



The University of Edinburgh

Open Science Approaches at the University of Edinburgh

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Abstract

- Large, research intensive university involved in multiple national and international networks
- Openness, scholarship, industry and innovation
- Supporting our researchers in doing all aspects of Open Science
- What does – and what might – the future hold?



1. CONTEXT



The University of Edinburgh

- Founded in 1583: sixth-oldest university in the English-speaking world and one of Scotland's ancient universities
- Largest HEI in Scotland with 13,800 staff (6,816 academic) and 39,576 students
- 20 schools in 3 Colleges:
 - Arts, Humanities & Social Sciences
 - Medicine & Veterinary Medicine
 - Science & Engineering
- Research-led institution - member of the Russell Group, Coimbra Group, LERU, UNICA and Universitas 21
- 25 Nobel laureates affiliated with the University (at last count)
- Research income over £250 million last year
- Mission: the creation, dissemination and **curation** of knowledge



Information Services Directorates

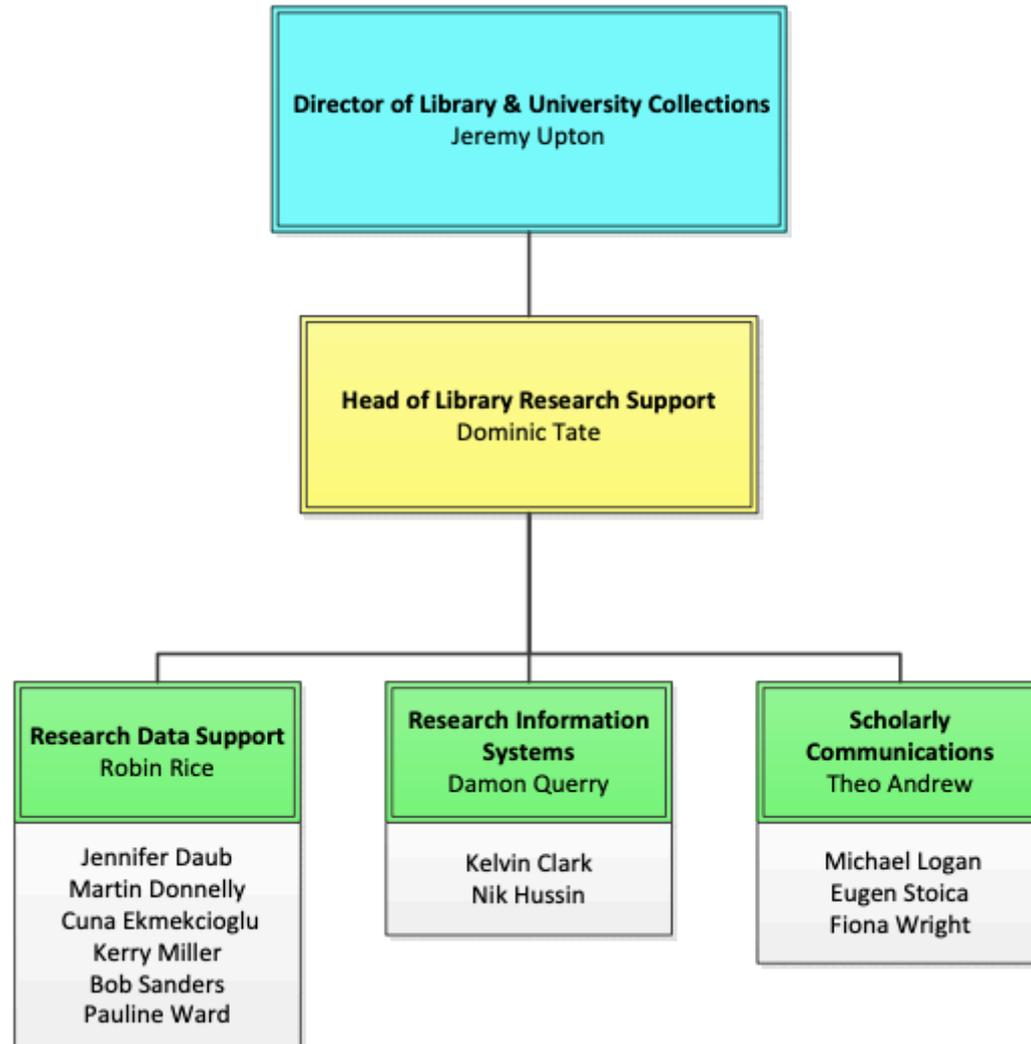


Argyle House © CoStar

- Applications
- IT Infrastructure
- Learning, Teaching & Web
- **Library & University Collections**
- User Services
- Information Security
- EDINA
- Digital Curation Centre



Library Research Support





Research Data Service

- **Cross-cuts** multiple Information Services directorates
- **Provides tools and services** for researchers
- **Trains** staff and students on all matters relating to RDM
- **Advises** on improvements to University infrastructure to support the RDM agenda
- **Supports** researchers with data management planning
- **Manages** helpdesk and consultancy service



Edinburgh's policy approach...

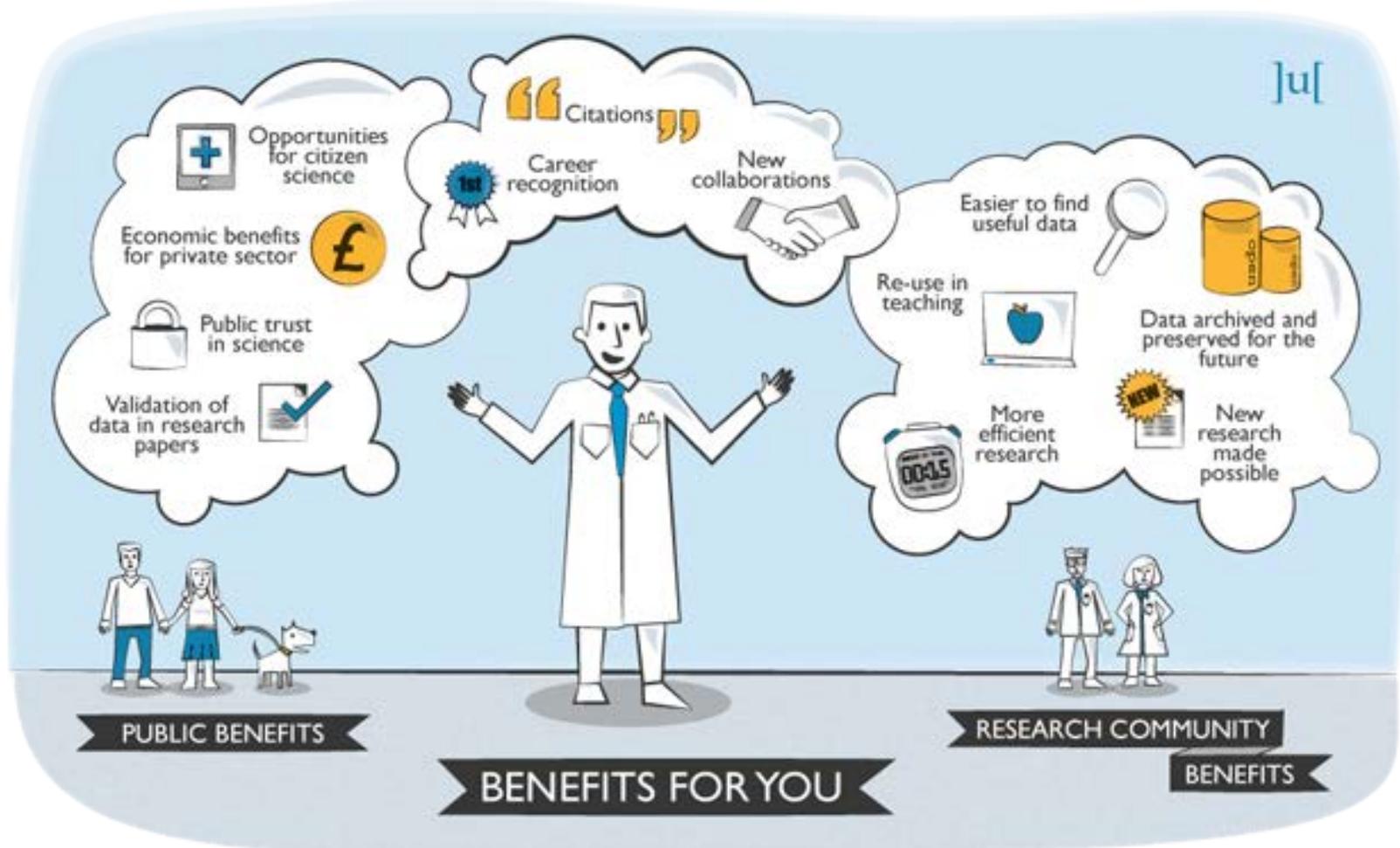
- Formal commitments to research integrity, Open Access, DMPs, open data
 - Articulates clear responsibilities of the researcher and of the institution
- Open?
 - Current publications policy is “Open (Access) where appropriate”: now moving away from supporting hybrid OA, in line with Plan S
 - Current data management policy (2011) doesn't really use the word Open: it predates the popularisation of this terminology
- Both policies due for updates in the coming year...
 - Are we moving towards “Open by default”? It feels that way...



Benefits of/drivers for Openness

- **INTEGRITY, TRANSPARENCY and QUALITY:** The evidence that underpins research can be made open for anyone to scrutinise, and attempt to replicate findings. This leads to a more robust scholarly record, and reduces risk of academic fraud
- **IMPACT and LONGEVITY:** Open outputs/resources receive more citations, over longer periods
- **SPEED:** The research process becomes faster overall
- **DURABILITY:** Fewer important datasets will be lost
- **EFFICIENCY, ACCESSIBILITY and RE-USE:** Research can be funded once, and outputs used many times for a variety of purposes. Interested third parties can (where appropriate) access and build upon publicly-funded research outputs with minimal barriers to access

Benefits of Openness: for research





Help support open science today.

[Donate Now](#)

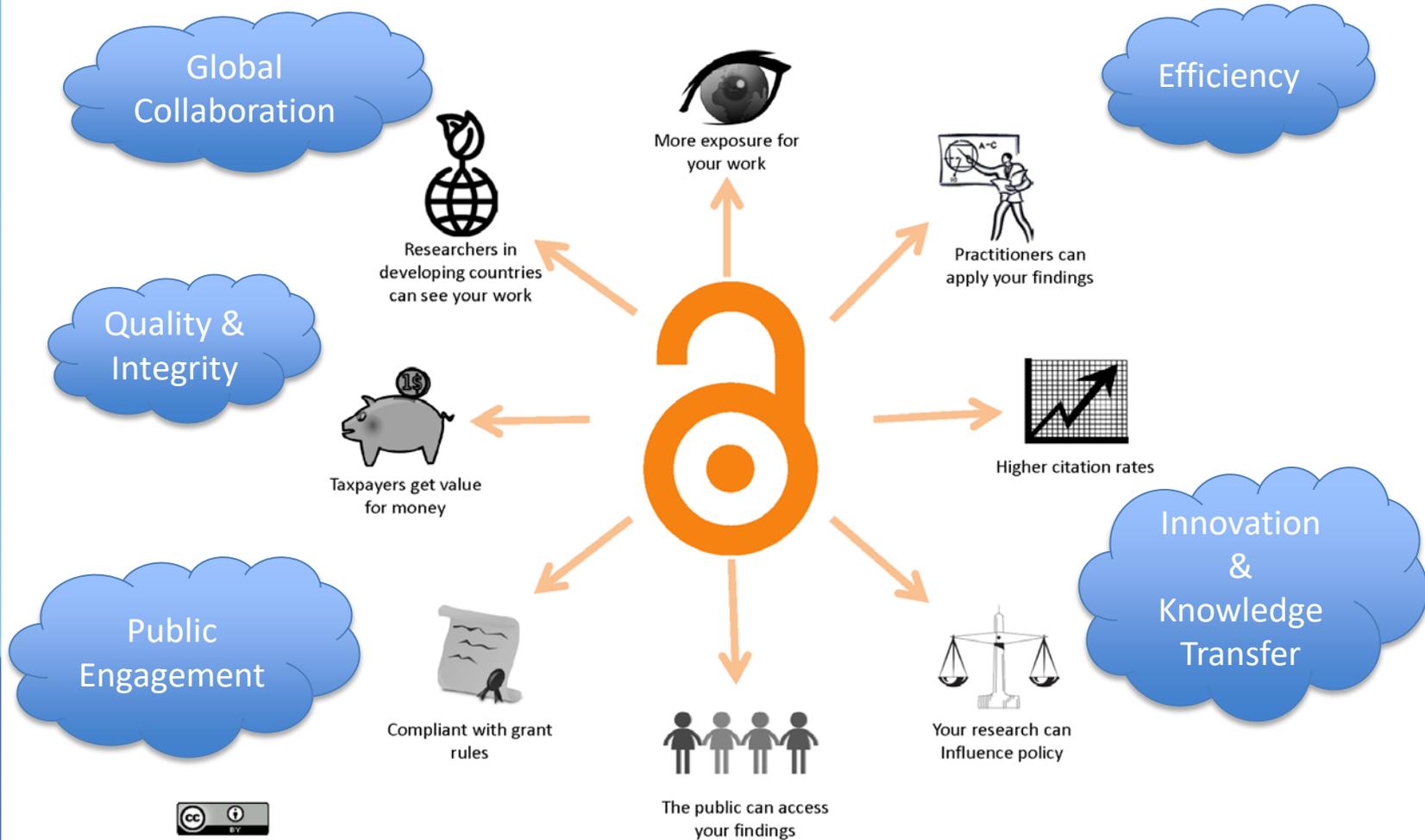
28 classic and contemporary psychology findings replicated in more than 60 laboratories each across three dozen nations and territories

Nov. 19, 2018

Summary. A team of 186 researchers conducted replications of 28 classic and contemporary findings in psychology. Overall, 14 of the 28 findings failed to replicate despite the massive sample size with more than 60 laboratories contributing samples from all over the world to test each finding. The study examined the extent to which variability in replication success can be attributed to the study sample. If a finding replicated, it replicated in most samples with occasional variation in the magnitude of the findings. If a finding was not replicated, it failed to replicate with little variation across samples and contexts. This evidence is inconsistent with a popular explanation that failures to replicate in psychology are likely due to changes in the sample between the original and replication study. Ongoing efforts to improve research rigor such as preregistration and transparency standards may be the best opportunities to

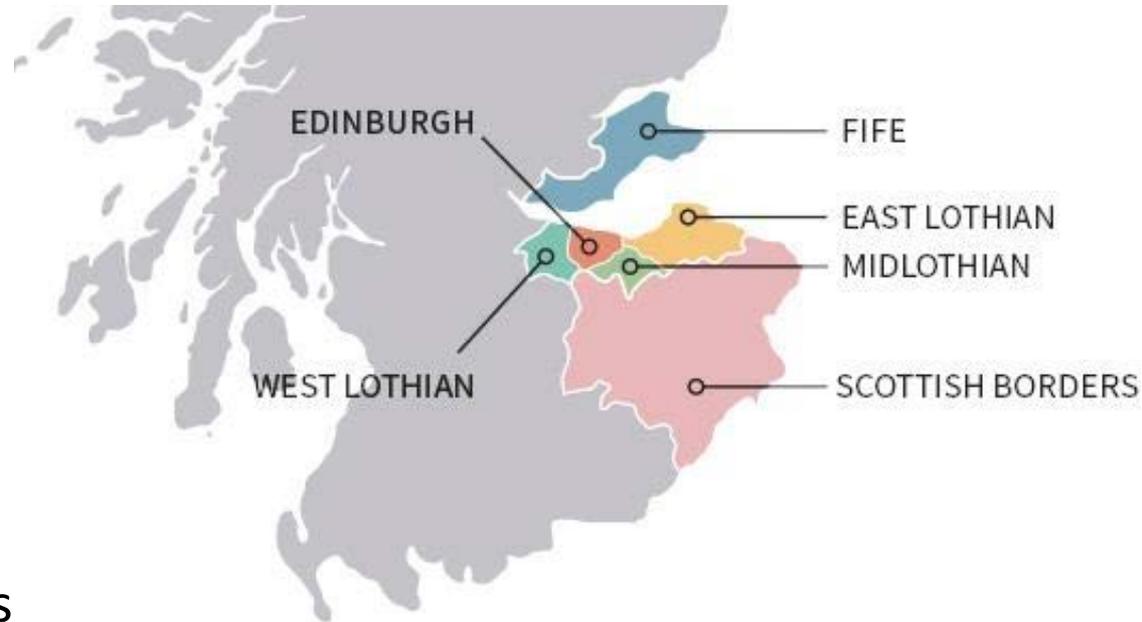
<https://www.nature.com/articles/s41567-018-0342-2>

Benefits of Openness: other



City Region Deal

- Overall investment of £1.1billion from UK and Scottish governments and industry partners
- Involves UoE and other regional HEIs & FE colleges
- Aims to establish the region as the data capital of Europe, attracting investment, fuelling entrepreneurship and delivering inclusive growth via data-driven innovation
- Training 100,000 people in data applications over 10 years



<http://www.acceleratinggrowth.org.uk/>



Let's Unlock Growth



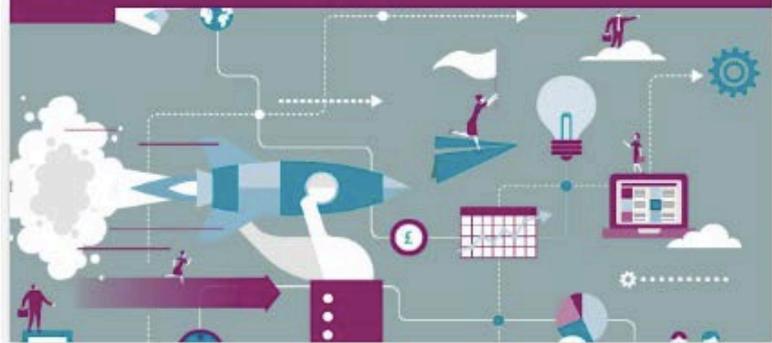
The Edinburgh and South East Scotland City Region Deal is a major investment into the area, where 24% of the population of Scotland live.

Data-Driven Innovation



Our Data-Driven Innovation (DDI) Programme reflects the growing importance of data in economic growth, social change, and public services.

Working with Industry



With our combined track record and expertise in data science, the University of Edinburgh and Heriot-Watt University are well-placed to help private, public, and third sector partners benefit from data-driven innovation, with academics from many disciplines

Data Capital of Europe



Data-Driven Innovation was included in the City Region Deal because rapid growth locally in the technology sector and in world-class data science expertise is fully recognised, as is the potential for further development.



2. ADAPTING EDINBURGH'S PROVISION TO MEET THE DEMANDS OF OPEN SCIENCE





First, can we define it?

“Open Science is the practice of science in such a way that others can collaborate and contribute, where research data, lab notes and other research processes are freely available, under terms that enable reuse, redistribution and reproduction of the research and its underlying data and methods.”

- EU FOSTER Project

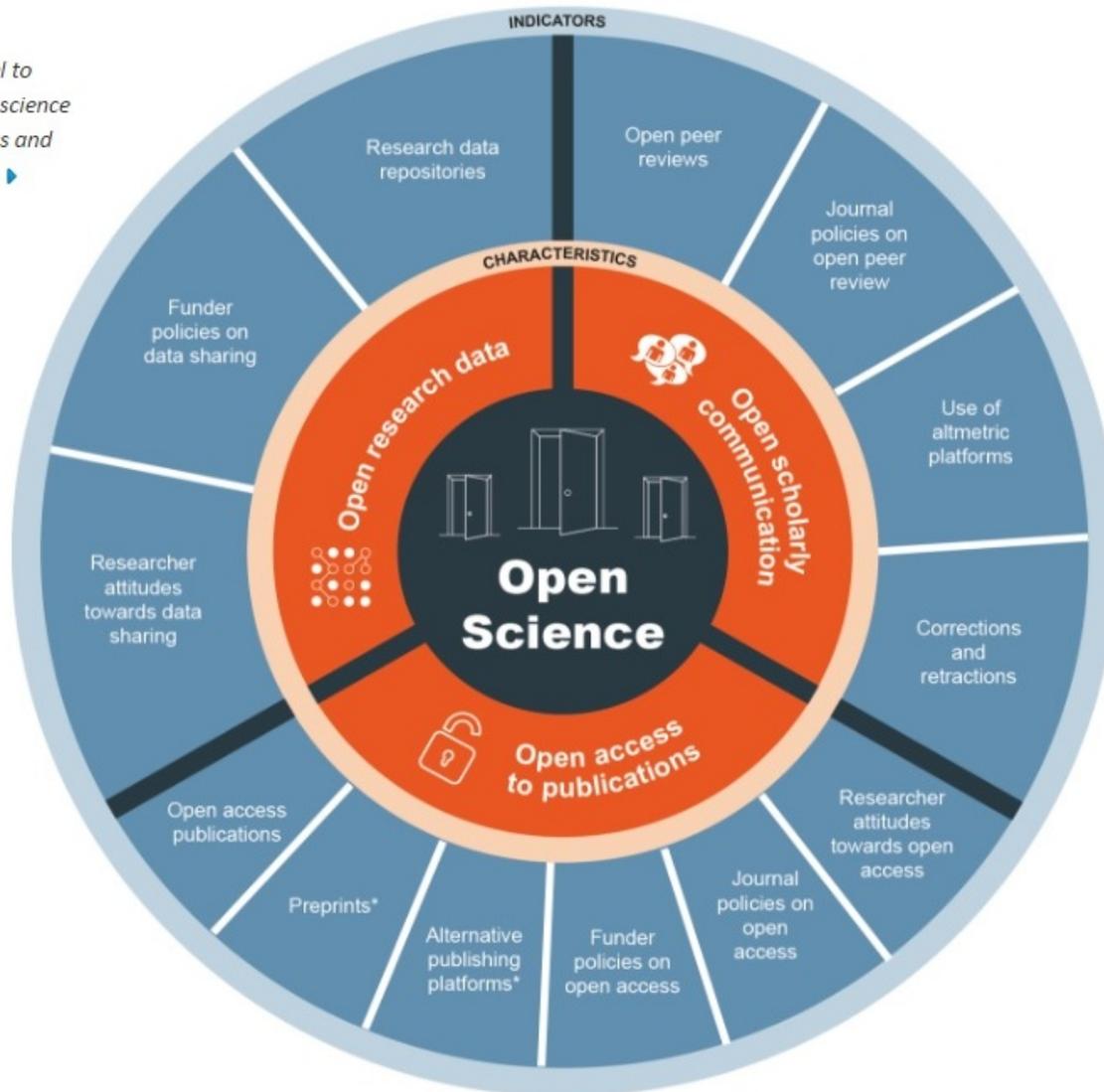
NOTE: EU references to “science” do cover social sciences, humanities, and to some extent the arts, but the UoE’s preferred term is more likely to be “Open Research”



Constituent parts of Open Science

- OA publications
- Data sharing
- Software preservation
- Open notebooks, workflows and methods
- Pre-registration
- Open peer review
- Open hardware
- Open rewards/recognition (are badges enough?!)

Use the wheel to explore open science characteristics and indicators. ▶▶



* These indicators are for both open access to publications and open scholarly communication.



Constituent parts of Open Science I

Mapping them to (our) infrastructure...

- OA publications [SCHOLARLY COMMS]
- Data sharing [RESEARCH DATA SERVICE, DIGITAL CURATION CENTRE]
- Software preservation [SOFTWARE SUSTAINABILITY INSTITUTE]
- Open notebooks, workflows and methods [EDINA, RSPACE, OTHERS]

(ALL OF THE ABOVE EITHER IN PLACE OR ADVANCED)



(Other related activity at Edinburgh)

DCC also heavily involved in:

- OpenAIRE
- FOSTERplus
- European Open Science Cloud
- Open Data/Science policy analysis in partnership with SPARC Europe (reference at end)
- Expert advice and training for the European Commission, especially around Data Management Plans and Planning (DMP reviews, DMPonline tool, etc)



Constituent parts of Open Science II

Mapping them to (our) infrastructure...

- Pre-registration [RESEARCH INFORMATION SYSTEMS? OPEN SCIENCE FOUNDATION?]
- Open peer review [LEAVE IT TO THE SCHOLARS?]
- Open hardware [EDINBURGH PARALLEL COMPUTING CENTRE? IT INFRASTRUCTURE?]
- Open rewards/recognition [UNIVERSITY/COLLEGE LEVEL? DORA declaration will also be signed.]

(N.B. THIS SLIDE IS MOSTLY SPECULATION!)



3. NEXT STEPS AND FUTURE WORK



Current state of play

- Library Research Support is taking the lead on the Open Research agenda across the University.
 - Initial paper taken to Research Policy Group in February 2018.
 - An Open Science Roadmap for the University is in preparation (draft presented to RPG in October.)
 - Draft includes 37 recommendations, based on the LERU declaration, with a RAG status for each Question (see next slide.)
- Working with research managers and Deans of Research to design cultural change. Thought leadership from academics, then implemented by managers... not forgetting community engagement and targeted measures, accountability and monitoring.
 - Some OS-related changes are beyond LRS's immediate sphere of influence
 - e.g. academic recruitment, promotion and reward.



LERU roadmap

Cultural change

1. Appoint a senior manager to lead Open Science approaches across all 8 pillars of the Open Science debate identified by the European Commission.
2. Develop a programme of cultural change, which is necessary to support the changes in principle and practice which Open Science brings.
3. Establish advocacy programmes, which should identify the benefits of Open Science approaches, whilst being realistic about the challenges.
4. Draw up a communication strategy, which enables the whole university body to become familiar with Open Science practices.

The future of scholarly communication

5. Have institutional mandates to support the move to full Open Access, whose implementation can be monitored regularly.
6. Deliver a roadmap for how they, or specific groupings, can develop agreed plans for the future of scholarly publishing in their institution.
7. Advocate the use of author identifier systems such as ORCID across their institution.
8. Consider supporting new forms of scholarly publishing from third parties dedicated to Open Access approaches.
9. Where appropriate, establish new mechanisms for scholarly publishing based on the good practice identified in this paper.

FAIR data

10. Adopt or update an institutional policy on research data management -ideally modelled on the template produced by LEARN⁶¹-, embracing the FAIR principles and based on an 'as open as possible, as closed as necessary' philosophy, and establish a dedicated committee on research data management to monitor the implementation and uptake of such a policy.
11. Design and establish services for data stewardship, provide researchers with suitable infrastructures, and identify funding and resources to archive and to publish data.
12. Create a catalogue of where researchers have published data (or stored if not available for any reason)- as is currently done with publications, and consider how to use this information in any research assessment or evaluation (cf. recommendations on rewards).
13. Provide free access to metadata in order to facilitate the discovery of data for which access must be restricted because of privacy, security, or confidentiality issues, making sure such metadata fulfil the FAIR principles, and establishing a grade of accessibility to those restricted research data.⁶²

Open Science and its role in universities:
A roadmap for cultural change

LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES
University of Amsterdam • Universitat de Barcelona • University of Cambridge • University of Copenhagen • York College Dublin • University of Edinburgh • University of Frankfurt • Universitat de Göttingen • Universität Heidelberg • University of Helsinki • Universität Leipzig • Leibniz Universität Hannover • Universitat de Lleida • Universitat de València • University of Warwick • Ludwig-Maximilians-Universität München • University of Oxford • Sorbonne University • Université Paris-Saclay • University of Strasbourg • Utrecht University • University of Zurich





Research Data Service Roadmap

- Research Data Service Roadmap: August 2017-July 2020, approved by academic-led steering group. Building on (mostly) success of earlier two Roadmaps, starting 2012
- Divided into five themes
 - Theme A: Unification of the service - from RDM programme to unified research data service
 - Theme B: Research data management planning
 - Theme C: Working with data
 - Theme D: Sharing and preserving research data
 - Theme E: Training and support
- 32 challenging objectives with associated actions, milestones and deliverables

<https://www.ed.ac.uk/is/rdm-roadmap>



Roadmap Challenges (both!)

- Getting through the sheer volume of work in a coordinated way
- Managing stakeholder expectations as we go
- Keeping up with developments in data science and data stewardship and being responsive to signals of change
- Reaching beyond enthusiast and early adopters to the majority of researchers
- Publish or perish culture: anything beyond publications perceived as second class research objects
- Scholarly publishing commercial giants competing for the data space
- Balancing FAIR data with GDPR: “As open as possible, as closed as necessary...”

Near future activities

A selection from the Roadmaps...

- Identify senior Open Science champion(s)
- Develop networks within the University
- Continue to unify look and feel of components, and emphasise a straightforward and coherent narrative
- Improve in-person and online training provision, particularly around dealing with sensitive data
- Encourage data management plans and sharing at postgraduate level, incorporating software management as next step in the Open Science chain
- Continue to explore and define requirements for electronic (lab) notebooks

Longer-term?

- Open Access Publication Plans + Data Management Plans + Software Management Plans (as encouraged by the SSI)
 - Note the Wellcome Trust's new outputs management approach ("Policy on data, software and materials management and sharing" – replaces the previous individual policies on OA and data)
 - New EC recommendation ("Commission Recommendation of 25.4.2018 on access to and preservation of scientific information") also adopts a more holistic approach, covering more of the constituent parts of Open Science (OA, data, software/hardware)
- Will policy move from DMPs > OMP/Rs?! Tendency shifting in this direction (from both policy and provision perspectives), but depends on wider context/environment, and on institutional maturity, in data management especially
 - (N.B. none of this is set in stone!)



References, resources and links

LERU Roadmap for Open Science

<https://www.leru.org/publications/open-science-and-its-role-in-universities-a-roadmap-for-cultural-change>

LIBER Open Science Roadmap

<https://libereurope.eu/blog/2018/07/03/liber-launches-open-science-roadmap/>

DCC / SPARC Europe Open Data Policy Analyses

<https://sparceurope.org/update-analysis-open-data-policies-finds-new-activity-around-oa-od-policies-multiple-countries/>

UoE links

<https://www.ed.ac.uk/is/research-data-service>

<https://www.ed.ac.uk/is/research-data-policy>

<https://www.ed.ac.uk/is/rdm-roadmap>



Thank you / Takk

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