

Introduction to Open Science

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Open Science: your definition

Could you please provide me a definition?

What do we mean with “science”



I. SCOPE OF APPLICATION

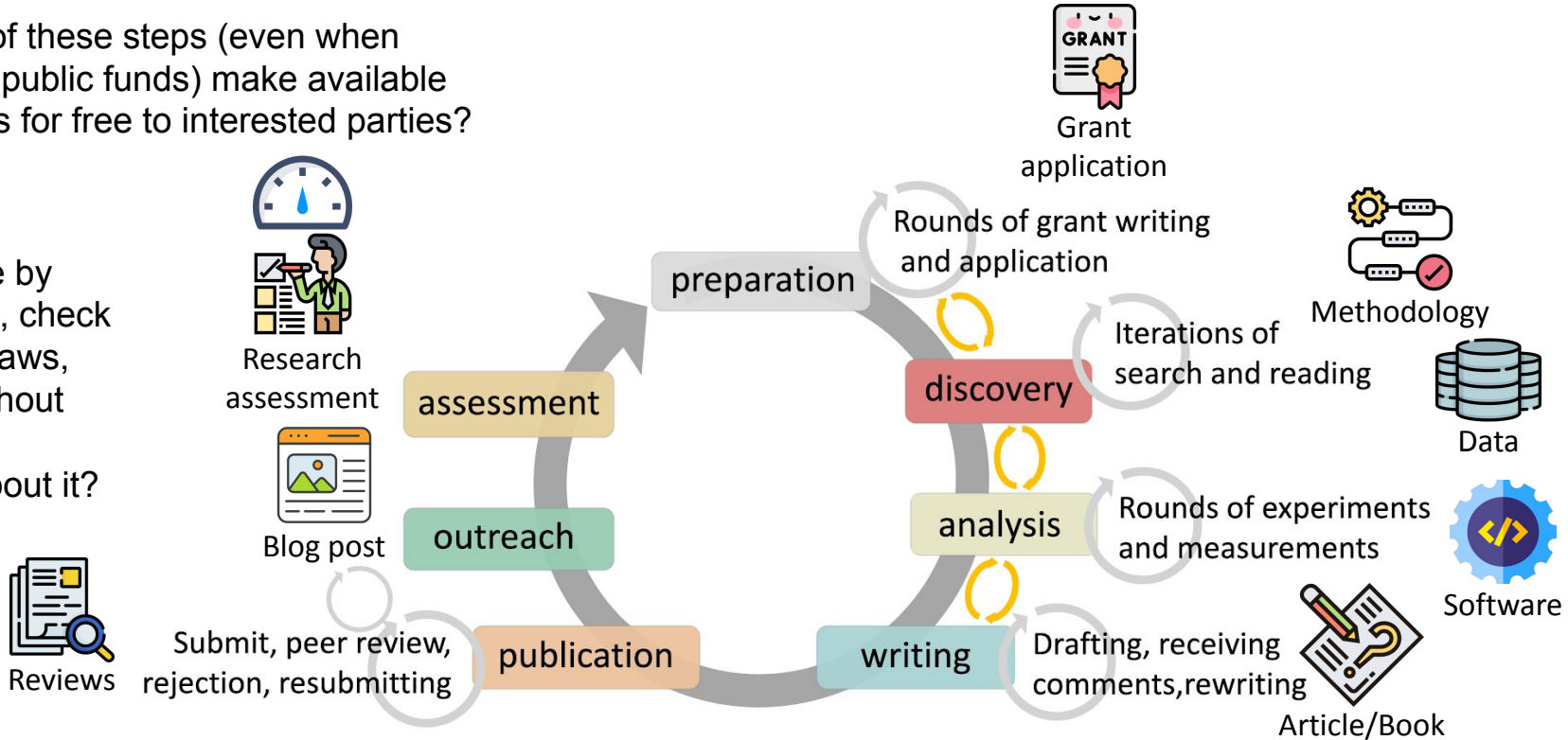
1. For the purposes of this Recommendation:

- (a) (i) The word “science” signifies the enterprise whereby humankind, acting individually or in small or large groups, makes an organized attempt, by means of the objective study of observed phenomena and its validation through sharing of findings and data and through peer review, to discover and master the chain of causalities, relations or interactions; brings together in a coordinated form subsystems of knowledge by means of systematic reflection and conceptualization; and thereby furnishes itself with the opportunity of using, to its own advantage, understanding of the processes and phenomena occurring in nature and society

Research workflow

What if **none** of these steps (even when supported via public funds) make available their outcomes for free to interested parties?

How can we understand a research done by someone else, check if it is free of flaws, improve it, without having crucial information about it?



Informal definition (a slogan)



**OPEN SCIENCE:
JUST
SCIENCE
DONE RIGHT**

Open Science schools of thought

School of thought	Central assumption	Involved groups	Central Aim	Tools & Methods
Democratic	The access to knowledge is unequally distributed.	Scientists, politicians, citizens	Making knowledge freely available for everyone.	Open Access, intellectual property rights, Open data, Open code
Pragmatic	Knowledge-creation could be more efficient if scientists worked together.	Scientists	Opening up the process of knowledge creation.	Wisdom of the crowds, network effects, Open Data, Open Code
Infrastructure	Efficient research depends on the available tools and applications.	Scientists & platform providers	Creating openly available platforms, tools and services for scientists.	Collaboration platforms and tools
Public	Science needs to be made accessible to the public.	Scientists & citizens	Making science accessible for citizens.	Citizen Science, Science PR, Science Blogging
Measurement	Scientific contributions today need alternative impact measurements.	Scientists & politicians	Developing an alternative metric system for scientific impact.	Altmetrics, peer review, citation, impact factors

Definition by UNESCO: aim



I. AIM AND OBJECTIVES OF THE RECOMMENDATION

1. The aim of this Recommendation is to provide an international framework for open science policy and practice that recognizes disciplinary and regional differences in open science perspectives, takes into account academic freedom, gender-transformative approaches and the specific challenges of scientists and other open science actors in different countries and in particular in developing countries, and contributes to reducing the digital, technological and knowledge divides existing between and within countries.

Definition by UNESCO: what is it

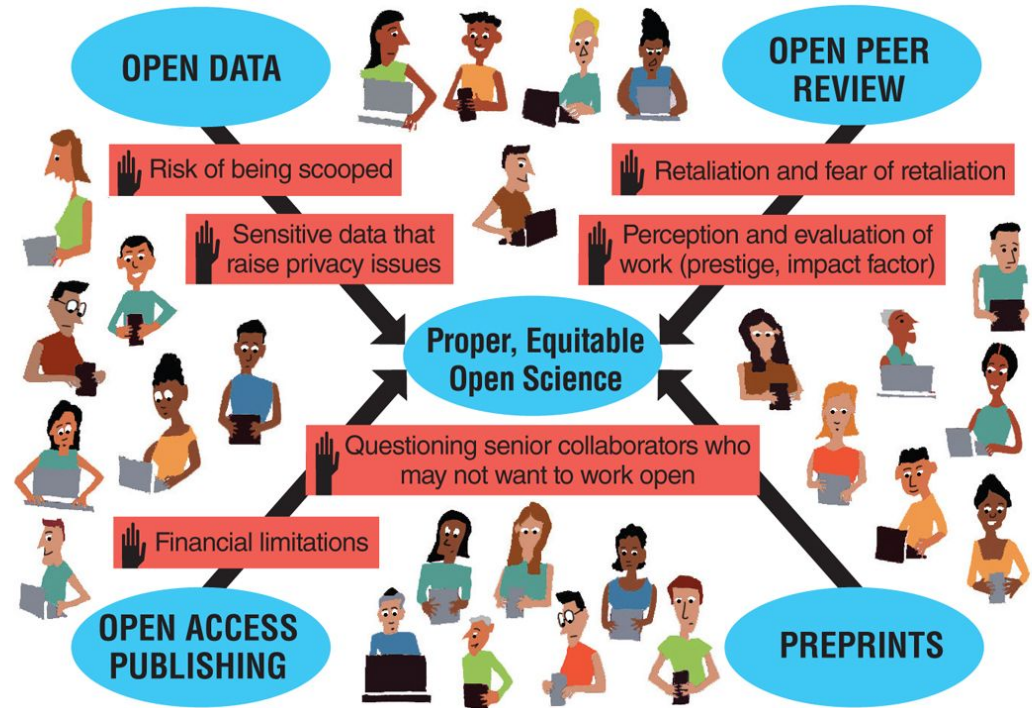


II. DEFINITION OF OPEN SCIENCE

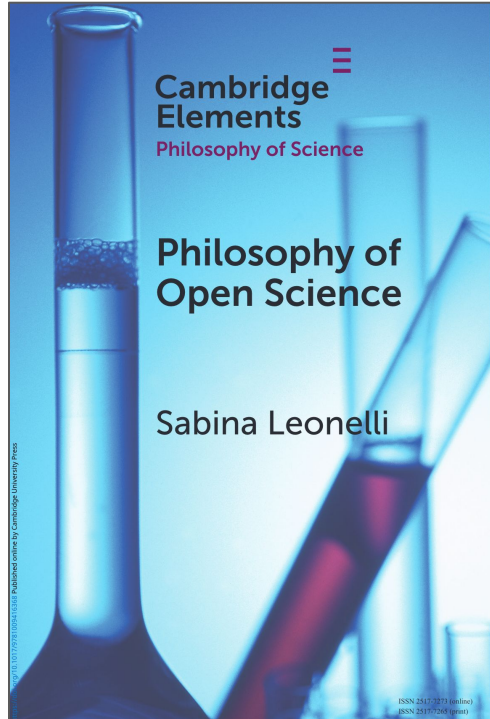
6. For the purpose of this Recommendation, **open science** is defined as an inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society, and to open the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community. It comprises all scientific disciplines and aspects of scholarly practices, including basic and applied sciences, natural and social sciences and the humanities, and it builds on the following key pillars: open scientific knowledge, open science infrastructures, science communication, open engagement of societal actors and open dialogue with other knowledge systems.

Do all support Open Science?

Factors such as a scientist's career stage, employment stability, financial circumstances, country of origin or residence, and cultural context (including their race, gender identity, and ethnicity) may all create barriers to specific aspects of Open Science



Different narratives are possible for openness



Object-oriented view

Transparency

Quality

Inclusion

Make research accessible to a wide variety of potential users, and then use criteria for assessing reliability of research and enable reuse of research

Process-oriented view

Inclusion

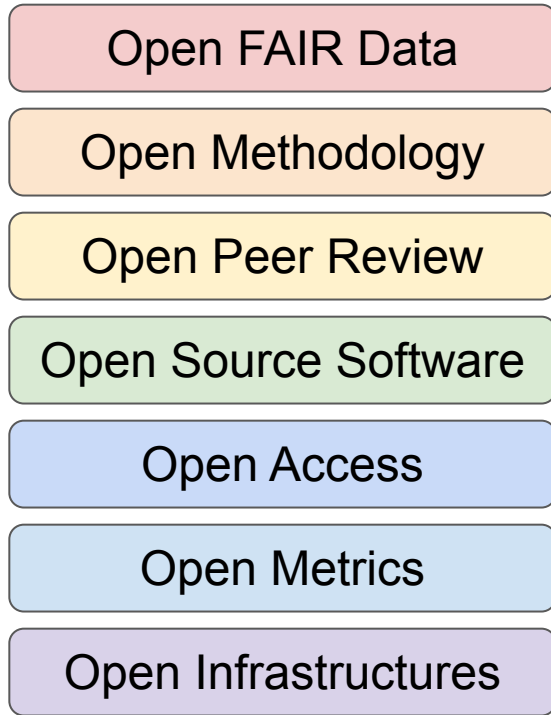
Quality

Transparency

Consider what it take to make research more inclusive, diverse, and just

Sharing does not constitute a necessary starting point nor a sufficient condition for conducting reliable and responsible Open Science

Which Open Science facets we will see



point of view

Reproducibility

the results obtained by an experiment should be achieved again with a high degree of reliability when the study is replicated, e.g. by different researchers using the same methodology

Mandatory text to read for the next lecture

Meng, X.-L. (2020). Reproducibility, Replicability, and Reliability. Harvard Data Science Review, 2(4). <https://doi.org/10.1162/99608f92.dbfce7f9>

End

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