This is a preprint (v.1, 04.10.2024) that is currently undergoing peer review.

International Initiatives to Enhance Awareness and Uptake of Open Research in Psychology: A Systematic Narrative Review

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Abstract: 199 words.

Main text: 11,578 words

Tables: 2

Figures: 4

Supporting Information: https://osf.io/uap7j/

Disclosures

Conflicts of Interest: Charlotte R. Pennington is a Local Network Lead for the UK Reproducibility Network (UKRN) and Thomas Rhys Evans is an Institutional Lead for UKRN. Thomas Rhys Evans is also an Associate Editor for Royal Society Open Science, but is not involved in the editorial review of, nor the decision regarding this article. This work is an initiative from The Framework for Open and Reproducible Research Training (FORRT; https://forrt.org), and all authors are active members.

Funding: Charlotte R. Pennington was supported by an internal Research England grant awarded by Aston University.

Transparency & Openness Statement: This systematic, narrative review was conducted in line with the 2020 Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement (PRISMA; Page et al., 2021). The PRISMA 2020 checklist, screening and article records, and supporting materials for this review are available at: https://osf.io/uap7j/.

CRediT Statement: Conceptualization: M.K., F.A., T.R.E., C.R.P. **Data curation:** M.S., C.R.P. **Formal Analysis:** M.S., M.K., F.A., T.R.E., C.R.P. **Investigation:** M.S., C.R.P. **Methodology:** M.S., C.R.P. **Project Administration:** C.R.P. **Resources:** M.S., C.R.P. **Software:** M.S. **Validation:** M.S., M.K., T.R.E., C.R.P. **Visualisation:** M.S., C.R.P. **Writing - original draft:** M.S., C.R.P. **Writing – review & editing:** M.S., M.K., F.A., T.R.E., C.R.P.

Abstract

Background: Concerns about the replicability, reproducibility, and transparency of research have ushered in a set of practices and behaviours under the umbrella of 'open research'. To this end, many new initiatives have been developed that represent procedural (i.e., behaviours and sets of commonly used practices in the research process), structural (new norms, rules, infrastructure, and incentives), and community-based change (working groups, networks). **Objectives:** To outline international initiatives that enhance awareness and uptake of open research practices in the discipline of psychology. **Methods:** A systematic, narrative review was conducted in three stages: (1) a web search to identify open research initiatives in psychology; (2) a literature search to identify supporting publications; and (3) a hand search of grey literature. Eligible initiatives were coded into a narrative theme of procedural, structural, or community-based change. **Results:** A total of 187 initiatives were identified; 30 were procedural (e.g., toolkits, resources, software), 70 structural (e.g., policies, strategies, frameworks), and 87 community-based (e.g., working groups, networks). **Discussion:** Open research is progressing at pace through various initiatives that share a common goal to reform research culture. We hope that this review promotes their further adoption and facilitates coordinated efforts between individuals, organisations, institutions, publishers, and funders.

Key words: open research; open science; initiatives; research reform; systematic review

Introduction

> "*Is there currently a crisis of confidence in psychological science reflecting an unprecedented level of doubt among practitioners about the reliability of research findings in the field? It would certainly appear that there is*." – Pashler & Wagenmakers (2012, pp. 528).

Concerns regarding the replicability, reproducibility, and transparency of psychological research have proliferated in recent years, sparking what is now commonly referred to as the 'replication crisis'[1]. Despite similar concerns being debated passionately in the 1960s (see Lakens, 2023 for an overview), and not being exclusive to psychology (Begley & Ellis, 2012; Errington et al., 2021), a series of landmark events in the 2010s has led to fast-paced action aiming to reform this discipline (see Nelson et al., 2018). The first of these events was the publication of Bem (2011) who across 9 experiments reported evidence of precognition – a phenomenon which proposes that people's conscious awareness of future events can influence current ones. Surprised by how these findings could be published, many researchers voiced concerns about the inherent flexibility involved in the process of designing and analysing scientific studies, with such 'researcher degrees of freedom' likely leading to a prevalence of false positives in the published literature (Simmons et al., 2011; Wagenmakers et al., 2011). Independent teams of researchers subsequently failed to replicate Bem's findings (Galak et al., 2012; Ritchie et al., 2012). Around the same time, a high-profile case of academic fraud was proven in psychology, with Diederik Stapel admitting to fabricating data across many of his publications (see Stapel, 2014). These events led to a special issue of *Perspectives on Psychological Science* on replicability in psychological science, with Pashler and Wagenmakers (2012) asserting that the discipline was facing a 'crisis of confidence'.

Yet without replication as the norm in psychology (Koole & Lakens, 2012), the extent of this crisis remained relatively unknown until the conclusion of a 3-year large-scale replication project led by the Open Science Collaboration (OSC) in 2015. In a mammoth effort including over 270 international researchers, the OSC aimed to replicate 100 randomly selected findings from three prestigious psychology journals, finding that only 36% successfully replicated with a statistically significant effect in the same direction as the original study, and effect size estimates 32% smaller. Had the original effects been true, a minimum replication rate of 89% would have been expected (Field et al., 2019). This high proportion of 'failures' to replicate is consistent with accumulating evidence from other replication studies, despite the use of well-powered samples, preregistered protocols, tests of moderators, and exploration of variation across samples and settings (Ebersole et al., 2016; Klein et al., 2014; 2018).

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1 The 'replication crisis' within Psychology is also referred to as a 'credibility revolution' (see Vazire, 2018), renaissance (Nelson et al., 2018), and opportunity/debate (Munafò et al., 2022). We use the term 'crisis' consistently through this article in line with Hussey (2022) who suggests that crises are "a call to action […] an urgency that motivates people to act".

The discipline of *meta-science* – the scientific study of science itself – has shed light on many intertwining contributors to replicability, reproducibility, and transparency in research (Peterson & Panofsky, 2023). For example, researchers have outlined numerous questionable research practices (QRPs), such as 'Hypothesising After the Results are Known (HARKing; Kerr, 1998) and *p*-hacking techniques that exponentially increase the likelihood of detecting false positives (see John et al., 2012; Nagy & Hergert, 2024; O'Boyle, & Götz, 2022; Simmons et al., 2011). Furthermore, academic incentive structures have received greater critical revaluation for their focus on quantity over quality, arguably contributing to weak specification of theories and analysis plans, inadequate statistical power, poor measurement, a lack of replication and reproducibility checks, and non-transparent reporting (see; Nosek et al., 2022; Pennington, 2023 for overviews). Many biases also influence both individual researchers and the wider research landscape, such as confirmation bias whereby researchers favour evidence in line with their expectations, and publication bias whereby journals value positive over null or inconclusive findings (Munafò et al., 2017; 2022). Together, such incentives have helped build a research ecosystem that has rewarded and recognised the wrong elements of research – the novelty of results over robust and transparent methods and inferences.

Optimistically, through a better understanding of these issues, a new era of 'open research' has been fast advanced with the goal of reforming research and the more general ecosystem in which it sits. Open research, also referred to as open science or open scholarship, is an umbrella term reflecting the idea that "scientific knowledge of all kinds, where appropriate, should be openly accessible, transparent, rigorous, reproducible, replicable, accumulative, and inclusive" (Parsons et al., 2022). Within this sphere, many practices, such as preregistration, Registered Reports, open materials, code, and data, and article preprints have been developed and/or re-ignited across the research pipeline. Study preregistration allows researchers to initiate a time-stamped plan of their research questions, hypotheses, methods, and analysis plans prior to data collection and/or analysis, and is proposed to enhance transparency, limit analytical flexibility (or make it more detectable), and allow others to transparently evaluate the capacity of a test to falsify a prediction (see Lakens, 2019; Nosek et al., 2018; Simmons et al., 2021 for various perspectives). Importantly, preregistration can be implemented for all kinds of research (e.g., primary and secondary data analysis; qualitative and quantitative; Haven & van Grootel, 2019; Pennington, 2023; van den Akker et al., 2021) and represents a 'plan rather than a prison' where necessary deviations can be documented (Lakens, 2024). Registered Reports (RRs) represent a publishing model that integrates preregistration; in a 'Stage 1' protocol, researchers submit their research question(s), hypotheses, and detailed methods and analysis plans for peer review, and if this protocol is deemed to meet the RR criteria, a decision of 'In Principle Acceptance' is offered. At 'Stage 2', the researchers then append their results and discussion, and final acceptance is based on adherence to the Stage 1 protocol and the accurate representation of the findings. Unlike traditional articles, then, RRs shift the focus to rigorous

methodology and analytical reporting rather than the nature of the results (Chambers & Tzavella, 2022). Another practice of making all study materials (e.g., survey items, stimulus materials), code (programming and analytical) and data publicly available facilitates replication, reproducibility, and reuse (Houtkoop et al., 2018; Fortunato & Galassi, 2021; Tenopir et al., 2020). At the point of dissemination, there has been greater adoption of Open Access Publishing (e.g., Nosek & Bar-Anan, 2012) with preprint servers (e.g., *PsyArXiv*) representing green open access repositories, thus allowing free access to research, earlier discoverability, and faster feedback and correction mechanisms (see Moshontz et al., 2021).

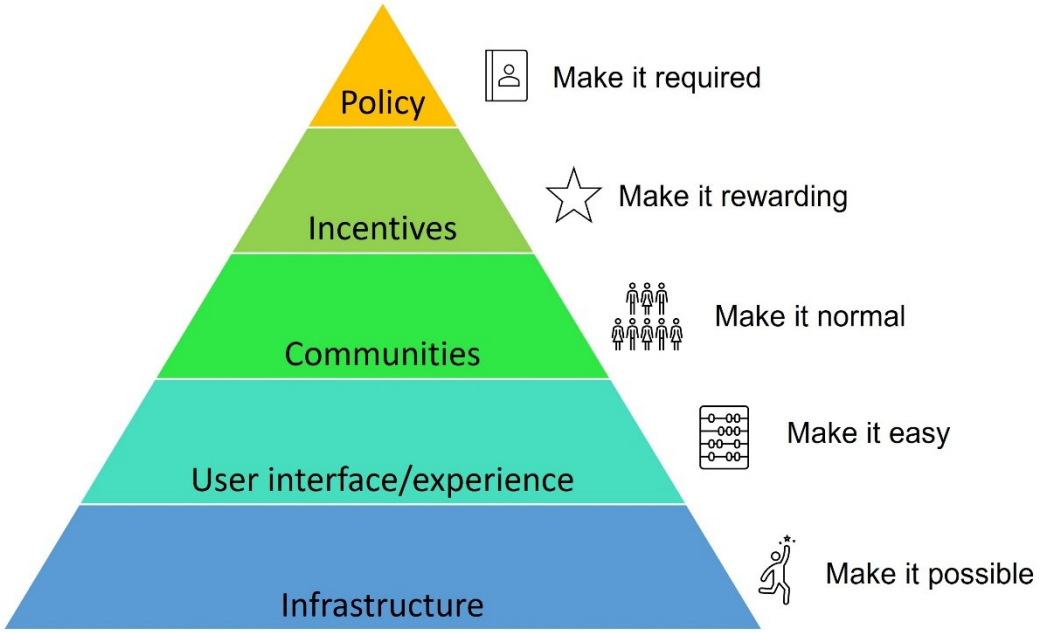
By way of improving wider research culture, there have also been initiatives to foster better equity, diversity, inclusion, accessibility and representation in psychological science, in terms of researchers, early-career scholars, and study participants (see Azevedo et al., 2022; Elsherif et al., 2022; Ghai, 2021; Ledgerwood et al., 2022; Murphy et al., 2020). For example, there have been efforts to improve collaboration across the Global North and South to advance scientific knowledge (e.g., Basnight-Brown, 2024; Jeftic et al., 2024), and an increased recognition of 'citizen science' – directly involving members of the general public in research (Hecker et al., 2018). Organisations such as the Framework for Open & Reproducible Research Training (FORRT) also aim to bridge open research through open education, pedagogical reform, and social justice advocacy to foster inclusive and participatory research practices across diverse geographies, disciplines, and contexts. As such, open research not only aims to foster research integrity, but build a more inclusive scientific community to accelerate solutions for complex problems and democratise knowledge (Dougherty et al., 2024).

To facilitate wide-scale and permanent uptake of open research, however, we need to focus on behaviour change – and behaviour change is hard. Researchers are embedded within a historical social and cultural system which shapes their behaviour through the communication of norms (this is what we do, this is what other researchers should do), the power of incentives (this is what researchers are rewarded for), and the integration of current policy (this is what a researcher needs to do as part of the system; Nosek, 2019). As such, advocates of open research have developed different strategies for culture change, such as the Center for Open Science's strategy to make it possible, easy, normative, rewarding, and required (see Figure 1; with the caveat of this being where possible and appropriate). Each of these elements will depend on various initiatives created by groups of people, research institutes, organisations and communities, publishers, and funders. Indeed, many different open research initiatives are developing at pace, with a recent commentary outlining several procedural (i.e., behaviours and sets of commonly used practices in the research process), structural (new norms, rules, infrastructure and incentives), and community changes (teamwork and collaboration; Korbmacher et al., 2023) that can be mapped onto the aforementioned strategy of behaviour change. However, for such initiatives to be useful and effective, we need to ensure that we are not duplicating

efforts at the risk of creating fragmented (and overworked) communities. In other words, reforms to improve research culture must be coordinated across the research ecosystem.

Figure 1.

The Center for Open Science (COS) strategy for culture change. *Note.* This figure has been reproduced from https://www.cos.io/blog/strategy-for-culture-change under a CC-BY-4.0 licence.



To this end, we performed a systematic, narrative literature review to identify international initiatives that enhance awareness and uptake of open research practices in the discipline of psychology. Following the PRISMA guidelines for systematic reviews, we first conducted an extensive webpage search to identify different initiatives that may not be described within the published literature. We then followed this with an empirical literature and hand search to find supporting publications. In line with a recent commentary by Korbmacher et al. (2023), we categorised each initiative into one of three themes: procedural, structural, or community change. We focused exclusively on the discipline of psychology because it has been a trailblazer for many new open research initiatives owing to its so-called 'replication crisis' and can therefore provide a roadmap for other disciplines who are experiencing, or are yet to experience, similar issues. Furthermore, different disciplines will have different goals and perceived facilitators and barriers associated with open research. As such, we hope that this focus on psychology will allow its respective individuals, institutions, research organisations, funders, and journals to implement initiatives that are relevant and appropriate to foster long-term, sustained behaviour change and, ultimately, research reform.

Method

Literature Search

This systematic, narrative review was conducted in line with the 2020 Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement (PRISMA;

Page et al., 2021). The PRISMA 2020 checklist, screening and article records, and supporting materials for this review are available at: https://osf.io/uap7j/.

Search strategy

The review comprised three stages. In Stage 1, we conducted an online web search of open research initiatives based on the rationale that not all initiatives would be available in the published literature (i.e. university-level initiatives, podcasts etc.). In Stage 2, we conducted an empirical literature search to bolster this web search with any published articles that describe or provide an overview of the identified initiatives and to identify any additional initiatives that were missed in Stage 1. The keywords and search terms used were: *open research/science/scholarship initiatives; open research/science/scholarship resource; guidelines; strategy; agenda; policy; schemes;* and *organisations* using the following Bolean operators:

(((Open (research OR science OR scholarship) AND (initiatives OR resource OR guideline OR strategy OR agenda OR policy OR schemes OR organisation)))) AND Psychology

In Stage 3, a hand search of initiatives was conducted to identify any initiatives that were not identified in Stage 1 and 2 and/or supporting grey literature. For the latter, this was conducted by searching for the initiative name using the electronic databases stated below.

The Stage 1 web search was conducted between 16/05/2023 and 02/08/2023 and involved searches of international institutional, government, and organisation web pages (e.g., Open Science Framework; Framework for Open & Reproducible Research Training), as well as social media platforms such as 'X' and 'Facebook' where open research initiatives are routinely described and promoted. The Stage 2 search was conducted on 29/08/2023 and involved a literature search of publications from electronic databases, specifically Web of Science, Scopus, EBSCO and Pubmed, and the Psychology specific preprint server PsyArXiv. Additional filters included a date range of 01/01/2011 to 29/08/2023 and the inclusion of 'psychology' in the search strategy to exclude non-psychology articles, as well as the exclusion of review articles excluded via tick boxes. The year 2011 was selected as the start date because it represents the year in which several notable controversies (e.g., Bem, 2011; Crocker, 2011; Wagenmakers et al., 2011) sparked debate of a 'replication crisis' in psychology (Pashler & Wagenmakers, 2012), and led to a paradigmatic shift towards open research (Gong, 2023; Munafò et al., 2017, 2022). The Stage 3 hand search was conducted between 01/04/24 and 01/06/2024 during drafting of this manuscript.

Eligibility criteria

The inclusion criteria for all stages were as follows:

1. Literature articles and/or web pages that describe open research initiatives.
2. Initiatives established between the date range of January 2011 and August 2023.
3. Eligible resources that were relevant to the discipline of psychology, by either referencing psychology specifically or other relevant fields such as the social sciences, neuroscience, research, or science.

4. Initiatives that were written in or translated to English language.
5. Initiatives that were fully established (i.e., not in the conception or development phase, not retired) and original published articles (i.e., no review articles).

Screening procedure

All data was reviewed by the first author (M.S) and verified by the lead author (C.R.P). The search results from each stage were input into a Microsoft Excel spreadsheet after which duplicates were removed. In Stage 1, relevant initiatives were identified via a web search with the associated web page then reviewed against the inclusion criteria. In Stage 2, publications were identified that either supported an initiative identified in Stage 1 or identified a missed initiative. Here, the abstract of each publication was reviewed against the inclusion criteria after which a full-text review was performed. In Stage 3, a hand review was conducted, with any supporting publications relating to an already identified initiative added alongside it in the spreadsheet. All exclusions and their reasons are outlined in Table 1.

Table 1

Excluded criteria and reasons.

Exclusion Criterion	Reason
Not an initiative.	The webpage or publication does not outline or discuss the initiative: it discusses open research generally (e.g., definitions, commentaries).
Initiative not current.	The open research initiative is not fully established, may have been piloted, or retired.
Initiative prior to 2011.	Initiative established prior to 2011 before the advent of the ‘replication crisis’ and ‘credibility revolution’ in psychology.
Not open research focussed.	The initiative is not related to, or does not focus on, open research; for example, it vaguely mentions open research practices used in articles, but not with the aim of increasing awareness or uptake of open research.
Not in the English language.	The webpage or publication describing the initiative is not written or translated into English.
Not within the discipline of psychology.	The focus of the article is not relevant to the discipline of psychology: this includes articles that make reference to psychology but that implement the initiative in a different discipline (e.g., an initiative from pharmacy that discusses psychological effects).
Not a literature article.	Conference presentations, corrections to previous articles, theses, and dissertations were excluded to focus the review on peer-reviewed published research. However, conference proceedings (full academic papers published in the context of an academic conference or workshop) were eligible for inclusion.
Not an additional initiative (Stage 2)	Publications that discuss an initiative that was already identified in the Stage 1 web search and already had a supporting publication.
Review article (Stage 2)	Publications that are a review article synthesising open research initiatives (e.g., other narrative or systematic reviews and meta-analyses).
Full text not available (Stage 2)	No full text of the publication is available.
Unable to access full text (Stage 2)	Unable to access full text through through institutional or public access platforms (e.g., institutional repositories, preprint servers, Google Scholar, ResearchGate).

Quality assessment

A quality assessment was not required for this systematic review because no evaluation was undertaken; specifically, this review mapped current initiatives with a focus on intervention foci and not efficacy. The landscape is very dynamic and in its infancy so is currently lacking robust evaluation (see Pownall et al., 2023). As such, we do not judge open research initiatives to be of high or low quality because they are simply intended to increase awareness and/or uptake. This review therefore identifies and summarises open research initiatives within psychology with the goal of facilitating their adoption and wider research culture reform where relevant and appropriate.

Data extraction

The literature search was conducted, and the data retrieved by the first author (M.S). In Stage 1, the following details were recorded in Microsoft Excel: initiative name, description, country of origin, stage initiative was found, any published papers that support the initiative, direct link to the initiative webpage, and the coded thematic category (see 'Results' below and https://osf.io/uap7j/ for supporting information). In Stage 2, a search of existing literature was conducted to support initiatives found in Stage 1 and identify any that were missed; any initiative that did not already have a supporting publication then had this inserted alongside it in the "Supporting Papers" cell. In Stage 3, a hand search was conducted to identify any initiatives that were not identified in Stage 1 and 2, as well as any publications that supported each initiative. The cell "Stage initiative was found" states whether the publication was found at Stage 1, 2 or 3.

Data synthesis and analysis

A narrative synthesis approach was selected as the analysis strategy using the guidelines outlined by Popay et al. (2006). This approach uses text to synthesise or 'tell the story' of the findings and is appropriate when statistical data is not used. Using the initiative's current description, the lead author then coded each to one of three thematic categories of *procedural, structural,* or *community change* for narrative synthesis, in accordance with Korbmacher et al. (2023). Table 2 provides the definition for each theme. The senior author (C.R.P) then masked coded these initiatives to the three themes and any discrepancies were reviewed by two additional coders (T.R.E and M.K) and then agreed upon by the entire project team. As this review does not rely on statistical data, there was no requirement for a method to handle missing data nor an assessment for risk of bias due to missing results. There were also no requirements for an assessment of certainty of the body of evidence because the nature of this review is to map out open research initiatives that aim to enhance awareness and uptake of open research in psychology.

Table 2

Definitions of thematic categories.

Theme	Definition
Procedural initiatives	*Procedural initiatives encompass behaviours and sets of commonly used practices in the research process.* i.e. Initiatives that help researchers to use open research practices or change behaviours to improve the research landscape (e.g., guidebooks, toolkits, code, templates, web platforms, datasets/bases etc.).
Structural initiatives	*Initiatives that describe and outline new norms and rules at the institutional level, create new infrastructure, or embed open research practices into educational curriculum and/or incentivise researchers to adopt improved practices.* i.e. Initiatives typically at a structural/top-down level that make possible, embed, or even mandate the uptake of open research practices, across research institutions, groups, or organisations.
Community initiatives	*Community initiatives foster teamwork, collaboration, and discussion within the scientific community to increase awareness or uptake of open research practices.* i.e. These initiatives are usually bottom-up, grassroots initiatives (e.g., led by students, early career researchers) that aid awareness and uptake of open research through supporting, promoting and community building.

Results

Search yield

The Stage 1 web search yielded a total of 315 initiatives and the Stage 2 literature search identified 2809 publications (Web of Science: n = 2243; EBSCO: 252; Pubmed: 91; Scopus: 39; PsyArXiv: 184). Before the abstract review, 2 duplicates in Stage 1 and 179 duplicates in Stage 2 were removed. Stage 3 yielded an additional 15 initiatives and 104 additional supporting publications.

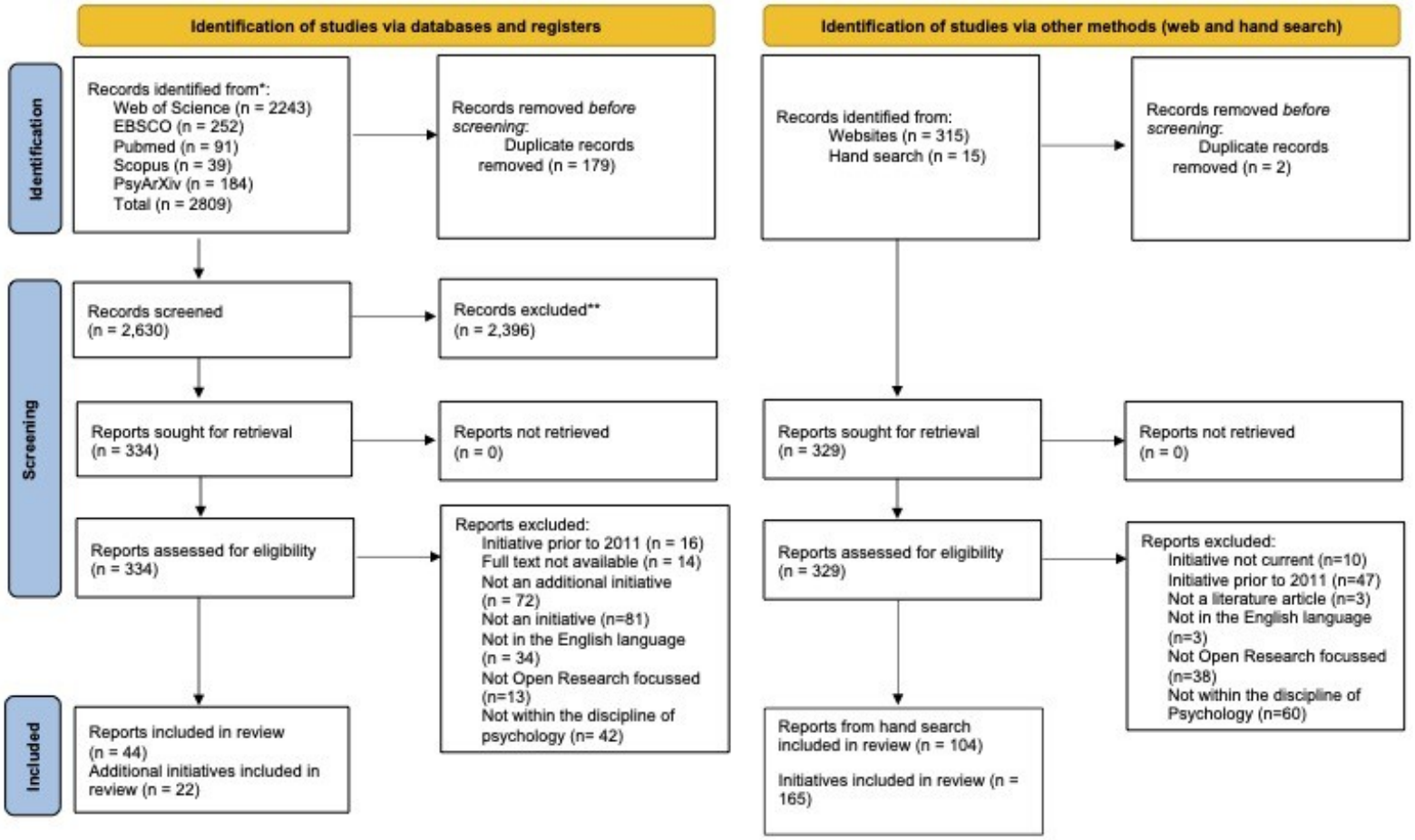
In the abstract review, 161 initiatives in Stage 1 and 2,396 articles in Stage 2 were removed for the reasons articulated fully in Table 1 above. The reasons were as follows: not an initiative (Stage 2, n = 256), initiative not current (Stage 1, n = 10), prior to 2011 (Stage 1, n = 47; Stage 2, n = 256), not open research focussed (Stage 1, = n = 38; Stage 2, n = 453), not in English language (Stage 1, n

= 3; Stage 2, *n* = 1), not within the discipline of psychology (Stage 1, *n* = 60; Stage 2, *n* = 1409), and not a literature article (Stage 1, *n* = 3; Stage 2, *n* = 21).

In Stage 2, the remaining 334 texts were fully screened by reading their full text and 290 were excluded as follows: not an initiative (*n* = 81), prior to 2011 (*n* = 16), not open research focussed (*n* = 13), not in English language (*n* = 34), not within the discipline of psychology (*n* = 42), not an additional initiative (*n* = 72), review article (*n* = 17), no full text available (*n* = 14), and unable to access full text (*n* = 1). After these exclusions, the remaining 44 articles were included of which 23 articles provided initiatives that were not identified in Stage 1 and 22 provided support for initiatives already identified in Stage 1.

In Stage 1 (web search), there remained 150 initiatives, Stage 2 (publication search) provided 22 new initiatives and Stage 3 (hand search) provided 15 new initiatives. The total number of initiatives included for the review was 187. Of these, 30 were coded as procedural, 70 structural, and 87 community based. Supplementary Table 1 provides a detailed breakdown of each initiative. In the narrative review below, we provide direct links to each initiative and the associated publications. With regards to the latter, it is important to note that the citations are not always the authors and/or developers of the initiative: that is, our systematic search also identified papers that describe or outline each initiative.

Figure 2.
PRISMA flow diagram.



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: http://www.prisma-statement.org/

Procedural initiatives

Toolkits and resources help researchers, publishers, universities, research organisations and other stakeholders understand how to use different open research practices, and their associated platforms provide the infrastructure to house these. A total of 30 procedural initiatives were identified that provide toolkits, guidebooks, templates, tools, datasets, web applications that help researchers to use open research practices or aim to change behaviours to improve the research landscape.

Some platforms and toolkits provide support and platforms for specific open research practices, such as preregistration and open data. The platform *AsPredicted* (Dienlin et al., 2021; Simmons et al., 2018) was launched in 2015 and makes it easy for researchers to initiate preregistration of their studies and allow other researchers to read, verify, and evaluate them. Here, researchers answer 9 simple questions regarding their study and, once submitted, a time-stamped PDF document is registered to the domain. As of now, preregistration is not mandated by most journals, funders, institutions, or research organisations, with AsPredicted providing the tools and infrastructure for researchers to register their studies if they choose. Other platforms also identified in this review facilitate open research practices, such as the *Network of Open Science Initiatives at Psychology Departments* (NOSI; Robson et al., 2021), which provides protocols, links, and resources for preprints, preregistration, Registered Reports, open code, materials, and data, reproducible manuscripts, publishing null results, transparent qualitative research, and much more. There are also guides for adopting Registered Reports, hosted by the *Open Science Framework*, including Frequently Asked Questions (FAQs), resources for researchers, funders and editors, and supporting videos and articles (see also Chambers & Tzavella, 2022).

With regards to sharing research data, *OpenNeuro* (Markiewicz et al., 2021) provides a free platform for validating and sharing a broad range of brain imaging data, such as for MRI, PET, MEG, EEG, and iEEG, following the FAIR principles for data sharing. The *Collaborative Informatics and Neuroimaging Suite Toolkit for Anonymous Computation* (*COINSTAC,* Plis et al., 2016; Martin et al., 2023) is a tool developed to support federated analysis specifically for neuroimaging data by overcoming the aforementioned barriers to collaboration through the use of federated analysis and standardisation of collaboration methods. COINSTAC enables researchers to run decentralised neuroimaging analyses to perform larger collaborative studies, enabling them to build statistical or machine learning models to advance research in this area. More generally, another initiative named *OpenRefine* (Kusumasari, 2016) provides an open source tool for working with messy data, allowing researchers to clean and transform it from one format to another, and then extend it with web services and external data. In order to facilitate the sharing of data analysis workflows, the *Common Workflow Language Project* (Crusoe et al., 2022; Suetake et al., 2023) provides free and open standards for describing and sharing command-line tool based workflows to aid computational reuse and portability. It includes many features developed in collaboration with the community, such as support for software containers,

resource requirements, and workflow-level conditional branching. Other tools aim to improve measurement and assessment, such as the *International Cognitive Ability Resource* (ICAR; Dworak et al., 2021); a public-domain assessment tool to facilitate the broader assessment of neuropsychological and cognitive abilities in research and practice.

Other procedural initiatives provide Open Educational Resources (OERs), such as training workshops, that aim to teach students and researchers the new landscape of open research and equip them with the skills to adopt associated practices. The *'Facilitate Open Science Training for European Researchers (FOSTER)' Open Science initiative* (see Orth et al., 2016; Robson et al., 2021; Schmidt et al. 2016) provides an e-platform to host training on all relevant topics in the area of open research for the European community and the *FOSTER Open Science Training Handbook* (Heck et al., 2020) is a key educational resource for instructors and trainers that brings together methods, techniques, and practices. A similar initiative *Opensciency* provides core open research curriculum through lesson plans and learning objectives to introduce students to important definitions, tools, and resources in open research. The *Open Science MOOC* (Labastida, 2015) provides a range of online courses to equip students and researchers with essential skills for open research through videos, research articles, dummy datasets and codes, and tasks, and the *LMU Open Science Center* (Schönbrodt, 2019) provides workshop materials for study preregistration, power analysis, open data, materials, privacy, and open access. The *Principles and Practices of Open Research: Teaching, Research, Impact, and Learning* (PaPOR TRaIL; Egan et al., 2020) outlines a course tailored to undergraduate and master's students to provide best scientific practice in open research and help them to embed these principles and practices into their own research projects.

New software has been developed to help advance open research, transparency, and reproducibility. Statistical software, such as *Jamovi* (Şahin & Aybek, 2019), *JASP* (Ummul-Kiram et al., 2021), and *R-Studio* (da Silva & Moura, 2020) are open-source and allow researchers to clean, screen, and analyse data, create reproducible figures and tables, and share data and associated outputs that are freely accessible. Other software facilitates the detection of errors and QRPs in research outputs. Specifically, *P-curve* (Simonsohn et al., 2014) is a statistical tool that can be utilised to explore the evidential value of research findings or detect selective reporting from a set of quantitative findings; *Stat Check* (Nuijten et al., 2016; Nuijten, 2022) can detect statistical errors in articles by reproducing the calculations outlined in an article and comparing the findings to examine their consistency; and *Z-curve* (Brunner & Schimmack, 2020) provides a tool for estimating the expected replication rate of a study based on the mean power after selection for significance. Together, such procedural initiatives can help researchers to embed open research practices routinely in both research and education.

There are also many new initiatives that aim to improve recognition and rewards for practising open and responsible research. The *Aligning Incentives*

ToolKit (Dougherty et al., 2024) was developed to support the efforts of individuals who recognise the issues with the current academic rewards system and wish to address them. Through a series of fact sheets, it provides a brief overview of several topics relating to research assessment, such as aligning metrics to core values, accessibility, diversity and inclusivity, and embedding open research practices. It also includes an example worksheet on values-aligned behaviours to support research incentive reform. Similarly, *NOR-CAM* (Universities Norway, 2021) provides a toolbox for recognition and rewards in academic careers through a flexible and holistic framework for research assessment. It includes a guide that adopts three core principles for research assessment for use by institutions, funders, and national authorities: more transparency, greater breadth, and comprehensive assessment. Another initiative, *Ouvrir la Science* provides guidance to research organisations on how to develop and enhance their own policies and practices towards the long-term preservation and openness of research data. The *UNESCO Open Science Toolkit* (Peršić & Straza, 2023) collates a set of open-access guides, policy briefs, factsheets and indexes based on the UNESCO Open Science Recommendations. For example, there are guides on building capacity for open science, developing policies, funding, bolstering infrastructure, engaging societal actors, and supporting open-source hardware, as well as factsheets on understanding open research and identifying predatory academic journals and conferences. Each piece is a living resource updated to reflect new developments and the status of implementation of the recommendation.

The *Tools to Advance Research Assessment (TARA)* is a project to facilitate the development of new policies and practices for academic career assessment. It comprises a toolkit of resources informed by the academic community to support academic institutions working to improve policy and practice as well as specific projects, such as *ReformScape* (Gärtner et al., 2024; Schönbrodt et al., 2024) – an online dataset that provides the criteria and standards that academic institutions use for hiring, review, promotion, and tenure around the world. Another project is that of *Project TIER* (Medeiros & Ball, 2017) whose mission is to promote systemic change in professional norms related to research transparency and reproducibility. The main initiative from Project TIER is the 'TIER Protocol' which specifies the contents and organisation of reproducibility documentation for projects involving computations with statistical data. This documentation then allows the researcher and other research teams to reproduce all the computations necessary to generate the results presented in scholarly outputs. *Curate Science* (LeBel et al., 2019) is an initiative to strengthen research through the development of toolkits and web applications to enhance the transparency and credibility of research. It includes a set of transparency standards, a replication tracker, and transparency audits.

These aforementioned initiatives are developed by researchers and organisations in the Global North (i.e., America, Europe, United Kingdom), but it is essential that developing countries are supported to embed open research within their ecosystems. The *African Open Science Platform* was co-founded in 2016 to convene and coordinate the interests, ideas, people, institutions, and resources

needed to advocate and advance open science in and for Africa. The Platform's mission is to centre African scientists at the cutting edge of contemporary, data-intensive science, signalling this as a fundamental resource for a modern society. The platform provides a federated hardware, communications, and software infrastructure as well as policies and resources to support open research (e.g., data management; Boulton et al., 2018).

Finally, procedural initiatives have been developed to improve the publishing landscape. For example, the *OAPEN Open Access Books Toolkit* (see Midha. 2022) is a publicly available resource that aims to help authors better understand open access book publishing and to promote trust in open access books. The *Collaborative Knowledge Foundation* (CoKo; Ratan, 2018) is an organisation that designs and builds new systems to transform and benefit the publishing community through open-source tools that enable the dissemination of critical knowledge 'better, faster, and cheaper'. They construct core open infrastructure, tools, and platforms aligned with the true purpose of publishing – to advance collective knowledge.

Structural initiatives

Structural initiatives comprise new research frameworks, strategies, principles, policies, and infrastructure that are embedded into the research ecosystem, garnering support from institutions, journals, funders, and the government. A total of 70 structural-based initiatives were identified in this review:

Many countries and nations now have Open Research agendas and policies, such as the USA's *Biden-Harris Administration* (see Horder, 2023) which has initiated new grant funding, improvements in research infrastructure, and expanded opportunities for research participation and public engagement to advance open and equitable research. Under this new administration, the White House Office of Science and Technology Policy (OSTP) declared 2023 the "Year of Open Science", advancing many open research policies, such as a public access memorandum on "ensuring free, immediate, and equitable access to federally funded research" and the National Institute of Health's Data Management and Sharing policy. The United Nation's Educational, Scientific and Cultural Organization (UNESCO), a specialised agency of the U.N., also developed their "*Recommendation on Open Science*" in 2021, which provides an internationally agreed definition, set of shared values, and guiding principles for open research (see Figure 2). It outlines a set of actions conducive to the fair and equitable operationalisation of open research for all across individual, institutional, national, regional, and international levels (see Camkin et al., 2022). To date, over 190 countries have adopted this recommendation to abide by common standards for open research.

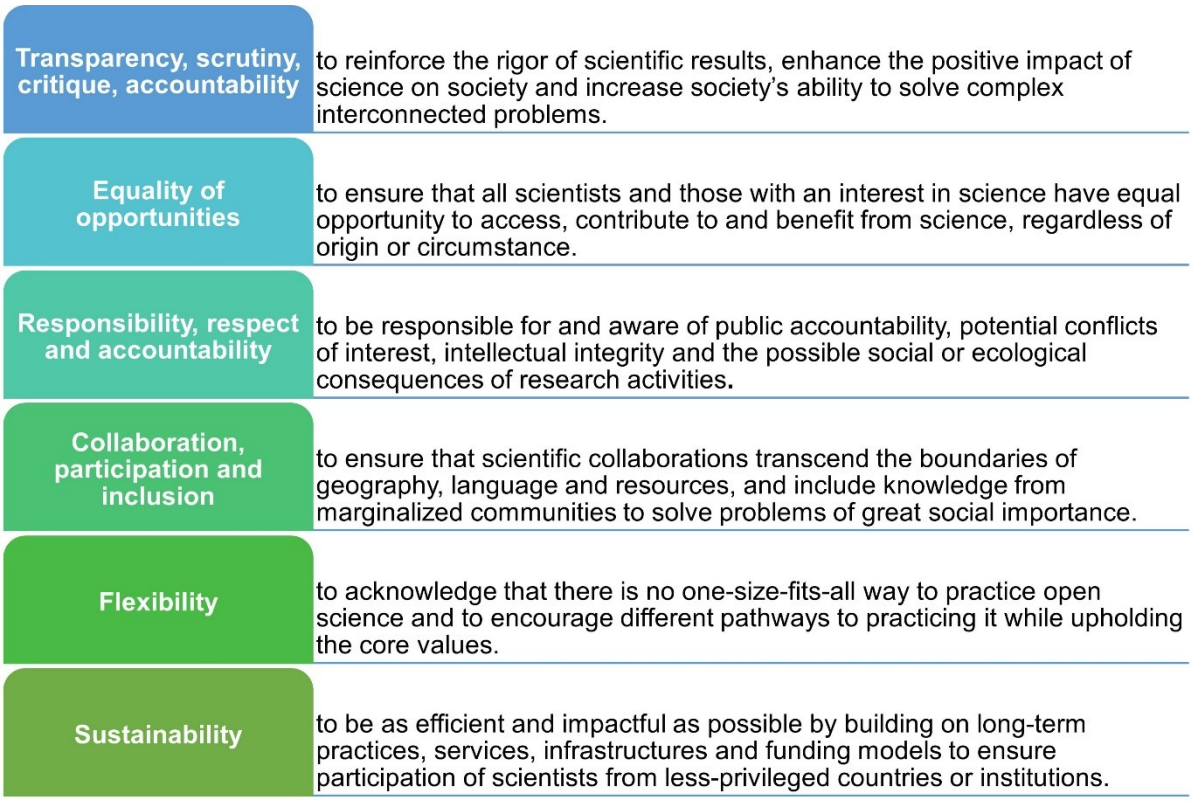
Similarly, the European University Association (EUA) has developed an *Open Science Agenda for 2025* and beyond (see Umbach, 2024) which defines priorities in the field of open research and describes the current context, challenges, and developments. It aims to support its members to transition to open research, contributing to the development of associated policies, and encouraging universities to play a more proactive role in the regulatory and financial frameworks shaping this process. The *Latvian Open Science Strategy 2021-2027* (Hansson-SNIC et al., 2022) aims to provide society, researchers, businesses, policymakers and other stakeholders with freely accessible scientific information, and promote meaningful societal engagement in the scientific research process and includes several initiatives, such as requiring data management plans for all state-funded research programmes and creating an open research monitoring system. The *Slovenia Scientific Research and Innovation Activities Act 2022* states that scientific research must comply with principles of open research and provides funding for the implementation of associated principles.

Other country-specific strategies include the *Estonian Research and Development and Innovation Strategy 2014-2020* (see Seppo et al., 2013), the *Finnish Open Data Programme for 2013-2015* and subsequently the *Finnish Open Science and Research Roadmap* (Ministry of Education and Culture Finland, 2014) the *Croatian Open Science Cloud Initiative* (Melinščak Zlodi, 2023), the *MINERVA project* to support open science in Moldova and Armenia (Turcan et al., 2022) and

the Scientific and Technological Research Council's *Open Science Policy* for Türkiye (Moradi & Abdi, 2023). The *National Open Science Cloud Initiatives (NOSCIs)* (Ševkušić et al., 2022) is a work package of the *NI4OS- Europe mission* funded by the European Commission and represents a national-level coalition of open research stakeholders that seek to develop a national strategy, open services, and infrastructure for open research. This initiative aims to facilitate the integration of EU Member States and associated countries in a *European Open Science Cloud (EOSC),* a federated ecosystem of research data infrastructures that will allow the scientific community to share and process publicly funded research results and data across borders and scientific domains. The European Commission also envisage a strategic vision for Citizen Science at the national level and have developed the *Mutual Learning Exercise on Citizen Science Initiatives - Policy and Practice* (see Haklay et al., 2022) that facilitates the exchange of information, experience, lessons, good practice, policies and programmes for supporting and scaling up citizen science.

Figure 3

The guiding principles of the UNESCO Recommendation on Open Science. Note. This figure was produced into figure format from information provided at: https://www.unesco.org/en/open-science/about



Some structural initiatives focus on specific aspects of open research, such as ensuring FAIR open data and open access research outputs. The *Flemish*

Research Data Network (FRDN; Neyens et al. 2024) has unified a network of Flemish research organisations to develop preconditions for the exchange and reuse of FAIR research (meta) data, the *Turkey Research Data and Open Data Task Force* have created data management plans for Turkish universities, follow world developments on open data, and support the creation of interoperable systems, and the UK's *Open Data White Paper* (Lasthiotakis et al., 2015) outlines how the UK will unlock and seize the benefits of responsibly sharing data. The *Beijing Declaration on Research Data* (CODATA et al., 2019) is a statement that encourages global cooperation especially for public research data. It incorporates another initiative of the *FAIR principles* (Stocker et al., 2022; Wilkinson et al., 2016) which provide guidelines for improving the Findability, Accessibility, Interoperability and Reuse of digital assets. The *Japan Science & Technology Agency (JST) policy on Open Access* (Kano, 2014) provides implementation guidelines for open access publications and data management. Similarly, Denmark have developed a *National Strategy for Open Access*, which states that from 2025 onwards there should be "unimpeded digital access for all peer-reviewed scientific articles from Danish research institutions'' to achieve the "maximum effect from research", and Sweden have developed the *Swedish Research Bill 2016/17:50* (Grafström et al., 2017), which in 2016 stated that their goal is to "implement a full transition to Open Access to research results, including scholarly publications, artistic works and research data, within 10 years''. The *Norwegian Government 2017* provided national goals and guidelines for open access to research articles, with the goal for all publicly funded Norwegian research articles to be made openly available by 2024 (Mikki et al., 2018). In 2018, the European Commission and European Research Council announced the launch of cOAlition S an initiative that, from 2021, sees all scholarly publications funded by national, regional and international research councils and funding bodies published in open access journals, on open access platforms, or made immediately available through open access repositories without embargo. Funding agencies have also developed Open Access policies, such as the UK Research & Innovation (UKRI) funding council who mandate that research articles should be made publicly available as of 2022 and monographs and book chapters as of 2024 (Fathallah, 2022).

Such mandates have seen a rise of *Green Open Access* (also known as 'self-archiving'; Laakso & Multas, 2023) whereby the author's accepted manuscript is uploaded to an institutional or disciplinary open access repository, and Gold Open Access (Laakso & Multas, 2023) where an Article Processing Charge (APC) is typically paid to the journal publisher through institutional 'read and publish' deals or through the researcher's own funding or expenses. New national and international policies, such as the aforementioned UNESCO recommendation on open science and cOAlition S support the development of non-commercial and community-driven forms of open access publishing, such as through *Diamond Open Access* (Bardi et al., 2023) where outputs are preserved with no fees to either the reader or author. To accelerate *free* open access, preprint servers have been formed for many disciplines and countries, specifically *AfricArXiv* (Ahinon et al. (2020), which enhances the discoverability of research from and about Africa, *PsyArXiv* (Ummul-Kiram et al., 2021), a preprint server for the psychological

sciences, and *SSRN* (Adolph et al., 2012) and *preprints.org* (Pagliaro 2021) that provides a multidisciplinary platform to make early versions of research output permanently available, discoverable, and citable.

New infrastructure has also been built to facilitate the implementation of open research. The *Center for Open Science* (COS; Grant et al., 2023) was founded in 2013 to start, scale, and sustain open research by democratising research access, improving inclusion and diversity of stakeholders, enhancing accountability for research integrity, facilitating self-correction, and expanding transparency and sharing of all research content to improve research rigour and reproducibility. Advancing these goals, COS developed and operates the *Open Science Framework* (OSF; see Foster & Deardorff, 2017) – a free, open-source web application that supports the entire research lifecycle from planning, execution, reporting, publishing, archiving and discovery, with OSF preprints, registries, collections, and institutions. COS has also introduced the *Transparency and Openness Promotion (TOP) Guidelines* (see Grant et al., 2023; Nosek et al., 2015) which are eight modular standards to move scientific communication towards greater openness: namely, citation standards, data transparency, analytic methods transparency, research materials transparency, design and analysis transparency, study preregistration, analysis plan preregistration, and replication. The 'TOP Factor' is a metric that reports how journals adhere to these guidelines categorised as "not implemented" or between Levels 1 and 3. *The Research Data Alliance* (Berman & Crosas, 2020; Wu et al., 2019) is also a large-scale international member-based organisation focused on the development of infrastructure to reduce barriers for data sharing and exchange; it allows researchers to share and re-use data across technologies, disciplines, and countries to address the grand challenges of society.

Other platforms also make sharing each element of the research cycle easier: the *European Open Science Cloud* (EOSC; Budroni et al., 2019; Stocker et al., 2022) is an open, federated, ecosystem of infrastructure, services, research artefacts and standards that allow European researchers to engage in open research, the *EOSC Future* (Arvanitidis et al., 2023) is a platform for FAIR data, resources and open research services, and *B2SHARE* (Berenji et al., 2015) enables researchers, scientific communities, and citizen scientists to store, publish, explore, and share FAIR-compliant data. Research repositories have also been developed by individual institutes and organisations; for example, the *CeON Aggregator* (Materska, 2016) is run by the University of Warsaw and integrates with COS to provide a single point of access for Polish repositories. The *C-BIG Repository* (Das et al., 2022) was developed by the Montreal Neurological Institute to provide the infrastructure for sharing data from patients with neurological disease. The *National Open Research Analytics (NORA)* (Ibanez & Lauridsen, 2022) is a Danish national initiative that provides national data infrastructure, which through *Research Portal Denmark* provides a national perspective on Danish research from both global, local, and institutional sources. The *Registry of Efficacy and Effectiveness Studies* is a database of causal inference studies designed to increase the transparency of and access to information about efficacy and

effectiveness studies in education and related fields (see Cook et al., 2022). Many new repositories have also been created in response to new research governance, support, and funding policies around open science publications, such as *CORE* (Jarke et al., 2022), *La Referencia*, *Open Research Europe*, *Plan P - Transform to Open Science*, the *OA Switchboard* (Anderson et al., 2022; Campfens & Fry, 2022), the *Open Journals System* (Alperin et al., 2018), *Ubiquity Press* (Sondervan & Stigter, 2018), *Scottish Universities Press* (Wojturska, 2023), and *Open Monograph Press*. The *Open Access Directory* (OAD; see Nosek et al., 2020) offers an information service compiling factual lists about open access and the *SciFree Journal Search Tool* allows researchers to search for journals offering open access publication.

Open research has also brought revolutions to journals, peer review, and publishing models. Formed in 2016, *Peer Community In* (PCI; Avissar-Whiting et al., 2024; Guillemaud et al., 2019) is a non-for-profit, non-commercial platform that outsources and publishes the peer review of preprints and offers publication in their free open access journal. *Peer Community In Registered Reports* (PCI-RR; see Chambers & Tzavella., 2022; O'Grady, 2021; Pennington & Heim, 2022; Zoccall & Mallamaci, 2023) was launched in 2021 and is dedicated to receiving, reviewing, and recommended Registered Reports via preprint servers. Funding is now available through *Registered Reports Funding Partnerships* (Clark et al., 2021; Drax et al., 2021) whereby research funders and journals partner together in order to integrate their procedures for funding applications and Registered Report submissions into one streamlined process; for example, Cancer Research UK require that if a funding application is successful, authors then submit their proposed research as a Registered Report to one of 12 journals that are currently taking part in this pilot.

PeerRef also operates journal-independent peer-review through article preprints, aiming to make research assessment open, efficient, and researcher-centric (see Avissar-Whiting et al., 2024). The Journal *F1000Research* (Kirkham & Moher, 2018) started its journey in 2012, offering an open access platform that provides immediate publishing for articles with no editorial bias. Once a paper is deposited, expert reviewers are invited to take part in transparent post-publication peer review, and their reports and names are published alongside the article together with the author's responses and comments from registered users. Authors are then encouraged to publish revised versions of their article, with those that pass peer review indexed in external databases such as PubMed and Scopus. The *Journal of Open Research Software* (JORS; Graziotin, 2023) and the *Journal of Open Source Software* (JOS; Smith et al., 2018) publish software meta-papers and accompanying software packages, allowing recognition of the pivotal auxiliary outputs of research. Some journals, such as the *Journal of Health Psychology*, now have a Mandatory Data Sharing Policy (see Marks, 2020) which requires authors to make all raw data fully accessible to increase the transparency, openness and replicability of psychological research. The *Peer Reviewer's Openness (PRO) Initiative* (Morey et al., 2016) is an initiative for peer reviewers themselves that declares a minimum requirement for publication of any scientific results must be the public submission of materials used in generating those results; signatories of

this initiative will not offer comprehensive review for, nor recommend the publication of, any manuscript that does not meet these minimum requirements.

For open research to become normative, sustained, and permanent, institutions and research organisations need to recognise, incentivise, and reward it. Promisingly, initiatives are also being implemented to achieve this. The *San Francisco Declaration on Research Assessment* (DORA; American Society for Cell Biology, 2012; Cole et al., 2023) is a worldwide initiative with the mission to advance practical and robust approaches to research assessment globally across all scholarly disciplines. In this light, DORA has worked globally with researchers, funders, institutions, learned societies and publishers to raise awareness of the need for research assessment reform, to discover and disseminate good practice, and to co-create new tools and processes that will enable real and positive change. To date, over 3,000 organisations across 165 countries have signed up to this declaration (McKiernan et al., 2024), with positive changes in revised standards for hiring, promotion, and progression highlighted by *ReformScape* (Gärtner et al. 2024; Schönbrodt et al., 2024); a searchable collection of criteria and standards for hiring, review, promotion, and tenure from academic institutions. The *Hong Kong Principles* (HKPs; Moher et al., 2020) help research institutions to minimise perverse incentives that can drive researchers to engage in QRPs by assessing responsible research practices, valuing complete reporting, rewarding open research practices, and acknowledging and recognising research activities and tasks such as peer review and mentoring. Like DORA, the HKPs highlight issues with quantitative metrics such as publication impact factor or citation counts, whilst additionally outlining how such metrics are inappropriate for evaluating rigour and public involvement in research (McKiernan et al., 2024). The *Roundtable on Aligning Incentives for Open Science* (Joseph, 2021) convenes critical stakeholders to discuss the effectiveness of current incentives for adopting open research practices, current barriers, and ways to move forward to optimally align reward structures and institutional values. The *Contributor Roles Taxonomy (CRediT)* (Holcombe, 2019) is a high-level taxonomy of roles that describe each contributor's specific contribution to a scholarly output, shifting the traditional concept of authorship, and its associated rewards, to ensure that all those who make substantial contributions to a project are appropriately credited. There are also incentives to undertake open research practices such as Open Science Badges (Grahe, 2014; Kidwell et al., 2016) that acknowledge when preregistration, open materials, and open data have been implemented. *Open Research Awards* (see Merrett et al., 2021) are also being led by many institutions and organisations to recognise researchers adopting open research practices or facilitating positive research culture reform.

Community initiatives

Community initiatives foster teamwork, collaboration, and discussion within the scientific community to increase awareness or uptake of open research practices. Many of these initiatives are spearheaded by students and Early Career Researchers (ECRs) aiming to aid awareness and uptake of open research through supporting, promoting, and community building. A total of 87 community-based

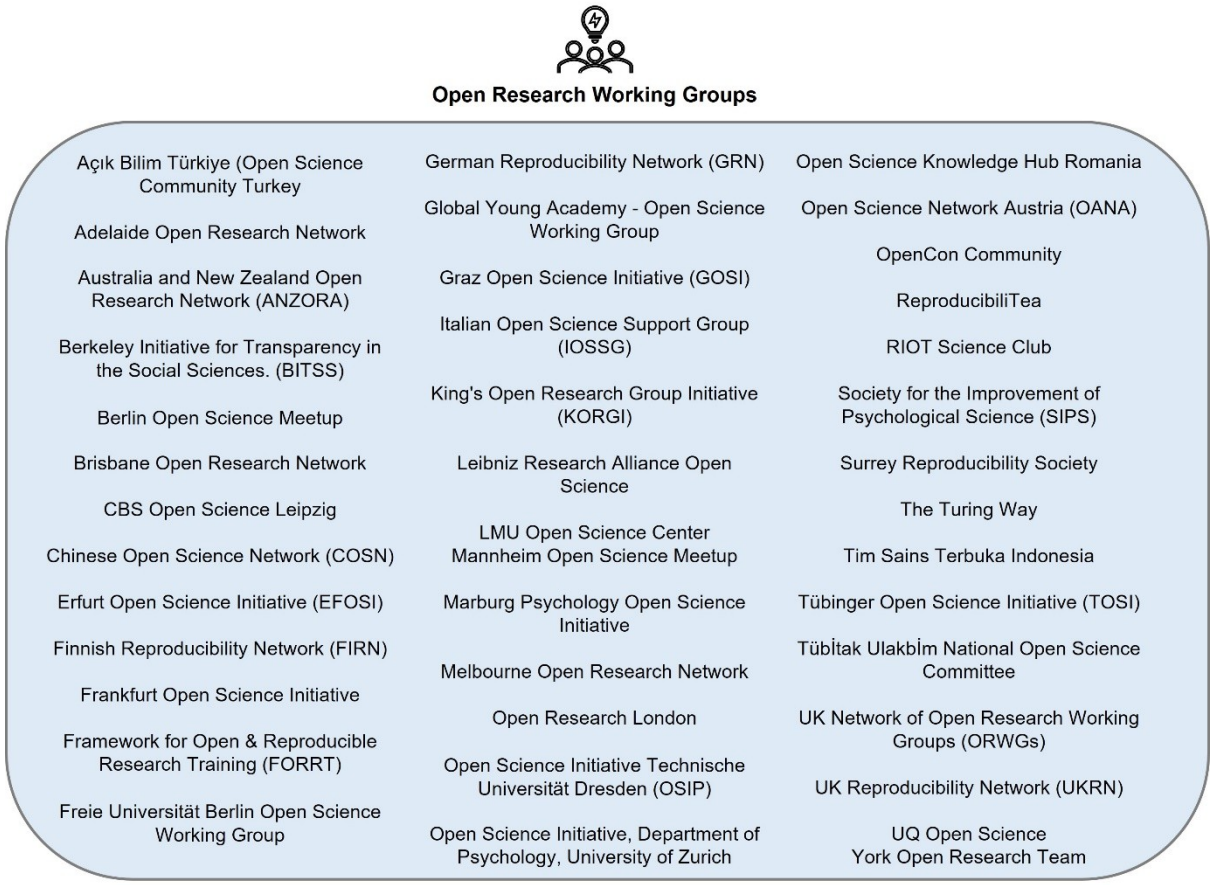
initiatives were identified:

Most community initiatives identified were open research/science working groups, networks, societies, hubs, and committees. These share common goals to discuss and advocate for awareness for open research, promote and organise training, and disseminate best practices. These communities are shown in Figure 4 to aid brevity within the text. For example, the *UK Reproducibility Network* (UKRN; Robson et al., 2021) is a national peer-led consortium that aims to promote and ensure rigorous research practices by establishing appropriate training activities, designing and evaluating research improvement efforts, disseminating best practice and working with stakeholders to coordinate efforts across the sector. The volunteer community of UKRN have written several 'primers' on open research practices, such as preprints, preregistration, and Registered Reports. UKRN also coordinates the activities of numerous international reproducibility networks, with 19 countries currently affiliated such as the *German Reproducibility Network* (GRN; Rahal et al., 2021), and the *Finnish Reproducibility Network* (FIRN; Voikar et al., 2023). In addition, the *UK Network of Open Research Working Groups* (ORWGs) are action-oriented teams within higher education seeking to reform science to make the processes and products of research as transparent, accessible, and reproducible as possible. They work together to develop policy initiatives, host events and conferences, produce educational materials and workshops, conduct collaborative research projects centred on open research, and assess community needs to bring more researchers toward open practices. The *Berkeley Initiative for Transparency in the Social Sciences* (BITSS; Miguel et al., 2014) aims to improve credibility of research through collaboration with researchers, faculty, students, publishers and funders to advance transparency, reproducibility, rigour, and ethics in research. The *Chinese Open Science Network* (COSN; Jin et al., 2023) raises awareness of open research through workshops, talks, journal clubs, and resource translation. Some institutions also have Open Research Teams, such as the *York Open Research Team* (Catt & Smith, 2023) who work with academic and research staff, postgraduate researchers, and others to provide guidance and training in planning, publishing, preserving and sharing research. Similarly, the *Tim Sains Terbuka* (Steltenpohl et al., 2021) aims to improve science and technology through open research in Indonesia.

There are also community initiatives that span multiple countries, institutions, and organisations. Specifically, *ReproducibiliTea* (see Kalandadze & Hart, 2022; Orben, 2019) is an initiative (currently) across 113 institutions in 27 countries that helps researchers create local journal clubs at their universities to discuss papers and ideas centered around reproducibility, open science, and scientific reform. Likewise, *RIOT Science Club* (see Kalandadze & Hart, 2022) is a forum that aims to encourage Reproducible, Interpretable, Open and Transparent science allowing for researchers to learn about new practices for research reform. *The Turing Way* (Arnold et al., 2019) is an open science, open collaboration, and community-driven project that involves and supports a diverse community of contributors to make data science accessible, comprehensible and effective for everyone. They have guides for reproducible research, project design,

communication, collaboration, and ethical research. *OpenDots* is a not-for-profit initiative made up of international organisations, academic institutions, researchers and citizens, with the aim of creating a collaborative network that allows knowledge about open research to be concretised through information campaigns, workshops, webinars, open-source technology tools and platforms. The *Society for the Improvement of Psychological Science* (SIPS; Steltenpohl et al., 2021) is an international organisation that aims to improve the quality of methodology and practices in psychological research by improving training and research practices and improving institutional policies to incentivise better scientific practices.

Figure 4. Overview of Open Research Working Groups, Networks, Societies, Hubs, and Committees for researchers.



For open research to be sustained, pedagogical reform is required through the integration of open and reproducible science into the taught curriculum. The *Framework for Open and Reproducible Research Training* (FORRT; Azevedo et al., 2019) is a grass-roots interdisciplinary and international community of over 1200 early career scholars dedicated to advancing open research through open education, pedagogical reform, social justice advocacy, and meta-science. FORRT advocates for the integration of open research topics into higher education to advance research transparency, reproducibility, rigour, and ethics, developing a wide range of OERs such as a glossary of open research terms, lesson plans, and a series of community-built syllabi and teaching materials. By implementing

initiatives designed to reduce barriers to participation in open research, FORRT actively works to democratise access to cutting-edge research practices and educational resources. These efforts ensure that underrepresented groups have the necessary tools, training, and support to fully engage in transparent, rigorous, and reproducible science, contributing to a more diverse and equitable global research community.

Other initiatives also share a common goal in highlighting the need for OERs for democratising knowledge, reforming pedagogy, and training students in best open research practices. For example, *The Research on Open Educational Resources for Development* (ROER4D; King et al., 2016) project investigates what ways and under what circumstances the adoption of OERs can address the increasing demand for accessible, relevant, high-quality and affordable education in the Global South. The *Collaborative Replications and Education Project* (CREP; Wagge et al., 2019) provides training, support and professional growth opportunities for students and instructors completing replication projects. Promisingly, some community initiatives are driven by students themselves, such as the *Student Initiative for Open Science* (SIOS; Pouwels, 2022) that focuses on educating social sciences undergraduates and graduates about good research practices with a particular emphasis on open research. *The Carpentries* (see Robson et al., 2021) builds global capacity in essential data and computational skills for conducting efficient, open, and reproducible research by teaching foundational coding and data science skills to researchers worldwide. *Sains Terbuka Airlangga* is the first Indonesian initiative committed to promoting and educating students and young researchers to adopt open research practices. The *Institute for Globally Distributed Open Research and Education* (IGDORE; Nosek et al., 2020) is an independent research institute dedicated to improving the quality of science, science education, and quality of life for scientists, students and their families. The *Higher Education Leadership Initiative for Open Scholarship* (HELIOS; Carter et al., 2023) is a cohort of colleges and universities committed to collective action to advance open scholarship within and across their campuses.

In addition to providing the necessary training for open research practices and providing a safe space for students, ECRs, and researchers to discuss issues in the research ecosystem, there are initiatives whose goal is to specifically improve equality, representation, diversity, and accessibility through wider research culture reform. *Bullied Into Bad Science* (Nosek et al., 2020) aims to instigate institutions to take action to improve academic culture for Early Career Researchers (ECRs) and to create a fairer, more open and ethical research and publication environment. *Free Our Knowledge* (Robson et al., 2021) who seeks a fairer and secure future in academia and a normalised open and reproducible research practice. FORRT also conducts targeted outreach to ECRs and scholars from Low- and Middle-Income Countries (LMICs) to foster a more equitable and diverse global research community.

Many community initiatives exist to foster citizen science, such as the *Australian Citizen Science Association* (ACSA; Borda et al., 2019), the *Citizen*

Science Association (CSA; Storksdieck et al., 2016), *CoAct - Citizen Social Science* (Perelló, 2022), the *European Citizen Science Association* (ECSA; Martek et al., 2022), and *EU Citizen Science* (Wagenknecht et al., 2021)) that seek to give citizen groups an equal 'seat at the table' through active participation in research and advance research progress through the sharing of knowledge, collaboration, capacity building, and advocacy. The *Code for Science and Society* (Arancio et al., 2022) is a not-for-profit organisation that aims to improve the public's ability to find, collect, and share the open data they use to make more informed decisions in the benefit of public interest. The *Open and Collaborative Science for Development Opportunities* (OCSD network; Albagi et al., 2015) is a community of open research practitioners and leaders that learn together and contribute towards a pool of open knowledge on how collaboration could address local and global development challenges. Science communication podcasts that focus on open research have also been formed, such as the *Everything Hertz* podcast (Quintana & Heathers, 2021) that discusses methodology and scientific culture, and the *ORION Open Science Podcast* (ORION, 2021) that includes topics on data sharing, citizen science, peer review, and professional development in open research.

Big Team Science has been advanced through the open science movement, which involves open, large-scale collaboration between researchers who work together to solve fundamental research questions and pool resources across different labs, institutions, disciplines, cultures, and continents (Forscher et al., 2023; Pennington et al., 2022). The *Psychological Science Accelerator* (Beshears et al., 2022) is a globally distributed network of psychological science laboratories that coordinates data collection for democratically selected studies with the mission to accelerate the accumulation of reliable and generalisable research. The *ManyLabs* initiative (e.g., Klein et al., 2014; Ebersole et al., 2016) accelerates big team science with a focus on replication studies, and has since joined hands with another initiative named *StudySwap* (Dienlin et al., 2021), which is a platform for inter-lab replication, collaboration, and research resource exchange. Supporting such initiatives, the *repliCATS project* (Hoogeveen et al., 2020) crowdsource predictions about the reliability and replicability of published research in social science fields. The *Consortium for Reliability and Reproducibility* (CoRR; Zuo et al., 2014) is yet another community-led initiative that has developed an open research resource for neuroimaging that facilitates the assessment of test-retest reliability and reproducibility of functional and structural connectomics studies through shared data. *RedTeams* (see Lakens, 2020) work together to constructively criticise each other's work or to find errors during the entire research process, with the overarching goal of maximising research quality.

There are also several community-led repositories that aim to embed open research practices to improve research culture. These initiatives are categorised as community-based rather than structural because, although they provide new infrastructure for research, they are built and resourced by the scientific community *for* the scientific community. Some of these initiatives are associated with open access; for example, the *Directory of Open Access Books* (DOAB;

Whitford, 2014) is a community-driven discovery service that indexes and provides access to scholarly, peer-reviewed open access books and helps users to find trusted open access book publishers, and *PeerLibrary* facilitates the global conversation on academic literature allowing users to share insights and exchange feedback to facilitate innovative research. *Paperity* is the first multidisciplinary aggregator of Open Access journals and papers, consolidating academia around open literature and *Unpaywall* (Dhakal, 2019) is a free database of over 50 million Open Access scholarly articles. The *Harvard Open Access Project* (Suber, 2019) aims to facilitate the growth of Open Access through consultation, collaboration, and community building and directs assistance to support research and policy analysis on Open Access. Some initiatives are dedicated to the 'afterlife' of published research articles, with a focus on rigorous and robust peer-review processes and research evaluation. Specifically, *PREreview* (Avissar-Whiting et al., 2024; Nosek et al., 2020) is a web-platform for posting, reading, and engaging with preprint reviews and *The Unjournal* (Avissar-Whiting et al., 2024) aims to build a better system for evaluating research through journal-independent feedback, ratings and evaluation of hosted papers. Furthermore, *Qeios* (see Avissar-Whiting et al., 2024; Kwasnicka et al., 2022) is an publishing platform that enables the open peer review of preprints, committed to fostering a research community that values open communication, rapid dissemination of knowledge, and constructive feedback.

Other repositories have been built by the community to share datasets, software, and research outputs. *Zenodo* (Peters et al., 2017) is a general-purpose open repository that allows researchers to deposit papers, datasets, software, and digital artefacts, and *rOpenSci* (Nosek et al., 2020) is a community initiative that aims to transform research through open data, software and reproducibility by developing R-packages via community driven learning, review, and maintenance. Other initiatives promote knowledge dissemination more broadly. The *Knowledge Futures Group* (Staines, 2020) build and support products and protocols to make knowledge open and accessible to all; the *Open Knowledge Foundation* apply open knowledge to design infrastructures and organisations of the future; and the *Open Scholar Community Interest Company* develop ideas and tools that promote open and transparent research collaboration. Furthermore, *LIBSENSE* (Abbott et al., 2020) is a programme aimed at building a community of practice and progressing adoption of open research services and infrastructures in Africa; *FORCE11* (Wu et al., 2019) is a community of scholars, librarians, archivists, publishers and funders whose goal is to facilitate change through improved knowledge creation and sharing, and the *Goettingen Open Source and Science Initiative of Psychology* (GOSSIP; Nosek et al., 2020) are a community committed to trustworthy and replicable results as well as the free availability of scientific results who hold regular information events and workshops on Open Science; and the *Open Digital Health Initiative* (Kwasnicka et al., 2022) are an organisation who encourage health scientists, practitioners and technology developers to share evidence-based digital health tools.

Finally, some initiatives bring together communities of researchers

dedicated to providing reliable open scholarly infrastructure through their joint efforts. *Just One Giant Lab* (Masselot et al. (2022) provides a platform for open communities across the world to build impactful projects and offer special services for communities and organisations who require further guidance. The *Joint Roadmap for Open Science Tools* (JROST; Narock & Goldstein, 2019) brings together key technology organisations and researchers who are actively involved in design and production of open scholarly infrastructure, offering workshops and other coordinated activities. *Open Innovation in Science* (OIS; Beck et al., (2022) investigate and experiment with open and collaborative practices to generate new research questions and translating research into innovation.

Discussion

The 2010s entered the discipline of psychology into a long-lasting period of deep reflection: a cascade of events exemplified the impact of distorted incentives, QRPs and fraud, and large-scale replication attempts highlighted issues in replicability, reproducibility, and transparency in the field. This so-called 'crisis' was a call to action, sparking fast-paced changes in the way that research is conducted and the wider landscape in which research sits – commonly referred to as open research. Open research aims to improve psychological research by making it more accessible, transparent, rigorous, reproducible, replicable, accumulative, and inclusive. This systematic, narrative review identified 187 initiatives that aim to enhance awareness and uptake of open research practices in psychology internationally, with each categorised into procedural (n = 30), structural (n = 70) and community-based change (n = 87). We hope that by integrating these initiatives, this review promotes their further adoption and ensures coordinated efforts between individuals, institutions, research organisations, funders, and journals.

Procedural initiatives encompass behaviours and sets of commonly used practices in the research process and comprise toolkits, resources, and guidelines for implementing open research, as well as the necessary infrastructure to support these. There are now numerous guides that teach both students and researchers how to implement various open research practices, such as preprints, study preregistration, Registered Reports, open materials, code, software, and data, helping to demystify these practices and mitigate perceived misnomers to their implementation. One helpful aspect of many of these toolkits and resources is that they offer different entry levels to ease into open research (where possible and appropriate), or to overcome barriers: for example, researchers new to the practice of preregistration, or who are facing tight time constraints in their research, can use AsPredicted.org which asks researchers to answer nine simple questions about their research design and analyses; any researcher who has designed a study, or has acquired ethical approval, should know the answers to these questions making this a relatively simple and pain-free task. Once a researcher feels acquainted with this process, they can then 'level up' to more extensive and detailed preregistration protocols, such as those offered on the Open Science Framework. Similarly, after trying their hand with preregistration, researchers can implement Registered Reports within their research workflow: a publishing format that integrates study preregistration through a Stage 1 protocol and, upon receiving In Principle Acceptance (IPA), guarantees publication of the research so long as it meets the RR guidelines and criteria. Some researchers argue that the uptake of open research has been slow. However, the scale of the identified initiatives within this review, which have been developed by researchers themselves and usually in a voluntary capacity, suggests that there has been remarkable progress to integrate open research in psychology.

Traditionally, research practice has been governed by what are now understood to be problematic incentives made normative by research institutions, organisations, publishers, and funders. For example, many journals and research

evaluation exercises have focused on the novelty of study findings and many funders focus on 'blue sky' or high-risk-high-reward ideas. Novel findings, of course, are important to accelerate scientific knowledge, but they need to be underpinned by rigorous, robust, and trustworthy processes. Replications of research and reproducibility checks should also be recognised as equally, if not more, important. Researchers' esteem has also routinely been recognised (i.e. hiring and promotion) through the quantity of their outputs or questionable metrics (e.g., citation h-index; Journal Impact Factors) rather than their quality (e.g., robustness, rigour, transparency, and inclusiveness). It is therefore promising to see vast changes in this sphere, too: our review identified 70 structural-based changes such as open research agendas, policies, frameworks, and supporting infrastructure developed with the goal to make open research routine and normative. Notably, many government officials have recognised the requirement for open research to be at the core of the scientific enterprise, with the White House Office of Science and Technology Policy declaring 2023 the "Year of Open Science", and the European University Association (EUA) developing an open science agenda. Indeed, strategies of behaviour change (see Korbmacher et al., 2023; Nosek, 2019) in this area propose that for open research to become sustained it needs to be made possible and easy, normalised, rewarded and required, with the latter influenced by such top-down structural initiatives. Promisingly, these initiatives have substantial backing from the research community: for example, over 7000 individuals and 1600 organisations have signed the Budapest Open Access Initiative declaration (BOAI, 2024) which aims to make research free and unrestricted in all academic fields internationally (Jähne, 2021); over 5,000 journals and organisations have signed the TOP guidelines as a widely used tool for implementing open science practices (see https://osf.io/y2rr6; Grant et al., 2023); and over 25,000 individuals and organisations across 65 countries have signed DORA (https://sfdora.org/signers/) to change the culture of research assessment.

For open research to be sustained, however, we require coordinated efforts across individual researchers, students, journals, funders, institutions, and organisations. Again, promisingly, this appears to be happening. This review identified 80 community-based initiatives, such as reproducibility networks that aim to promote training, disseminate best practices, and advocate for the awareness of open research in partnership with various stakeholders (e.g., UKRN; Robson et al., 2021) and open scholarship groups that aim to embed the teaching of open research into the educational curriculum (e.g., FORRT; Azevedo et al., 2019). Indeed, many grassroots initiatives, such as FORRT and ReproducibiliTEA, which rely on volunteer contributions and community-building, have demonstrated substantial impact in promoting open research education, meta-research, big team science, and research integrity. To sustain such efforts, it is crucial that institutions and funders recognise and support the contributions of these community-driven projects to ensure their longevity and success.

The positive social element to these communities is also invaluable in creating an open and non-judgemental space to discuss research culture, which reduces barriers to its implementation. Notably, the ReproducibiliTea journal club (Orben, 2019) helps researchers to create journal clubs to provide a 'safe space' to

discuss ideas and issues surrounding research. This entirely volunteer-based initiative is now implemented by over 113 institutions in 27 countries. Many of these initiatives have been developed by students and Early Career Researchers wanting to make positive change: initiatives such as Bullied into Bad Science (Nosek et al., 2020) and Free Our Knowledge (Robson et al., 2021) aim for a fairer, open and more ethical research landscape. Community initiatives therefore foster inclusion, teamwork, and collaboration within the scientific community. To increase knowledge of open research practices more widely, there are also numerous podcasts such as Everything Hertz (Quintana & Heathers, 2021) and the ORION Open Science Podcast (ORION, 2021). In order to increase collaboration, inclusiveness, and representation in psychological research, the idea of Big Team Science has also been advanced (see Forscher et al., 2023; Pennington et al., 2022), with community initiatives such as the Psychological Science Accelerator (PSA; Beshears et al, 2022) and *StudySwap* (Dienlin et al., 2021) providing better access to resources, allowing more diverse data to be collected, and accelerating the accumulation of reliable and generalisable knowledge. Importantly, there has also been a drive to directly involve citizens in scientific research with initiatives such as the Citizen Science Association (CSA; Storksdieck et al., 2016) and European Citizen Science Association (ECSA; Martek et al., 2022).

Together, then, numerous procedural, structural, and community-based initiatives are enhancing both research practice and wider culture, contributing to the discipline of psychology becoming a trailblazer in open research.

Challenges for sustaining open research.

This systematic review has identified 187 initiatives to enhance awareness and uptake of open research in psychology, highlighting extremely positive changes. To ensure that open research is sustained, however, several existing issues need to be addressed. First, it is essential that open research is normalised through coordinated efforts between individuals, journals, funders, institutions, and research organisations (see Stewart et al., 2022 for a similar perspective). If one element is addressed without the other (e.g., researchers focus on high-quality outputs [individual level] but are incentivised to focus on novelty [e.g., structural level]), then the problems we have seen historically within this discipline will prevail and meaningful reform will fail (Evans et al., 2022). Many community-led efforts are voluntary in nature and require support, recognition, and funding. Indeed, there are encouraging developments in this sphere, such as new funding for meta-research and responsible research practice (e.g., UKRI, NWO, Research England, Einstein Foundation, SIPS) but many of these offer a limited amount of funding (compared to discipline-specific research), and this needs to be increased and sustained. Similarly, it is important that open research *initiatives* are developed and implemented in a collaborative and coordinated fashion to ensure that efforts are not duplicated and that they do not become fragmented. For example, we identified many initiatives that appear to have common goals but exist separately within the research ecosystem: by joining these initiatives up and working together, their momentum and impact will likely be maximised.

Furthermore, this review highlights international initiatives demonstrating that a move to open research is widespread. However, there are geographical and regional gaps in open research and its associated initiatives, which reflects wider inequalities in support, funding, and infrastructure for (open) research. For example, Li et al. (2022) report that, in 2021, there were over 1000 open data repositories in the USA, 400 in Germany and 300 in the UK, yet only 48 in China. Furthermore, there are clear differences in the availability of resources by geographic region and between social groups, which present barriers to open research (see Korbmacher et al., 2023; Ghai et al., *in press*; Ledgerwood et al., 2022; Petersen et al., 2021; Pownall et al., 2021 for discussion). Indeed, some of the aforementioned initiatives aim to overcome such inequalities by sharing resources and funding (e.g., StudySwap, PSA) and facilitating research in – and with researchers from – underrepresented countries (see Basnight-Brown, 2024; Jeftic et al., 2024). Such inequalities are imperative to discuss and mitigate in the context of open research, as they not only limit the global reach and impact of scientific advancements but also risk perpetuating systems where research from underrepresented regions and groups is marginalised (Korbmacher et al., 2023). Addressing these disparities through equitable access to resources, inclusive collaboration, and targeted funding is required for creating a truly open, diverse, and innovative research community that benefits all.

Conclusion

The last decade has seen wide-scale behaviour change to encompass open research – a move to ensure knowledge is accessible, transparent, rigorous, reproducible, replicable, accumulative, and inclusive. This systematic narrative review identified 187 procedural, structural, and community-based initiatives that aim to enhance awareness and uptake of open research. The scale and momentum of these developments presents an optimistic future for psychological research: through coordinated efforts between researchers, institutions, funders, journals, organisations, and stakeholders, open research can lead to a more credible and useful research landscape, as well as a more inclusive, representative, and diverse research culture. We hope that by integrating these many initiatives, this review will them, facilitate their further adoption and coordinated efforts, and lead to complementary initiatives to sustain open research.

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Supplementary Table 1.

Initiatives identified in the review (n = 187). Table outlines the *initiative's name, country of origin, overview, narrative theme, supporting publications, and the stage it was identified.*

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
African Open Science Platform (AOSP)	Africa	The African Open Science Platform convenes and coordinates the interests, ideas, people, institutions and resources needed to advocate and to advance open science in and for Africa.	Procedural	Boulton et al. (2018)	Stage 1
Aligning Incentives ToolKit	All	This toolkit was developed to support the efforts of individuals who recognize the issues with the current academic rewards system and wish to address those issues.	Procedural	Dougherty et al. (2024)	Stage 3
AsPredicted	All	AsPredicted is a platform that makes it easy for researchers to pre-register their studies, and easy for others to read and evaluate those pre-registrations.	Procedural	Dienlin et al. (2021) Simmons et al. (2018)	Stage 2
Collaborative Informatics and Neuroimaging Suite Toolkit for Anonymous Computation (COINSTAC)	All	COINSTAC is software to foster collaborative research, removing large barriers to traditional data-centric collaboration approaches.	Procedural	Martin et al. (2023) Plis et al. (2016)	Stage 2

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Collaborative Knowledge Foundation (Coko)	All	Our mission: to use Open Source to transform how knowledge is created, improved, and shared. Rethink, build or extend your publishing processes and technology with Coko.	Procedural	Ratan (2018)	Stage 1
Common Workflow Language project	All	Common Workflow Language (CWL) is a group of organisations and individuals aiming to enable scientists to share data analysis workflows. CWL project produces free and open standards for describing command-line tool based workflows.	Procedural	Crusoe et al. (2022) Suetake et al. (2023)	Stage 1
Curate Science	All	Curate Science is an initiative to strengthen science by developing web apps/tools to curate the transparency and credibility of research.	Procedural	LeBel et al. (2019)	Stage 1
FOSTER Open Science	EU	The FOSTER and FOSTER+ projects focus on promoting the practical implementation of Open Science, with activities targeting academic staff, young scientists and policy-makers.	Procedural	Orth et al. (2016) Robson et al. (2021) Schmidt et al. (2016)	Stage 1
FOSTER Open Science Training Handbook	All	A key resource towards developing Open Access and Open Science curricula and andragogies.	Procedural	Heck et al. (2020)	Stage 2
International Cognitive Ability Resource (ICAR)	All	The International Cognitive Ability Resource is a public-domain assessment tool aiming to encourage the broader assessment of cognitive abilities to facilitate	Procedural	Dworak et al. (2021)	Stage 2

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
		neuropsychological assessment in medical research and practice.			
Jamovi	All	Free and open, Jamovi is a new “3rd generation” statistical spreadsheet designed to be easy to use.	Procedural	Şahin & Aybek (2019)	Stage 3
JASP	All	JASP is an open-source project with the main goal to help statistical practitioners reach maximally informative conclusions with a minimum of fuss.	Procedural	Ummul-Kiram et al. (2021)	Stage 2
Netzwerk der Open-Science-Initiativen (NOSI) / Network of Open Science Initiatives at Psychology Departments (NOSI)	Germany	This project is the central platform for the Network of (German-speaking) Open Science Initiatives providing protocols, links, and resources that might be of interest to others interested in Open Science.	Procedural	Robson et al. (2021)	Stage 1
Nor-CAM	All	Proposes a flexible and holistic framework for recognition and rewards in academic research assessment.	Procedural	Universities Norway (2021)	Stage 3
OAPEN Open Access Books Toolkit	All	The OAPEN open access books toolkit is a free-to-access resource that aims to help academic book authors to better understand open access book publishing, and to promote and increase trust in open access books.	Procedural	Midha (2022)	Stage 1
Open Science MOOC	All	Open Science education. This MOOC is designed to help equip students and researchers with the skills they need to	Procedural	Labastida (2015)	Stage 1

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
		excel in a modern research environment.			
Open Science Workshop Materials of the LMU Open Science Center	Germany	This project contains materials for workshops on Open Science related topics.	Procedural	None identified.	Stage 1
OpenNeuro	All	A free and open platform for validating and sharing BIDS-compliant MRI, PET, MEG, EEG, and iEEG data	Procedural	Markiewicz et al. (2021)	Stage 2
OpenRefine	All	OpenRefine is a free, open source tool for working with messy data: cleaning it; transforming it from one format into another; and extending it with web services and external data.	Procedural	Kusumasari (2016)	Stage 1
Opensciency	All	Opensciency is core open science curriculum material, drafted to introduce important definitions, tools, and resources; and provide for participants at all levels recommended practices.	Procedural	None identified.	Stage 1
Ouvrir la Science	EU	This Science Europe Practical Guide aims to provide guidance to research Organisations on how to develop and enhance their own policies and practices towards the long-term preservation and openness of research data.	Procedural	None identified.	Stage 1
P-curve	All	p-curve is a statistical tool that can be used to assess the	Procedural	Simonsohn et al.	Stage 3

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
		evidential value of a set of findings. Evidential value is present when selective reporting can be ruled out as the sole explanation for a set of statistically significant findings.		(2014)	
Principles and Practices of Open Research: Teaching, Research, Impact, and Learning (PaPOR TRaIL)	All	This course was developed to provide a foundation in best scientific practice with focus to develop an open educational resource providing a comprehensive introduction to open research, and to help students incorporate open research in their research projects.	Procedural	Egan et al. (2020)	Stage 2
Project TIER	All	Project TIER's mission is to promote a systemic change in the professional norms related to the transparency and reproducibility of empirical research in the social sciences.	Procedural	Medeiros & Ball (2017)	Stage 1
R-Studio	All	RStudio is an open sourced, integrated development environment (IDE) for R and Python.	Procedural	da Silva & Moura (2020)	Stage 3
Registered Reports	All	Registered Reports is a publishing format that emphasises the importance of the research question and the quality of methodology by conducting peer review prior to data collection.	Procedural	Chambers & Tzavella (2022)	Stage 1
Stat Check	All	Statcheck is an R package designed to detect statistical errors in peer-reviewed psychology articles by searching papers for statistical results, redoing the calculations described in each paper, and comparing the two values to see if they match.	Procedural	Nuijten (2022) Nuijten et al. (2016)	Stage 1
Tools to Advance	All	Tools to Advance Research Assessment (TARA) is a project	Procedural	None identified.	Stage 3

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Research Assessment (TARA)		to facilitate the development of new policies and practices for academic career assessment.			
UNESCO Open Science Toolkit	All	The Toolkit is a set of guides, policy briefs, factsheets and indexes developed in collaboration with UNESCO Open Science partners or through discussions with and inputs from the members of the UNESCO Working Groups on Open Science.	Procedural	Peršić & Straza (2023)	Stage 1
Z-Curve	All	A method for estimating the expected replication rate (ERR) –the predicted success rate of exact replication studies based on the mean power after selection for significance.	Procedural	Brunner & Schimmack (2020)	Stage 3
African Open Access Principles: AfricArXiv	Africa	Enhancing the discoverability of research from and about Africa	Structural	Ahinon et al. (2020)	Stage 1
B2SHARE	All	B2SHARE is a reliable and trustworthy way for researchers, scientific communities and citizen scientists to store, publish and share research data in a FAIR way.	Structural	Berenji et al. (2015)	Stage 1
Beijing Declaration on Research Data	All	A set of data policies adapted to the new Open Science paradigm.	Structural	CODATA et al. (2019)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Biden-Harris Administration	USA	Actions across the federal government to advance national open science policy ensuring Free, Immediate, and Equitable Access to Federally Funded Research,.	Structural	Horder, (2023).	Stage 1
C-BIG Repository	All	An Open Science resource that promotes scientific research and discovery in neurological diseases and accelerates the development of new treatments.	Structural	Das et al. (2022)	Stage 2
Center for Open Science (COS)	All	The Center for Open Science (COS) employs a systems strategy involving technology to make open practices possible and easy involving communities and stakeholders.	Structural	Grant et al. (2023)	Stage 1
CeON Aggregator	Poland	CeON Aggregator is a single access point to Polish open access repositories providing greater visibility of Polish research output.	Structural	Materska (2016)	Stage 1
cOAlition S	All	cOAlition S is an initiative to make full and immediate Open Access to research publications a reality. It is a network of international funders that promotes the implementation of open access to scientific publications.	Structural	Schiltz (2018)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Contributor Roles Taxonomy (CRediT)	All	CRediT (Contributor Roles Taxonomy) is a high-level taxonomy of roles that describe each contributor's specific contribution to the scholarly output.	Structural	Holcombe (2019)	Stage 3
CORE	All	CORE provides access to the largest collection of open access research papers, collecting and indexing research from repositories and journals.	Structural	Jarke et al. (2022)	Stage 1
Croatian Open Science Cloud Initiative (HR-OOZ)	Croatia	Initiative will bring together relevant stakeholders in creating required preconditions for the implementation, realisation, and promotion of open science, to improve research conditions and achieve top research results.	Structural	Melinščak Zlodi (2023)	Stage 1
Denmark's National Strategy for Open Access 2018	Denmark	Research institutions and university colleges must implement Open Access preferably via the green model.	Structural	Ministry of Higher Education & Science Denmark (2018)	Stage 1
Diamond Open Access	All	This initiative aims for a scholarly publishing infrastructure that is equitable, community-driven, academic-led and -owned.	Structural	Bardi (2023)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
EOSC Future	EU	A trusted platform for open science and FAIR data, resources and services integrating existing data and services from science communities, research infrastructures and e-infrastructures.	Structural	Arvanitidis et al. (2023)	Stage 1
Estonian Research and Development and Innovation Strategy 2014-2020	Estonia	“Knowledge-based Estonia” refers to open access as one of the measures for increasing the social and economic benefits of research and development.	Structural	Seppo et al. (2013)	Stage 1
European Open Science Cloud (EOSC)	EU	An open, federated, trust-based ecosystem of infrastructure, services, research artefacts and standards that will enable European researchers to share research artefacts and use a wide range of resources.	Structural	Budroni et al. (2019) Stocker et al. (2022)	Stage 1
F1000Research	All	F1000 is an open research platform for researchers in all subject areas.	Structural	Avissar-Whiting et al. (2024)	Stage 1
FAIR principles	All	Provide guidelines to improve the Findability, Accessibility, Interoperability, and Reuse of digital assets.	Structural	Stocker et al. (2022) Wilkinson et al. (2016)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Finnish Open Data Programme for 2013-2015	Finland	Aimed at opening up access to public sector information and for public information resources to be (legally) opened available for free use in 2020.	Structural	None identified.	Stage 1
Finnish Open Science and Research Roadmap (OSR Roadmap)	Finland	This roadmap goal is to promote open science and the availability of information.	Structural	Ministry of Education and Culture Finland (2014)	Stage 1
Flemish Research Data Network (FRDN)	Belgium	Flemish Research Data Network (FRDN) is a network of Flemish research organisations that develop the preconditions necessary to motivate and enable researchers to exchange and reuse (FAIR) research (meta) data.	Structural	Neyens et al. (2024)	Stage 1
Gold Open Access	All	Open access publishing refers to the publication of scholarly works as articles in open access journals, as open access monographs, or as contributions to open access edited volumes or conference proceedings.	Structural	Laakso & Multas (2023)	Stage 2
Green Open Access	All	Green open access refers to making a work published with a publisher available to the public in an institutional or disciplinary open access repository.	Structural	Laakso & Multas (2023)	Stage 2

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Hong Kong Principles	All	The Hong Kong Principles help research institutions to minimise perverse incentives that invite them to engage in questionable research practices and reward researchers for behaviour that leads to trustworthy research.	Structural	Moher et al. (2020)	Stage 1
Japan Science & Technology Agency (JST) policy on Open Access	Japan	Policy defines JST's stance on Open Access to research publications and management of research data resulting from research projects funded by JST.	Structural	Kano (2014)	Stage 1
Journal of Open Research Software (JORS)	All	JORS features peer reviewed Software Metapapers describing research software with high reuse potential and publishes research papers covering creating, maintaining and evaluating open source research software.	Structural	Graziotin (2023)	Stage 1
Journal of Open Source Software (JOSS)	All	The Journal of Open Source Software is a developer friendly, open access journal for research software packages. Committed to publishing quality research software with zero article processing charges or subscription fees.	Structural	Smith et al. (2018)	Stage 1
LA Referencia	Latin America	LA Referencia gives visibility to the scientific production of higher education and research institutions in Latin America, promotes open and free access to the full text, with emphasis on publicly financed results.	Structural	None identified.	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Latvian Open Science Strategy 2021-2027	Latvia	Aims to provide society, researchers, businesses, policymakers and other stakeholders with freely accessible scientific information, and promote meaningful societal engagement in the scientific research process.	Structural	Hansson-SNIC et al. (2022)	Stage 1
Mandatory Data Sharing Policy	All	Journals policy to make data open and accessible.	Structural	Marks (2020)	Stage 2
MINERVA project 2018	Moldova, Armenia	The main aim of the MINERVA is to develop conditions for the implementation of the core principles of Open Science at universities in Moldova and Armenia.	Structural	Turcan et al. (2022)	Stage 1
Mutual Learning Exercise on Citizen Science Initiatives-Policy and Practice	EU	The MLE aims to facilitate the exchange of information and support and scale up citizen science through identifying the good practices, policies and programmes of the various approaches.	Structural	Haklay et al. (2022)	Stage 1
National goals and guidelines for open access to research articles, Norwegian Government 2017	Norway	The government’s goal is that all publicly funded Norwegian research articles should be made openly available by 2024, and the government has established guidelines and measures for open access to research articles.	Structural	Mikki et al. (2018)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
National Open Research Analytics (NORA)	Denmark	National initiative to enable robust and open insights and analytics of Danish research.	Structural	Ibanez & Lauridsen (2022)	Stage 1
National Open Science Cloud Initiatives (NOSCIs)	EU	The main aim of NOSCI will be the promotion of synergies and the optimization/articulation of their participation in European and global challenges in this field of open science communicationOSC.	Structural	Ševkušić et al. (2022)	Stage 2
OA Switchboard	All	The OA Switchboard is an independent intermediary, providing shared infrastructure, standards and back office services for funders, institutions and publishers.	Structural	Anderson et al. (2022) Campfens & Fry (2022)	Stage 1
Open Access Directory (OAD)	All	The Open Access Directory is a compendium of simple factual lists about open access (OA) to science and scholarship.	Structural	Nosek et al. (2020)	Stage 1
Open Data White Paper	UK	This White Paper sets out clearly how the UK will continue to unlock and seize the benefits of data sharing in the future in a responsible way.	Structural	Lasthiotakis et al. (2015)	Stage 2

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Open Monograph Press	All	Open Monograph Press is an open source software platform for managing and publishing scholarly books. An initiative from the PKP/OJS Public Knowledge Project.	Structural	None identified.	Stage 1
Open Research Awards led by institutions or organisations	All	Academic awards to recognise open research practices adopted.	Structural	Merrett et al. (2021) Examples: Aston University Open Research Awards Surrey Open Research Awards	Stage 3
Open Research Europe (ORE)	All	Open Research Europe is an open access publishing platform for the publication of research stemming from Horizon 2020, Horizon Europe and/or Euratom funding across all subject areas.	Structural	None identified.	Stage 1
Open Science Badges	All	Badges to acknowledge open science practices to the reader that the content has been made available and certify its accessibility in a persistent location.	Structural	Grahe (2014) Kidwell et al. (2016)	Stage 1
Open Science Framework (OSF)	All	OSF is a free, open platform to support your research and enable collaboration.	Structural	Foster & Deardorff (2017)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
OSF Collections	All	OSF Collections enables research communities and organisations to visibly encourage and promote open science practices.	Structural	None identified.	Stage 1
Peer Community In (PCI)	All	PCI is a non-profit organisation of researchers offering peer review, recommendation and publication of scientific articles in open access for free.	Structural	Avissar-Whiting et al. (2024) Guillemaud et al. (2019)	Stage 1
Peer Community In Registered Reports	All	The Peer Community In (PCI) initiative is a non-profit, non-commercial platform that publishes the peer-reviews of preprints.	Structural	Chambers & Tzavella (2022) O'Grady (2021) Pennington & Heim (2022) Zoccall & Mallamaci (2023)	Stage 3
Peer Reviewer's Openness (PRO) Initiative	All	A minimum requirement for publication of any scientific results must be the public submission of materials used in generating those results.	Structural	Morey et al. (2016)	Stage 1
PeerRef	All	A single point of peer review that makes research assessment open, efficient, and researcher-centric.	Structural	Avissar-Whiting et al. (2024)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
PKP/OJS Public Knowledge Project - Open Journals System	All	PKP has been building publishing platforms, including OJS, OMP, and OPS, using free and open source software (FOSS) principles and licensing.	Structural	Alperin et al. (2018)	Stage 1
Plan P - Transform to Open Science	All	Promoting partnership between progressive academic institutions, peer-review services, and leading pure Open Access journals.	Structural	None identified.	Stage 1
preprints.org	All	Preprints.org is a multidiscipline platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable.	Structural	Pagliaro (2021)	Stage 1
PsyArXiv	All	A free preprint service for the psychological sciences	Structural	Ummul-Kiram et al. (2021)	Stage 1
ReformScape		ReformScape is a searchable collection of criteria and standards for hiring, review, promotion, and tenure from academic institutions.	Structural	Gärtner et al. (2024) Schönbrodt et al., (2024) e.g. University of Groningen Responsible Research Assessment Guidelines for	Stage 3

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
				Hiring, Evaluations and Awards Panels	
Registered Reports Funding Partnerships	All	Research funders and journals partner in order to integrate their procedures for funding applications and Registered Reports submissions into one process.	Structural	Chambers & Tzavella (2022). Clark et al. (2021) Drax et al. (2021)	Stage 3
Registry of Efficacy and Effectiveness Studies (REES)	All	REES is a database of causal inference studies designed to increase transparency of and access to information about both ongoing and completed efficacy and effectiveness studies.	Structural	Cook et al. (2022)	Stage 2
Research Data Alliance (RDA)	All	The Research Data Alliance (RDA) builds the social and technical bridges to enable the open sharing and re-use of data.	Structural	Berman & Crosas (2020) Wu et al. (2019)	Stage 1
Roundtable on Aligning Incentives for Open Science	All	Convenes critical stakeholders to discuss the effectiveness of current incentives for adopting open science practices, current barriers of all types, and ways to move forward to optimally align reward structures and institutional values.	Structural	Joseph (2021)	Stage 1
San Francisco Declaration on Research Assessment (DORA)	All	The Declaration on Research Assessment (DORA) recognizes the need to improve the ways in which the outputs of scholarly research are evaluated.	Structural	American Society for Cell Biology. (2012) Cole et al. (2023)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
				McKiernan et al. (2024)	
SciFree Journal Search Tool	All	A group of people working together with libraries around the world to help make 100% Open Access and Open Science sustainable and equitable.	Structural	None identified.	Stage 1
Scottish Universities Press	Scotland	SUP provides a clear and cost-effective route for researchers to make their work freely available to a global audience, responding to upcoming changes to REF, UKRI and other funder policies around open access books.	Structural	Wojturska (2023)	Stage 1
Slovenia Scientific Research and Innovation Activities Act 2022	Slovenia	According to the Act's general principles, scientific research must comply with principles of open science. Funding will be available for implementation of open science principles.	Structural	Slovenia DECREE on the implementation of scientific research work in accordance with the principles of open science	Stage 1
SSRN	All	SSRN is an open-access online preprint community that allows you to share pre-publication manuscripts and credit for your ideas before formal publication.	Structural	Adolph et al. (2012)	Stage 1
Swedish Research Bill 2016/17:50	Sweden	Government’s goal is that all scientific publications resulting from publicly funded research should be made available immediately after they are published.	Structural	Grafström et al. (2017)	Stage 1
The EUA Open	EU	Through the Agenda, EUA aims to support its members in	Structural	Umbach (2024)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Science Agenda 2025		the transition to Open Science, contribute to the development of policies that foster Open Science, and encourage universities to play a more proactive role in the regulatory and financial frameworks shaping this process.			
Transparency and Openness Promotion (TOP) Guidelines	All	There are eight standards to move scientific communication toward greater openness. These standards are modular, facilitating adoption in whole or in part.	Structural	Grant et al. (2023) Nosek et al. (2015)	Stage 2
TUBITAK Open Science Policy	Turkey	TUBITAK, in line with the global developments in the field of Open Science, has identified principles for publications and research data of TUBITAK researchers and any research or researcher funded by TUBITAK.	Structural	Moradi & Abdi (2023)	Stage 1
Turkey Research Data and Open Data Task Force	Turkey	Task force carry out priority studies on translating documents created by RDM Group (working under OpenAIRE) and adapt them to universities in Turkey.	Structural	None identified.	Stage 1
Ubiquity Press / Ubiquity Partner Network	All	An open access publisher of peer-reviewed academic journals, books and data. A fully independent university and society presses that provides an opportunity to share resources and experience, and to cascade content between presses, all of which result in much greater efficiency.	Structural	Sondervan & Stigter (2018)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
UK Research and Innovation (UKRI) Open access policy	UK	UKRI's open access policy for research publications that acknowledge funding from UKRI and any of its councils ensuring that findings from research funded by the public through UKRI can be freely accessed, used and built on.	Structural	Fathallah (2022)	Stage 1
UNESCO Open Science Recommendation	All	The UNESCO Recommendation on Open Science provides an internationally agreed definition, set of shared values and guiding principles for open science. It also identifies a set of actions conducive to a fair and equitable operationalization of open science for all at the individual, institutional, national, regional and international levels.	Structural	Camkin et al. (2022)	Stage 1
Açık Bilim Türkiye (Open Science Community Turkey)	Turkey	Open Science Community Turkey is a community that aims to make Turkish content and educational studies on open science. It aims to be an open discussion space with the participation of students and academics.	Community	Nosek et al. (2020)	Stage 1
Adelaide Open Research Network	Australia / New Zealand	The Australia / New Zealand Open Research Network supports practitioners to teach and learn, to provide guidance on opening research, and to advocate for more open sciences.	Community	None identified.	Stage 1
Australia and New Zealand Open Research Network (ANZORA)	Australia / New Zealand	Australia and New Zealand Open Research Network aims to support efforts to reform institutional policies and practices, and educate others about open research.	Community	Nosek et al. (2020)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Australian Citizen Science Association (ACSA)	Australia	ACSA is a member-based incorporated association that seeks to advance citizen science through the sharing of knowledge, collaboration, capacity building and advocacy.	Community	Borda et al. (2019)	Stage 1
Berkeley Initiative for Transparency in the Social Sciences. (BITSS)	USA	The Berkeley Initiative for Transparency in the Social Sciences works to improve the credibility of science by advancing transparency, reproducibility, rigour, and ethics in research.	Community	Miguel et al. (2014)	Stage 1
Berlin Open Science Meetup	Germany	The Berlin open science meetup is a monthly gathering of researchers who want to go open and share or develop solutions to achieve that goal.	Community	None identified.	Stage 1
Big Team Science	All	Work of multiple teams to carry out joint projects	Community	Forscher et al. (2020) Pennington et al. (2022) Uhlmann et al. (2019)	Stage 2
Brisbane Open Research Network	Australia	The Brisbane Open Research Network (BORN) aims to promote open research and help to connect people to share resources, practices, and a sense of community.	Community	None identified.	Stage 1
Bullied Into Bad Science	UK	Bullied Into Bad Science is an initiative for early career researchers aiming for a fairer, more open and ethical	Community	Nosek et al. (2020)	Stage 1

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
		research and publication environment.			
CBS Open Science Leipzig	Germany	CBS Open Science is an institute-wide initiative to empower open, transparent, and reproducible research, hosting regular meetings and workshops for researchers at all career levels to foster open science.	Community	Bellmund et al. (2022)	Stage 1
Chinese Open Science Network (COSN)	China	The Chinese Open Science Network (COSN) is a community that organises workshops, tutorials, talks, journal club sessions, and translates Open Science-related articles and blogs from English to Chinese.	Community	Jin et al. (2023)	Stage 1
Citizen Science Association (CSA)	North America	The Citizen Science Association (CSA) is an organisation that connects people from a wide range of experiences to advance knowledge through research and monitoring done by, for, and with members of the public.	Community	Storksdieck et al. (2016)	Stage 1
CoAct - Citizen Social Science	EU	CoAct is a project that aims to bring together and further develop methods to give citizen groups an equal ‘seat at the table’ through active participation in research.	Community	Perelló (2022)	Stage 1
Code for Science and Society	All	Work aims to improve the public’s ability to find, collect, and share the open data they use to make more informed decisions in the benefit of the public interest.	Community	Arancio et al. (2022)	Stage 1
Collaborative	All	CREP’s mission is to provide training, support, and	Communit	Wagge et al.	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Replications and Education Project (CREP)		professional growth opportunities for students and instructors completing replication projects.	y	(2019)	
Consortium for Reliability and Reproducibility (CoRR)	All	The goal of CoRR was to create an open science resource for the imaging community that facilitates the assessment of test-retest reliability and reproducibility for functional and structural connectomics through shareding the data.	Community	Zuo et al. (2014)	Stage 2
Directory of Open Access Books (DOAB)	All	The aim of DOAB is to increase discoverability of open access books.	Community	Whitford (2014)	Stage 1
Erfurt Open Science Initiative (EFOSI)	Germany	The Erfurt Open Science Initiative (EFOSI) has set the goal of using open science practices to increase the transparency of social and behavioural science research and to improve the reliability of its results.	Community	Nosek et al. (2020)	Stage 1
EU Citizen Science	EU	EU-Citizen.Science is an online platform for sharing knowledge, tools, training and resources for citizen science – by the community, for the community.	Community	Wagenknecht et al. (2021)	Stage 1
European Citizen Science Association (ECSA)	EU	The European Citizen Science Association (ECSA) is an organisation with main goals to increase the democratisation of science and encouraging the growth of citizen science in Europe	Community	Martek et al. (2022)	Stage 2
Everything Hertz	All	A podcast that discusses methodology and scientific	Communit	Quintana &	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
		culture. Methodology, scientific life, and bad language.	y	Heathers (2021)	
Finnish Reproducibility Network (FIRN)	Finland	Finnish Reproducibility Network (FIRN) is a consortium that investigates and discusses the factors that contribute to robust research, promoting training activities, and disseminating best practice.	Community	Voikar et al. (2023)	Stage 1
FORCE11	All	FORCE11 is a community of scholars, librarians, archivists, publishers and research funders that has arisen organically to help facilitate the change toward improved knowledge creation and sharing.	Community	Martone (2015) Wu et al. (2019)	Stage 1
Framework for Open and Reproducible Research Training (FORRT)	All	FORRT is advancing research transparency, reproducibility, rigour, and ethics through pedagogical reform and meta-scientific research.	Community	Azevedo et al. (2019)	Stage 1
Frankfurt Open Science Initiative	Germany	Frankfurt OSI is a group who aims to implement, establish, and support open science practices.	Community	None identified.	Stage 1
Free Our Knowledge	All	Project Free Our Knowledge is driven by early career researchers who seek a fairer and more secure future in academia.	Community	Robson et al. (2021)	Stage 1

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Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Freie Universität Berlin Open Science Working Group	Germany	A group of researchers, educators, students, and librarians who are interested in promoting Open Science at Freie Universität Berlin.	Community	Nosek et al. (2020)	Stage 1
German Reproducibility Network (GRN)	Germany	The German Reproducibility Network (GRN) is a consortium that aims to increase trustworthiness and transparency of scientific research.	Community	Rahal et al. (2021)	Stage 1
Global Young Academy - Open Science Working Group	All	The GYA Open Science working group is promoting policy change towards Open Science with a special focus on Open Access, Open Data, Open Software and a new initiative on Open Conferences.	Community	Nosek et al. (2020)	Stage 1
Goettingen Open Source and Science Initiative of Psychology (GOSSIP)	Germany	GOSSIP is committed to trustworthy and replicable results as well as the free availability of scientific results, they hold regular meetings and offer information events and workshops on the subject of "Open Science".	Community	Nosek et al. (2020)	Stage 1
Graz Open Science Initiative (GOSI)	Austria	Researchers and students from all over Graz and interested in Open Science and Open Access.	Community	None identified.	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Harvard Open Access Project (HOAP)	USA	HOAP fosters the growth of open access using a combination of consultation, collaboration, community-building, and direct assistance to undertake research and policy analysis on OA.	Community	Suber (2019)	Stage 1
Higher Education Leadership Initiative for Open Scholarship (HELIOS)	USA	HELIOS is a cohort of colleges and universities committed to collective action to advance open scholarship within and across their campuses.	Community	Carter et al. (2023)	Stage 1
Institute for Globally Distributed Open Research and Education (IGDORE)	All	IGDORE is an independent research institute dedicated to improving the quality of science, science education, and quality of life for scientists, students and their families.	Community	Nosek et al. (2020)	Stage 1
Italian Open Science Support Group (IOSSG)	Italy	Provides support and tools to respond to challenges that open science poses to research.	Community	Gargiulo (2020)	Stage 1
Joint Roadmap for Open Science Tools (JROST)	All	Through workshops and other coordinated activities we will bring together the key technology organisations and researchers who are actively involved in the design and production of open scholarly infrastructure.	Community	Narock & Goldstein (2019)	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Just One Giant Lab	All	Platforms for open communities across the world to use framework to build impactful projects for the better and offer special services for communities and organisations who want further guidance.	Community	Masselot et al. (2022)	Stage 1
King's Open Research Group Initiative (KORGI)	UK	KORGI is an action-oriented committee with the aim to push for changes in policies and procedures to promote transparent, accessible and reproducible research.	Community	None identified.	Stage 1
Knowledge Futures Group	All	Knowledge Futures is an independent nonprofit organisation to build and support products and protocols to make knowledge open and accessible to all.	Community	Staines (2020)	Stage 1
Leibniz Research Alliance Open Science	Germany	We are the Leibniz Strategy Forum on Open Science, striving to foster Open Science practices within the Leibniz Association and beyond.	Community	Moradi & Abdi (2023)	Stage 1
LIBSENSE	Africa	LIBSENSE provides an avenue through which different stakeholder communities can collaborate to define priority activities, share knowledge, and develop relevant services.	Community	Abbott et al. (2020)	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
LMU Open Science Center	Germany	LMU Open Science Center has the mission to promote and to foster open science practices. The OSC aims to be a central knowledge hub for all practical questions surrounding open science.	Community	Schönbrodt (2019)	Stage 1
Mannheim Open Science Meetup	Germany	The Mannheim Open Science Meetup initiative invites interested students to the Open Science information and networking evening. The Open Science discourse often revolves around tools and practices for academic researchers.	Community	None identified.	Stage 1
ManyLabs	All	In Many Labs studies, several research groups attempt the replication of either one particular study or a whole set of studies. Manylabs is a nonprofit focused on sensors for science and science education. Our goal is to make it easier for students, scientists, and everyone else to collect and analyse data about the world around them.	Community	Ebersole et al. (2016) Klein et al. (2014)	Stage 3
Marburg Psychology Open Science Initiative	Germany	The Open Science Initiative of the University of Marburg is an association of scientists of all career levels and departments on the topic of Open Science.	Community	None identified.	Stage 1
Melbourne Open Research Network	Australia	The Melbourne Open Research Network is a collection of researchers and research-associated workers aiming to facilitate growth of Open practices providing a platform for the sharing of resources.	Community	None identified.	Stage 1
Open and Collaborative Science for Development Opportunities	All	OCSD network is a community of Open Science practitioners and leaders that learn together and contribute towards a pool of open knowledge on how collaboration could address local and global development challenges.	Community	Albagi et al. (2015)	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
(OCSD Network)					
Open Digital Health initiative	All	An organisation aiming to encourage health scientists, practitioners, and technology developers to share evidence-based digital health tools and make them open, scalable and accessible for all.	Community	Kwasnicka et al. (2022)	Stage 2
Open Innovation in Science (OIS)	All	Investigate and experiment with open and collaborative practices in science along the entire process generating new scientific research and translating it into innovation.	Community	Beck et al. (2022)	Stage 2
Open Knowledge Foundation	All	Open Knowledge are committed to applying open knowledge as a guiding principle to design the infrastructures and organisations of the future, inspiring and leading.	Community	None identified.	Stage 1
Open Research London	UK	A community of students, researchers and librarians in London passionate about making the outputs of publicly funded research more open and reusable.	Community	None identified.	Stage 1
Open Scholar Community Interest Company (C.I.C)	All	Open Scholar C.I.C. develop ideas and tools that promote open and transparent scientific collaboration for a faster, more efficient and natural organisation, evaluation and dissemination of global knowledge.	Community	None identified.	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Open Science Initiative Technische Universität Dresden (OSIP)	Germany	Aims to support researchers in implementing Open Science practices and in exchanging ideas with colleagues about the knowledge gains, but also problems, that arise in the process.	Community	None identified.	Stage 1
Open Science Initiative, Department of Psychology, University of Zurich	Germany	The central concern of the working group e is the information, promotion and support of researchers and teachers in the implementation of the necessary open science measures.	Community	None identified.	Stage 1
Open Science Knowledge Hub Romania	Romania	Open Science Knowledge Hub Romania provides national support and being the main connector with international initiatives regarding open science, free access to scientific results financed from public funds.	Community	None identified.	Stage 1
Open Science Network Austria (OANA)	All	Open Science Austria helps its members to keep track of the diverse, extensive and rapidly developing national and international initiatives and strategic papers.	Community	Kraker et al. (2016)	Stage 1
OpenCon Community	All	OpenCon is a community of emerging leaders that has advanced open policies, launched projects and organisations, built new tools, fostered the adoption of open practices, and host events.	Community	None identified.	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
OpenDots	All	It is an initiative with the aim of creating a collaborative network that allows knowledge about Open Science to be concretized.	Community	None identified.	Stage 1
ORION Open Science Podcast	All	From data sharing to citizen science and from peer review to professional development the podcasts will explore the current scientific system, and what Open Science practices can do to improve the way we do science.	Community	ORION (2021)	Stage 1
Paperity	All	The first multidisciplinary aggregator of Open Access journals and papers. Connecting authors with readers, boosting dissemination of new discoveries, consolidating academia around open literature.	Community	None identified.	Stage 1
PeerLibrary	All	Collaborative discovery, annotations, collections. Find. Explore. Organise.	Community	None identified.	Stage 1
PREreview (Post, Read, and Engage with preprint reviews)	All	PREreview (Post, Read, and Engage with preprint reviews) is a web platform for hosting preprint reviews and sharing them openly with everyone and share their feedback about preprints with other groups.	Community	Avissar-Whiting et al. (2024) Nosek et al. (2020)	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Psychological Science Accelerator (PSA)	All	The Psychological Science Accelerator is a globally distributed network of psychological science laboratories that coordinates data collection for democratically selected studies.	Community	Beshears et al. (2022)	Stage 1
Qeios	All	Research you can trust. We've reimagined peer review to create the most trustworthy, constructive, and unbiased publishing process. On Qeios, research isn't just peer-reviewed—it's peer-approved. Unveiling new ways of creating and distributing knowledge.	Community	Avissar-Whiting et al. (2024) Kwasnicka et al. (2022)	Stage 1
RedTeams	All	Red teams work together to constructively criticise each other's work or to find errors during the entire research process, with the overarching goal of maximising research quality (Lakens, 2020).	Community	Lakens (2020)	Stage 3
repliCATS project	All	The repliCATS project's aim is to crowdsource predictions about the reliability and replicability of published research in social science fields.	Community	Hoogeveen et al. (2020)	Stage 3
ReproducibiliTea	All	Journal club that helps researchers create local Open Science journal clubs at their universities to discuss diverse issues, papers and ideas about improving science, reproducibility and the Open Science movement.	Community	Kalandadze & Hart (2022) Orben (2019)	Stage 1
RIOT Science Club	UK	The RIOT Science Club is a forum where researchers can learn about Open Research reforms and practices, and central to its aims is encouraging Reproducible, Interpretable, Open & Transparent Science.	Community	Kalandadze & Hart (2022)	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
rOpenSci	All	rOpenSci fosters a culture that values open and reproducible research using shared data and reusable software.	Community	Nosek et al. (2020)	Stage 1
Sains Terbuka Airlangga	Indonesia	Committed to promote and to educate students and young researchers to adopt Open Scientific Practices.	Community	None identified.	Stage 1
Society for the Improvement of Psychological Science (SIPS)	All	The Society for the Improvement of Psychological Science (SIPS) brings together scholars working to improve methods and practices in psychological science.	Community	Paul et al. (2021) Steltenpohl et al. (2021)	Stage 1
Student Initiative for Open Science (SIOS)	Netherlands	SIOS is a student-led open science initiative that is focused on educating undergraduate and graduate-level students about good research practices.	Community	Pouwels (2022)	Stage 1
StudySwap	All	A platform for interlab replication, collaboration, and research resource exchange. An online platform where researchers can find one another to share their research resources.	Community	Dienlin et al. (2021)	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Surrey Reproducibility Society	UK	Aims to encourage research students from all disciplines to participate in regular meetings to discuss open and reproducible research methods. Efforts to promote scientific transparency and rigour.	Community	None identified.	Stage 1
The Carpentries	All	The Carpentries builds global capacity in essential data and computational skills for conducting efficient, open, and reproducible research.	Community	Robson et al. (2021)	Stage 1
The Research on Open Educational Resources for Development (ROER4D)	All	ROER4D project investigates what ways and under what circumstances the adoption of open educational resources (OER) could address the increasing demand for accessible, relevant, high-quality and affordable education.	Community	King et al. (2016)	Stage 2
The Turing Way	All	The Turing Way project is open source, open collaboration that involves and supports a diverse community of contributors to make data science accessible, comprehensible and effective for everyone.	Community	Arnold et al. (2019)	Stage 1
The Unjournal	All	Building a better system for evaluating rigorous, impactful research that organise and fund public journal-independent feedback, rating, and evaluation of hosted papers and dynamically-presented research projects.	Community	Avissar-Whiting et al. (2024)	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Tim Sains Terbuka Indonesia	Indonesia	The aim is to improve science and technology through the open science movement, which for the first time in Indonesia was started systematically by the Open Science Team.	Community	Steltenpohl et al. (2021)	Stage 1
Tübinger Open Science Initiative (TOSI)	Germany	The Tübingen Open Science Initiative (TOSI) is a grassroots initiative that spans multiple faculties . We see ourselves as a learning community and are always open to new perspectives and interested in exchange.	Community	Nosek et al. (2020)	Stage 1
TÜBİTAK ULAKBİM NATIONAL OPEN SCIENCE COMMITTEE	Turkey	To support open science, to establish institutional and national policies on open science and open access, to follow up within the scope of the European Union acquis and framework programs, and to determine its legal dimension.	Community	Tuglular (2022)	Stage 1
UK Network of Open Research Working Groups (ORWGs)	UK	Open Research Working Groups are action-oriented teams within higher education seeking to reform science to make the processes and products of research as transparent, accessible and reproducible as possible.	Community	None identified.	Stage 1
UK Reproducibility Network (UKRN)	UK	The UK Reproducibility Network (UKRN) is a national peer-led consortium that aims to promote and ensure rigorous research practices by establishing appropriate training activities, designing and evaluating research improvement efforts, disseminating best practice and working with stakeholders to coordinate efforts across the sector. We also work collaboratively with various external stakeholders to ensure coordination of efforts across the sector. UKRN investigates factors that contribute to robust research, promoting training activities, and disseminating best practice.	Community	Robson et al. (2021)	Stage 1

OPEN RESEARCH INITIATIVES

Initiative	Country	Overview	Theme	Supporting Papers	Stage found
Unpaywall	All	Free database of Open Access scholarly articles, with an API and browser extension. Goal is to integrate Open Access into scholarly reading workflows.	Community	Dhakal (2019)	Stage 1
UQ Open Science	Australia	UQ Open Science is a group of scientists at the University of Queensland Australia interested in promoting open science in their work and disciplines.	Community	None identified.	Stage 1
York Open Research	UK	The Open Research team works with academic and research staff, postgraduate researchers, and other staff providing guidance and training to help plan, publish, preserve and share your research.	Community	Catt & Smith (2023)	Stage 1
Zenodo	All	Zenodo is a general-purpose open repository allowing researchers to deposit research papers, data sets, research software, reports, and any other research related digital artefacts.	Community	Peters et al. (2017)	Stage 2