

Ethical challenges and limits of RRI for improving the governance of research and innovation processes

Retos éticos y límites de la RRI para mejorar los procesos de gobernanza de la investigación y la innovación

RENÉ VON SCHOMBERG (RWTH Aachen University),¹ ELSA GONZÁLEZ-ESTEBAN (Universitat Jaume I)²
and ROSANA SANAHUJA-SANAHUJA (Universitat Jaume I)³

Von Schomberg, René, González-Esteban, Elsa and Sanahuja-Sahanuja, Rosana (2022). Ethical challenges and limits of RRI for improving the governance of research and innovation processes. *Recerca. Revista de Pensament i Anàlisi*, 27(2), pp. 1-6. doi: <http://dx.doi.org/10.6035/recerca.6750>

Responsible research and innovation (RRI) imposes normative requirements on research and innovation processes⁴ resembling three successive steps, each more ambitious than its predecessor, with distinct features.

For the research dimension the distinct features reflect the normative requirements of, first, credible research (through, for example, codes of conduct and standards for scientific integrity); second, responsive research (by opening up science to societal demands); and third, responsible research (which includes the anticipation of socially desirable outcomes). Equally distinct features reflect the requirements of credible innovation, responsive innovation, and responsible innovation (Von Schomberg, 2019).

The articles compiled in this special issue of RECERCA. REVISTA DE PENSAMENT I ANÀLISI touch upon various challenges and limits of RRI for improving the governance of research and innovation processes. Specifically,

¹ rene.vonschomberg@hotmail.com

² esteban@uji.es

³ sanahujr@uji.es

⁴ This study was supported by European Project “Ethics Governance System for RRI in Higher Education, Funding and Research Centres” [872360], funded by the Horizon 2020 programme of the European Commission, and by the Scientific and Development Research Project “Applied Ethics and Reliability for Artificial Intelligence” PID2019-109078RB-C21, financed by MCIN/AEI /10.13039/501100011033.

they reflect the normative challenges of these successive steps, each of which requires its own framework for good practice. The contributions to this special issue can be understood as an attempt to advance the development of these practices.

First, the creation of knowledge in science underlies various different universalisable codes for ‘good’ research conduct, enabling a global research practice that is virtually independent of cultural and national constraints. As the previous director of the US National Science Foundation, Subra Suresh, put it: ‘Good science anywhere is good for science everywhere’.

The issue of ‘what good science is’ can be seen as a purely internal matter for the scientific community. Indeed, it has always been scholarly societies or academies of science that have tackled this issue of credible research, which arguably also constitutes the most basic requirement of RRI.

However, we should not forget that these scholarly societies and other scientific institutions only engaged with the internal issue of good scientific conduct and scientific integrity in response to external societal pressure and clear ethical challenges. That this matter is far from settled is demonstrated by two articles in this special issue, one tackling an ethical issue of social science research (Lozano Aguilar, 2022) and another on the ethical biomedical issue of organ donation (Martínez López et al., 2022).

Yet, within its ‘open scholarship’ dimension, responsible research and innovation have added to the pressure to revise or extend the normative requirements of this first step for RRI governance. Hence, as well as credible, honest research, it is also calling for the revision of existing codes of conduct to promote good science, particularly with a view to achieving credible, reproducible and re-usable data, all of which are necessary to enhance science itself.

Open research and scholarship can be defined as “sharing knowledge and data as early as possible in the research process in open collaboration with all relevant knowledge actors” (Burgelman et al., 2019). Open research and scholarship (often simply referred to as ‘open science’ in the research policy-making context) is operationalised by researchers who use, re-use and produce open research outputs such as publications, software and data, engage in open collaboration with other scientists, and whenever appropriate for the subject matter of study, seek open collaboration

with non-scientific knowledge actors such as industrial organisations, civil society organisations or public authorities.

During the COVID-19 pandemic, we witnessed a change in the *modus operandi* of doing science as public authorities started to incentivise open science globally. This made it possible to deliver swiftly on vaccines. Without open science, the arrival of these vaccines in the market would have taken at least a decade under the usual circumstances of competitive, closed forms of science.

The research value of ‘openness’ can be seen as a constitutional value for the scientific community as such. Open scientific discourse —the exchange of ideas and competing approaches— is fundamental for the progress of modern science. ‘Openness’ is presupposed by the Mertonian norm of ‘communism’ (common ownership of scientific discoveries) and thus part of the ethos of science (Merton, 1979). However, the meaning of ‘openness’ is manifold and depends on the scientific discipline or the scientific mission in which it is embedded. With the emergence of open science, equally ethical issues become evident concerning the limits to ‘openness’ in particular contexts. In this special issue, the limits to openness are discussed with a view on data used in machine learning (Senent & Bueso, 2022) and with regard to the identity of the individuals being researched (Pérez-Soria, 2022). Open research and scholarship are particularly manifest in the case of interdisciplinary scientific cooperation aiming to develop a socially desirable output, as demonstrated by the case of COVID-19. Open research and scholarship have been incentivised in order to make science more efficient (better sharing of resources), more reliable (better verification of research data) and more productive with regard to producing a socially desirable output (in this case a vaccine). Research virtues or norms have been phrased historically as a subset of general human virtues. From the Mertonian *cudos* norms (Merton, 1979) to the codified principles of research integrity incorporated in the All European Academies’ European Code of Conduct for Research Integrity, norms or principles have been described as a fundament of a ‘good’ research practice. The ‘responsibility’ of the scientific community is then often described as an overarching duty to promote, manage, and monitor a research culture that is based on the scientific integrity of its members (ALLEA, 2017). Furthermore, research integrity includes a particular form of responsibility, namely the accountability of the whole internal scientific process from idea to publication. The

‘implementation’ of scientific integrity is managed by self-regulation of the scientific community.

Traditionally the scientific community has stopped short of taking any form of responsibility for consequences and side-consequences of the societal use of scientific insights and technologies and its unpredictable impacts on society. The responsibility for those consequences has been ‘allocated’ to the political system. This division of responsibilities has become a subject of intense debate virtually since the end of World War II. Intense debate on the risks of emerging technologies has led to the adoption of national laws and European directives on the risks, quality and efficacy of products arising from the use of new technologies. Western societies have gained the capacity to indirectly govern emerging technologies, notably by managing their risks and outlawing specific undesirable outcomes, such as cloning human beings. Our institutions thus have governance structures in place to manage the risks of technologies such as nuclear technology, genetics or nanoengineering. However, we do not have established capacities to anticipate or direct science and innovation towards socially desirable outcomes such as vaccines, or outcomes that underpin or make the transition towards sustainability possible. Responsible research and innovation has emerged as a response to this deficit in the governance of science and technology. RRI requires a form of governance that will either direct science towards socially desirable outcomes or manage innovation processes in such a way that those socially desirable outcomes are more likely to emerge (Stilgoe et al., 2013; Von Schomberg, 2019). Rodríguez (2022) discusses the limits of RRI in “Developments and limits in responsible innovation: RRI and Open Science within the ideological framework of institutionalised progress”.

It is therefore desirable to further develop a governance framework which institutionalises the organisation of co-responsibility across the spheres of science, policy and society on subjects that require open science missions, such as COVID-19. The institutionalisation of co-responsibility requires a kind of governance which goes beyond self-regulating mechanisms within science itself. There is a ‘responsibility’ for ‘organising co-responsibility’, shared by scientific, policy and societal actors. The institutionalisation of this responsibility will have consequences for the way science is funded and organised, for example through policy and financial incentives to embark on socially relevant open research missions, or by co-creating and co-designing research agendas with scientific, policy and soci-

etal actors, which are currently foreseen in the European Union's new Framework for Research and Innovation, Horizon Europe (2021-2027). An important aspect is the governance of the research missions themselves. When open research missions are conducted to achieve a socially desirable objective, their governance and organisation will have to differ significantly from research missions with a primary technological objective (for example: 'putting a man on the moon'). In fact, the ultimate step to complete RRI with anticipatory governance is inherent in this type of mission-oriented research. Urueña (2022) reflects systematically on anticipation as a core element of a wider concept of responsibility.

The governance of research of innovation based on a framework of RRI thus requires credible research, open and responsive research and responsible research that anticipates socially desirable outcomes. This anticipation also presupposes that such research and innovation are inevitably value-driven as those values mark the desirability or undesirability of research and innovation outcomes. García-Barranquero and Diéguez (2022) and Castro Sánchez (2022) discuss specific challenges for value-driven research and innovation in the discourse on transhumanism and the historic case of the Spanish elections of 1936, respectively.

REFERENCES

- All European Academies (2017). *The European Code of Conduct for Research Integrity*. <https://allea.org/code-of-conduct/>
- Burgelman Jean Claude, Pascu, Corina, Szkuta, Katrzyna, Von Schomberg, René, Karalopoulos Athnasios, Repanas, Konstantinos & Schoupe, Michel (2019). Open Science, Open Data, and Open Scholarship: European Policies to Make Science Fit for the Twenty-First Century. *Front. Big Data*, 2, 43.
- Castro Sánchez, Álvaro (2022). Historia y neutralidad ideológica. Valores, posiciones políticas y ética de la investigación. *Recerca. Revista de Pensament i Anàlisi*, 27(2).
- García-Barranquero, Pablo & Diéguez, Antonio (2002). El doble efecto de la pandemia en el discurso transhumanista. *Recerca. Revista de Pensament i Anàlisi*, 27(2).

- Lozano Aguilar, José Félix (2022) El sentimiento kantiano de respeto como núcleo normativo en investigaciones sociales en contextos de vulnerabilidad. *Recerca. Revista de Pensament i Anàlisi*, 27(2).
- Martínez-López, Maria Victoria, Martín Nieto, Eva María & Cruz Piqueras, Maite (2022). ¿Permiso para investigar? Reflexiones sobre los requisitos éticos de la observación participante en el contexto de la entrevista familiar de obtención de órganos. *Recerca. Revista de Pensament i Anàlisi*, 27(2).
- Merton, Robert K. (1979). The Normative Structure of Science. In Merton, Robert K. *The Sociology of Science: Theoretical and Empirical Investigations* (223-280). Chicago: University of Chicago Press.
- Pérez-Soria, Judith (2022). Qué hacer en la investigación cualitativa ante la apertura de datos. *The Sociology of Science: Theoretical and Empirical Investigations*, 27(2).
- Rodríguez, Hannot (2022). Desarrollos y límites de la innovación responsable: RRI y Open Science frente al entramado ideológico del progreso institucionalizado. *Recerca. Revista de Pensament i Anàlisi*, 27(2).
- Senent, Rosa M. y Bueso, Diego (2022). The Banality of (Automated) Evil: Critical Reflections on the Concept of Forbidden Knowledge in Machine Learning Research. *Recerca. Revista de Pensament i Anàlisi*, 27(2).
- Stilgoe, Jack, Owen, Richard & Macnaghten, Philip (2013). Developing a Framework for Responsible Innovation. *Research Policy*, 42(3), 1568-1580.
- Urueña López, Sergio (2022). La anticipación en la búsqueda de una innovación responsable: gradientes de radicalidad ético-política *Recerca. Revista de Pensament i Anàlisi*, 27(2).
- Von Schomberg, René (2019). Why responsible innovation. In Von Schomberg, René and Hankins, Jonathan (eds.). *International*

Handbook on Responsible Innovation: A Global Resource (12-32). Cheltenham & Northampton, MA: Edward Elgar.