



Towards a Philosophy of Open Scientific Practices: Comparing Research Environments



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PHIL_OS (21-27): A Philosophy of Open Science for Diverse Research Environments



Situating research processes

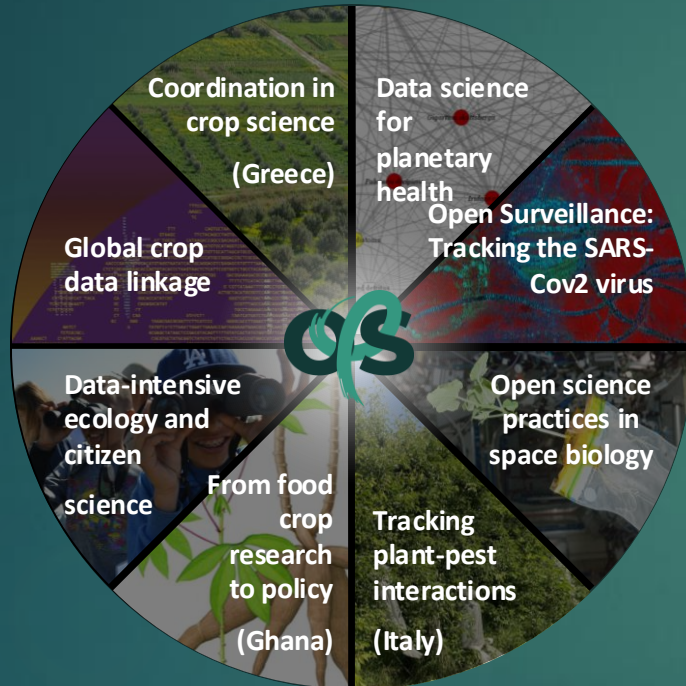
To understand how inferential practices relate to characteristics of research environments, epistemic diversity and (in)justice

- **Approach:** *co-produced* philosophy, history and social studies of science (with scientists, OS infrastructures and policy-makers)
- **Focus:** interpretations of openness as a window on the epistemic implications of
 1. **Diversity** in research environments
 - Backgrounds and skills
 - Resourcing: material, human, conceptual, institutional, infrastructural
 - Grounds for reasoning around “best practice”
 2. **Inequity** between research environments
 - Constraints on methods, resourcing and networks
 - Reputational cycles and epistemic injustice



Science Policy

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Methods: Philosophy of science in practice

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Day 1 (28 April): The state of the field(s)

09:15–13:00 Session 1: Conceptual Updates from PHIL_OS

- 09:15–09:30 Sabina Leonelli and Desantila Hysa: Welcome
- 09:30–09:55 Conceptual and historical trajectories: Sabina Leonelli
- 09:55–10:20 Methods: Rachel A. Ankeny
- 10:20–10:45 Research environments and diversity: Rose Trappes

10:45–11:15 *Break*

- 11:15–11:40 Data communities: Emma Cavazzoni, Paola Castaño
- 11:40–12:05 Standards and protocols: Nathanael Sheehan, Fotis Tsiroukis
- 12:05–12:30 Inequity, justice: Paola Castaño, Rena Alcalay
- 12:30–12:55 Engagement, collaboration: Joyce Koranteng-Acquah, Richard Williams

13:00–14:00 *Lunch*

14:00–18:00 **Session 2: Research collaborations**

- 14:00–14:45 ELGO–DEMETRA, Greece (Fotis, Greek collaborators)
- 14:45–15:30 CSIR, Ghana (Joyce, Ghanian collaborators)

15:30–15:45 *Break*

- 15:45–16:30 Haly-ID, Italy (Emma, Italian collaborators)
- 16:30–17:15 CIDACS, Brazil (Nathanael, Brazilian collaborators)
- 17:15–18:00 NASA Open Science Data Repository Analysis Working Groups, USA (Paola, USA collaborators)

Stroll into Landshut

19:30 *Conference Dinner*

21:00 Evening activities: The Research Game + *Data Shadows* film viewing

Day 2 (April 29): Comparison and analysis

09:00–10:30 Session 4: Policy – Informing ongoing OS

09:00–09:35 Project updates (5' each):

- Data management report ELGO–DEMETRA (Fotis)
- Data management report CRI (Joyce)
- PhenomUK (Hugh Williamson)
- GESDA (Richard)
- EDI (Kim Hajek, Paul Trauttmansdorff)
- G7 and AI in science, Metascience, Public Science Lab (Sabina)

09:35–10:00 Advisors updates on relevant initiatives (5' each):

- Carole Goble
- Sally Wyatt
- Sarah de Rijke

10:00–10:30 Brainstorm: opportunities and next steps

10:30–11:00 *Break*

11:00–13:00 Session 5: Comparison and cross–project analysis

11:00–11:30 Sensitivities and initial steps (Sabina); template for case– based OS monitoring (Paola)

11:30–12:00 Break–out groups

12:00–13:00 Reporting back, general discussion, and steps forward

13:00–14:00 *Lunch*

14:00–15:30 Session 6: **Going forward**

14:00–14:45 Feedback from advisors and collaborators

14:45–15:30 Responses and discussion with the project team

15:30–16:00 *Break*

16:00–17:00 Session 7 and **Wrapping Up**

19:00 *Closing Dinner for Remaining International Delegates, Hotel Restaurant*

News

- ▶ New end date: August 2027
- ▶ ISHPSSB Symposia, July 2025: Performing our collaborations and each fieldsite in its complexity and specificity (8 SYMPOSIUM, of which 6 are directly organized around PHIL_OS themes and fieldwork)
- ▶ EPSA Symposium (August 2025) and Special Issue “The Role of Philosophy in Public Policy”
- ▶ Final Conference: **4-6 May 2025**, Garching – Munich, CfP to be launched in early June

Highlights

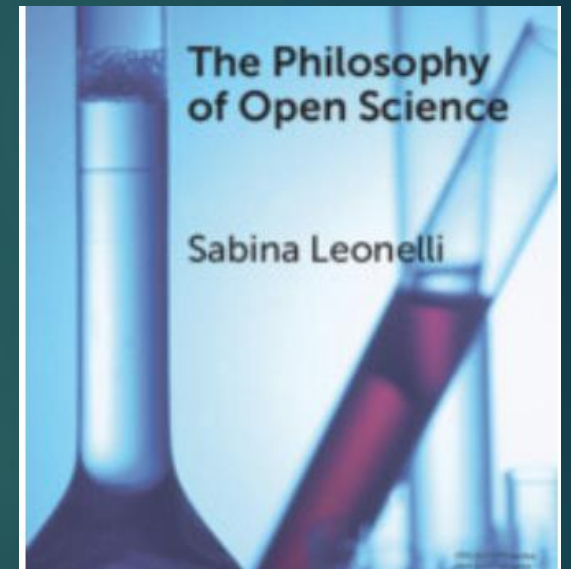
- ▶ Special issue “The Nature of Research Environments” appearing in European Journal for the Philosophy of Science
- ▶ Philosophy of Open Science: >10K views and >6.5K downloads as of April 22 (+ >1.5K on PhilSci) – keynoted Munin conference, GWP, several webinars and podcasts for large OS organisations worldwide

NEW WORK:

- ▶ Structural injustice [see Rena] & multiplex research environments [see Rose]
- ▶ Misinformation (with Marcel Boumans and Maya Goldenberg) and impact of political polarization on science [see Richard]
- ▶ Convenience AI and Environmental Intelligence [see Richard] + What is evidence-based policy?
- ▶ Engaged empiricism, extractivism and data shadows
- ▶ **History of philosophy: approaches to the Open Society and their legacies for current OS**

Openness as “sharing resources”: An object-oriented view

- ▶ about **unlimited access**: making any research element available at any time for everyone
- ▶ about the **digital transformation**: it is a novel phenomenon and completely dependent on ICTs
- ▶ always **good**: it automatically improves the content of science as well as researchers' working conditions
- ▶ **global**: it can reach everybody with an interest in research, no matter where they are based
- ▶ facilitating **equity** in research production and consumption: it makes previously inaccessible resources available to those who may wish to use them



Open Science today

- ▶ Supported by Open Science movement in research and innovation
- ▶ Critiqued for alignment to extractive epistemologies (e.g. industry predating on publicly sponsored outputs, Gold OA publishing model)
- ▶ Stigmatised by association with Diversity, Equality and Inclusion policies



The EU's open science policy

Open Science is at the centre of European research policy. Policies, initiatives and structures are developed and implemented to open up European science and research to make them more efficient and productive, seamless, transparent and robust as well as responsive to policy and society needs and expectations.



Join us

BUSINESS

6 reasons why open science might be the future of business

Nov 20, 2023



Making sense of openness in research

- ▶ Failure of cosmopolitan ideal
- ▶ Serious geopolitical tensions
- ▶ Triumph of corporate ownership over research tools and results (augmented by AI)
- ▶ Deeply unequal, fragmented research environment
- ▶ Hyper-reliance on fragile digital systems
- ▶ Unsustainable data ecosystem
- ▶ Unclear role for pluralism and epistemic diversity (politically tainted, scientifically unfashionable vis-à-vis dominant repertoires)

In which sense is research open? Can and should it be, if at all? Why continue to talk about openness?



European Research Council

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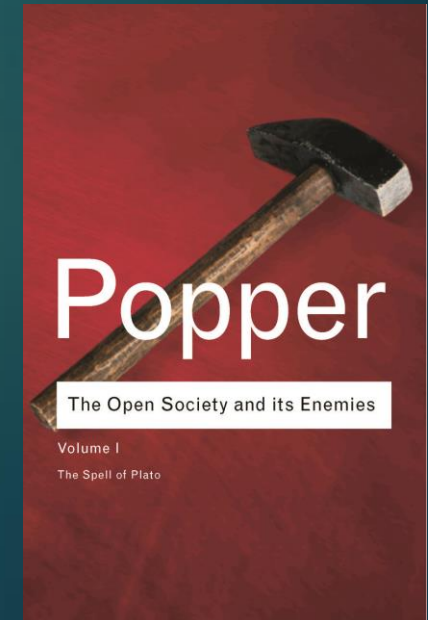
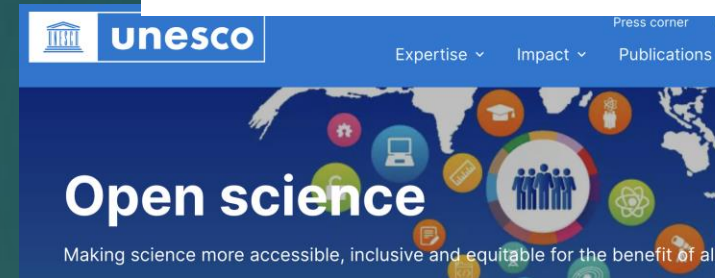


Open Science for an Open Society?

- ▶ Openness as constitutive value for both Western science and representative democracy
 - ▶ “the task of democracy is forever that of creation of a freer and more humane experience in which all share and to which all contribute” (Dewey 1939)
 - ▶ Right to reliable evidence for decision-making (Leonelli 2024)
 - ▶ Blurred boundaries between Open Science, Open Government, Open Administration, Open Innovation: e.g. data flows across them as crucial to public health research (Leonelli 2021, Kriege and Leonelli 2021, Leonelli 2024)
- ▶ My proposal today: **consider the history of Open Science in relation to evolution of conceptions of Open Society**
- ▶ Obvious passage point: Karl Popper’s 1945 *The Open Society and its Enemies*
 - ▶ Highly influential politically
 - ▶ Reference point for object-oriented OS
 - ▶ Deeply tied to Popper’s Logic of Discovery

About open science

Open Science has the potential of making the scientific process more transparent, inclusive and democratic. It is increasingly recognized as a critical accelerator for the achievement of the United Nations Sustainable Development Goals and a true game changer in bridging the science, technology and innovation gaps and fulfilling the human right to science.



Popper's Rational Openness

- ▶ Open Society as one “in which individuals are confronted with personal decisions” (1945)
 - ▶ **Methodological individualism:** emphasis on personal freedom and the right to make up one's own mind
 - ▶ **Social engineering:** what kind of society – and institutions – may best encourage such a critical attitude at the individual level?
 - ▶ **Inquiry into the unknown as critical to human survival:**
 - ▶ key to social exchanges facilitating individual well-informed choices – and with it, the very meaning of human existence - is the identification and critical evaluation of the reasons underpinning one's beliefs and related courses of action: “if we wish to remain human, then there is only one way, the way into the open society. We must go on into the unknown, the uncertain and insecure, using what reason we may have to plan as well as we can for both security and freedom” (1945, 189).
- ▶ In sum: Popper's view of openness is one steeped in informed, rational deliberation, where a key concern is how institutions and public venues may be designed so that those with political power can do the least harm

Popper's Rational Openness

- ▶ Clear reliance on falsificationist epistemology:
 - ▶ Scientific discovery as a matter of verifying the veridicity of existing beliefs through testing and critical debunking
 - ▶ Individuals championing different beliefs can discuss their differences and critically evaluate the merits of each other's views with reference to common criteria
 - ▶ Individuals need to follow logic of discovery, rather than letting emotions and/or dogmatic beliefs (religion) get in the way
- ▶ Open Society as relentless quest for open inquiry:
 - ▶ Dogmas are regularly challenged
 - ▶ Social norms are aligned with ever-evolving cutting-edge knowledge of the natural and social world, as ascertained through the scientific method
 - ▶ Promise to overcome social prejudice (attractive to the political left)
 - ▶ Emphasis on personal freedom (attractive to the political right)

Popper's Rational Openness: Legacy

- ▶ Legacy appropriated by free-market ideologists such as Friedrich van Hajek, who seized on the imagination of **openness as (market-mediated) freedom**
- ▶ Fertile ground for object-oriented view of OS as "unlimited sharing":
 - ▶ emphasis on individual freedom to access and re-use all research outputs
 - ▶ sharing fostered by commodification of research process as part of the free market

Popper's Rational Openness: Legacy

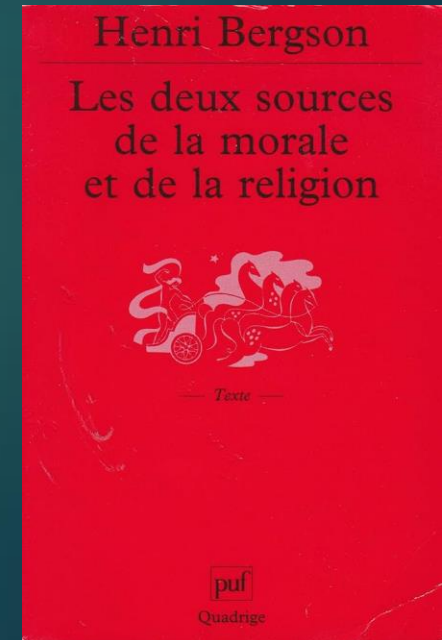
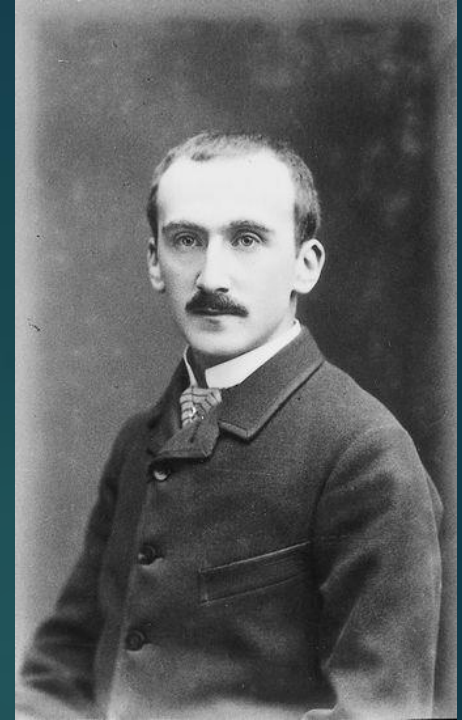
- ▶ This reading is arguably to the detriment of Popper's own sociological imagination of 'piecemeal engineering', where regulation and governance are crucial to coordinating different perspectives
 - ▶ emphasis on **democratic rule** as the only realistic means to obtain free exchange and support pluralism in society, as well as the encouragement of criticism and dissent that ground Popper's epistemology
 - ▶ respect for the **rule of law** provides the boundaries within which critical engagement can take place (including any required constraint on markets and whichever form of protectionism may be needed to shield individuals from economic exploitation)

An alternative: Bergson's Openness

- ▶ Why this comparison? Both Bergson and Popper:
 - ▶ inspired by science to conceptualise social advancement as constructive confrontation among its diverse members
 - ▶ embraced creative significance of going beyond the boundaries imposed by one's own intellectual stance, cultural background and position within society
 - ▶ invested in a cosmopolitan ideal of transdisciplinary dialogue and peaceful debate over violent clash (against the background of 1930s-1940s Europe, e.g. Bergson's diplomatic roles)
 - ▶ fostered the idea of an open society, with Bergson's elaboration of the concept an important source of inspiration for Popper
- ▶ However! Philosophical disagreements over epistemology of inquiry translate into different interpretations of
 - ▶ what an open society may consist of, and
 - ▶ how this vision may fuel understandings of openness within intellectual – and particularly empirical – inquiry such as exemplified by the natural sciences

Bergson's Humane Openness

- ▶ "*Les Deux Sources de la Morale et de la Religion*", published 1932 and translated 1935 as "Two Sources of Morality and Religion"
- ▶ Closed tendency of life
 - ▶ determinism and exclusion, boundedness
 - ▶ ideas of authority, hierarchy and immobility (Lefevbre 2013, 90)
 - ▶ synonymous with adherence to 'moral obligations' entrenched in religion or politics or other sources of routinised social guidance (DS 256)
 - ▶ crucial role of preserving the integrity and stability of a group, by ensuring that its members look out for each other and defending the group against external pressures and/or intruders



Bergson's Humane Openness

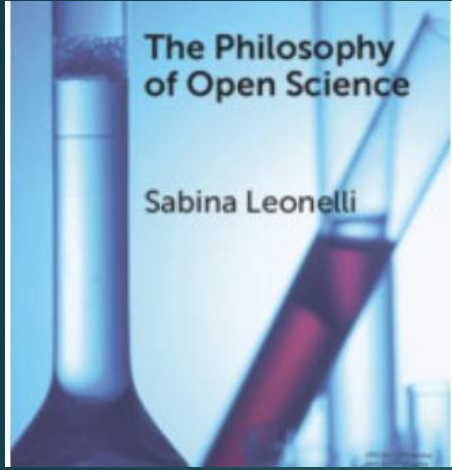
- ▶ Open tendency of life
 - ▶ dynamism, indeterminacy and unsettledness, as in the ideas of open-endedness and inclusion
 - ▶ related to concepts of liberty, equality and fraternity
 - ▶ creativity and change can only come from some degree of challenge to the status quo, and willingness to engage in what is as yet unknown and unintelligible
- ▶ The iteration and tension between closed and open tendencies are what sustains life itself – as already in *Creative Evolution*:
 - ▶ “Life tends towards self-preservation, reproduction and stability, and toward continuous and unpredictable change”

Bergson's Humane Openness

- ▶ Openness is hard work: many reasons to resist change, disruption and unpredictability
- ▶ But it is possible through *love*
 - ▶ disposition or mode of attention: the capacity to care and reach out to an 'other'
 - ▶ breaking out of the cycle of hostility caused by the tendency to close down groups, habits, ways of life
 - ▶ foundation for biological reality and political institutions such as democracy
 - ▶ "such institutions would be unimaginable (in terms of genesis) and incomprehensible (in terms of everyday practice) were we not able to see at their core a nonpreferential love irreducible to closed morality. In Bergson's treatment, therefore, love is a concrete and practical political force" (9). In other words, "love enables human beings to participate in the essence of life itself: creation, unpredictability, newness." (Lefebvre & White 2012).
- ▶ Love permeates both closed and open tendencies of society
 - ▶ emotion based on preference and exclusion, e.g. romantic love, for instance, is addressed to someone rather than others, and is thereby exclusive
 - ▶ can also be universal and non-directed, e.g. Universal Declaration of Human Rights
 - ▶ not motivated by esteem, attractiveness or convenience; it manifests without specific reasons or motivation, and unattached to a specific object to which it can dedicate itself. As Bergson puts it, "its form is not dependent on its content" (DS 1006-7/38)

Bergson's Humane Openness

- ▶ Bergson's openness cannot exist in separation from the human capacity to focus on specific relationships and form exclusive attachments.
 - ▶ Open tendency helps overcome closed tendency to love someone or something in ways bounded by specific motivations, selfish interests and personal experience.
 - ▶ Openness pushes humans to go beyond their own experiences and perceptions, consider different ways of life, and foster the capacity to challenge and change one's worldview, thus encouraging indeterminacy, instability, dynamism.
 - ▶ All this works because *openness is in productive iteration with forms of closedness*, without which humans would not be able to focus on singularities and goal-directed actions at all.
- ▶ It is the iteration between closed and open tendencies that makes openness humane
 - ▶ Humane = "showing kind, care and sympathy towards others, especially those who are suffering" (Cambridge English Dictionary <https://dictionary.cambridge.org/us/dictionary/english/humane>).
- ▶ So: humane openness involves ***the capacity to perceive the world beyond the boundaries of one's own experience, and use that augmented perception to fuel emotional and intellectual commitments to specific processes***, whether they be people, projects and/or institutions.



A process-oriented philosophy of OS

Discovery as skilled, distributed interaction **with the world**

- centrality of **connections** (intellectual as much as material and emotional) among research participants as backbone to communication, constructive critique and creative exchange
- focus on **social agency**
 - creating new intimacies, potentially facilitating trust and collaboration
- does not require control over resources
 - focus away from debates over ownership
- **justice** and **diversity** as crucial conditions for inquiry

Connections need to be *judicious*:

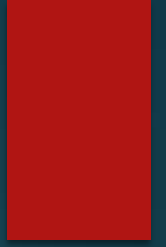
- Situated and responsive to context
- Determining what constitutes relevant context is key part of any investigation

Openness as engagement



- ▶ about **responsible use**
- ▶ about the critical and constructive scrutiny of how **digital platforms** can support existing and future work
 - ▶ Encouraging development of relationships that can sustain and nurture scientific research in the long term
- ▶ **good for some and not others**: value-judgements and choices are unavoidable when developing open research and infrastructures
- ▶ **accessible to some and not others**: transparent criteria for which users are privileged can be a platform for trustworthiness
- ▶ facilitating **equity** in research production and consumption
 - ▶ Makes previously inaccessible resources *more easily* available to those who may wish to use them *for specific purposes* (whose social and scientific value has been explicitly evaluated)

Conclusions: *Contrasting and Complementary* Visions of Inquiry for an Open Society



Two versions of Open Science: sharing *versus* engagement

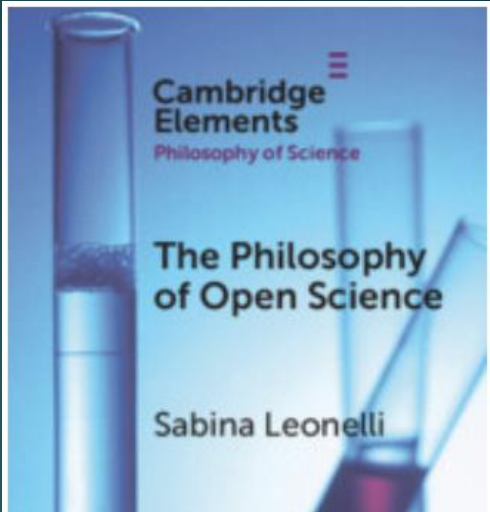
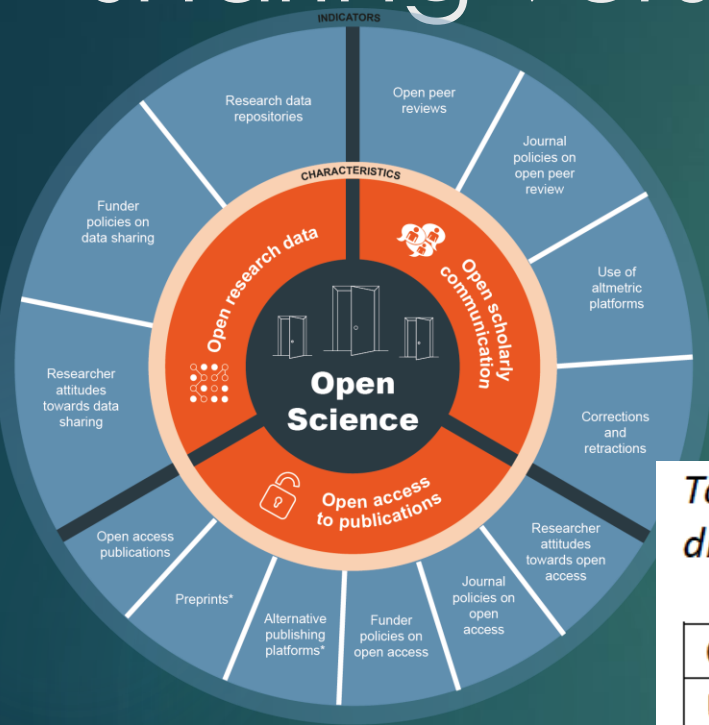


Table 3. Synoptic comparison of the main features of the two interpretations of openness I have discussed in this book.

Openness as sharing	Openness as judicious connection
Unlimited	Relational
Digital	Social
Good	Divisive
Global	Situated
Equal	Equitable
Focused on itemized outputs (objects that can be shared)	Focused on social agency (ways of doing and being with others)













Open inquiry for an Open Society: rational *versus* humane versions



- ▶ Popper: openness as critical exchange within the boundaries of the rules of law and rationality
 - ▶ the recognition of other forms of understanding becomes crucial ground for questioning existing beliefs, methods and intuitions
 - ▶ an oppositional way of conceptualising openness that may help forge ever more refined (in Popper's interpretation, *progressive*) ways of living, thinking and knowing
- ▶ Grounding the object-oriented view of knowledge and openness as sharing
- ▶ Bergson: openness a non-selfish, non-goal-directed form of love
 - ▶ the adoption of a caring attitude of respect for the world in its complexity
 - ▶ paying attention to what may be different from oneself, thereby freeing oneself from narrow-mindedness tied to preconceived interests and motivations
 - ▶ recognises the importance of nurturing human inquirers and the connections that sustain them
 - ▶ Openness as novel meaning-making: involves vulnerability, 'staying with the trouble' – which in turns exacts an emotional toll
 - ▶ Human cognition and planning are limited – never 'full control'
- ▶ Grounding the process-oriented view of knowledge and openness as engagement

Thank you for your attention



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The practice of open inquiry: Complementary insights for the future of research

Considering these two versions raises key questions for science and policy:

1. Role of emotions and values in open inquiry: how to manage trust in a pluralistic society?

- ▶ E.g. debate around Bergson's invitation to trust moral leaders: how to balance that out with wisdom of social connections and diversity? What constitutes undue influence?

2. Role of individuals versus groups towards achieving openness

- ▶ Popper's piecemeal engineering – crucial to bring individuals, however gifted and visionary, in regular connection with each other and their broader collectives, to keep creative paths towards open inquiry accountable and sensitive to local requirements (scientific/epistemic, social, emotional etc)
- ▶ Close to Longino's critical contextual empiricism in this respect

3. Extent to which open inquiry involves radical social transformation (away from free market myth – see Oreskes later today!)

- ▶ Ensuring institutionalized, non-discriminatory coordination of multiple perspectives (Popper)
- ▶ Calibrating social structures to substantive human relationships and humanistic/environmental goals (Bergson)



The practice of open inquiry: Comparing rational and humane openness

- ▶ Popper condemns Bergson as retreating to religion
- ▶ Popper is suspicious of individuals acting as role models, and strongly critiques Bergson's emphasis on 'mystics' as people with exceptional moral strength and visionary qualities – in Popper's view, it is the interaction among individuals that makes society open, and the logic of inquiry needs to guide such interaction so that they remain grounded in well-justified beliefs and rational argument.

Outline

1. Openness in the contemporary (scientific) world
2. Popper's rational openness: Open society as critical confrontation, personal choice and progress
3. Bergson's humane openness: Open society as love nurturing both social bonds and creativity
4. The practice of open inquiry: Comparing rational and humane openness
5. Conclusion: Reinstating humane foundations for Open Science

5. Lessons learnt for contemporary Open Science

- ▶ To which extent is Bergson's view realistic?
- ▶ Recognises the importance of nurturing the humans – and their connections – that are the inquirers
- ▶ But big problem with trusting moral leaders?? How to balance that out with wisdom of social connections and diversity?
- ▶ This is where Popper's piecemeal engineering becomes useful again – crucial to bring individuals, however gifted and visionary, in regular connection with each other and their broader collectives, so as to keep creative paths towards open inquiry accountable and sensitive to local requirements (scientific/epistemic, social, emotional etc)

Thank you for your attention



References:

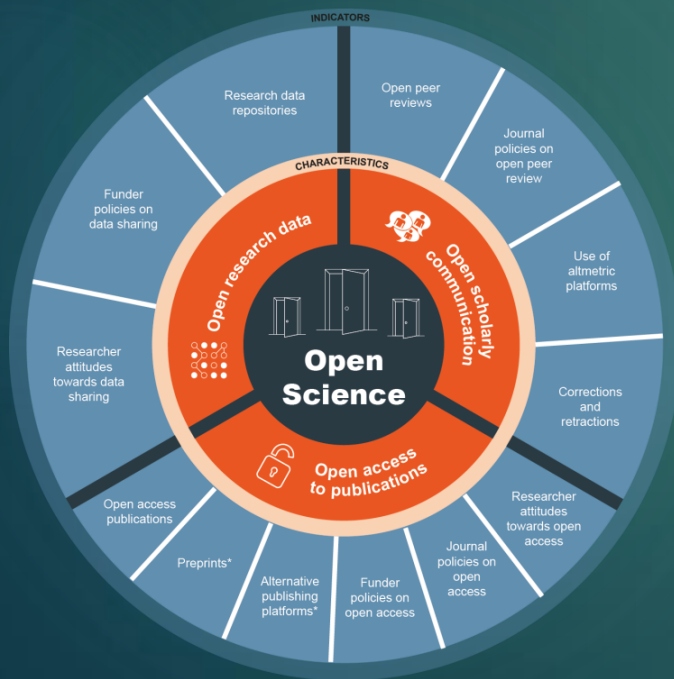
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Open Science 1.0

“a **new** approach to the scientific process based on **cooperative work** and new ways of diffusing knowledge by using **digital technologies** and new collaborative tools.. [...] .. **sharing** and using all available knowledge at an **earlier stage** in the research process”

Carlos Moedas, *Open Innovation, Open Science, Open to the World* (2015)

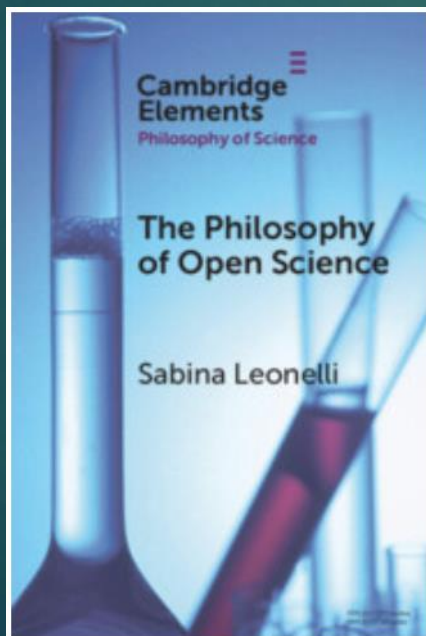
- Fast, efficient, free sharing of research outputs helps
- ▶ To manage Big Data and the digital transformation of research processes
 - ▶ To build on existing collections as public goods and data sharing norms/technology (esp. in life sciences)
 - ▶ To involve diverse publics and forms of scrutiny in science, thereby improving quality and addressing inequity and injustice
 - ▶ To ensure the production of robust, reliable and socially responsive science and technology



Openness as sharing

- ▶ about **unlimited access**: making any research element available at any time for everyone
- ▶ about the **digital transformation**: it is a novel phenomenon and completely dependent on ICTs
- ▶ always **good**: it automatically improves the content of science as well as researchers' working conditions
- ▶ **global**: it can reach everybody with an interest in research, no matter where they are based
- ▶ facilitating **equity** in research production and consumption: it makes previously inaccessible resources available to those who may wish to use them

Open Science 2.0



Transparency

Quality

Inclusion

Inclusion

Quality

Transparency

Openness as engagement



- ▶ about **responsible use**
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Discovery as skilled, distributed interaction with the world

Does not require control over resources:

Away from debates over ownership

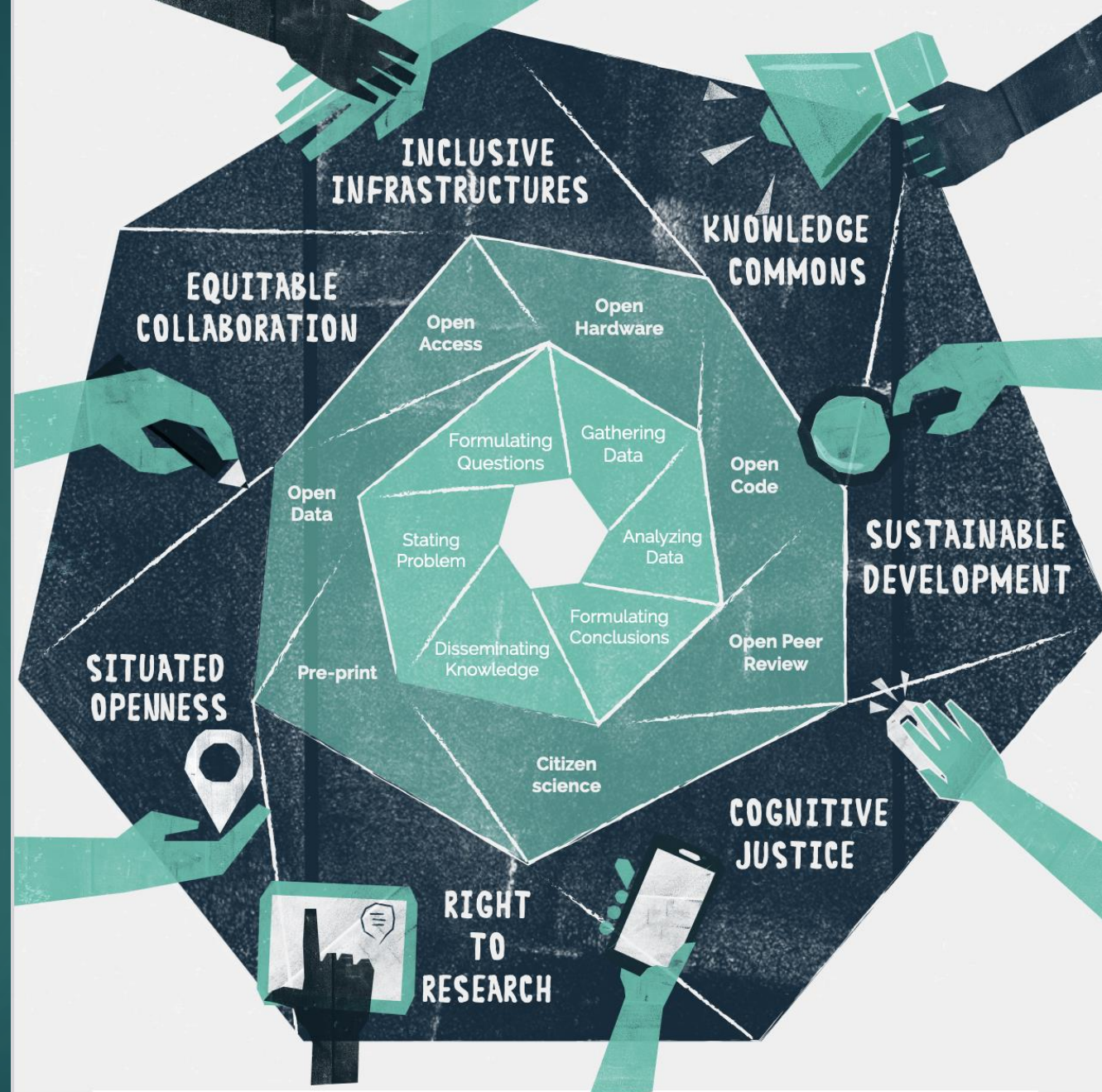
Focus on social agency: creating new intimacies, potentially facilitating trust and collaboration

Epistemic justice and diversity as crucial conditions for inquiry

Connections need to be *judicious*:

Situated and responsive to context

What constitutes relevant context is key part of any investigation



An object-oriented philosophy of OS



- ▶ Sharing as unlimited access to resources → focus on **appropriation**
 - ▶ Research components as bounded objects to be collected and shared
 - ▶ Discovery as linear path from accumulation of objects to extraction of insight
 - ▶ Grounded on commodification of research components: Central role of intellectual property and debates over ownership and control
- ▶ Sharing as unlimited collaboration → focus on **disruption** of appropriation
 - ▶ Social movement approach: often bypassing IP and refusing to engage with ownership claims
 - ▶ YET: model of discovery remains unchallenged: focus on sharing commodified outputs, complicity with epistemology of data accumulation