



SCIENCE, SOCIETY AND CITIZENS: SUGGESTIONS (AND HOPES) ON HOW TO FOSTER RRI IN HORIZON EUROPE

More democratic research and innovation

Robert Braun and Erich Griessler

Abstract

For decades the idea that scientists, policy makers and industry know best in research and innovation has been convincingly challenged. The concept of Responsible Research and Innovation [RRI] combines various strands of critique and takes up the idea that research and innovation need to be democratized and must engage with the public in order to serve the public. The proposed future EU research funding framework programme, Horizon Europe, excludes a specific program line on research in RRI. We propose a number of steps the European Parliament should take to institutionalize RRI in Horizon Europe and beyond.

Keywords

Participation and science governance; Public perception of science and technology; Science and policy-making

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“Our situation is not comparable to anything in the past. It is impossible, therefore, to apply methods and measures which at an earlier age might have been sufficient. We must revolutionize our thinking, revolutionize our actions, and must have the courage to revolutionize relations among nations of the world. Clichés of yesterday will no longer do today, and will, no doubt, be hopelessly out of date tomorrow.”

Albert Einstein: Ideas and Opinions, 1954, p. 150.

European citizens, as other people of the Globe, seem to be in a dire situation today. Scientific knowledge production, research and innovation assist peoples of Europe to live better lives.¹ However, there is a growing disbelief in science, political suspicion towards evidence based policy making and growing concern with inequitable societies [Mejlgaard et al., 2018a]. Nevertheless, research and innovation is still dominantly entangled in its traditional ‘Republic of Science’

¹This flash commentary is based on research carried out within the NewHoRRIZon project. NewHoRRIZon receives funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 741402. For more information see (www.newhorizon.eu). Authors would like to thank all members of the NewHoRRIZon consortium who have provided research input and comments for this piece.

[Polanyi, 1962] where self-defined 'excellence' is the canon of self-improvement, public interest and the principal provider of progress.

In a recent study [Shipton et al., 2018] researchers claim that the main reason for the extinction of a hominin population on the Arabian Peninsula was their routinized, linear approach to technological innovation as well as their favoring of fixed and easy access to their physical and intellectual resources. While the genus *Homo* was successful in the Early and Middle Pleistocene, they neither made additional efforts climbing the hill for better stones for their bifaces, nor did they develop new tools that better fit the challenges of the changing climate.

We, today, are socio-technically conservative and techno-scientifically reluctant to revolutionize our actions in how we do research. The old 'way of seeing' [Kuhn, 1962] research and innovation is very much present. *"I have to admit I did not feel much except great joy because it was a success. It was really later that we thought more about it (. . .) I don't feel any guilt or blame about it. I think if we would not have done it, somebody else would have and we would have the bomb in any case"* says Lilli S. Horning, a chemist involved in the Manhattan project [Horning, 2015]. Her recollection and assessment of an extreme case of technological innovation — the atomic bomb — epitomizes the dominant linear mode of thinking about the relationship of science and society — 'act first and think later about its societal implications'; contingent technological development post-rationalized in retrospect as inevitable ('it would have happened anyway').

For decades the idea that scientists, policy makers and industry know best in research and innovation has been convincingly challenged for different reasons from a multitude of angles including anti-nuclear power movement, bioethics, environmentalism, ethics, feminism, science and technology studies. One of the first targets that raised the question about ethical and social implications of big science was the development of the atomic bomb by the Manhattan project. Public controversies about assisted reproductive technology, genetic testing, bio- and nanotechnology, nuclear energy, to name a few, followed [Kleinman et al., 2010].

Though the issue of responsibility might play out differently in basic research, applied research and innovation, the concept of Responsible Research and Innovation [RRI] [Von Schomberg, 2013; Owen, Bessant and Heintz, 2013; Stilgoe, Owen and Macnaghten, 2013] combines these various strands of critique and takes up the idea that science/industry and elite politics cannot be left on their own, that research and innovation need to be democratized and must engage with the public in order to serve the public [Braun, 2018]. The main aim of RRI is to reconnect science, democratic institutions and citizens. This idea has been cultivated by the European Commission in several successive Framework Programmes. It has yielded an abundance of methods, theories, practices of RRI [Mejlgaard et al., 2018b]. Research has also shown that RRI makes a difference [Bührer et al., 2017; Deblonde, 2015] and that there are clear societal and economic benefits of doing RRI in societal, democratic and economic terms but also in terms of doing better science and innovation [Wuketich et al., 2016].

New 'ways of seeing' blossomed. Civil society actors, artists, lay people have been involved in research and innovation. New concepts, approaches and ideas, from open innovation to quadruple helix innovation, from fablabs to maker spaces have

been invested into. This led to innovations that *nobody* ‘would have come up with’ or ‘would have done’ — to paraphrase Horning [2015].

We,² however, find in our research on the implementation of RRI as a cross-cutting issue within H2020 that even European research programming adopts only select elements, rather than the overarching concepts, of RRI and the Open Agenda [cf. Bernstein et al., 2018; Griessler et al., 2018; Novitzky et al., 2018]. Some elements of RRI (e.g. gender equality and open access) are integrated successfully, while progress on others lags (e.g., ethics and public engagement). Even in the more successful areas of integration, institutionalization is done without evidence of coordinated strategic planning or learning from experiences. Our research also shows that RRI lacks a shared understanding and practice on a more conceptual and strategic level. There is a high variability in requirement, evaluation, and successful implementation of RRI keys. Definitions of “excellence” in evaluation criteria are not consistent across H2020 priorities.

Our first diagnosis of the state of RRI in H2020 concluded that investments in RRI and the Open Agenda are far from complete and should be continued in Horizon Europe with greater attention to strategy and clear commitment; continued investment is still required in capacity building; and inclusion of more diverse perspectives and expertise is desirable [Stilgoe, Lock and Wilsdon, 2014]. The demarcation rationality of scientists [Glerup and Horst, 2014] should be challenged and a workable epistemic community [Haas, 1992] around RRI must be further developed and sustained.

Such epistemic communities are not only shaped by the results, facts and data of scientific research but also by strategies, conceptualizations and influences of power. Policy makers, researchers and other key stakeholders should make four fundamental steps:

- a. more investment in evidence based research on RRI methods, processes and societal benefits of RRI to allow for learning in order to genuinely integrate RRI in research funding;
- b. developing recommendations, operating rules and standards determining the appropriate action expected [Antoniades, 2003]. This means better aligning RRI with the actual rules that govern R&I programming and carrying through respective changes towards RRI from problem formulation in funding programs to evaluation criteria and follow-up requirements.
- c. mainstreaming the concept of RRI organized in a comprehensive narrative showing its ideas and potential;
- d. investing in training, education, and publicity to circulate an idea of RRI.

In our first Policy Brief [Braun and Bernstein, 2018] and on other venues³ we made specific recommendations that Members of the European Parliament could put into action:

²The NewHoRRizon consortium was commissioned to do a full analysis of the state of RRI in Horizon 2020 and come up with policy proposals to mainstream RRI in European and national research funding programmes.

³Citizens’ participation in research and innovation: opportunities and challenges in Horizon Europe 2021–2027, Euroscience/NewHoRRizon Session at ESOF 2018 (13 July, 2018, Toulouse).

1. A separate program line, similar to SWAFS, should continue to fund research in RRI to explore new possibilities in R&I governance and other societal benefits, alternative methods and openings to make a difference.
2. The design of Horizon Europe should place increased and strategic emphasis on 'excellence' in terms of transparent, and socially robust knowledge that is inclusive of stakeholder and citizen perspectives, including such approaches in determining research agendas, offering inter- and trans-disciplinary viewpoints and inviting stakeholders to the evaluation process. This should be applied across Horizon Europe not only in the so called Missions.
3. Missions in Horizon Europe are instruments to invite revolutionary thinking in addressing challenges. Mission boards should have robust and formalized roles for citizens, public interest groups and consultations. One such 'mission' should specifically target how to institutionalize responsibility in research and innovation based on MoRRI indicators [Mejlgaard et al., 2018b].
4. Research shows that criteria-changing policies work best with additional investments in capacity building and training of programme officers, evaluators, researchers, innovators, and stakeholders to learn more about ways science and technology are embedded in society and about the benefits of building more inclusive approaches to R&I. This should be part of Horizon Europe and an independent unit should oversee the process.
5. In-person citizen consultations could be organized to complement online citizen consultations at key points in work programme development; commissioned inputs from conventional stakeholder committees of the EC should be supplemented with broader, more diverse stakeholder groups.
6. Investments in the development of "Key Performance Indicators" or other methods of monitoring and evaluating RRI implementation could provide vital tools and instruments that can be implemented and learned from at a greater scale across R&I programming.

Research and innovation must be re-politicized and democratized. European decision makers should step up their efforts in institutionalizing responsibility in research and innovation. This is to be done through assisting in creating more research evidence of responsible practices and methods, supporting and propagating a comprehensive concept and narrative of RRI, as well as deepening the application of rules, norms and processes of responsibility across European and national research funding instruments. This move towards responsibility however should spur research and innovation. The SWAFS program line did exactly this in Horizon 2020 and should do the same in Horizon Europe for the next seven years. 'Our current stones for modern bifaces' may lay on the 'other side' of the current closed and linear research and innovation practice. As research on and the praxis of RRI has shown there are open and responsible ways to create a more democratic and future proof European Republic of Science and Innovation.

References

- Antoniades, A. (2003). 'Epistemic communities, epistemes and the construction of (world) politics'. *Global Society* 17 (1), pp. 21–38.
<https://doi.org/10.1080/0953732032000053980>.
- Bernstein, M. J., Griessler, E., Brandstätter, T., Cohen, J., Loeber, A., Seebacher, L. M., Marschalek, I. and Unterfrauner, E. (2018). *NewHoRRizon Project D2.1. Diagnosis: RRI in Excellent Science*. Deliverable to the European Commission. Grant agreement No. 741402. European Union.
- Braun, R. (11th January 2018). 'Excellent research is focused on citizens, not citations'. *Research Europe*, p. 8.
- Braun, R. and Bernstein, M. (May 2018). *Responsible Research and Innovation in H2020, current status and steps forward*. Brussels, Belgium.
URL: <https://newhorizon.eu/wp-content/uploads/2018/06/newhorizon-ri-h2020-policy-brief-001.pdf>.
- Bührer, S., Lindner, R., Berghäuser, H., Woolley, R., Mejlgaard, N., Wroblewski, A. and Meijer, I. (2017). *Monitoring the evolution and benefits of RRI: report on the researchers' survey*. Brussels, Belgium.
- Deblonde, M. (2015). 'Responsible research and innovation: building knowledge arenas for glocal sustainability research'. *Journal of Responsible Innovation* 2 (1), pp. 20–38. <https://doi.org/10.1080/23299460.2014.1001235>.
- Glerup, C. and Horst, M. (2014). 'Mapping 'social responsibility' in science'. *Journal of Responsible Innovation* 1 (1), pp. 31–50.
<https://doi.org/10.1080/23299460.2014.882077>.
- Griessler, E., Álvarez, E., Bernstein, M., Bierwirth, A., Braun, R., Christensen, M. V., Daimer, S., Goos, K., Hönigsmayer, H., Mejlgaard, N., Nielsen, M. L., Nielsen, M. W., Starkbaum, J. and Tabarés, R. (2018). *NewHoRRizon Project D5.1. Diagnosis: RRI in Diversity of Approaches*. Deliverable to the European Commission. Grant agreement No. 741402. European Union.
- Haas, P. M. (1992). 'Introduction: epistemic communities and international policy coordination'. *International Organization* 46 (1), pp. 1–35.
<https://doi.org/10.1017/s0020818300001442>.
- Horning, L. S. (2015). *The bomb*. [Documentary film]. In *Artre*. Ed. by R. DeNooyer.
- Kleinman, D. L., Delborne, J., Cloud-Hansen, K. A. and Handelsman, J. (2010). *Controversies in science and technology*. Vol. 3. New York, U.S.A.: Mary Ann Liebert, Inc.
- Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago, U.S.A.: University of Chicago Press.
- Mejlgaard, N., Woolley, R., Bloch, C., Bührer, S., Griessler, E., Jäger, A., Lindner, R., Bargmann Madsen, E., Maier, F., Meijer, I., Peter, V., Stilgoe, J. and Wuketich, M. (2018a). 'Europe's plans for responsible science'. *Science* 361 (6404), pp. 761–762.
<https://doi.org/10.1126/science.aav0400>.
- Mejlgaard, N., Bloch, C., Madsen, E. B., Griessler, E., Wuketich, M., Meijer, I., Woolley, R., Lindner, R., Bührer, S., Jäger, A., Tsipouri, L. and Stilgoe, J. (2018b). *Monitoring the evolution and benefits of responsible research and innovation in Europe*. Ed. by V. Peter and F. Maier. Brussels, Belgium: European Commission.
- Novitzky, P., Blok, V., Timmermans, J., Dvořáčková, J., Kebo, V., Macenauer, L., Machát, Z. and Vostál, F. (2018). *NewHoRRizon Project D3.1. Diagnosis: RRI in Industrial Leadership*. Deliverable to the European Commission. Grant agreement No. 741402. European Union.

- Owen, R., Bessant, J. and Heintz, M. (2013). Responsible innovation: managing the responsible emergence of science and innovation in society. U.S.A.: John Wiley & Sons. <https://doi.org/10.1002/9781118551424>.
- Polanyi, M. (1962). 'The republic of science'. *Minerva* 1 (1), pp. 54–73. <https://doi.org/10.1007/bf01101453>.
- Shipton, C., Blinkhorn, J., Breeze, P. S., Cuthbertson, P., Drake, N., Groucutt, H. S., Jennings, R. P., Parton, A., Scerri, E. M. L., Alsharekh, A. and Petraglia, M. D. (2018). 'Acheulean technology and landscape use at Dawadmi, central Arabia'. *PLOS ONE* 13 (7), e0200497. <https://doi.org/10.1371/journal.pone.0200497>.
- Stilgoe, J., Lock, S. J. and Wilsdon, J. (2014). 'Why should we promote public engagement with science?' *Public Understanding of Science* 23 (1), pp. 4–15. <https://doi.org/10.1177/0963662513518154>.
- Stilgoe, J., Owen, R. and Macnaghten, P. (2013). 'Developing a framework for responsible innovation'. *Research Policy* 42 (9), pp. 1568–1580. <https://doi.org/10.1016/j.respol.2013.05.008>.
- Von Schomberg, R. (2013). 'A Vision of Responsible Research and Innovation'. In: *Responsible Innovation*. Ed. by R. Owen, J. Bessant and M. Heintz. New York, NY, U.S.A.: John Wiley & Sons, Ltd, pp. 51–74. <https://doi.org/10.1002/9781118551424.ch3>.
- Wuketich, M., Lang, A., Griessler, E. and Polt, W. (2016). Monitoring the evolution and benefits of Responsible Research and Innovation (MoRRI): RRI benefits and economic effects. Summary and assessment of empirical data. Brussels, Belgium: European Commission.

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