

Open Science & Research Assessment: How can they go together?



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ENLIGHT Webinar, 21 May 2024



Open Science = diverse practices & workflows

- Publishing a paper in an OA journal or book (or other peer-reviewed media) („OA publishing“)
- Deposit of a preprint* or final author manuscript in a repository („OA via repositories“)
- Making data available via a repository (FAIR data and open data)
- Making own research (more) reproducible
- Engaging societal actors and citizens in research
- ...

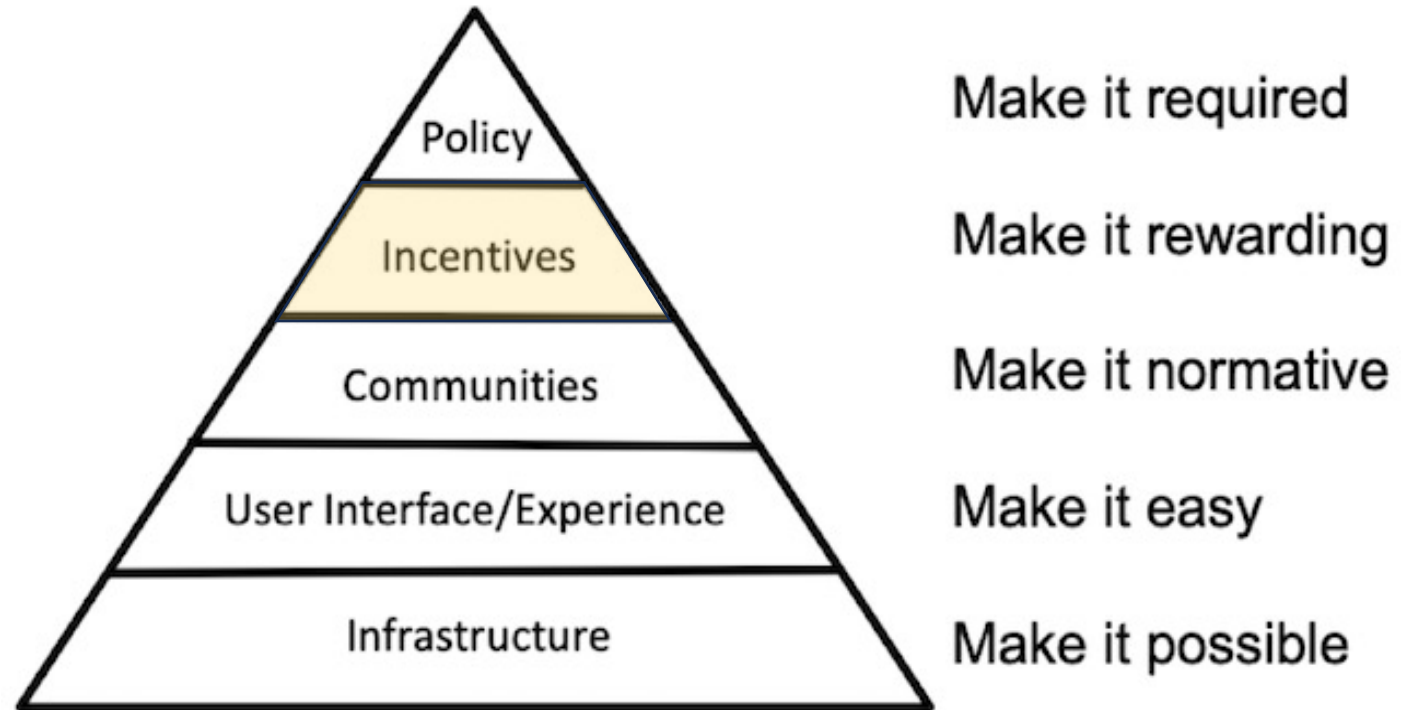
But this may also involve some **challenges**: e.g. additional effort to make data and software FAIR, costs of publishing, trust in the quality of the journal, intellectual property rights, etc.

* **Preprint** = final author manuscript (before peer review), submitted or ready for submission to a publisher



Open Science requires cultural change

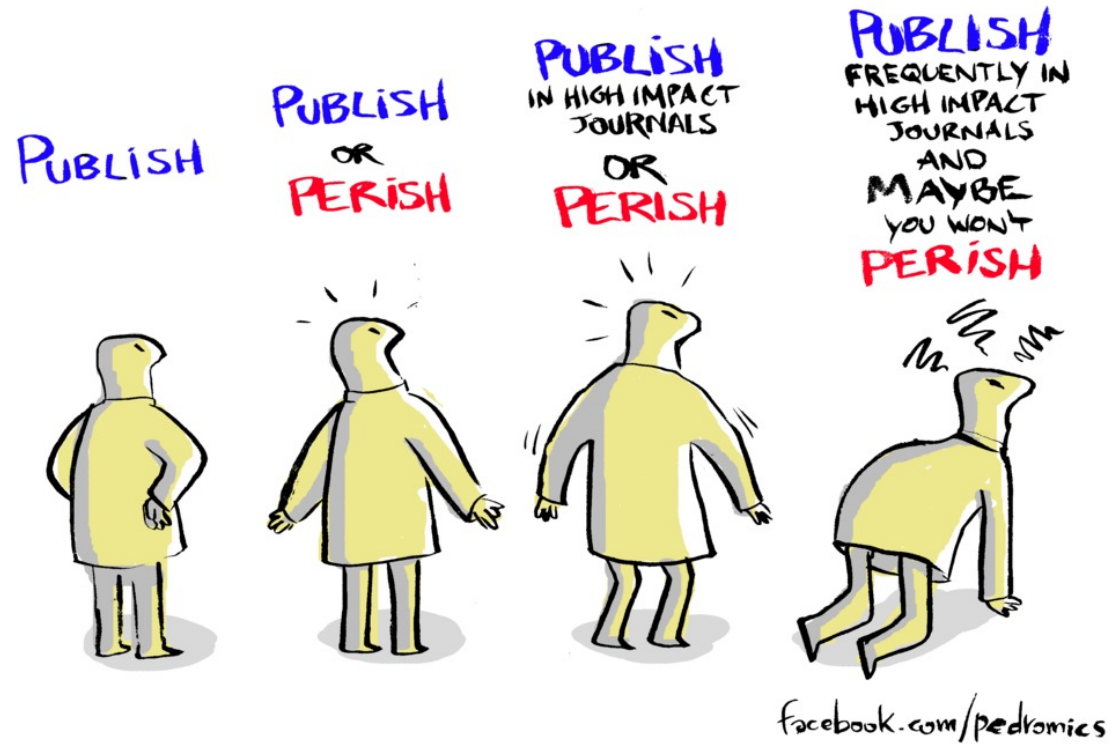
- Open science/scholarship targets a broad **cultural change** in research, education & communication
- **Bottom-up and top-down efforts** are combined
- A range of **benefits** can be achieved, e.g. broader access to and (re)use of research outcomes (publications, data, code, etc.)
- However, **incentives and rewards** are still rather limited



Open Science: Strategy for Cultural Change
(Nosek, 2019, <https://www.cos.io/blog/strategy-for-culture-change>)

Research careers, a publish or perish trap

THE EVOLUTION OF ACADEMIA



Researcher role realities

19th century
scientist

I must find the
explanation for this
phenomenon in order
to truly understand
Nature...



21st century
~~scientist~~
academic

I must get the
result that fits my
narrative so I can
get my paper into
Nature..



facebook.com/pedromics

... and a constant need to secure grants



Adapted from: Polyp cartoons,
http://www.polyp.org.uk/cartoons/consumerism/polyp_cartoon_Rat_Race.jpg

Scholarly communication attitudes of early career researchers

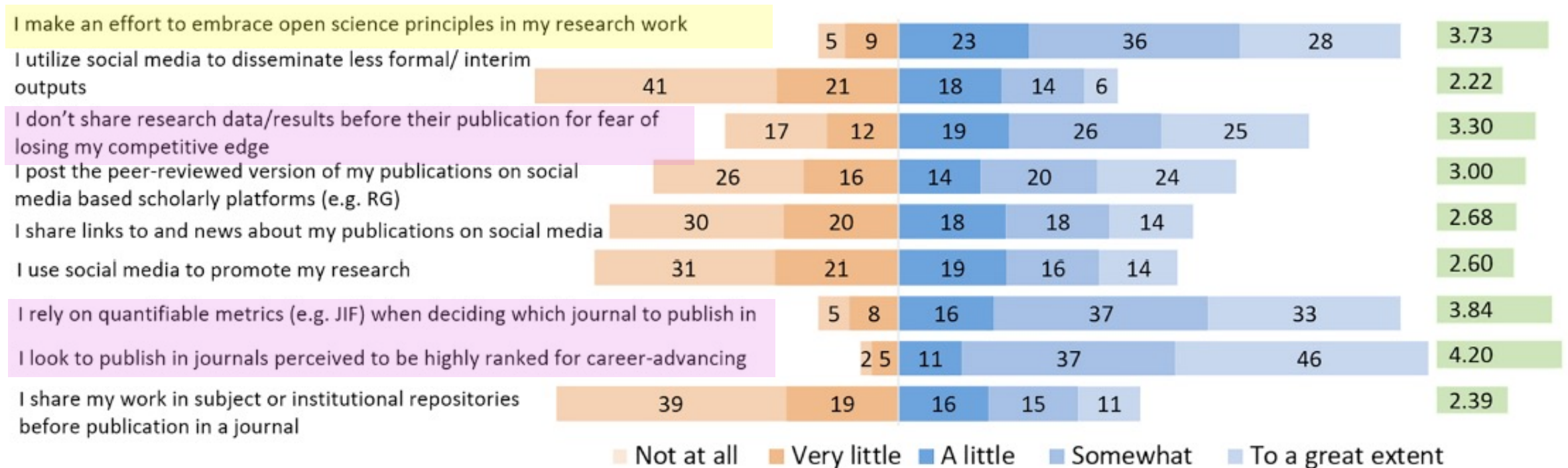
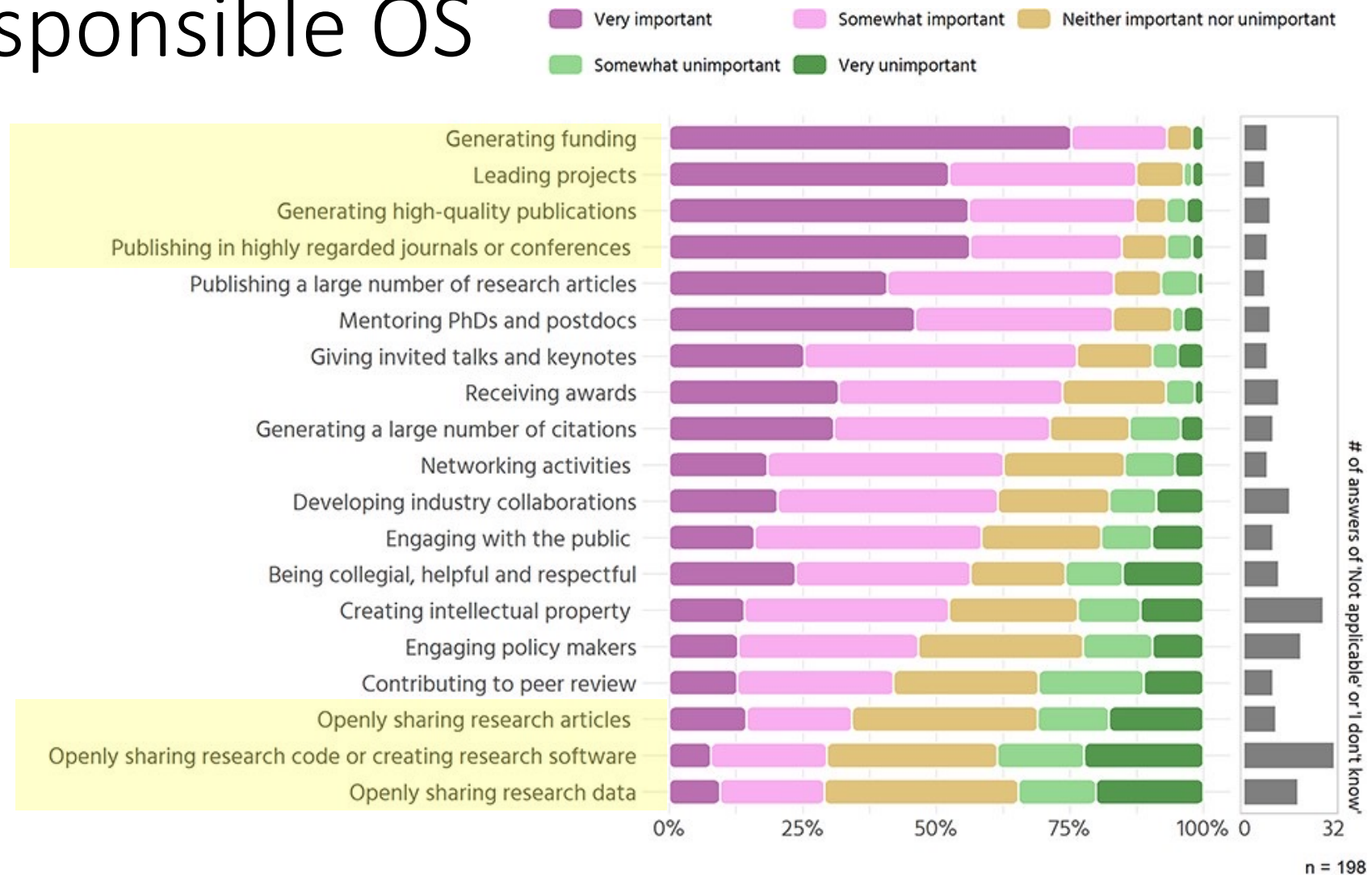


FIGURE 3 Percentages and mean value for 'To what extent are the following statements true about your current practices concerning publishing?' (N = 1,533).

Source: Nicholas, D., Jamali, H. R., Herman, E., Watkinson, A., Abrizah, A., Rodríguez-Bravo, B., Boukacem-Zeghmouri, C., Xu, J., Świgoń, M., & Polezhaeva, T. (2020). A global questionnaire survey of the scholarly communication attitudes and behaviours of early career researchers. *Learned Publishing*, 33(3), 198–211. <https://doi.org/10.1002/leap.1286>

Mismatch between promotion criteria and responsible OS



Source: Ross-Hellauer, T., Klebel, T., Knoth, P., & Pontika, N. (2023). Value dissonance in research(er) assessment: individual and perceived institutional priorities in review, promotion, and tenure. *Science and Public Policy*. <https://doi.org/10.1093/scipol/scad073>

Reform movements

- **From evaluative bibliometrics to responsible metrics** (DORA, 2013; Leiden Manifesto, 2015; Metric Tide report, 2016; Hong Kong Principles, 2020)
- From a narrow focus on publications and grants to **a broader set of activities, principles and values**
 - Diversity, equity, inclusiveness, collaboration (in terms of activities and practices, outputs, skills, roles, disciplines, career stages, etc.)
 - Openness, reproducibility
 - Research integrity
 - Expected impacts (e.g. contributions to SDGs)
- However, there is **a gap between positive views on the potential of reforms and their actual implementation.**

Towards Reforming Research Assessment

2013

The screenshot shows the DORA website homepage. At the top left is the DORA logo. The navigation menu includes 'About', 'Communities', 'Meetings', 'Grants', and 'Contact'. Below the navigation, there are links for 'DORA at 10', 'The Declaration', 'Signers', 'Project TARA', and 'News and Resources'. A search bar with the text 'Sign DORA' is visible. The main heading is 'San Francisco Declaration on Research Assessment'. Below the heading, there is a paragraph of text: 'There is a pressing need to improve the ways in which the output of scientific research is evaluated by funding agencies, academic institutions, and other parties. To address this issue, a group of editors and publishers of scholarly journals met during the Annual Meeting of The American Society for Cell Biology (ASCB) in San Francisco, CA, on December 16, 2012. The group developed a set of recommendations, referred to as the San Francisco Declaration on Research Assessment. We invite interested parties across all scientific disciplines to indicate their support by adding their names to this Declaration.' To the right of the text, there are language options: العربية, Bahasa Indonesia, 中文, Catala, Čeština, Српски, and Deutsch.

2020

The screenshot shows a PLOS BIOLOGY article page. The article title is 'The Hong Kong Principles for assessing research: Fostering research integrity'. The authors listed are David Moher, Lex Bouter, Sabine Kleinert, Paul Glasziou, Mai Har Shari, and Ulrich Dimagi. The article was published on July 16, 2020. The page shows the article's abstract, introduction, and principles. The first principle is 'Principle 3: Reward the practice of open science (open research)'. The page also shows a table with '254 Save' and '155 Citation'.

2021



2022

The image shows the cover of a scoping report titled 'Towards a reform of the research assessment system'. The cover features a blue and white wavy pattern. The text on the cover includes 'Scoping Report' and 'November - 2021'. The logo for 'Research and Innovation' is visible at the bottom right.

2015

The image shows the cover of a report titled 'The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management'. The cover features a photograph of a beach with a ruler in the foreground. The text on the cover includes 'The Journal Impact Factor is frequently used to measure the scientific output of individuals and institutions'.

2015

The image shows the cover of a manifesto titled 'The Leiden Manifesto for research metrics'. The cover features a photograph of a person sitting on a rock, looking at a globe. The text on the cover includes 'Use these ten principles to guide research evaluation, urge Diana Hicks, Paul Wouters and colleagues.' and 'Data are increasingly used to govern science. Research evaluations that were once bespoke and performed by peers are now routine and reliant on metrics. The problem is that evaluation is now led by the data rather than by judgement. Metrics have proliferated, usually well-intentioned, but always well-informed, when ill-applied. We risk damaging the system with the very tools designed to improve it, as evaluations are increasingly implemented by organizations without knowledge of, or advice on, good practice and interpretation. Before 2000, there was the Science Citation Index and ISI/ISI from the Institute for Scientific Information (ISI), used by experts for specialist analyses. In 2003, Thomson Reuters launched an integrated web platform, making the Web of Science database widely accessible. Competing citation indices were created: Elsevier's Scopus (released in 2004) and Google Scholar (beta version released in 2006). Web-based tools to easily compare institutional research productivity and impact were introduced, such as InCites (using the Web of Science) and SciVal (using Scopus), as well as software to analyse individual citation profiles using Google Scholar (Publish or Perish, released in 2007). In 2015, Jorge Hirsch, a physicist at the University of California, San Diego, proposed the h-index, popularizing citation counting for individual researchers. Interest in the journal impact factor grew steadily after 1965 (see 'Impact factor obsessions'). Lately, metrics related to social usage

The image shows the cover of an agreement titled 'AGREEMENT ON REFORMING RESEARCH ASSESSMENT'. The cover features a blue and white wavy pattern. The text on the cover includes 'AGREEMENT ON REFORMING RESEARCH ASSESSMENT' and '20 July 2022'.

Comparison of approaches

Table 1: Elements of international recommendations for responsible assessment²

	RECOMMENDATIONS	DORA	LEIDEN	METRIC TIDE	HONG KONG
METHOD	• Journal-metrics as surrogate measure of quality	✓			
	• Quantitative evaluation support qualitative assessment		✓	✓	
	• Qualitative judgment based on portfolios		✓		
	• Misplaced concreteness and false precision		✓		
CRITERIA	• Explicit criteria used in evaluating	✓			
	• Systemic effects of assessment and indicators		✓	✓	
	• Scrutiny and regular updating of indicators		✓	✓	
DATA	• Open and transparent data and methods	✓	✓	✓	
	• Licence allowing unrestricted reuse	✓			
	• Allowing those evaluated to verify data and analysis		✓	✓	
	• Best possible data in terms of accuracy and scope			✓	
VALUE DIVERSITY	• All research outputs and broad range of impacts	✓	✓	✓	✓
	• Missions of the institution, group or researcher		✓		
	• Excellence in locally relevant research		✓		
	• Variation by field in publication and citation practices		✓	✓	
	• Plurality of research and career paths			✓	✓
	• Responsible practices, complete reporting, open science				✓
	• Research activities and contributions				✓
	• Multilingualism and outputs in all languages				

Source: EUTOPIA-TRAIN. (2022). *Open Science in research assessment. An overview of quantitative and qualitative approaches*. Zenodo. <https://doi.org/10.5281/zenodo.7097264>

What if, RRA does not take OS into account?

- **Reinforces the status quo** of evaluation and ignores the changes in research workflows and communication
- **Conflicts** with research policies: Open availability to research outputs and additional open practices are increasingly mandated / encouraged by research funders
- **Missed opportunities** to incentivize and reward good practices, e.g. enable reproducibility, data sharing and reuse, make research accessible for different audiences

Funder requirements: European Commission

Mandatory vs. recommended Open Science practices

- Proposers **have to provide concrete information on how they plan to comply with the mandatory OS practices**
- OS practices will be evaluated under the **'Excellence'** criterion (in particular under methodology) and under **'Quality and efficiency of implementation'**
- A clear explanation on how **recommended OS practices** are adopted will result in a **higher evaluation score**.

Mandatory open science practices

- Some open science practices are **mandatory for all beneficiaries per the grant agreement**. They concern:
 - **open access to scientific publications** under the conditions required by the grant agreement;
 - **responsible management of research data in line with the FAIR principles** of 'Findability', 'Accessibility', 'Interoperability' and 'Reusability', notably through the generalised use of data management plans, and open access to research data under the principle 'as open as possible, as closed as necessary', under the conditions required by the grant agreement;
 - **information about the research outputs/tools/instruments needed to validate the conclusions of scientific publications or to validate/re-use research data**;
 - digital or physical access to the results needed to validate the conclusions of scientific publications, unless exceptions apply;
 - in cases of **public emergency**, if requested by the granting authority, immediate open access to all research outputs under open licenses or, if exceptions apply, access under fair and reasonable conditions to legal entities that need the research outputs to address the public emergency¹⁹.

These obligations are described in the Model Grant Agreement (Article 17) and detailed guidelines on complying with them are provided in the Annotated Grant Agreement (Article 17).

Source: European Commission. Horizon Europe Programme Guide, 19 July 2021, https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

Example: Netherlands

Position paper published in 2018 by the Association of Universities in the Netherlands (VSNU), Netherlands Federation of University Medical Centers (NFU), Royal Netherlands Academy of Arts and Sciences (KNAW), Dutch Research Council (NWO), and Netherlands Organization for Health Research and Development (ZonMw)

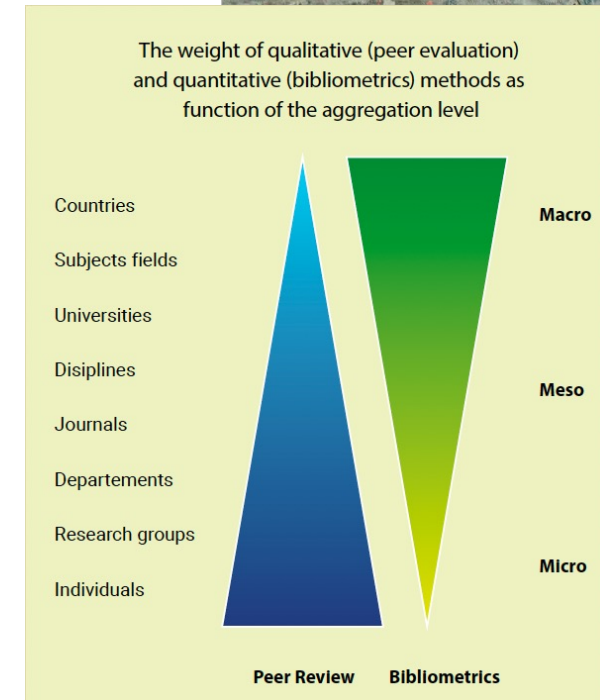
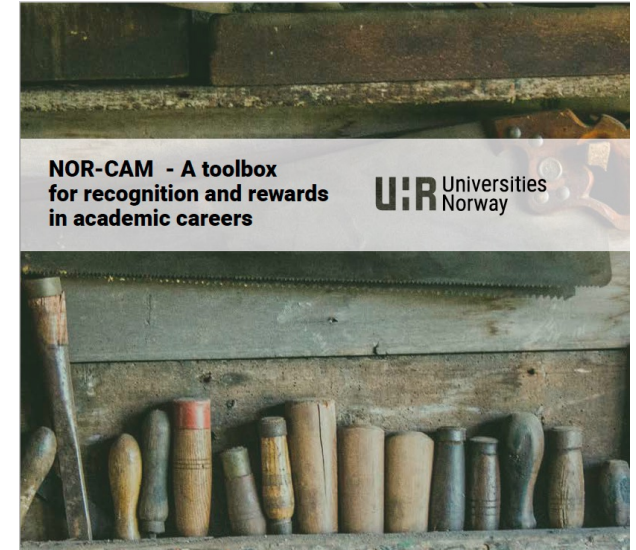
Main aims:

1. Enable the diversification and vitalization of career paths
2. Acknowledge the independence and individual qualities and ambitions of academics as well as recognizing team performances
3. Emphasize quality of work over quantitative results (such as number of publications)
4. Encourage all aspects of open science
5. Encourage high quality academic leadership



Example: Norwegian Career Assessment Matrix (NOR-CAM)

- Developed by a working group commissioned by Universities Norway (32 universities and university colleges), published in Nov 2021
- 6 principles + 4 recommendations
- Principles
 - #1 Balancing quantitative and qualitative measures
 - #2 Everybody should not do everything
 - #3 Open Science as a fundamental principle**
 - #4 Transparency in assessment and identifying what earns merit
 - #5 Promoting gender balance and diversity
 - #6 Assist in the concrete practice of job vacancy announcements and assessment processes locally
- Six competence areas: A. Research output, B. Research process, C. Pedagogical competence, D. Impact and innovation, E. Leadership, and F. Other experience



Examples from CoARA Action Plans

- Reference to **institutional guidelines and policies** on OS, publication metrics, principles include that data and methods used, and the results are as open and transparent as possible
- Reference to **national frameworks** (e.g. NOR-CAM, FIN-CAM) and **initiatives** (e.g. UKRN OR4 project)
- **Evaluate practices, criteria and tools** based on solid evidence and state-of-the-art research on research and make data openly available for evidence (Commitment 10)
- Active monitoring of the development of **open data sources** (e.g. OpenAlex) and analysis tools related to publication metrics alongside the commercial ones (WoS, Scopus)
- Raise **awareness, training and monitoring** of open research and responsible research assessment

https://zenodo.org/communities/coara_action_plans/

ENLIGHT joint actions on Open Science

*“If you want to go fast, go alone.
If you want to go far, go together.”*

- Identify and spell out your values and goals: **ENLIGHT Open Science Principles** (Nov 2023)
- Make your values known: **OS Ambassadors** (launched in Sept 2022), supported by the OS Experts Network
- Recognize and reward accordingly: Implementation of an **OS Award** (Spring 2023)

ENLIGHT OPEN SCIENCE PRINCIPLES



Endorsed by the ENLIGHT Rectors on 23 Nov 2023, Uppsala.
<https://enlight-eu.org/index.php/university-about-us/news-events/158-news/1043-enlight-rectors-endorse-joint-open-sciences-principles>

ENLIGHT Open Science principles:

1. Promotion of Open Science

The ENLIGHT alliance recognizes that Open Science is a key component of their scholarly processes. Therefore we

- Enhance the sharing of knowledge and good practices at the institutional level and across the ENLIGHT alliance.
- Aim to support Open Science broadly, including via training and skills development.
- Support the development and realization of an Open Science agenda and policy.

2. FAIR and Open Data

The ENLIGHT alliance stresses the importance of the FAIR data principles (**F**indable, **A**ccessible, **I**nteroperable and **R**eusable) and will

- Support the implementation of FAIR, for example by developing or contributing to FAIR-enabling infrastructures, and/or by guiding researchers towards such existing infrastructures.
- Optimize access to research data and the use of such digital research data wherever possible (“as open as possible as close as necessary”).
- Work towards using and contributing to a distributed and open infrastructure for research data, including integration with the European Open Science Cloud (EOSC).

3. Open Access

The ENLIGHT alliance underlines the value and benefits of unrestricted and immediate open access to scholarly publications and thus will

- Encourage and support researchers in providing free and unrestricted online access to all research publications, ideally immediately after publication.
- Promote bibliodiversity and increase awareness of various open access routes available as an alternative to author-pays models of open access.
- Support researchers in retaining their original rights to share and publish their works and other research outputs under an open license.

4. Open Education

The ENLIGHT alliance supports Open Education as a valuable part of a diverse and inclusive environment and will

- Encourage their research and teaching staff to create, share and use open educational materials and methodologies.
- Strive to support training and development opportunities for the research community that facilitate an understanding of open educational tools and methodologies.

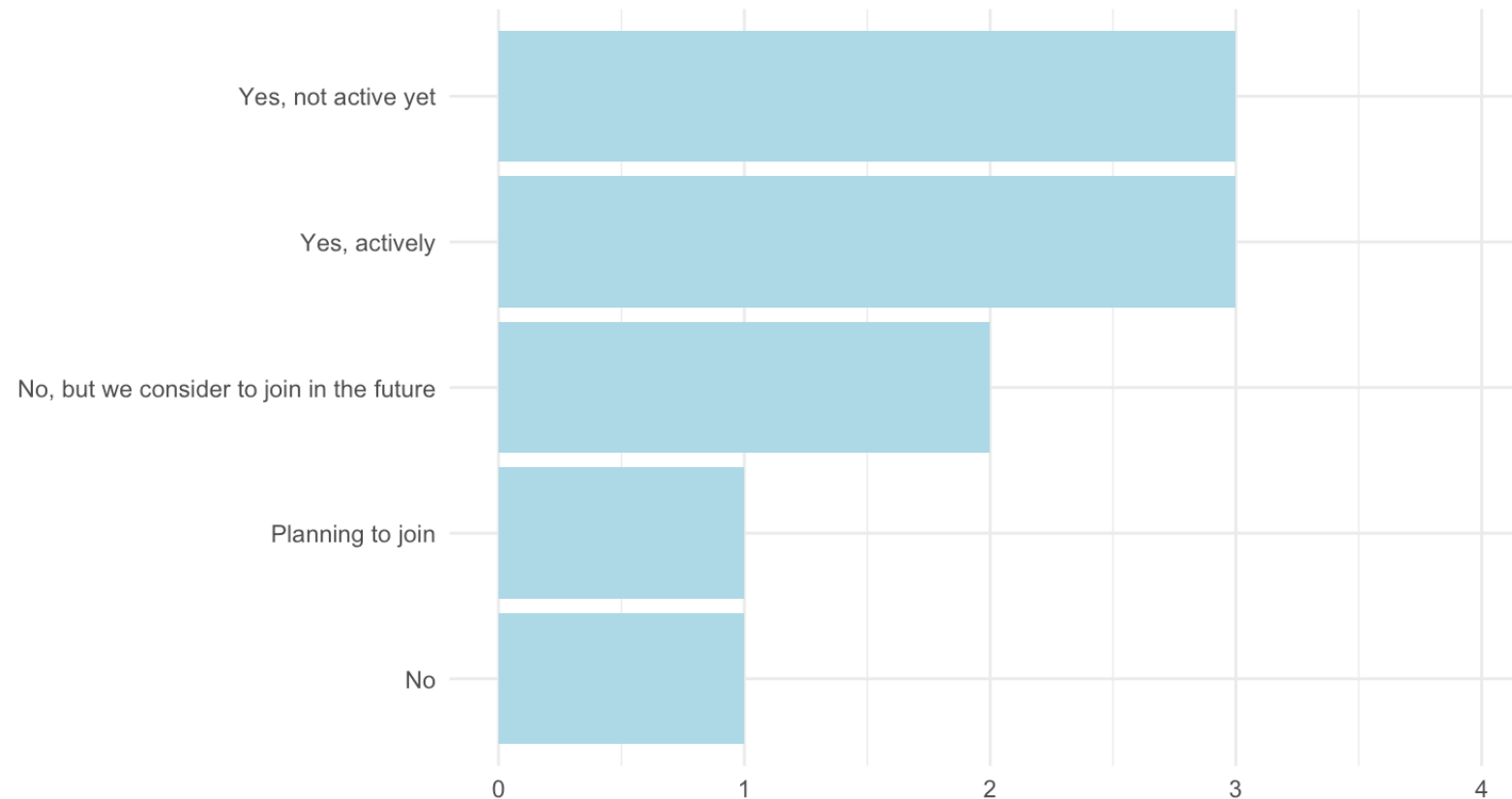
5. Responsible Research Assessment

The ENLIGHT alliance promotes the inclusion of Open Science principles in research assessment and will

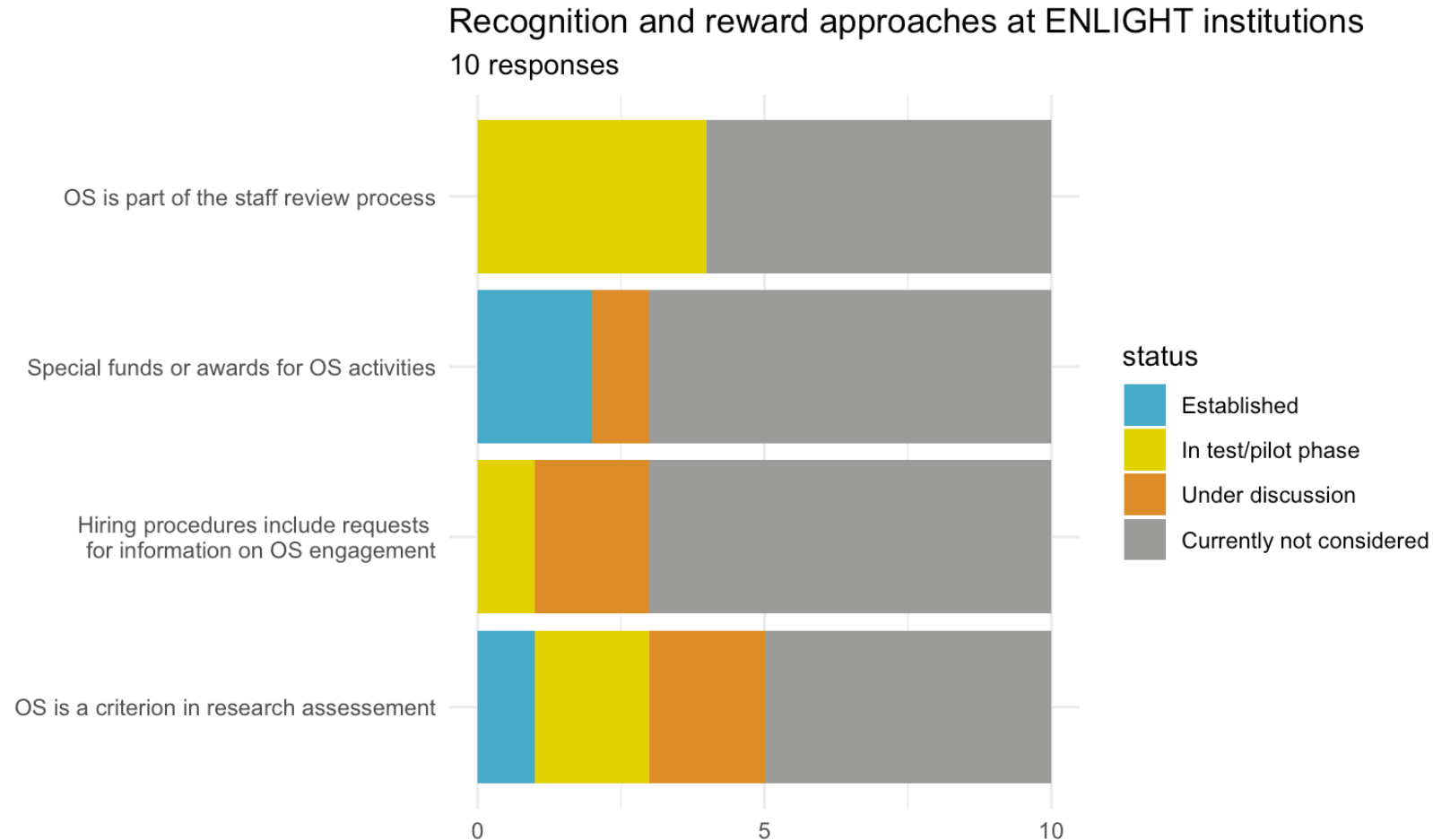
- Raise awareness for the different aspects of research assessment reform and commit to high quality standards in their own research assessment procedures.
- Align with the [Declaration on Research Assessment](#) (DORA) or the [Agreement on Reforming Research Assessment](#) (CoARA), wherever possible.
- Incentivize Open Science practices as means for enhancing the quality and impact of research.

ENLIGHT OS Survey: Engagement with CoARA

Status of CoARA membership of ENLIGHT partner universities



Has OS arrived in recognition and reward approaches? (institutional perspective)



Examples at ENLIGHT universities

University of Groningen: Open Science Award, annual, in place since 5 years

- Case studies on open research and/or open education practices
- E.g. making research outputs freely accessible, online tools and services, alternative models of publication and peer review, open collaborative methods
- Submissions are screened for eligibility
- 3 prizes are drawn randomly from all submissions

<https://www.rug.nl/research/openscience/open-research-award/submission-guidelines>

University of Gent: Since 5 years full professors can report on Open Science activities in research evaluations. This is voluntary and it remains unclear how often this actually happens.

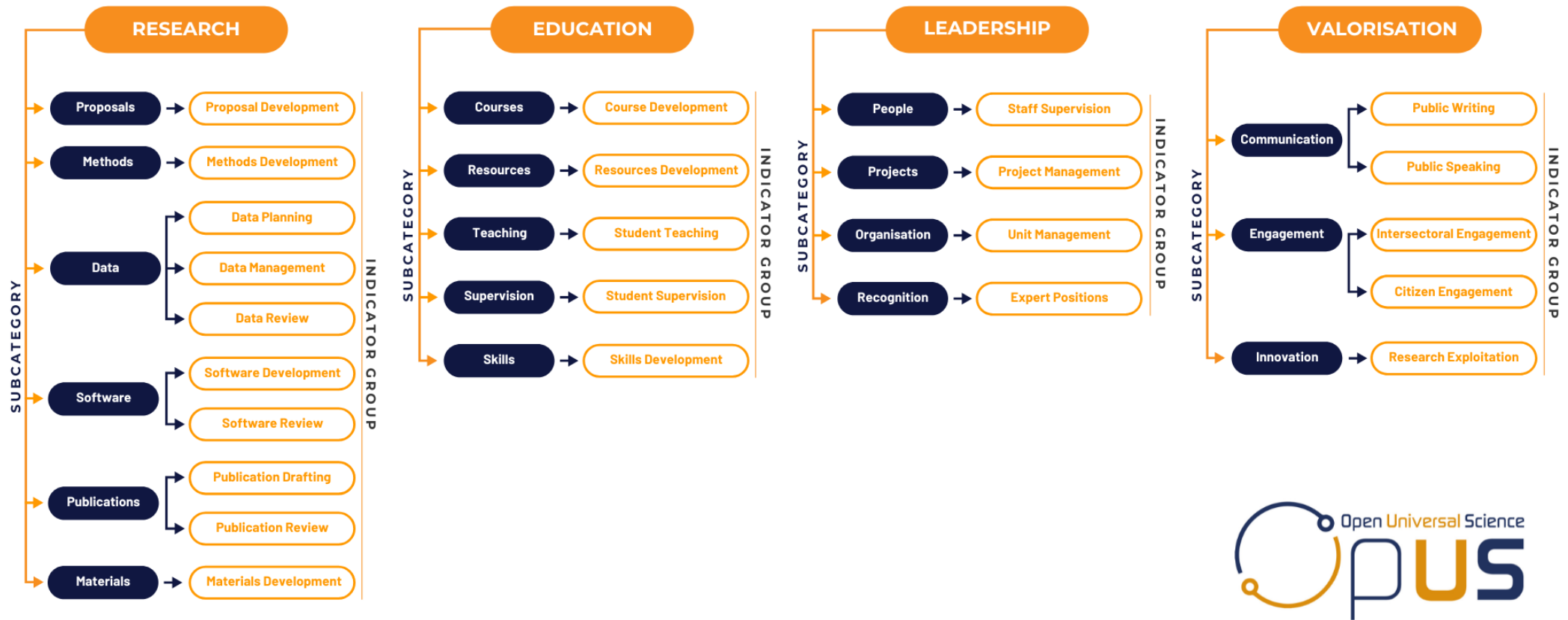
University of Göttingen: Some academic hiring committees for professorships have used a clause that requests the candidates to indicate past and future plans in engagement for open, transparent and reproducible research (e.g. Clinical Psychology and Psychotherapy, Scientific Information Analytics).

A brief look at OS-RRA frameworks

- **Generic frameworks and data infrastructure** under development, e.g.
 - [PathOS](#) - Open Science Impact Pathways: Evaluates and develops indicators to measure academic, societal and economic impacts of OS ([handbook](#) under development).
 - [OPUS](#) - Open Universal Science: has developed the **OPUS Research Assessment Framework** (building on OS-CAM, European Commission 2017) and pilot implementations.
 - [GraspOS](#) - Next Generation Research Assessment to Promote Open Science: Develops an **Open Science Assessment Framework (OSAF)**, builds an infrastructure for metrics (data-tools-services, not published yet) and conducts [pilot studies](#).
 - [SciLake](#) - Democratising and making sense out of heterogeneous scholarly content: With focus on Knowledge Graphs the project creates open data infrastructures and services in support of discovery and research assessment.
- **Disciplinary and institutional implementation approaches**, e.g.
 - psychology research community
 - institutional approach in the medical sciences

Projects: OPUS

OPUS Researcher Assessment Framework



Source: O'Neill, G. (2024). Graphical Representation of the OPUS Researcher Assessment Framework. Zenodo. <https://doi.org/10.5281/zenodo.10670853>

Related report: O'Neill, G. (2024). OPUS Deliverable 3.1: Indicators and Metrics to Test in the Pilots. Zenodo. <https://doi.org/10.5281/zenodo.10670779>

Example indicator: Research data

Table 21: Open Science Indicators and Metrics for Category Research Subcategory Data

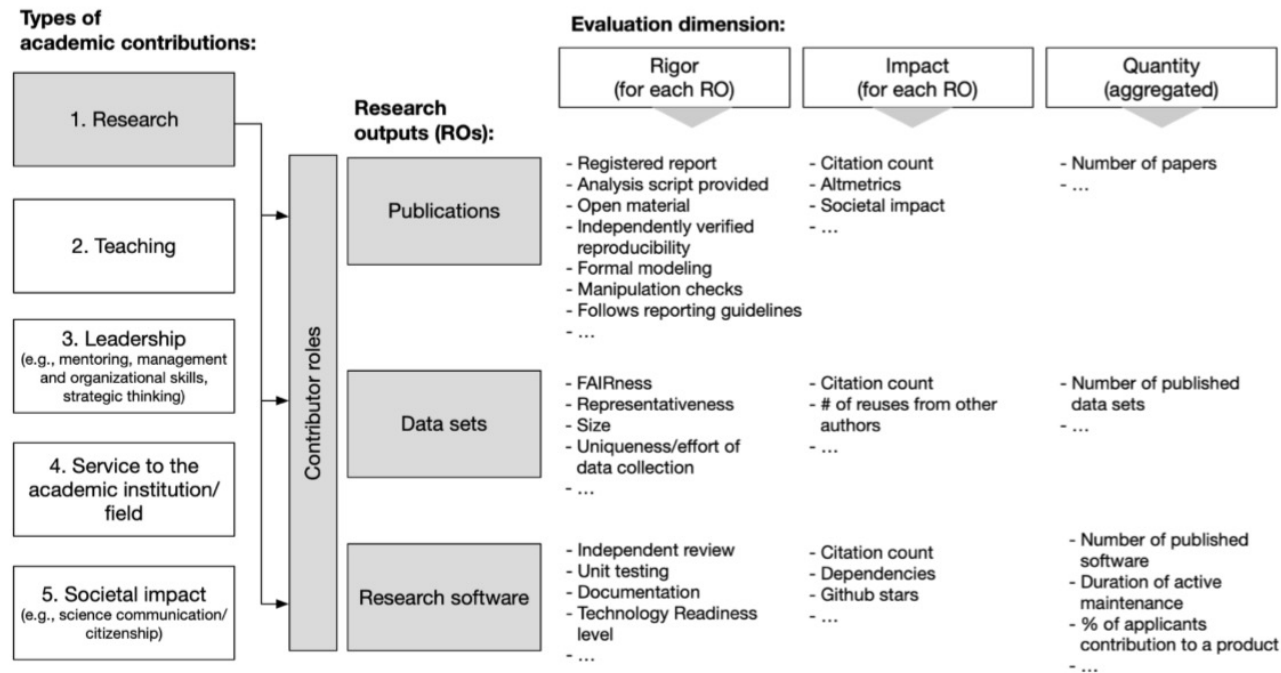
Indicator Group	Indicator Type	Quantitative Metric
Data Planning	Process	# of (FAIR) Developing Data Management Plans Openly Available
	Output	# of (FAIR) Finalised Data Management Plans Openly Available
	Outcome	# of (FAIR) Implemented Data Management Plans Openly Available
Data Management	Process	# of Developing (FAIR) Data Sets Openly Available
	Output	# of Finalised (FAIR) Data Sets Openly Available
		# of Archived (FAIR) Data Sets Openly Available
	Outcome	# of Openly Available (FAIR) Data Sets Accessed
# of Openly Available (FAIR) Data Sets Cited		
Data Review	Process	# of Draft (FAIR) Data Set Peer Reviews Openly Available
	Output	# of Submitted (FAIR) Data Set Peer Reviews Openly Available
	Outcome	# of Accepted (FAIR) Data Set Peer Reviews Openly Available

Source: O'Neill, G. (2024). OPUS Deliverable 3.1: Indicators and Metrics to Test in the Pilots. Zenodo.

<https://doi.org/10.5281/zenodo.10670779>

Disciplinary approaches: Psychology – I

Academic contributions are multifaceted



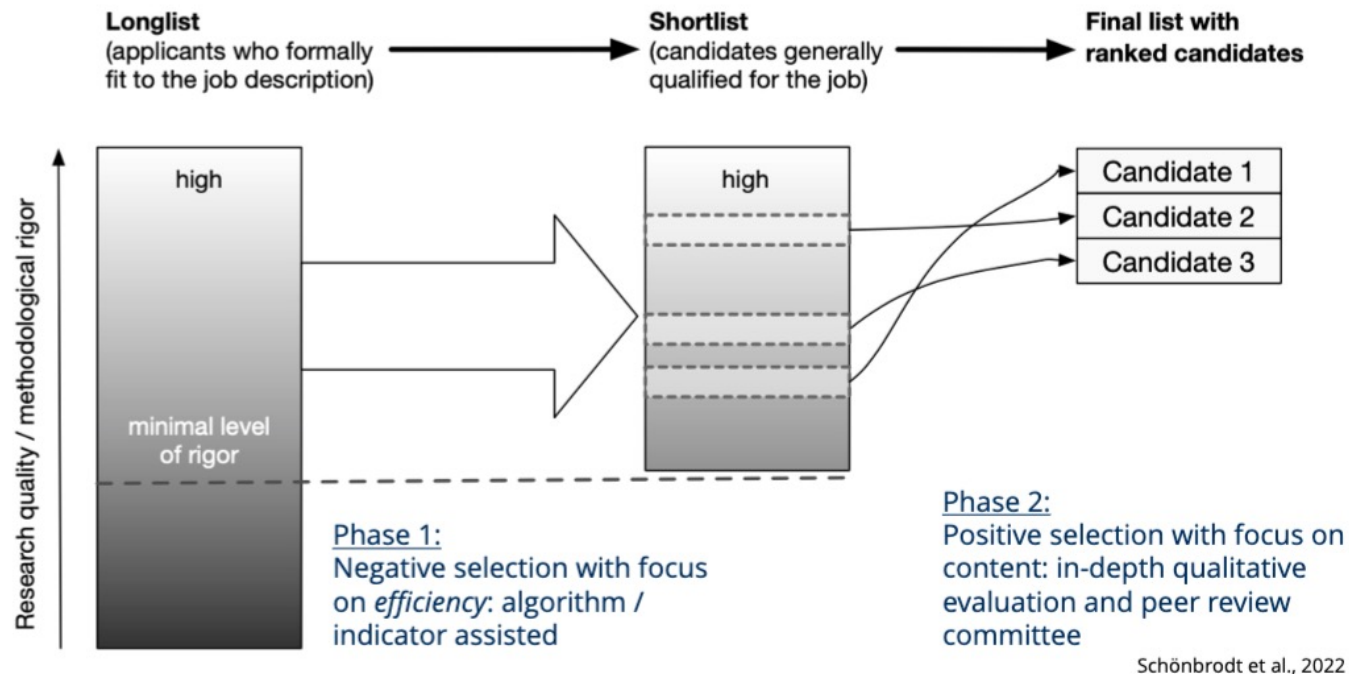
Schönbrodt et al., 2022

Schönbrodt, F., Gärtner, A., Frank, M., Gollwitzer, M., Ihle, M., Mischkowski, D., Phan, L. V., Schmitt, M., Scheel, A. M., Schubert, A.-L., Steinberg, U., & Leising, D. (2022). *Responsible Research Assessment I: Implementing DORA for hiring and promotion in psychology*. PsyArXiv. <https://doi.org/10.31234/osf.io/rgh5b>

Disciplinary approaches: Psychology – II

Efficiency in hiring committees

Can it handle 100+ applicants?



Schönbrodt, F., Gärtner, A., Frank, M., Gollwitzer, M., Ihle, M., Mischkowski, D., Phan, L. V., Schmitt, M., Scheel, A. M., Schubert, A.-L., Steinberg, U., & Leising, D. (2022). *Responsible Research Assessment I: Implementing DORA for hiring and promotion in psychology*. PsyArXiv. <https://doi.org/10.31234/osf.io/rgh5b>

Institutional approaches: Open data incentive

Example: Charité, Berlin
Institutes of Health

Criteria for datasets to qualify as open data for performance-oriented funding at the Charité and indicator-oriented funding at BIH 2024

Data have to be shared in the context of an article publication; i.e. stand-alone data are not considered.

Source:
<https://www.bihealth.org/en/translation/innovation-enabler/quest-center/projects/project/einfuehrung-von-open-data-als-zusaetzlicher-indikator-fuer-die-interne-leistungsorientierte-mittelvergabe-lom-forschung>

The criteria for the open data incentive as of 2024 are as follows:

Research data have been made freely accessible by researchers of the Charité/BIH

OR the data have been shared with restricted access and meet the following requirements:

- Data is stored in an external repository (or archive, database, registry)
- A standardized access route is named, i.e. the access requirements, the procedure for a request and the responsible persons or offices are described
- The reason for the restricted access is stated or is directly evident from the data being subject to data protection
- Access is possible for all academic researchers – at least from the European Economic Area
- Co-authorship of articles is not a condition for the provision of the data
- The access to the data is free of charge or maximally requiring compensation of expenses

Institutional approaches: Responsible Research Dashboard

Charité Dashboard on Responsible Research

Charité has committed itself to establish, promote and maintain a research environment which enhances the robustness of research and the reproducibility of results ([Rethinking Health – Charité 2030](#)).

This dashboard gives an overview of several metrics of open and responsible research at the Charité (including the Berlin Institute of Health). For a detailed discussion about monitoring core Open Science practices see ([Cobey et al. 2023](#)). For more detailed information on the methods used to calculate those metrics, the dataset underlying the metrics, or resources to improve your own research practices, click one of the following buttons on the right.

For more detailed open access metrics you can visit the [Charité Open Access Dashboard](#) developed by the Charité Medical Library.

[See methods](#)

[See resources](#)

[See dataset](#)

Latest Update: April 2024

Open Science

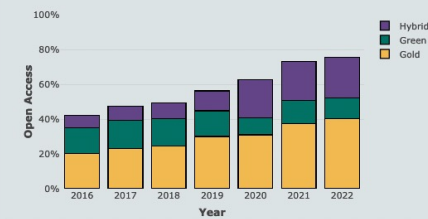
Show absolute numbers

Double-click or select rectangular area inside any panel to zoom in

Open Access

76 %

of publications were open access in 2022



Preprints

507

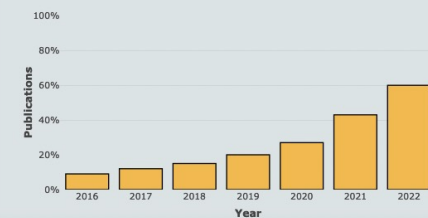
preprints published in 2022



Any Data (DAS) or Code Availability Statement (CAS)

60 %

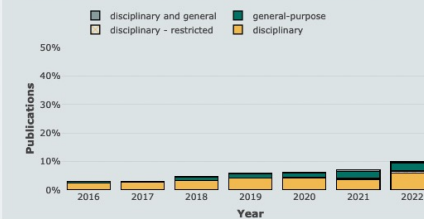
of screened publications included a Data (DAS) or Code Availability Statement (CAS) in 2022



Any Open Data

9 %

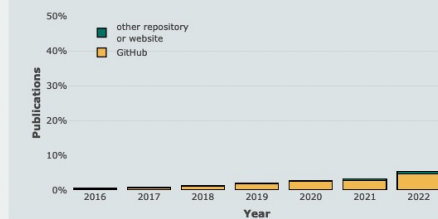
of screened publications mentioned sharing data openly in 2022



Any Open Code

5 %

of screened publications mentioned sharing code openly in 2022



Conclusions on how RRA can integrate OS at the institutional level

#1 Review assessment methodologies, data and indicators

- Transparency of methods and indicators, reproducibility of quantitative analysis
- Collect information on OS activities and outputs (via quantitative and qualitative methods)
- Support the move towards open research information & open infrastructures (Barcelona Declaration)

#2 Enable interventions, interlink policies, create incentives and rewards

- Review and revise evaluation criteria in grant selection, hiring and promotion
- Implement and promote what is expected (e.g. job announcements, CV template, guidance)
- Share the status of achievements (e.g. via dashboards, case studies)

#3 Take into account frameworks under development

- National frameworks, e.g. The Netherlands, Norway, Finland
- Disciplinary approaches, e.g. Psychology
- EU projects: GraspOS, OPUS, PathOS, SciLake

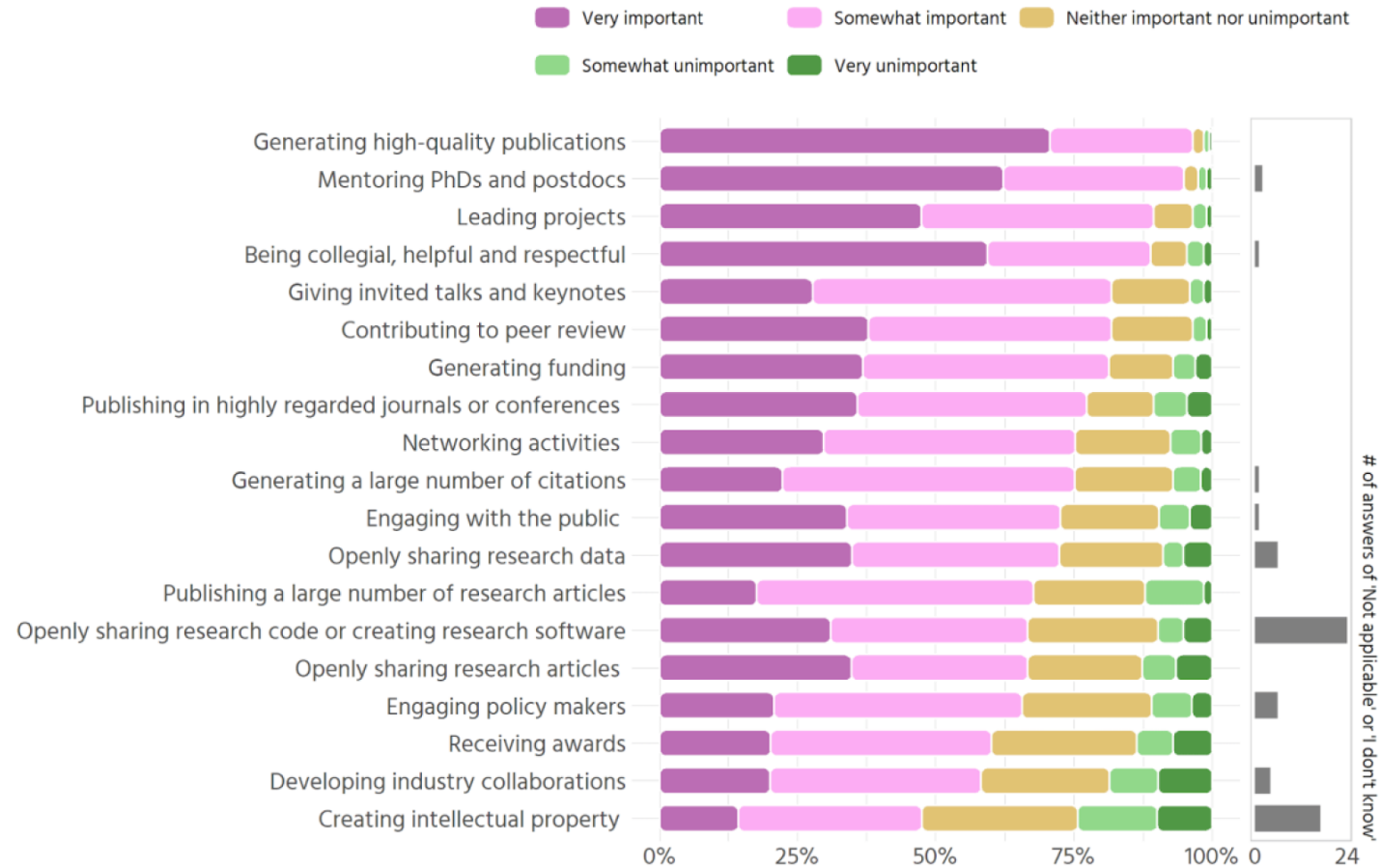
**Thank you for listening.
Your comments or questions?**

Contact: Birgit Schmidt, Göttingen State and
University Library, bschmidt@sub.uni-goettingen.de

References

- European Commission. Directorate General for Research and Innovation. (2017). *Evaluation of research careers fully acknowledging Open Science practices: Rewards, incentives and/or recognition for researchers practicing Open Science*. Publications Office. <https://data.europa.eu/doi/10.2777/75255>
- Gärtner, A., Leising, D., & Schönbrodt, F. (2022). *Responsible Research Assessment II: A specific proposal for hiring and promotion in psychology*. PsyArXiv. <https://doi.org/10.31234/osf.io/5yexm>
- Network, U. R., Barnett, J., Clark, R., Darby, R., Desborough, K., Evans, T. R., Farran, E. K., Gowie, E., & Jacobs, N. (2024). *OR4 Research Assessment Survey Report Working Paper No 5*. OSF. <https://doi.org/10.31219/osf.io/z52cn>
- Nicholas, D., Jamali, H. R., Herman, E., Watkinson, A., Abrizah, A., Rodríguez-Bravo, B., Boukacem-Zeghmouri, C., Xu, J., Świgoń, M., & Polezhaeva, T. (2020). A global questionnaire survey of the scholarly communication attitudes and behaviours of early career researchers. *Learned Publishing*, 33(3), 198–211. <https://doi.org/10.1002/leap.1286>
- O'Neill, G. (2024). OPUS Deliverable 3.1: Indicators and Metrics to Test in the Pilots. Zenodo. <https://doi.org/10.5281/zenodo.10670779>
- PathOS (n.d.). Open Science Indicators Handbook, <https://handbook.pathos-project.eu/>
- Ross-Hellauer, T., Klebel, T., Knoth, P., & Pontika, N. (2023). Value dissonance in research(er) assessment: individual and perceived institutional priorities in review, promotion, and tenure. *Science and Public Policy*. <https://doi.org/10.1093/scipol/scad073>
- UK Reproducibility Network, Barnett, J., Clark, R., Darby, R., Desborough, K., Evans, T. R., Farran, E. K., Gowie, E., & Jacobs, N. (2024). *OR4 Research Assessment Survey Report Working Paper No 5*. OSF. <https://doi.org/10.31219/osf.io/z52cn>

Researchers opinion on how important promotion criteria should be



Source: Ross-Hellauer, T., Klebel, T., Knoth, P., & Pontika, N. (2023). Value dissonance in research(er) assessment: individual and perceived institutional priorities in review, promotion, and tenure. *Science and Public Policy*. <https://doi.org/10.1093/scipol/scad073>

Open Science Career Assessment Matrix (OS-CAM) – I

Open Science Career Assessment Matrix (OS-CAM)	
<i>Open Science activities</i>	<i>Possible evaluation criteria</i>
RESEARCH OUTPUT	
Research activity	Pushing forward the boundaries of open science as a research topic
Publications	Publishing in open access journals Self-archiving in open access repositories
Datasets and research results	Using the FAIR data principles Adopting quality standards in open data management and open datasets Making use of open data from other researchers
Open source	Using open source software and other open tools Developing new software and tools that are open to other users
Funding	Securing funding for open science activities
RESEARCH PROCESS	
Stakeholder engagement / citizen science	Actively engaging society and research users in the research process Sharing provisional research results with stakeholders through open platforms (e.g. Arxiv, Figshare) Involving stakeholders in peer review processes
Collaboration and Interdisciplinarity	Widening participation in research through open collaborative projects Engaging in team science through diverse cross-disciplinary teams
Research integrity	Being aware of the ethical and legal issues relating to data sharing, confidentiality, attribution and environmental impact of open science activities Fully recognizing the contribution of others in research projects, including collaborators, co-authors, citizens, open data providers
Risk management	Taking account of the risks involved in open science
SERVICE AND LEADERSHIP	
Leadership	Developing a vision and strategy on how to integrate OS practices in the normal practice of doing research Driving policy and practice in open science Being a role model in practicing open science
Academic standing	Developing an international or national profile for open science activities Contributing as editor or advisor for open science journals or bodies
Peer review	Contributing to open peer review processes Examining or assessing open research
Networking	Participating in national and international networks relating to open science

Source: European Commission. Directorate General for Research and Innovation. (2017). *Evaluation of research careers fully acknowledging Open Science practices: Rewards, incentives and/or recognition for researchers practicing Open Science*. Publications Office. <https://data.europa.eu/doi/10.2777/75255>

OS-CAM – II

RESEARCH IMPACT	
Communication and Dissemination	Participating in public engagement activities Sharing research results through non-academic dissemination channels Translating research into a language suitable for public understanding
IP (patents, licenses)	Being knowledgeable on the legal and ethical issues relating to IPR Transferring IP to the wider economy
Societal impact	Evidence of use of research by societal groups Recognition from societal groups or for societal activities
Knowledge exchange	Engaging in open innovation with partners beyond academia
TEACHING AND SUPERVISION	
Teaching	Training other researchers in open science principles and methods Developing curricula and programs in open science methods, including open science data management Raising awareness and understanding in open science in undergraduate and masters' programs
Mentoring	Mentoring and encouraging others in developing their open science capabilities
Supervision	Supporting early stage researchers to adopt an open science approach
PROFESSIONAL EXPERIENCE	
Continuing professional development	Investing in own professional development to build open science capabilities
Project management	Successfully delivering open science projects involving diverse research teams
Personal qualities	Demonstrating the personal qualities to engage society and research users with open science Showing the flexibility and perseverance to respond to the challenges of conducting open science

Source: European Commission. Directorate General for Research and Innovation. (2017). *Evaluation of research careers fully acknowledging Open Science practices: Rewards, incentives and/or recognition for researchers practicing Open Science*. Publications Office. <https://data.europa.eu/doi/10.2777/75255>

Example: Norwegian Career Assessment Matrix (NOR-CAM)

6 assessment areas, results and competences, documentation, reflection

Source:

<https://www.uhr.no/en/resources/nor-cam/>

1. Area of competence	2. Results and competencies (examples)	3. Documentation	4. Reflection
A. Research output	<ul style="list-style-type: none">-Published works-Datasets-Software-Methodologies-Artistic results-Research reports	CRIS systems (e.g. Cristin) and other databases	Reflection on the relevance and quality of the results. Emphasis is placed on open access to published works and other results, as well as whether the data adhere to the FAIR principles.
B. Research process	<ul style="list-style-type: none">- Leadership and participation in research groups-Working across disciplines- Research integrity/RR1- Editorial activity- Peer reviews- Building consortia- External funding- Development of research infrastructure-Leadership and participation in clinical trials	CRIS systems and other databases. Narrative CV system with links to source data.	Reflection on roles and relevance. How and why various actors within and outside academia have been involved in the research process. Emphasis is placed on transparency in the research process.