to an individual perceiving they have the ability and skills to participate in open research practices; Physical **O**pportunity relates to the external factors that make using these practices possible, Social **O**pportunity to the social factors, such as cultural norms and cues, that encourage open research; and Reflective **M**otivation refers to the cognitive processes that direct and inspire open research practices, such as the extent to which these behaviours align with personal goals and values (Norris et al., [2022](#)¹; Silverstein et al., [2024](#)). By providing estimates of awareness and use

¹ The COM-B model also includes Physical Capability (having the strength, stamina or dexterity needed to perform a behaviour) and Automatic Motivation (arising from automatic impulses and associative learning), which were not thought to align with open research practices.

of open research across different boundaries, our research aims to inform education, training and policy whilst also highlighting areas in which the open research landscape should acknowledge and mitigate inequalities.

Figure 1. Potential barriers to engaging in open research.



Methods

Openness and Transparency Statement

This study was prospectively preregistered on the Open Science Framework on 14 June 2023 (<https://osf.io/2ewz6>), and data collection began on 26 June 2023. There were two deviations to the preregistration: first, we extended the data collection deadline to increase the sample size, and second, we expanded our survey distribution strategy so that researchers who were not members of regional reproducibility networks (<https://www.ukrn.org/global-networks>) could also disseminate. Given the descriptive aims of this study, these two deviations do not affect the analytic approach and strengthen the robustness of our findings by increasing sample size and representativeness (Lakens, [2024](#)). In line with the recommendations of Simmons et al. ([2012](#)), we report how we

determined our sample size, all data exclusions, and all measures in the study. We report our findings in line with the Checklist for Reporting Of Survey Studies guidelines (CROSS; Sharma et al., 2021). All materials, code, data, and supplementary materials are available at: <https://osf.io/njt37/>. The raw data has been anonymised to redact any demographic information (e.g., institution/department name). Certain variables have been split between datasets and a randomiser applied to uphold anonymity. It is important to note that an additional reason for restricting the sharing of aggregate data is to prevent the potential ranking of open research practices (e.g., by institution).

Sampling Strategy

The study approved by the ethics committee at the lead institutions (REFs: 36606-LR-May/2022-39378-2; 36606-A-May/2023-44788-1), and all respondents provided informed consent. To be eligible to take part, respondents had to be aged 18 and over and an active researcher at PhD candidate level or above. The survey was open to researchers across disciplines and methodological approaches, regardless of prior familiarity with open research. In line with Norris et al. (2022), we aimed to recruit a large sample size via convenience sampling. Respondents did not report their age, gender, or ethnicity as these were not a focus of the study.

A total of 4,175 respondents were recruited initially. In line with our preregistered exclusion criteria, 1,158 were excluded due to having incomplete data that suggested they exited the survey early ($n = 995$), not meeting the career stage criteria ($n = 97$), stating that they did not consent to take part after reading the information sheet ($n = 57$), indicating a 'test' response ($n = 5$, for the translated surveys), or being identified as a careless responder ($n = 4$, nonsensical open-ended responses). The final sample comprised 3,017 respondents from a total of 24 disciplines and 45 countries across the world regions of Europe ($n = 2,339$, 78%), South and North America ($n = 369$, 12%), Oceania ($n = 176$, 6%), Asia ($n = 80$, 3%),

and Africa ($n = 42, 1\%$)². Table 1 reports respondent demographics and Figure 2 visualises the sample size by country.

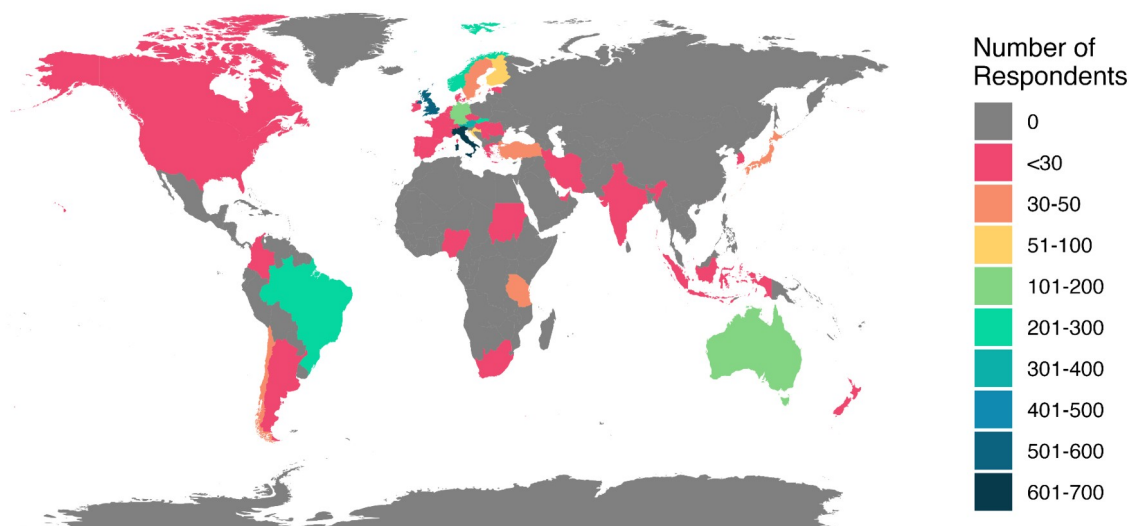
Table 1. Respondent demographics.

²The world regions were chosen based on Our World in Data and the United Nations (<https://ourworldindata.org/world-region-map-definitions>): Our World in Data defines six world regions: Europe, North America, South America, Oceania, Asia, and Africa. However, we then combined North and South America due to the small sample size in the former, which aligns with the United Nations who define five world regions: Europe, North and South America, Oceania, Asia, and Africa. We recognise therefore that there are several ways to define world regions, and we took a data driven approach in the current study to increase sub-sample sizes. Our data are openly available for anyone who wishes to look at the regional or country-level data. Countries included in Europe were Italy, UK, Austria, Slovakia, Norway, Germany, Finland, Croatia, Sweden, Switzerland, Netherlands, Belgium, Ireland, Serbia, Czech Republic, Denmark, France, Portugal, Romania, Estonia, Greece, Hungary, Balkans, and Spain. Countries included in North and South America were: United States, Canada, Brazil, Argentina, Chile, and Colombia; in Asia were Japan, China, South Korea, India, Indonesia, Turkey, Iran, Hong Kong, and UAE; in Africa were South Africa, Tanzania, Nigeria and Sudan; and in Oceania were: Australia and New Zealand.

Country	N (%)	Discipline	N (%)
Italy	625 (20.72%)	Psychology	645 (21.38%)
United Kingdom	503 (16.67%)	Biological & Sports Sciences	342 (11.34%)
Austria	309 (10.24%)	Social Sciences	269 (8.92%)
Brazil	295 (9.78%)	Medicine & Dentistry	257 (8.52%)
Slovakia	271 (8.98%)	Subjects allied to Medicine	202 (6.70%)
Norway	202 (6.70%)	Physical Sciences	157 (5.20%)
Germany	186 (6.17%)	Education & Teaching	156 (5.17%)
Australia	167 (5.54%)	Engineering & Technology	154 (5.10%)
Finland	57 (1.89%)	Language & Area Studies	101 (3.35%)
Croatia	56 (1.86%)	General and others in Sciences	89 (2.95%)
Chile	40 (1.33%)	Business & Management	86 (2.85%)
Turkey	35 (1.16%)	Humanities & Liberal Arts	81 (2.69%)
Sweden	34 (1.13%)	Mathematical Sciences	73 (2.42%)
Japan	34 (1.13%)	Geographical & Environmental Studies	65 (2.15%)
Tanzania	34 (1.13%)	Agriculture, Food & related studies	64 (2.12%)
Switzerland	27 (0.89%)	Computing	64 (2.12%)
Netherlands	23 (0.76%)	Historical, Philosophical & R.S.	43 (1.43%)
United States	22 (0.73%)	Law	42 (1.39%)
Belgium	20 (0.66%)	Veterinary Sciences	25 (0.83%)
Canada	10 (0.33%)	Combined & General Studies	23 (0.76%)
New Zealand	9 (0.30%)	Architecture, Building & Planning	21 (0.70%)
South Africa	6 (0.20%)	Creative Arts & Design	20 (0.66%)
Ireland	5 (0.17%)	Communications & Media	16 (0.53%)
Serbia	5 (0.17%)	General/Others	14 (0.46%)
India	4 (0.13%)		
Spain	4 (0.13%)	Methodology	N (%)
Czech Republic	2 (0.07%)	Quantitative	1268 (42.03%)
Denmark	2 (0.07%)	Mixed Methods	1226 (40.64%)
France	2 (0.07%)	Qualitative	371 (12.30%)
Indonesia	2 (0.07%)	Other	51 (1.69%)
Balkans	1 (0.03%)		
Argentina	1 (0.03%)	Career Level	N (%)
China	1 (0.03%)	PhD Student	696 (23.07%)
Columbia	1 (0.03%)	Professor	527 (17.47%)
Estonia	1 (0.03%)	Temporary Research-Only	475 (15.74%)
Greece	1 (0.03%)	Reader/Associate Professor	417 (13.82%)
Hong Kong	1 (0.03%)	Lecturer/Assistant Professor	281 (9.31%)
Hungary	1 (0.03%)	Senior Lecturer	199 (6.60%)
Iran	1 (0.03%)	Permanent Research-Only	178 (5.90%)
Nigeria	1 (0.03%)	Other	150 (4.97%)
Portugal	1 (0.03%)	Associate Lecturer/Adjunct Professor	61 (2.02%)
Romania	1 (0.03%)		
South Korea	1 (0.03%)	Involved in a research group	N (%)
Sudan	1 (0.03%)	Yes	1407 (46.64%)
UAE	1 (0.03%)	No	1564 (51.84%)
		Involved in OR initiatives	N (%)
		Yes	601 (19.92%)
		No	2379 (78.85%)

Note: Country = place of primary university/institution affiliation; UAE = United Arab Emirates; R.S. = Religious Studies; OR = open research. Percentages do not add to 100% due to missing data. Disciplines are categorised in accordance with the UK's Higher Education Statistics Agency's (HESA) Common Aggregation Hierarchy, Level 1 (HESA, [2022](#)).

Figure 2. Sample size by country. Figure created in R (version 4.5.2, 2025-10-31).



Procedure

An invitation was sent to international affiliates of the UK Reproducibility Network (UKRN; see <https://www.ukrn.org/international-networks/>) to collaborate on this research project. This approach was initially selected because RNs have a global reach and presented a unique opportunity to distribute broadly. A total of 20 countries with current RN leads were contacted using their organisational/institutional email, and a total of 15 countries signed up through this sampling strategy: Germany, Slovakia, Norway, Sweden, Australia, Netherlands, Croatia, Finland, Brazil, Italy, Austria, Canada, Portugal, Switzerland, and the United Kingdom. These leads then disseminated the survey through their institutional mailing lists, newsletters, research groups, working groups, collaborators, and internal communications teams. Social media announcements were restricted to official Slack groups (<https://slack.com/>) to avoid data quality issues outlined in Silverstein et al. (2024). Shortly after, we extended our sampling strategy so that additional collaborators from outside of the RN, who expressed interest, could disseminate the survey, with representation increasing to 45 countries in total. The survey was presented in English for 41 countries, and four countries translated the survey to their local language (Turkey, Brazil, Slovakia, and Croatia), with one researcher conducting the first translation, a second researcher conducting a back translation, and then the Lead for that country conducting final checks.

The survey was administered via Qualtrics (Provo, UT) and was available to complete for 29 weeks. Respondents were informed that their participation was voluntary, responses would be anonymised, and that they could withdraw at any time. They were also informed that their local RNs or country lead would receive a summary of responses to

inform internal policy and practice development and that the full anonymised dataset would be made openly available.

Materials

Brief Open Research Survey

The BORS (Norris et al., [2022](#)³) is a standardised questionnaire to assess awareness and use of open research practices. It is designed to be completed within a short-time frame (<5 minutes) to reduce burden whilst providing a detailed snapshot of open research practices at the current timepoint. In the current study, we utilised this survey in a cross-sectional design.

The survey begins by asking a series of demographic questions (see ‘Materials’; <https://osf.io/njt37>). It then presents respondents with 11 open science practices (Figure 3) and asks, “*Which of the following research practices are you aware of? (Tick all that apply)*”. Each open research practice is displayed with a brief definition and respondents select “I am aware of this” by ticking the corresponding box or leaving this blank if they are unaware of the practice. If a respondent reports that they are aware of a practice, they are shown these specific practices again and asked, “*Which of the research practices have you used, in your own research or in a collaboration with others? (Tick all that apply)*”, responding with one of three options: “I’ve used this”, “I’ve not used this”, or “Not applicable to my research”.

Subsequently, respondents are asked, “*What would help you to use more Open Research practices?*” and are asked to select up to 5 statements from a total of 15. Thirteen of these statements align to the COM-B model of behaviour change (Michie et al., [2011](#)), specifically: psychological capability (3 options): “*More information on open research practices*”, “*More training using open research practices*”, and “*Understanding ethical issues (e.g., issues around data sharing)*”; physical opportunity (4 options): “*Supporting infrastructure (e.g., sufficient storage for open data)*”, “*More time*”, “*Workload dedicated to open research*” and “*Dedicated funding for open research*”, social opportunity (4 options): “*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)*” and “*Support from junior researchers (e.g., PhD students, early career researchers)*”; and reflective motivation (2 options): “*Need for more positive opinions about open research*” and “*I do not plan to take up open research practices*”. Two additional

³ After receiving reviewer comments on the original BORS (Norris et al., [2022](#)), and through discussion with international collaborators, we made a number of minor changes to the current survey to ensure all terminology would be understood across countries and languages. These changes are reported in the preregistration (<https://osf.io/njt3>).

options allow respondents to select “*Nothing*” or “*Something else*”, with the latter permitting an open-ended response.

Lastly, respondents are asked demographic questions about their discipline, research methodology, career stage, and involvement in a research group and open research initiatives. Discipline categories were selected from the Higher Education Statistics Agency’s (HESA) Common Aggregation Hierarchy, Level 1 (HESA, [2022](#)). An open-ended textbox was included at the end of the survey which asked respondents, “*Do you have any other comments?*”.

Figure 3. Schematic of BORS survey with example responses. If respondents selected “I’m aware of this”, they were shown the options “I’ve used this”, “I’ve not used this”, and “N/A [Not applicable] to my research”.

Open Research Practice (Definition)	I’m aware of this	I’ve used this	I’ve not used this	N/A to my research
Open Research (Sometimes referred to as Open Scholarship or, in a more narrow application, Open Science. Research that is conducted in a manner that is transparent and openly available to others)	✓	✓		
Study Preregistration (E.g. pre-analysis plan, prospective registration)	✓	✓		
Registered Reports (A format of empirical article where a study proposal is renewed 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)				

Analytical Strategy

We preregistered an exploratory, descriptive approach for this study. All analyses were performed in JASP (JASP Team, V0.95.3), and descriptives are reported as full percentages. Where a participant did not tick “I am aware of this”, data were coded as “I’m not aware of this”. In accordance with Norris et al. (2022), we first report percentage awareness and use for the entire sample. This analysis is then reported by respondent’s world region, research discipline, methodology, career stage, research group membership (“Yes”, “No”), and involvement in an open research initiative (“Yes”, “No”). Due to the breadth of data available, we provide key details and comparisons in text and refer readers to the figures. With regards to the question about support for open research (“*What would help you to use more Open Research practices?*”), we report percentages for each statement for the entire sample.

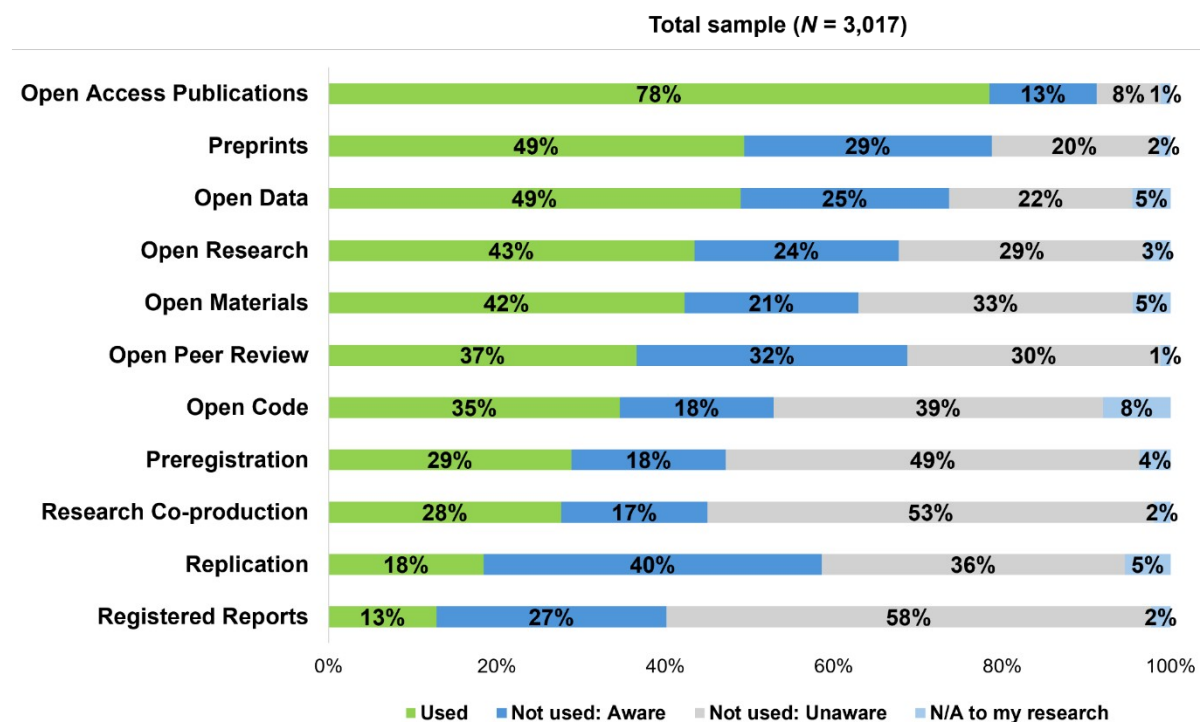
The questions, “*What would help you to use more Open Research practices?*”, and, “*Do you have any other comments?*” were open-ended. We performed qualitative content analyses on each to determine the presence of words, themes, or concepts (Kleinheksel et al., 2020) that mapped onto the 13 COM-B statements, following best practice guidance (Conry-Murray et al., 2024). A guidebook was developed to assist in coding; two researchers (C.R.P. and E.N.) coded the data, inter-rater reliability was assessed, and any discrepancies were discussed between these two researchers, with help from a third (K.CL.) to form consensus. Coder discrepancies occurred most frequently for responses that were deemed miscellaneous (did not map onto a specific COM-B statement) or where one coder suggested that a new theme should be developed. It is important to note that some responses were expansive and mapped onto several of the COM-B statements. In the following results, quotes are reported verbatim with ellipsis to denote where words have been omitted for length, and any identifiable information replaced with “REDACTED”.

Results

Awareness & Use of Open Research

Across the sample, respondents were predominantly aware of OA Publications (92%) and Preprints (80%) and awareness only fell below 50% for Research Co-production (47%) and Registered Reports (42%). The most used practice was OA Publications (78%) with none of the other practices reaching >50% (Figure 4). This apparent disconnect between awareness and use is not explained by respondents’ perceiving that these practices are not applicable to their research: across all practices, less than 8% respondents selected this response.

Figure 4. Percentage awareness and use of open research practices. For each practice, where a respondent stated, “I’m aware of this” they were then able to choose from “I’ve used this”, “I’ve not used this”, or “Not applicable [N/A] to my research”. For this reason, the percentage awareness in all figures is the sum of ‘Used’ (light green), ‘Not used: Aware’ (dark blue), and ‘Not applicable [N/A] to my research’ (light blue). Percentages for ‘Used’ are shown in light green.



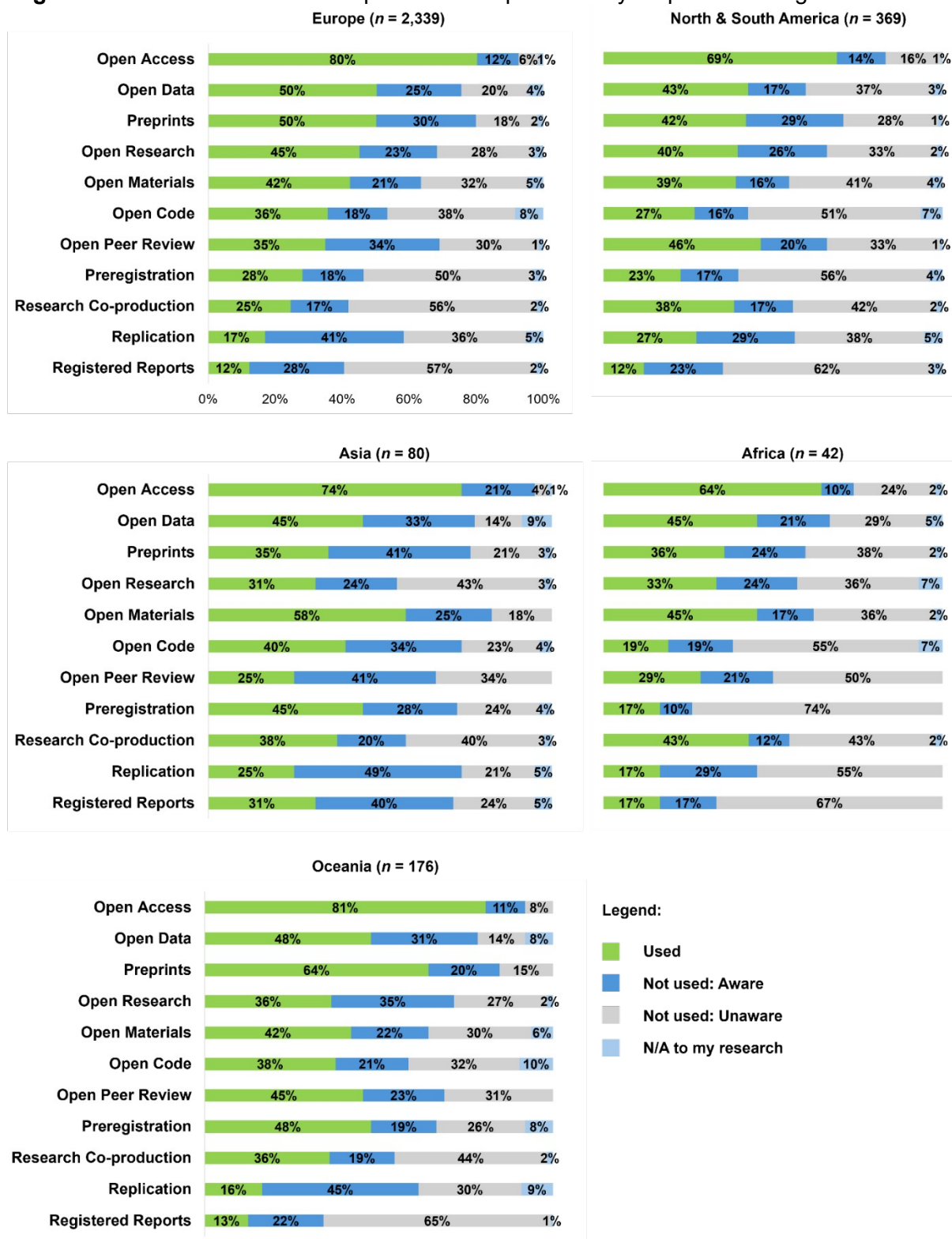
By Region

Across all regions, respondents were predominantly aware of OA Publications, with awareness highest in Asia (96%) and Europe (94%) and lowest in Africa (76%). Respondents from Asia reported the most uniform awareness across all open practices (>50%). For respondents in Europe, awareness was below 50% for Research Co-Production (44%) and Registered Reports (43%); in North and South America for Open Code (49%), Preregistration (44%) and Registered Reports (38%); in Africa for Replication (45%), Open Code (45%), Registered Reports (33%), and Preregistration (26%); and in Oceania for Registered Reports (35%).

Use of OA Publications was also the most used practice across regions, highest in Oceania (81%) and Europe (80%), and lowest in Africa (64%). Respondents from Europe reported the most uniform usage across all practices. After OA Publications, respondents in Europe used Open Data and Preprints the most (50%), with these two practices below 50%

for all other regions. Respondents in North and South America reported using Open Peer Review (46%) and Open Data (43%) the most; Asia reported using Open Materials (58%) and Preregistration (45%) the most but showed the greatest awareness-use gap across practices; Africa reported using Open Data and Open Materials (both 58%) the most; and Oceania reported using Preprints (64%) and Preregistration (48%) the most. Across all regions, use was 50% for Open Research (the term), Open Code, Open Peer Review, Preregistration, Research Co-production, Replication and Registered Reports (Figure 5).

Figure 5. Awareness and use of open research practices by respondent's region.



Note: For all descriptive figures herein, the order of open research practices follows the ranking of 'Use' (light green) for the first category (e.g., Europe for Figure 5).

Research Discipline

Respondents across disciplines reported high awareness of OA Publications (>88%), but awareness was higher for Preprints in Mathematical Sciences (96%) and Open Code in Computing (89%). Respondents across disciplines also reported high use of OA Publications (>56%) but use of Preprints was higher in Mathematical Sciences (86%) and Open Code in Computing (72%). Respondents in Medicine and Dentistry reported using OA Publications the most (87%) and Business and Management the least (56%).

Respondents from Psychology had the highest uniform awareness across open practices (>80%), except for Research Co-production (47%). Awareness of Preregistration was highest in Psychology (91%) and Medicine & Dentistry (70%) and lowest in the Physical Sciences (15%) and Humanities & Liberal Arts (9%). Awareness of the term Open Research was highest in Psychology (88%) and Computing (77%) and lowest in Agriculture, Food and Related Studies (58%) and Education & Teaching (54%). Awareness of Open Materials was highest in Psychology (89%) and Social Sciences (78%) and lowest in the Physical Sciences and Mathematical Sciences (both 47%) and General & Others in Sciences (43%). Awareness of Open Data was highest in Psychology (92%), Geographical and Environmental Studies and Computing (both 88%) and lowest in Mathematical Sciences, General & Other Sciences (both 66%) and Humanities & Liberal Arts (62%). Awareness of Preprints was highest in Mathematical Sciences (96%), Physical Sciences and Psychology (both 92%) and lowest in Humanities & Liberal Arts (63%) and Education & Teaching (55%). Awareness of Open Code was highest in Computing (89%) and Psychology (83%) and lowest in Agriculture, Food and Related Studies (38%) and Humanities & Liberal Arts (19%). Awareness of Open Peer Review was highest in Medicine & Dentistry (81%) and Psychology (80%) and lowest in Humanities & Liberal Arts and Business & Management (both 53%) and Mathematical Sciences (52%). Awareness of Replication was highest in

Psychology (91%) and Social Sciences (71%) and lowest in Engineering & Technology (32%) and Humanities & Liberal Arts (31%). Awareness of Registered Reports was highest in Psychology (80%) and Subjects Allied to Medicine (46%) and lowest in Humanities & Liberal Arts and Mathematical Sciences (19%) and the Physical Sciences (11%). Awareness of Research Co-production was highest in Education & Teaching (67%) and Social Sciences (58%) and lowest in Physical Sciences (33%) and Mathematical Sciences (22%).

With regards to use of open research practices, Psychology demonstrated the greatest uniformity, with only Open Peer Review (37%), Replication (31%), Registered Reports (25%) and Research Co-production (22%) below 50%. Biological & Sports Sciences reported high use of Open Data (63%) and Preprints (59%); Medicine & Dentistry – Open Peer Review (55%) and Preprints (53%); Physical Sciences – Preprints (71%); Mathematical Sciences – Preprints (86%) and Open Code (53%); Geographical & Environmental Studies – Open Data (69%) and the term Open Research (52%); and Computing – Open Code (72%), Preprints (61%), and Open Data (58%). All other practices fell below 50% use. Overall, use of Preregistration was the lowest for Physical Sciences and Humanities & Liberal Arts (both 1%); Open Research for Education & Teaching (28%) and Mathematical Sciences (25%); Open Materials for General & Others in Sciences (22%) and Mathematical Sciences (19%); Open Data for Humanities & Liberal Arts, Education & Teaching (both 30%), and Business & Management (28%); Preprints for Education & Teaching (28%) and Humanities & Liberal Arts (19%), Open Code for Education & Teaching (17%) and Humanities & Liberal Arts (2%); Open Peer Review for Mathematical Sciences (21%) and Business & Management (20%); Replication for Physical Sciences and Education & Teaching (10%) and Humanities & Liberal Arts (6%); Registered Reports for Physical Sciences and Mathematical Sciences (4%), and Research Co-production for Physical Sciences, General & Others in Sciences (both 20%) and Mathematical Sciences (11%; Figure 6).

Figure 6. Awareness and use of open research practices by discipline.

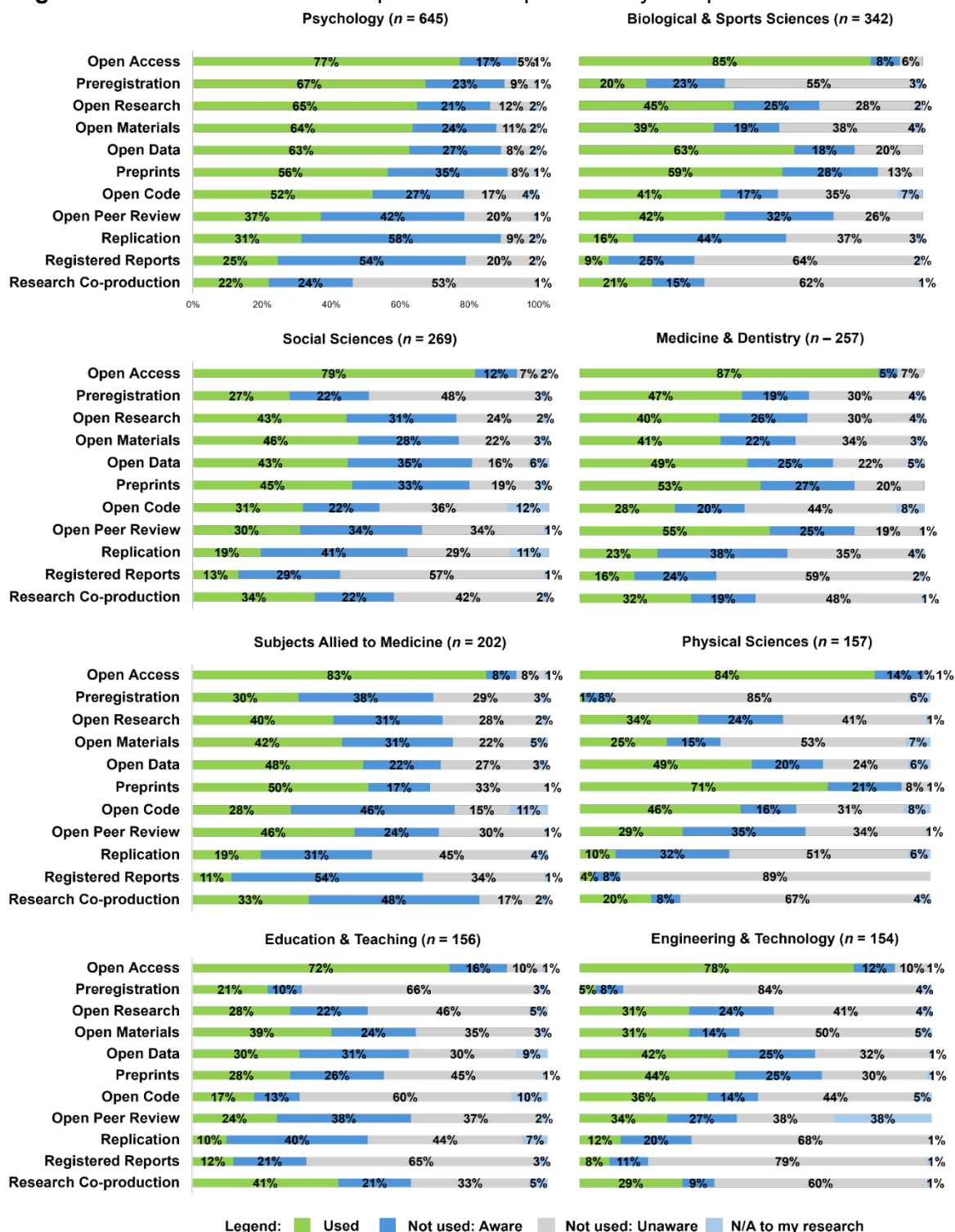
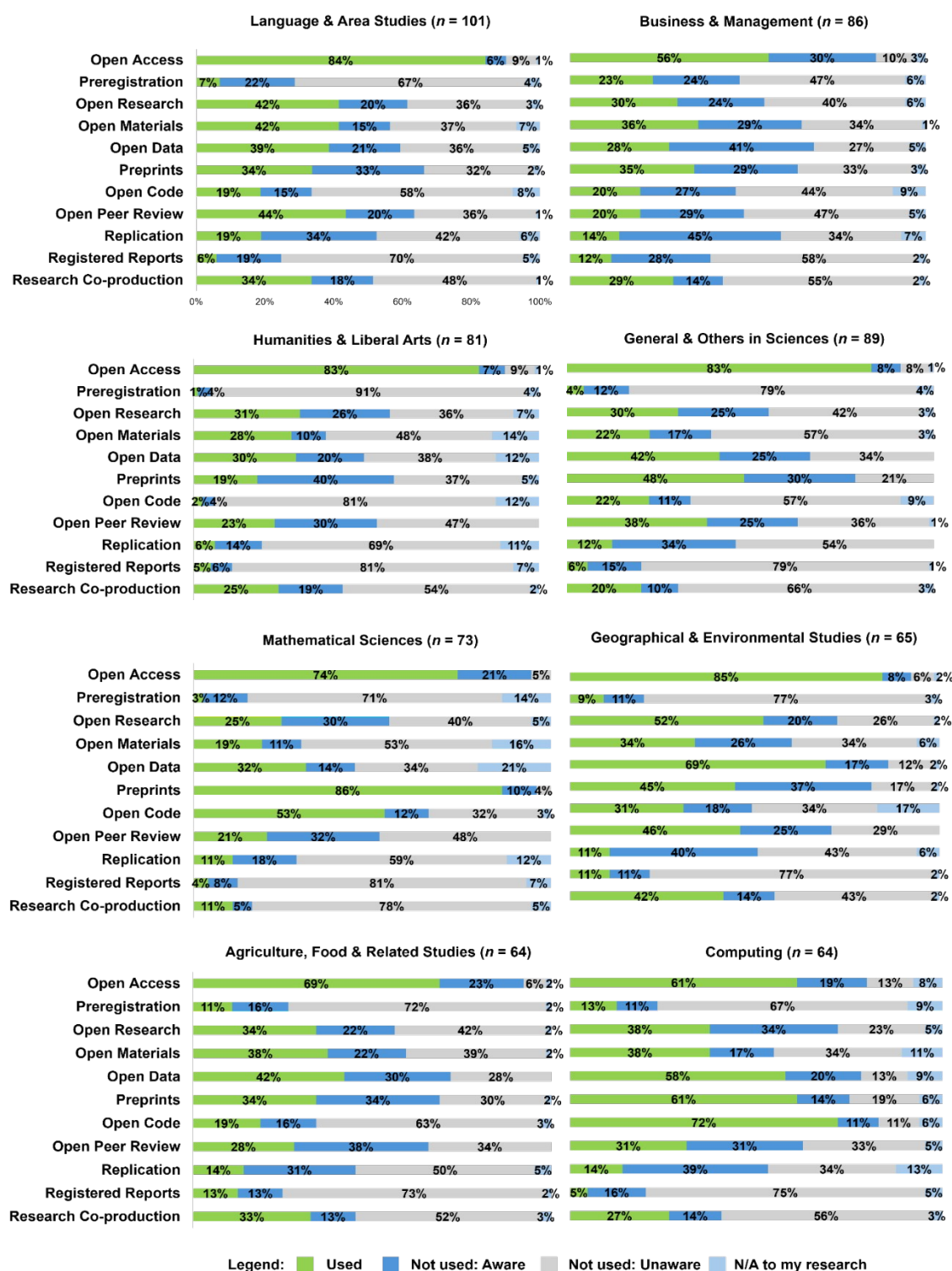


Figure 6 (cont.). Awareness and use of Open Research practices by disciplines.

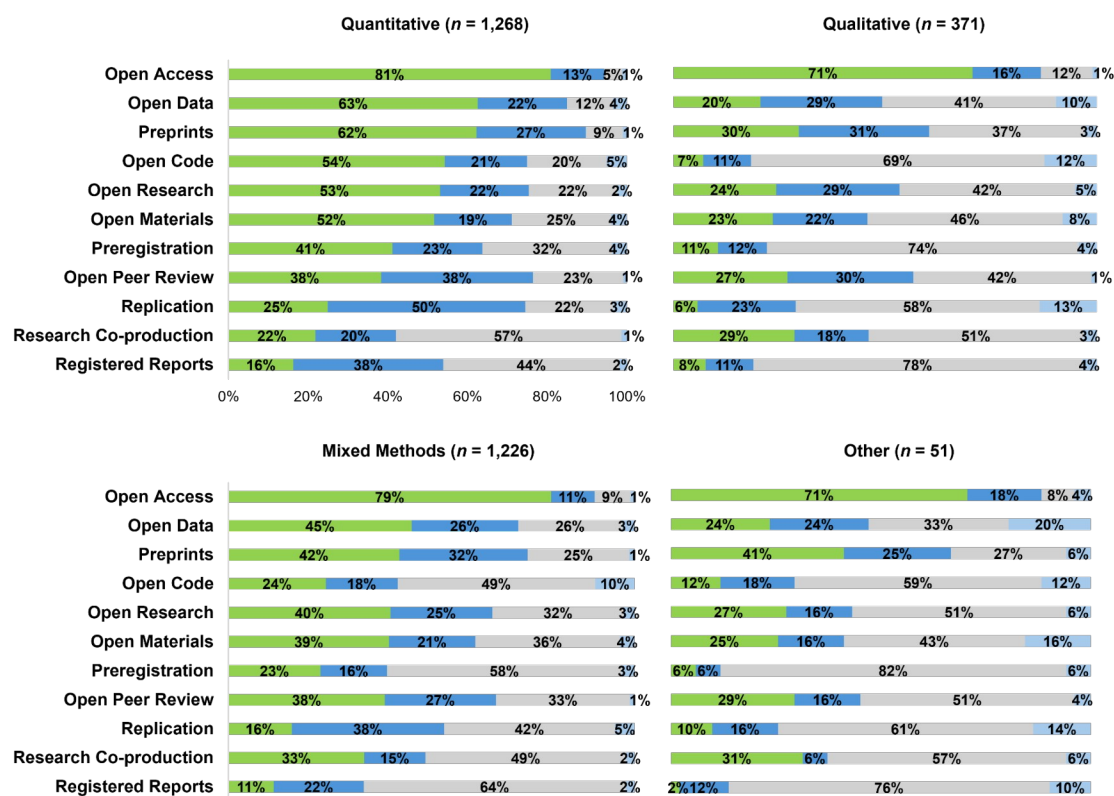


Methodology

Across methodologies, respondents were predominantly aware of OA Publications (>88%) and used this practice the most (>71%). Respondents using quantitative methodology reported the most uniform awareness across all practices (>68%) with all practices reaching >50% except for Research Co-production (43%). Respondents using qualitative methodology reported high awareness of Preprints (63%) and Open Data (59%) and awareness was below 50% for Research Co-production (49%), Replication (42%), Open Code (31%), Preregistration (26%), and Registered Reports (22%). Respondents using mixed methods reported high awareness of Preprints (75%) and Open Data (74%) and awareness was below 50% for Preregistration (42%) and Registered Reports (36%). Respondents using 'other' methodologies (e.g., theoretical and algorithmic; machine learning/AI), also reported high awareness of Preprints (73%) and Open Data (67%) and awareness was below 50% for Open Peer Review (49%), the term Open Research (49%), Research Co-production (43%), Open Code (41%), Replication (39%), Registered Reports (24%), and Preregistration (18%).

Respondents using quantitative methodology also reported the highest uniform use of all other open research practices, with all reaching >50% except for Preregistration (41%), Open Peer Review (38%), Replication (25%), Research Co-production (22%), and Registered Reports (16%). Except for OA Publishing, use of all other open research practices fell below 50% for respondents using qualitative, mixed methods, or 'other' methodology. Respondents using qualitative methodology least used Open Code (7%) and Replication (6%). Respondents using mixed methods least used Replication (16%) and Registered Reports (11%; Figure 7).

Figure 7. Awareness and use of open research practices by methodology.



Career Stage

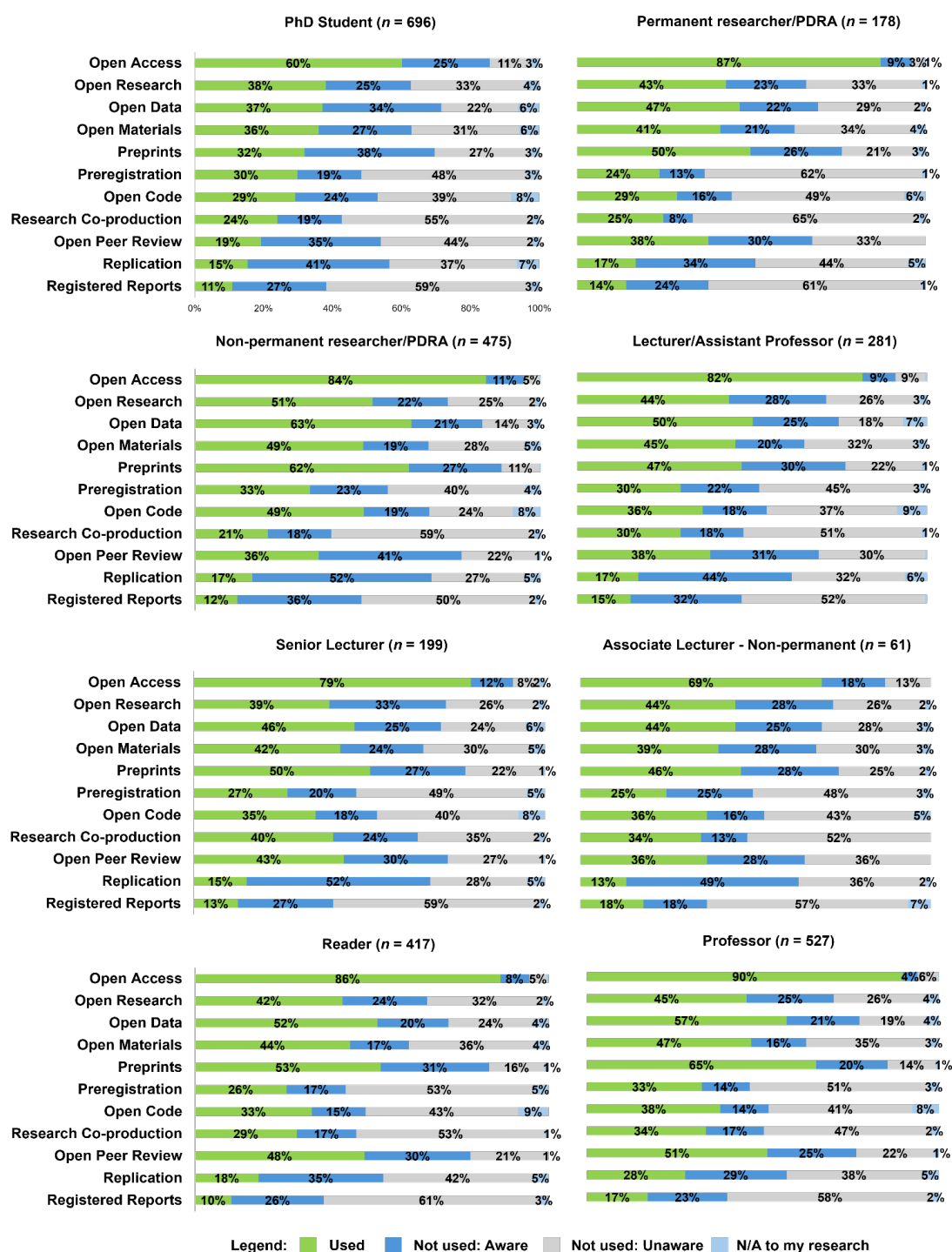
Across all career stages⁴, respondents were predominantly aware of OA Publications, with permanent Post Doctoral Research Associates (PDRAs) reporting the highest awareness (97%) and non-permanent Associate Lecturers reporting the lowest awareness (87%). Awareness of certain open research was below 50% for respondents in the following career stages: PhD students – Research Co-production (45%) and Registered Reports (41%); permanent PDRAs – Registered Reports (39%), Preregistration (38%), and Research Co-production (35%); non-permanent PDRAs – Research Co-production (41%); Associate Lecturers (non-permanent) – Research Co-production (48%) and Registered Reports (43%); Lecturers – Research Co-production (49%) and Registered Reports (48%); Senior Lecturers – Registered Reports (41%); Readers – Research Co-production (47%), Preregistration (47%), and Registered Reports (39%); Professors – Preregistration (49%) and Registered Reports (42%).

Use of OA Publications was also the most used practice across career stages, with Professors using this the most (90%) and PhD students using this the least (60%). For both PhD students and Associate Lecturers, use of the remaining open research practices dropped below 50%, with both groups using Replication (16% and 13%) and Registered

⁴ Respondents who answered 'other' to the question about their career stage are reported in the supplementary materials.

Reports the least (11% and 18%). Permanent PDRAs and Senior Lecturers reported high use of Preprints (both 50%); non-permanent PDRAs – Open Data (63%), Preprints (62%), and Open Research (51%); Lecturers – Open Data (50%); and both Readers and Professors reported high use of Preprints (53% and 65%) and Open Data (52% and 57%, respectively). All other practices across career stages fell below 50% (Figure 8).

Figure 8. Awareness and use of open research practices by career stage, ordered from early career to senior career stage.

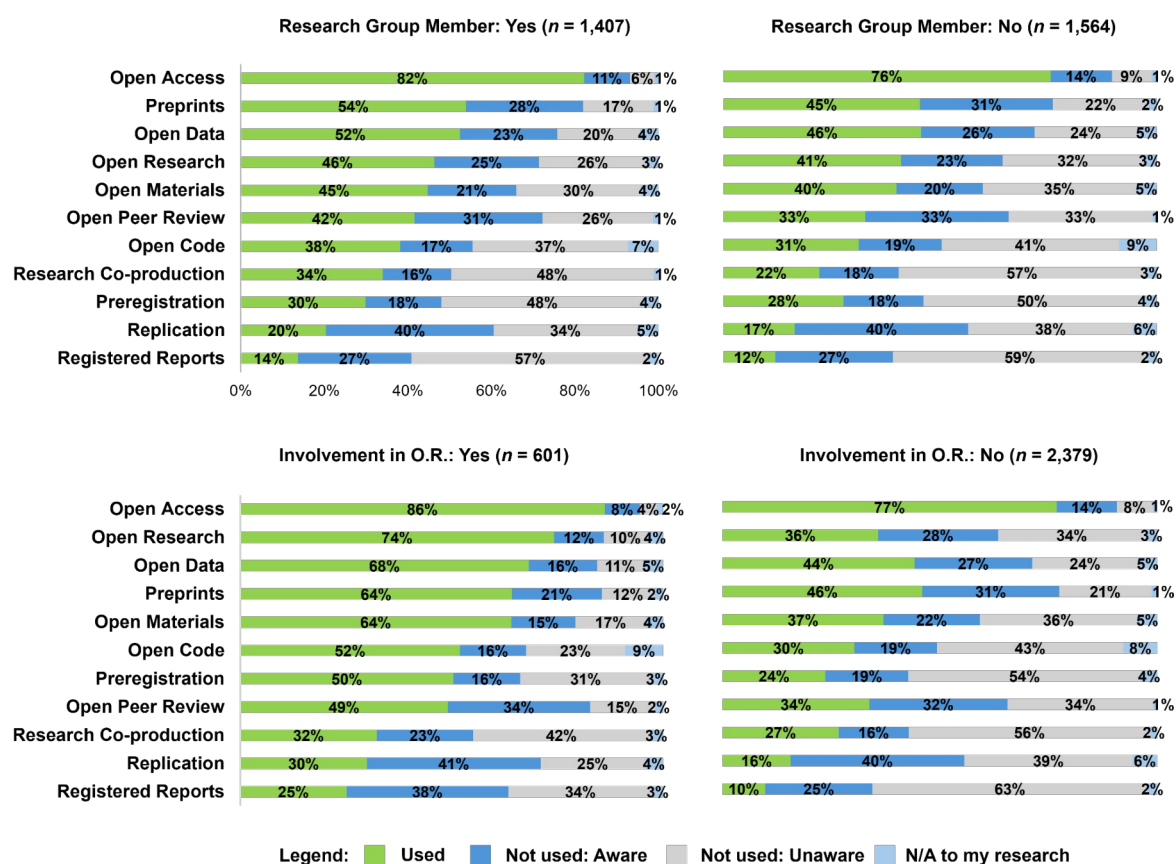


Involvement in Research Group or Open Research Initiative

Respondents involved in a research group reported slightly higher awareness and use of open research practices than those not involved. Respondents involved in an open research

initiative reported substantially higher awareness and use of open research; for example, use is $\geq 50\%$ for all practices except for Research Co-production, Replication, and Registered Reports, whereas use of OA Publishing is the only practice that reaches $>50\%$ for those not involved (Figure 9).

Figure 9. Awareness and use of open research practices by Research Group (“Yes”, “No”) and involvement in an open research initiative (e.g., ReproducibiliTEA journal clubs, “Yes”, “No”⁵). The left panel for each is sorted from the highest to lowest percentage use of the 11 open research practices.



It may be questioned why 10% of respondents who stated they were involved in an Open Research initiative did not select “I’m aware of this” for the term Open Research. We offer a few explanations for this: first, analysis of the raw data suggests that many of these respondents came from countries who do not have an equivalent term for ‘Open Research’ in their native language (see our preregistration for this note: <https://osf.io/2ewz6/files/tkf47>); second, some open-ended responses suggested that these respondents were part of an ‘Open Access’ initiative or were library staff, third, for the question about being involved in an initiative, we gave an example of the ‘ReproducibiliTEA journal club’ as an example; respondents may have been part of such initiative(s) but not heard of the term ‘Open Research’; fourth, some of these respondents may have perceived that being involved in this survey meant they were involved in such an initiative (e.g., one respondent stated, “Congratulations on this initiative” in their open-ended response after this question). As such, this may reflect familiarity with the term ‘Open Research’, which we reflect upon in our Limitations. There are no indications from the raw data that these represent careless responders, so they are retained in the analyses. In other analyses, these respondents represent only ~2% of the data.

Note: O.R. = Open Research.

Support for Open Research Practices

The ranked COM-B statements, pertaining to the strategies that would support respondents to use more open research practices, are shown in Table 2. Less than 2% of respondents reported not planning to take up open research practices or that no support was needed.

Table 2. Ranked COM-B statements (N = 3,017). Respondents were asked to select up to 5.

Statement	Rank	%	COM-B Category
Incentives from funders, institutions or other regulators	1	52%	Social Opportunity
Dedicated funding for open research	2	47%	Physical Opportunity
Recognition of open research in promotion & recruitment criteria	3	42%	Social Opportunity
More training using open research practices	4	42%	Psychological Capability
More information on open research	5	40%	Psychological Capability
More time	6	35%	Physical Opportunity
Supporting infrastructure	7	33%	Physical Opportunity
Understanding ethical issues	8	31%	Psychological Capability
Support from senior researchers	9	28%	Social Opportunity
Workload dedicated to open research	10	26%	Physical Opportunity
Need for more positive opinions about open research	11	13%	Reflective Motivation
Support from junior researchers	12	10%	Social Opportunity
I do not plan to take up using open research practices	13	1.9%	Reflective Motivation
Nothing	14	1.8%	N/A

Additional (optional) open-ended responses were provided by 156 (5.17%) respondents. These were categorised into the COM-B statements with substantial inter-rater

reliability between the two coders (Cohen's $\kappa = 0.78$ 95% CI 0.71-0.85). Overall, 10 out of the 13 COM-B statements were supported by the data (Table 3). The three that were not supported were: "*support from junior researchers*" (social opportunity), "*Support from senior researchers*" (social opportunity), and "*I do not plan to take up open research practices*" (reflective motivation). Some respondents discussed how they were already adopting open research initiatives with these responses categorised as "Nothing" (no support needed).

Five additional statements were developed, resulting in a total of 15 displayed in Table 3. The first was '*Rules and regulations*' which we categorised as physical opportunity. This focused mainly on open research practices becoming a mandatory requirement by journals, publishers, and funders. The second was '*Not a 'one size fits all' approach*' which we categorised as reflective motivation. This highlighted how certain open research practices may not be applicable or appropriate across all research disciplines (e.g., the Arts), epistemologies (e.g., concepts of 'replication' and 'reproducibility'), and methodologies (e.g., replication in qualitative research) with calls for more nuanced, contextual, and considerate perspectives. The third was '*Alternative publishing models*' which we categorised as physical opportunity. Here, numerous responses centred on moving away from for-profit journals, reducing the cost of OA publishing, and supporting Diamond OA. The fourth theme was '*Consideration of the challenges in conducting open research*' which was categorised as reflective motivation. This highlighted the need for more information around how to share sensitive, qualitative data and potential barriers such as data misuse or plagiarism, inequalities between countries, and disciplinary nuances regarding how to protect future patents and/or commercial products. The fifth theme was '*A need for culture change*', which we categorised as social opportunity. This focused on changing current evaluation frameworks and incentive structures to ensure that open research benefitted one's career. It also highlighted pressures of temporary contracts and uncertain career paths and the hyper-focus on publications as 'career currency'.

Additional (optional) free text comments were provided by 170 respondents (5.6%) at the end of the survey. These were again categorised into the 15 statements identified above. Here, a sub-theme emerged from the COM-B statement, "*More training using open research practices*" that recognised the need to embed open research earlier in taught educational curriculum. For example, one respondent stated, "*In [my] Masters Degree, Open Research was not discussed and taught, and it should have been. Ensuring it's covered in research modules is essential to uptake*". Furthermore, one additional theme was identified: "*Positive views on open research; already or planning to use*". This theme can be categorised as reflective motivation, with respondents discussing numerous open research initiatives they

are involved in and the practices they have adopted. This theme had a sub-theme of '*more than just practices*', with one respondent expressing how open research can be used to challenge the very structure of academia to improve diversity, inclusion, equality, and representativeness.

Table 3. Content analysis of open-ended responses to the question, “*What would help you to use more Open Research practices?*”. A total of 10 COM-B statements were supported, and 5 additional statements were developed.

More information on Open Research practices (psychological capability)		
“I need to understand what open research is and how it works”	“Readily available and easy to understand information on how to conduct/use open research practices”	“It would be helpful to learn a bit more about the reasons that lead to the assumption that open science contributes to well done science.”
More training using Open Research practices (psychological capability)		
“I find the Open Science website complicated and tricky to navigate. It took me ages to figure out how to do a really simple pre-registration, such that as I prepare to do more experiments, I am really dreading filling in the forms again”	“Being taught about it from an early research point. As a PhD student I was never taught anything else about research. You are left to figure all this out on your own.”	“Better implementation of open science practices in teaching, thus that young researchers learn it from the start and establish routines, before they work with me.”
Understanding ethical issues (psychological capability)		
“In many countries, including [REDACTED], sharing raw data is not legal. In general, open science needs to be supported by the law, first and foremost by EU law so that the various member states can transpose the relevant EU directives. This is important because sometimes one thing is permitted in one country, but not in another (or we may simply do not know if the other country permits it or not...)”	“Clearer guidelines on how to handle qualitative data in open research practices, discussion of how to handle making study data publicly available if participants' information & consent form did NOT detail that raw or cleaned data would be published”	“More information on how to protect the data being made available from misuse and plagiarism (this sometimes discourages people from making data and research results available)”
Supporting infrastructure (physical opportunity)		
“(large) data and code sharing infrastructure I can easily share with researchers not in my institution”	“Devoted and trained staff to support us, e.g. (open science) data manager”	“I am a huge fan of using open data, the main difficulty I have encountered is storage limits: many of the raw data sets we use (e.g. microscopy) have very large file sizes which are beyond open data storage limits...”
More time (physical opportunity)		
“The key thing is to have more time: with excessive workloads it is difficult to learn new skills or have time to consider how to apply them (e.g. for registered reports or pre-registration, which I would love to do).”	“The burden on people taking up open science is high, and it may take longer than the normal submission process. The system related to open research should be changed to one that is simple and quick to handle than it is now.”	“I do not have time to follow all the things related to publication. When a paper is accepted for me it is fine.”
Workload dedicated to Open Research (physical opportunity)		
“Open research is currently forced on researchers by some funding institutions but not always paid for, it requires time, effort and funding....this way I consider it mainly a nuisance”	“Any kind of consideration in the departmental workload to support the time needed for open research practices”	““The time dedicated to open stuffs is time subtracted to the next research or teaching activity, so it will not advance science but slow it if becomes too demanding in terms of data and other requirements.”
Dedicated funding for Open Research (physical opportunity)		
“We really need academic publishers to fund an online database of replications to off-set the publishing bias towards significant results (often still presented without effect size details).”	“Money to cover the costs, e.g. research assistance to prepare datasets for sharing, or money to make publications OA if collaborating with people in the Global South.”	“More funding for open science initiatives and academic institutions who implement open science practices”
Incentives from funders, institutions or other regulators (social opportunity)		

“Journals supporting open research practice, [...] better if journals can have a standardised or similar format to avoid large amount of edits, templates and examples”	“Work with research associations and journal editors to promote open science as a professional standard.”	“Inclusion of criteria that promote and fund Open Science in calls for proposals from all research funding agencies.”
Recognition of Open Research in promotion and recruitment criteria (social opportunity)		
“Open research should receive a higher score in the recruitment process or career progressions”	“A simple and powerful incentive would be for universities to prioritise academics who follow open research practices for research and teaching positions”	“That my career would not depend on how much I publish”
Need for more positive opinions about Open Research (reflective motivation)		
“Success stories from Open research practices that clearly illustrate the positive outcome of committing to these practices”	“Acknowledgement for PhD theses - e.g. replication is valuable but I'd never do it because my contract expires and it would waste my time because I cannot use it in my thesis”	“To be honest, this type of practices are really nice in theory. In practice, there are unethical researchers that have a reputation of scooping someone else's project. So, what about trying to limit [sic] this type of practices before bringing up the issue of open research?”
Additional statements developed		
Rules and regulations (physical opportunity)		
“Enforcement of open research practices by journals. For example, many journals require a "data available upon reasonable request" statement in published articles, but when I've emailed the author asking for data [...] the data is not available.”	“That open science would be the rule for ALL, not an occasional practice [sic] endorsed by some researchers but not others”	“Platforms such as scientific journals, scientific events, databases, institutional repositories, or scientific publishers adopting the requirement of OS practices for publishing or depositing documents”
Not a 'one size fits all approach (reflective motivation)		
“More kindness/consideration among researchers for when/which open research practices make sense when devising systemic incentive structures, i.e., taking into account different epistemologies & disciplines”	“The assumption that open science approaches are applicable to or necessary for all types of research is problematic. In my case, the ontological aims of open science are incompatible with qualitative methodologies”	“More discussion about nuances of open research practices - a one size fits all approach is not appropriate, for example is 'reproducibility' applicable to qualitative research?”
Alternative publishing models (physical opportunity)		
“Diamond Access - currently many researchers see OS as article fees, which OS is not. Also, we need more justice (for example: how is price for an OA fee estimated and can authors all over the world pay for that, and why would we support publishing companies as content providers either as authors/reviewers/editors). OS needs another scientific publication model [...]”	“A change in the publishing system to move from for-profit journals with few journal editors setting up enormous open-access prices to Diamond open-access practices such as Peer Community In is offering.”	“The universities and the scientific societies should promote and publish themselves open access journals with no fee for authors and readers, it makes no sense nowadays that a big amount of money is being spent for open access publications of commercial publishers.”
Consideration of the challenges in conducting O.R. (reflective motivation)		
“There is also the problem of present or future patent.”	“More information on how to protect the data being made available from misuse and plagiarism (this sometimes discourages people from making data and research results available)”	“It has always seemed to me that the practice favors wealthier countries, leaving peripheral countries with the adaptation of large databases, which can be accessed by others.”
A need for culture change (social opportunity)		
“A healthier researcher evaluation framework, where scientific worth is not heavily related to where you publish	“It is necessary to change the institutional mentality and requirements. We are all being asked to participate in	“[...] In short I believe that open science is good [sic] for science advancement but without structural changes in the working situation

and how often. Otherwise, having an already strenuous and uncertain career path as is, there is no pragmatic incentive to make the resources to produce/continue similar scientific outcomes (say code, e.g.) openly available."	exploitative publishing, to chase high impact factors, etc., while open access and free access to articles are increasingly seen as a bonus, as something that is "nice" if possible, but not so important."	of scientist, it will be always represent a threat in the perspective of a scientific career..Working in the academy in [REDACTED] means precariousness, and this is almost true in every country in Europe. The actual problem of "open science" is that on one hand is good for science, but on the other hand is bad for scientists' career. [sic]"
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Note: The table contains example quotes. Additional quotes can be found in the supplementary materials, and all (anonymised) open-ended responses can be found in the open data: <https://osf.io/njt37>

Discussion

The current study assessed awareness and use of open research in a large sample of international researchers across disciplines and methodologies. Across the sample, there was high awareness of most open research practices, except for Research Co-production and Registered Reports. Use was substantially lower, however, with only OA Publications reaching >50%. This apparent disconnect between awareness and use has been observed in many other studies (Alter et al., [2025](#); Fessinger et al., [2025](#); Norris et al., [2022](#)) and explanations may emerge from exploring variations based on respondent region, discipline, methodology, and career stage, as well as qualitative responses that unearth researchers' perceptions of these open research practices. We now turn to discuss these specific findings.

Respondents from the regions of Europe, North and South America, Africa and Oceania reported high awareness and use of OA Publications (>60%) and low awareness and use of Registered Reports. Respondents from Asia reported the most uniform awareness of all open research practices (>50%), but the highest awareness-use gap, and respondents from Europe reported the most uniform use. Awareness of Registered Reports was also uniformly low in Europe, North and South America, Africa and Oceania, with respondents in Europe also reporting low awareness of Research Co-production; respondents in North and South America reporting low awareness of Open Code and Preregistration; and respondents in Africa reporting low awareness of Replication and Open Code. After OA Publications, Europe showed high use of Preprints and Open Data, but use fell below 50% for all other regions. Whilst we remain tentative in making any generalisations due to the low sample sizes in some regions, we feel it is important to present these variations to highlight the barriers that certain regions may face in adopting certain open research practices. This aligns with recent commentaries that outline how the adoption of open research practices will be influenced by supporting infrastructure, education, the strength of regional policies and priorities, the representation of researchers in the publishing and funding landscape, language and platform accessibility, and wider regional research cultures (Chuan-Peng et al., [2025](#); Springer Nature, [2025](#)). A recent review shows that the majority of procedural, community and structural-based initiatives in open research come from developed regions (Skubera et al., [2025](#)). For open research to be a global enterprise, these barriers to participation need to be explicitly acknowledged and solutions sought.

Our data also reveal disciplinary variation in open research. Again, high awareness and use of OA Publishing was seen across disciplines, but use varied substantially: the highest use reported by respondents from Medicine and Dentistry and the lowest reported by

respondents from Business and Management. Despite having equal awareness and use of OA Publishing compared to other disciplines, respondents from Mathematical Sciences and Computing were more aware of Preprints and Open Code within their own disciplines, respectively. Respondents from Psychology showed the highest uniform awareness and use of open research practices, with the strongest uptake of preregistration. This likely reflects this field's reckoning with their widely popularised 'replication/reproducibility crisis' (Munafò et al., [2022](#); Pennington, [2023](#); Vazire, [2018](#)) as well as a renewed focus on preregistration (Nosek et al., [2018](#); van den Akker et al., [2024](#)). This analysis revealed that certain practices appear to be discipline-specific: those with strong quantitative traditions and established open infrastructures showed higher use of Preprints (e.g., Physical Sciences, Mathematical Sciences, Medicine & Dentistry, Computing, Biological & Sports Sciences; [ArXiv](#), [BioRxiv](#), [MedRxiv](#)), Open Data (e.g., Biological & Sports Sciences, Computing), Open Code (e.g., Mathematical Sciences, Computing). Indeed, disciplines such as the Mathematical and Physical Sciences have been using preprint servers long before discussions of open research began (Ginsparg, [2011](#); Gong, [2022](#)). More generally, however, respondents in the Physical Sciences, Mathematical Sciences, Humanities & Liberal Arts, and Education & Teaching appear repeatedly among the lowest adopters across a range of open research practices, including Preregistration, Replication, and Registered Reports. Indeed, not all open research practices will be equally applicable to every discipline or research methodology; for example, Preregistration and Registered Reports are useful for disciplines where hypothesis testing is common but may be less appropriate in disciplines with a focus on exploratory research or where researcher bias is arguably less prevalent or impactful. We remain tentative in our language here, however, because it can be argued that preregistration is applicable to exploratory research to prevent 'postdiction' once data is analysed (Nosek et al., [2018](#); Waldron & Allen, [2022](#)). Furthermore, no research is completely free of either researcher or publication bias and Preregistration and Registered Reports may provide a protective mechanism for this (Chambers & Tzavella, [2022](#); Ensink & Lakens, [2025](#)).

Turning to methodological variations, open research has been predominantly signposted in quantitative research domains, owing to concerns about researcher bias and QRPs (e.g., *p*-hacking; *HARKing*) that reduce replicability, reproducibility, and transparency (Kyriazos & Poga, [2026](#); Nagy et al., [2025](#)). It is therefore unsurprising that quantitative researchers in this study showed the highest awareness and use of open research practices. Despite this, use of Preregistration, Open Peer Review, Replication, and Registered Reports all fell below 50%. Potential explanations for this may be that structural and cultural incentives still predominantly recognise novelty over rigour that influence researcher

behaviour, as well as the misconception that preregistration and Registered Reports may reduce novelty, creativity, and exploration (Soderberg et al., [2021](#)). In contrast, qualitative and mixed methods researchers showed markedly lower awareness of many reproducibility-oriented practices (e.g., Open Code, Preregistration, Registered Reports) and reported very low usage, with no practice other than OA Publishing exceeding 50%. Recently, there have been critical discussions regarding the ontological and epistemological (in)compatibility of many open research practices for qualitative research (Cole et al., [2025](#); Harley & Cornelissen, [2020](#); Pratt et al., [2020](#); Pownall, [2024](#), [2025](#)). Viewing open research as incompatible with one's methodological framework has been reported as a barrier to PhD students' participation (Pownall et al., [2023](#)) and there have been calls to ensure epistemic, methodological and epistemological pluralism in open research reform (Pownall, [2025](#)).

Across career stages, awareness was particularly low for Preregistration, Registered Reports, and Research Co-production. Key variations occur in use of open research practices, with Professors using OA Publications the most and PhD students the least, potentially owing to the allocation of resources and access (e.g., funding for OA from grants or institutional publishing partnerships) as well as simply PhD students having had less opportunity to have published their work. For PhD students and (non-permanent) Associate Lecturers, use of all open research practices except for OA Publications fell below 50%, with the use of Replication and Registered Reports particularly low. This may reflect the precarity of job contracts and the current cultural norms of research – both replications and Registered Reports are also perceived as having additional time and administrative costs, (see Chambers & Tzavella, [2022](#); Pennington, [2024a](#), [2024b](#) for debates). Further, early career researchers, especially PhD students, experience pressure to conduct novel, original studies and to secure research grants to sustain their careers (Everett & Earp, [2015](#)). Professors also reported using more open research practices, except for Registered Reports. This may reflect their experience and time in the field, with Registered Reports being a relatively newer practice than others.

We further explored supportive mechanisms that may facilitate adoption of open research practices. Here we found that being involved in an open research initiative(s) was associated with greater awareness and use across all practices. Given that use of Preregistration, Registered Reports, and Replication were the lowest across sub-samples, involvement in an open research initiative may be an effective strategy to increase adoption of such practices. However, we remain tentative in this suggestion; due to the correlational nature of this data, it may also be the case that those who are already using open research practices will join associated initiatives. Underpinned by the COM-B model of behaviour

change (Michie et al., [2011](#)), respondents reported that the top five strategies that would support adoption of open research were incentives from funders, institutions or other regulators (*social opportunity*), dedicated funding (*physical opportunity*), recognition in promotion and recruitment criteria (*social opportunity*), more training and more information (*both psychological capability*). Indeed, there have been positive steps to incorporate open research training for both researchers and students (Azevedo et al., [2019](#); Pennington, [2023](#)), incentives such as badges for open research adoption (Kidwell et al., [2016](#)), changes to research assessment, and funding for meta-research (see Skubera et al., [2025](#)). Yet more work is needed to ensure that adopting open research doesn't create (further) inequities in the academic ecosystem. For example, it should be recognised that open research requires time and effort (Hostler, [2023](#)), and therefore a culture of *slower science* – emphasising quality and rigour over quantity and haste – should be prioritised (Frith, [2020](#)).

Turning to our qualitative data, we found that ten out of the thirteen COM-B statements were supported by respondents' perceptions of open research. Here, barriers to engaging with open research were highlighted, such as requiring more readily available and easy-to-understand information and training, the need to unpack and validate assumptions that some of these practices improve research, embedding training early in curricula, understanding how to overcome ethical and/or legal issues with (sensitive qualitative) open data, administrative support, dedicated time and funding, guidelines or requirements from journals and funders, and revisions to research assessment, promotion and hiring criteria. Additional statements were also developed and mapped onto the COM-B model. These focused on implementing rules and regulations (*physical opportunity*), alternative publishing models (*physical opportunity*), a need for culture change (*social opportunity*), conversations and consideration of the challenges in conducting open research (*reflective motivation*), and acknowledging that a 'one size fits all approach' is not always possible or appropriate (*reflective motivation*; e.g., for patents, see Nuechterlein et al., [2023](#)).

Limitations & Future Directions

Our research extends prior work to assess awareness and use of open research practices using a large international, multidisciplinary sample and exploring variations based on world region, discipline and methodology. However, respondents were mainly from Europe (77%) with low representation from Asia, Africa and the Middle East. This is an important consideration because opportunities to participate in open research may not be equal – specifically, researchers in developing countries may experience greater barriers (Chuan-

Peng et al., [2025](#)). We therefore recommend this work be expanded through global consortia and big team science approaches (see Ghai et al., [2025](#); Ledgerwood et al., [2022](#)).

It is also important to acknowledge that the BORS is a self-report survey, which whilst providing rich data on perceived awareness and use of open research, as well as qualitative data on researcher's perceptions, is limited by (a) who responds and (b) the subjective nature of self-reports (i.e., social desirability). For example, it could be argued that people who hold more positive perceptions of open research, or who are already aware of and using these practices, may be more likely to respond. Our demographic data does provide some reassurance that more respondents were *not* involved in an open research initiative ($n = 2,379$) compared to involved ($n = 601$), yet this does not fully mitigate the issue. One method to overcome this is to measure the use of open research practices directly from research outputs (see e.g. Hardwicke et al., [2021](#)), which can extend to their usability/efficacy (Crüwell et al., [2023](#); Ellis et al., [2024](#)). Yet such estimates cannot inform us about awareness, which is important for educational and training initiatives. Triangulation of these evaluations, then, should provide more reliable estimates of open research awareness and use that can be tracked longitudinally to evaluate behaviour change.

Finally, there are limitations of the survey design itself. First, we asked respondents whether they had used any of the presented open research practices, but this does not provide an estimate of how many times it is used. As such, our estimate of use should be considered a metric of 'lifetime prevalence'. Second, although we implemented improvements to the original BORS to ensure more consistent terminology across regions and disciplines, it may be that certain terms are prevalent in specific disciplines. To exemplify this, it would be reasonable to expect awareness and use of Open Research to be higher, given that the other practices sit under this umbrella term. We offer two possible explanations for this: first, researchers may be more aware of the term 'open science' or possibly even 'open scholarship'; second, some practices, such as OA Publications and Preprints, predate the term "Open Research" and, as we show, are used more predominantly in specific fields. Reflecting this cross-disciplinary issue, recent work has called for consistent and precise descriptions of certain open research practices (Mayo-Wilson et al., [2025](#)).

Conclusions

We explored awareness and use of eleven common open research practices in a large international sample of multidisciplinary researchers. In general, awareness and use was

highest for Open Access Publishing and lowest for Registered Reports. Further, there was a consistent disconnect between awareness and use across all practices and important variations between regions, disciplines, methodologies, and career levels. These findings highlight the need to consider when open research implementation is applicable, possible, and appropriate. Estimates of open research awareness can inform training and education whilst estimates of use can identify opportunities and barriers to adoption. Informed by the COM-B model of behaviour change, our findings further identify that initiatives which target social and physical opportunity (e.g., incentives from funders and institutions, dedicated funding, and recognition) and psychological capability (more information and training) may increase the use of open research practices.

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Declaration Statements

Transparency Statement: All materials, code, data and supplementary materials are available at: <https://osf.io/njt37/>. This study was prospectively preregistered before data collection and analysis: <https://osf.io/2ewz6>.

Funding: This research was supported by a Research England grant (*Enhancing Research Culture*), awarded to Dr. Charlotte R. Pennington of Aston University.

Conflict of Interests: C.R.P., E.N., J.R.B., N.B., C.B., A.C., K.Cl., W.P.C., E.K.F., S.G., V.C.H., A.J., E.S.P., S.P., J.S., M.S., S.L.K.S., S.S., M.Z., and K.C. are currently affiliated with the UK Reproducibility Network (UKRN). D.A.E., J.S., and M.I. were previously affiliated with UKRN. T.M.E. is an employee of the non-profit organization Center for Open Science that has a mission to increase openness, integrity, and trustworthiness of research. M.R.M. is the Executive Director of UKRN. O.B.A., L.M.P.B., R.F., V.A.J., & C.P. are affiliated with the Brazilian Reproducibility Network (BRRN). S.S. sits on the Transparency and Openness Promotion Advisory Board for the Center for Open Science. S.E.B., S.C., G.B.F., H.H., M.I., D.P.M., H.N., G.N., R.R., & F.D.S. are affiliated with the German Reproducibility Network (GRN). R.M. is affiliated with the Swiss Reproducibility Network (SWISSRN). M.R.dB is affiliated with the Dutch Reproducibility Network (NLRN). F.P.C., D.C., M.LAN., M.T.L., M.MO, B.R., M.SC., & M.V. are affiliated with the Italian Reproducibility Network (ITRN). V.V and V.K. are affiliated with the Finnish Reproducibility Network (FIRN). M.LAG., S.N., & N.C.W are affiliated with the Australian Reproducibility Network (AURN). M.A., V.Č., M.M., & J.R. are affiliated with the Slovak Reproducibility Network (SKRN). I.E.B., A.B., H.C., & T.K. are affiliated with the Norwegian Reproducibility Network (NORRN). I.B., L.U., & M.F.Z. are affiliated with the Croatian Reproducibility Network (CRORIN). G.N., M.G.B., & E.S.J.T. are affiliated with the Swedish Reproducibility Network (SWERN). E.S.J.T. is affiliated with the Belgian Reproducibility Network (BRN). M.I., M.LAG., S.N. were cofounders of the Society for Open, Reliable, and Transparent Ecology and Evolutionary biology (SORTEE), M.I. is a former member of SORTEE's Board of Directors, and M.G.B. and M.L. are sitting Board Members.

CRedit Statement: **Conceptualization:** C.R.P., E.N. M.R.M., K.CL.; **Data curation:** C.R.P.; **Formal analysis:** C.R.P., E.N., K.CL.; **Funding acquisition:** C.R.P.; **Investigation:** C.R.P., E.N., M.SK., R.M., O.B.A., M.A., A.A., R.A.A., J.R.B., N.B., L.M.P.B., M.G.B., I.E.B., S.E.B., A.B., C.B., M.R.dB., I.B., C.B.C-A., H.C., V.C., W.P.C., S.C., K.Cl., A.C., F.P.C., D.C., D.A.E., T.M.E., E.K.F., G.B.F., R.F., P.G., S.G., H.H., V.C.H., G.H., M.I., A.I., A.J., V.dA.J., Y.A.K., T.K., V-M.K., H.E.K., M.LAG., M.LAN., F.P.L., M.T.L., M.MA., H.M., M.MO., D.M., D.P.M., S.N., H.N., G.N., C.P., S.P., E.S.P., R.M.R., J.R., B.R., M.S., F.D.S., S.S., M.SC., J.S., S.L.K.S., E.S.J.T., L.U., M.V., V.V., N.C.W., Y.Y., C.Y., N.Y., M.Z., M.F.Z., M.R.M., K.CL.; **Methodology:** C.R.P., E.N., M.R.M., K.CL.; **Project administration:** C.R.P.; **Resources:** C.R.P.; **Software:** C.R.P., E.N., O.A., M.A., A.B., L.B., I.E.B., V.dA.J., H.C., V.C., R.F., H.E.K., T.K., M.MA., C.P., J.R., K.CL. **Supervision:** C.R.P.; M.R.M.; **Validation:** C.R.P., E.N., M.SK., Y.B., K.CL.; **Visualization:** C.R.P.; R.M. **Writing – original draft:** C.R.P., **Writing - review & editing:** C.R.P., E.N., M.SK., Y.B., R.M., O.B.A., M.A., A.A., R.A.A., J.R.B., N.B., L.M.P.B., M.G.B., I.E.B., S.E.B., A.B., C.B., M.R.dB., I.B., C.B.C-A., H.C., V.C., W.P.C., S.C., K.Cl., A.C., F.P.C., D.C., D.A.E., T.M.E., E.K.F., G.B.F., R.F., P.G., S.G., H.H., V.C.H., G.H., M.I., A.I., A.J., V.dA.J., Y.A.K., T.K., V-M.K., H.E.K., M.L., M.L.,

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