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ON RESPONSIBLE RESEARCH AND INNOVATION – AN OLD CONCEPT CLAD IN NEW CLOTHES

O odpowiedzialnych badaniach i innowacjach – stare pojęcie w nowych szatach

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A – przygotowanie projektu badania | study design, **B –** zbieranie danych | data collection, **C –** analiza statystyczna | statistical analysis, **D –** interpretacja danych | data interpretation, **E –** przygotowanie maszynopisu | manuscript preparation, **F –** opracowanie piśmiennictwa | literature search, **G –** pozyskanie funduszy | funds collection

SUMMARY

A fast evolution of science and technology often raises controversies. Numerous cases of research results which had been questioned or rejected by public opinion have clearly demonstrated that public concerns can be neither ignored nor reduced to the question of risk. Science no longer enjoys a special status and society is getting more and more concerned about the purposes and motivations of research, and demands to be included in the decision making process on research agenda. The article presents a concept of Responsible Research and Innovation – its roots and potential to address the problem of (a lack of) legitimacy without doing harm to research. The author points also that the concept of Responsible Research and Innovation (RRI) raises a lot of controversies. It looks like yet another attempt to manage science and to steer it more towards politically defined goals. Although it calls for public opinion to be more involved in setting agenda for research, it does not explain clearly how this involvement should actually be organized to be labelled "responsible". When analysed in depth, RRI appears to be quite complicated as it defines responsible research and innovation both through their outcomes and through a set of requirements that research and innovation processes should fulfil. Finally, it causes confusion since it gathers too many differing aspects of research and innovation-related activities under the same roof.

Keywords: responsibility, innovation, science society interactions

STRESZCZENIE

Szybki rozwój nauki i technologii często budzi kontrowersje. Liczne przykłady badań, które zostały zakwestionowane lub odrzucone przez opinię publiczną pokazały dobitnie, że obawy społeczeństw nie powinny być ani ignorowane, ani ograniczane do kwestii ryzyka. Nauka nie cieszy się już specjalnym statusem w społeczeństwie, a obywatele są coraz bardziej zainteresowani celami i motywacją stojącą za prowadzonymi badaniami naukowymi i domagają się włączenia w proces decyzyjny dotyczący przedmiotu i zakresu prowadzonych badań. Niniejszy artykuł prezentuje pojęcie „odpowiedzialne badania i innowacje" (OBI) – jego źródła, a także potencjału do rozwiązania problemu (braku) legitymizacji bez szkody dla samej nauki. Autor wskazuje również, że pojęcie to budzi wiele kontrowersji. Wygląda ono bowiem jak kolejna próba wywarcia wpływu na naukę i pokierowania zainteresowań naukowców w stronę politycznie zdefiniowanych celów. Chociaż pojęcie to zakłada większe zaangażowanie opinii publicznej w ustalaniu agendy badawczej dla nauki, nie wyjaśnia ono jednak precyzyjnie, jak takie zaangażowanie powinno wyglądać, aby dane badania naukowe lub działalność innowacyjną można było określić jako „odpowiedzialne". Kiedy przyjrzymy się bliżej definicji OBI, to okazuje się, że termin ten jest dość skomplikowany, jako że odpowiedzialne badania i innowacje definiowane są zarówno pod kątem ich wyników, jak i spełniania przez sam proces badawczy czy innowacyjny określonych parametrów. Poza tym, pojęcie OBI może powodować pewną dezorientację, że względu na to, iż łączy zbyt wiele różnych aspektów działalności badawczej i innowacyjnej.

Słowa kluczowe: odpowiedzialność, innowacje, relacje nauka–społeczeństwo

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It takes a lot of time before even the most promising basic research brings any tangible results or any technological invention makes it to the marketplace. Therefore it is hard to predict what impacts any research or technology may have on society. Innovation process looks completely different when seen from various perspectives and interests of scientists are not always in line with those of non-scientists [1–3]. There are many cases in which innovations have been rejected by their potential users (failure to introduce GMO in Europe is one of the most frequently listed here)[4–6]. The reasons behind a rejection may vary – sometimes it is a clear collision between the research results and values and beliefs of society, often however they seem to be completely irrational. In any case, it has become clear that although science and technology are capable of changing our lives and provide us with many benefits, scientists are under increased pressure to justify their research activities and their knowledge claims to broader society. And this is not only about anticipating problems with implementation of any concrete technology [7] – it is rather a problem of (a lack of) legitimacy of science [8–9]. Therefore, one can observe a growing pressure on research and innovation to be better aligned with interests of society and for societal and ethical considerations to be integrated into science and technology development. Some put this pressure in a broader context and describe it as a process of revision of a social contract, which for many years has guaranteed the scientific enterprise a special status in Western societies and autonomy against any social scrutiny. This pressure is being fuelled by past and present public controversies over nuclear power plant accidents, climate change, widespread environmental pollution and many other disputes dating back decades. What all these disputes have in common – apart from the general conclusion that they illustrate that science no longer enjoys a special status – is the fact that they explore the question of responsibility and argue that researchers' responsibility cannot be reduced to their professional roles.

The debate on responsibility has been gradually taken over by policy makers. The concept of *Responsible Research and Innovation* (RRI) can be described as the newest output of this debate. It gained its momentum during the preparations of the EU Horizon 2020 program, where it has been linked with the economic crisis and with the assumption that the so-called *Grand Challenges* – due to their very nature – cannot be solved by researchers only. One of the most frequently cited examples of this approach comes from a speech given by Maire Geoghenan-Quinn, the then European Commissioner for Research, Innovation and Science who said:

"As the Europe 2020 Strategy makes it clear, to overcome the current economic crisis we need to create a smarter, greener economy, where our prosperity will come from research and innovation. Science is the basis for a better future and the bedrock of a knowledge-based society and a healthy economy. After ten years of action at EU level to develop and promote the role of science in society, at least one thing is very clear: we can only find the right answers to the challenges we face by involving as many stakeholders as possible in the research and innovation process. Research and innovation must respond to the needs and ambitions of society, reflect its values, and be responsible [...]" [10].

Obviously, the final version of the concept of RRI, as promoted by the EU, turned out to be a compromise between the European Commission and the European Parliament – that is why it embraces both the economic aspect of innovation and the societal aspect of research. One has to remember though that these efforts were not separated from the outside world. To a large extent they reflected the needs expressed by other stakeholders, such as industry representatives, civil society organizations and scientists themselves [11].

Although the very term RRI is relatively new it would be hard to claim that it popped up suddenly and out of the blue. On the contrary, its content (not the exact wording) can be easily traced back and found in the previous Framework programmes of the European Union. Some look for its roots in the 4th EU Framework Programme which was launched in 1994 and tried to link societal issues with those directly related to research by the so-called ELSA (which stands for *ethical, legal and social aspects of emerging sciences and technologies*). Others claim that the whole debate on relations between science and society started much earlier. In 2013, under the auspices of the European Science Foundation, a group of experts led by Ulrike Felt of the University of Vienna published a report on Science in Society [12–13], in which the process of RRI was divided into five major steps. According to this report, the evolution started a bit earlier – that is with the slogan *Information politics and monitoring of citizens* which appeared in 1989, only to be replaced with *Raising Awareness of Science and Technology* in the 1990s and then by *Dialogue, participation and governance* in the early 2000s. All these were smashed away by *From Science and Society to Science in Society* in 2007 and currently – with the Innovation Union – had to leave the floor for the term *Responsible Research and Innovation*. Obviously, changing terminology does not mean a semantic change only – it rather reflects an ongoing debate on the embedment of science and innovation in a broader, socio-economic context. It is worth noticing here that none of these terms – either RRI or its predecessors – has been invented by the research community itself. They were rather initiated by science policy makers or funding bodies and implemented in a top-down manner. In other words, we can observe a long lasting process which – at first – looks like changing labels and replacing one phrase with a new catchy one. But, in fact, by observing this process, one can understand how priorities have been changing over these two decades and how consequent terms were used to put more emphasis on some specific features of the described phenomenon [14].

It is very difficult to explain what *Responsible Research and Innovation* really means as the concept is still under construction and even experts are not unanimous regarding its definition. But no doubt RRI, as a new approach to research and innovation, puts a lot of emphasis on the question of responsibility and points at a broad group of stakeholders who should actually share this responsibility. The most frequently cited definition of RRI, proposed by Rene von Schomberg assumes that "RRI is a transparent, interactive process by which societal actors and innovators become mutually

responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)" [15]. This approach however lacks lightness and simplicity which would make it understandable to non-experts. Therefore, in order to reach a broader audience it is worth quoting another definition, proposed by experienced science communicators who wrote that "RRI is the idea that since research and innovation have an impact on society, scientists as individuals and the research and innovation community as a system have a social, even societal, responsibility. Conversely, politicians, industries and citizens can't leave the burden of responsibility on the scientists' shoulders only – they need to define where society wants to go and get involved in setting research agendas that will take us there" [16].

The concept of *Responsible Research and Innovation* raises a lot of controversies. First, it looks like another attempt to manage science and to steer it more towards politically defined goals. No matter how successful we are going to be in implementing this concept, it cannot change the fact that unforeseen effects of technologies are utterly unpredictable. We can push science to be more accountable, more community based and more responsive to the needs of society but we have to be careful and do not cross a thin red line beyond which a scientific freedom might be at risk. Besides, the question of responsibility, so important in the context of RRI, needs to be further discussed and nuanced so that it takes into account obvious differences between curiosity driven research and applied research.

Second, RRI refers to societies and argues that public opinion should be more involved in setting agenda for research [17]. It is not clear however how this involvement should actually be organized [3, 18] to be labelled "responsible". In addition, the different contexts we find throughout Europe confront us with different challenges, and ask for different solutions. The uptake of the idea of RRI is much more visible and vigorous in such countries as the UK or the Netherlands than in Eastern Europe. Moreover, even if we do our best to involve all stakeholders in RRI-like practices, there is no guarantee that the values society holds dear will always be in harmony with whatever solutions to societal problems are technologically possible [19].

Third, although the term gathering research and innovation under the same roof may look promising, in reality it rather causes confusion. Even if we put aside concerns about potential overlap between RRI and *Corporate Social Responsibility* (CSR) we have to admit that most innovations are initiated and take place in the private sector, whereas most responsible research is – or will be – inspired by public authorities and publicly funded. The question is how we can encourage private sector to contribute to RRI and how some aspects of RRI – e.g. openness – can be accommodated and balanced with various different interests and positions of private companies?

Finally, sometimes one can get too much of a good thing. RRI when analysed in depth appears to be quite complicated. It defines responsible research and innovation both through their outcomes and through a set of requirements that research and innovation processes should fulfil [20–21]. It attempts to encompass all stages of R&I – from organisation of the research agenda and research teams, involvement of research target groups in R&I, implementation of the research results, feedback towards stakeholders and evaluation of the results, open access to the results by third parties, monitoring and evaluation of R&I to education. The fact that RRI serves as an umbrella term adds to its ambiguity and makes it a perfect tool for politicians rather than for researchers. Does RRI, as a concept, really possess a potential to become something more than just another fashionable buzz-word which sooner or later will be replaced by another term? Can something invented outside scientific community become an effective policy instrument and really transform our approach to research and innovation?

The concept of "responsible innovation" is relatively new. The use of the term suggests that over the past decades, innovation has not been all that responsible. Indeed, the negative impact of innovations on individuals, societies and eco-systems was often neglected in favour of economic growth. The emergence of responsible research and innovation can be understood as a new approach towards research and innovation, in which social and ethical aspects are explicitly taken into account and economic, socio-cultural and environmental aspects are balanced [20, 22]. One has to remember though that the impacts of technological innovations have always been difficult to predict. Even the idea of technology foresight, which was so popular in the 1970s and later, has been significantly modified and now it is more about monitoring of research and innovations processes and making them more dynamic and inclusive [23]. And the question of responsibility, which is at the core of RRI concept, is scattered and the fact that knowledge is co-produced by many "authors" does not add to its clarity [20].

It is natural for societies to react to a fast evolution of science and technology. Controversies and numerous cases of research results being rejected have clearly demonstrated that public concerns cannot be reduced to questions of risk. Society is getting more and more concerned about purposes and motivations of research and wants to have a say on them, too [24]. The key question now is how to address these concerns without doing harm to research and without expecting too much of society. Saying "no" is always easier and faster than making an effort to understand the aim and possible outcomes of research. Making an informed decision is not easier than casting a vote and science is no less susceptible to demagogy than any other sphere of life.

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References

1. Gibbons M, Limoges C, Nowotny H, Schwartzman S, Scott P, Trow M. The new production of knowledge: The dynamics of science and research in contemporary societies. London; 1994: 17–45.
2. Hessels LL, Van Lente H. Re-thinking new knowledge production: A literature review and a research agenda. Res Policy 2008; 37: 740–760.
3. Abels G. Citizen involvement in public policy-making: does it improve democratic legitimacy and accountability? The case of pTA. Interdiscipl Inform Sci 2007; 13 (1): 103–116.
4. Blankesteijn M, Munnichs G, van Drooge L. Contested science. Public controversies about science and policy. Rathenau Instituut Research & dialogue. Science, technology and innovation [online] [cit. 16.03.2016]. Available from URL: https://www.rathenau.nl/en/node/333.
5. Tsjalling S, Stemering D, Boenink M. Exploring techno-moral change: the case of obesity pill. In: Sollie P, Duwell M, ed. Evaluating new technologies. New York: Springer; 2009: 119–138.
6. Cook-Deegan R. The gene wars: science, politics, and the human genome. New York–London: Norton; 1994.
7. Nordmann A. Responsible innovation: The art and craft of anticipation. Journal of Responsible Innovation 2014; 1: 87–98, 109–112.
8. Wynne B. Public engagement as a means of restoring public trust in science – hitting the notes, but missing the music? Community Genet 2006; 9: 211–220.
9. Bauer M, Shukla W, Allum N. The culture of science: how the public relates to science across the globe. New York: Routledge; 2012.
10. Speech delivered at the conference "Science in dialogue – towards a European Model for Responsible Research and Innovation", Odense, Denmark, 23–25 april 2012, p. 10–11. Documentation. Below you can find the documentation that was produced during and after the conference [online] [cit. 10.03.2016]. Available from URL: http://ufm.dk/en/research-and-innovation/communicating-research/responsible-research-and-innovation.
11. Van Oudheusden M. Where are the politics in responsible innovation? European governance, technology assessments, and beyond. Journal of Responsible Innovation 2014; 1 (1): 2–5, 67–86 [online] [cit. 10.03.2016]. Available from URL: http://www.tandfonline.com/doi/full/10.1080/23299460.2014.882097.
12. Felt U, ed. Science in society: caring for our futures in turbulent times [online] 2013 [cit. 10.03.2016]. Available from URL: http://www.esf.org/publications.html.
13. Hannot R, Fisher E, Schuurbiers D. Integrating science and society in European Framework Programmes: Trends in project-level solicitations. Res Policy 2013; 42: 1126–1137.
14. Zwart H, Landeweerd L, van Rooij A. Adapt or perish? Assessing the recent shift in the European research funding arena from 'ELSA' to 'RRI'. Life Sciences, Society and Policy 2014; 10 (11): 1–4 [online] [cit. 10.03.2016]. Available from URL: http://lsspjournal.springeropen.com/articles/10.1186/s40504-014-0011-x.
15. Schomberg von R. Prospects for technology assessment in a framework of responsible research and innovation. In: Technikfolgen abschätzen lehren: Bildungspotenziale transdisziplinärer Methode. Wiesbaden: Springer VS; 2013: 39–61.
16. Troncoso A, Becker J. RRI for beginners [online] 2015 [cit. 10.03.2016]. Available from URL: http://www.ecsite.eu/activities-and-services/news-and-publications/digital-spokes/issue-10-0#section=section-indepth&href=/feature/depth/rri-beginners.
17. Robin W, Edge D. The social shaping of technology. Res Policy 1996; 25: 865–899.
18. Kerr A, Cunnigham-Burley S, Tutton R. Shifting subjects positions: experts and lay people in public dialogue. Soc Stud Sci 2007; 37 (3): 385–411.
19. Kupper F. RRI tools – where we are and what we are after [online] 2014 [cit. 10.03.2016]. Available from URL: http://www.euroscientist.com/rri-tools/.
20. Schomberg von R. A Vision of responsible research and innovation. In: Owen R, Bessant J, Heintz M, ed. Responsible innovation. Managing the responsible emergence of science and innovation in society. Chichester: Wiley; 2013; 51–74.
21. Stilgoe J, Owen R, Macnaghten P. Developing a framework for responsible innovation. Res Policy 2013; 42 (9): 1568–1580.
22. Block V. The emerging concept of responsible innovation. Three reasons why it is questionable and calls for a radical transformation of the concept of innovation. In: Koops BJ, Oosterlaken I, Romijn H, Swierstra T, van den Hoven J, ed. Responsible innovation. 2. Concepts, approaches, and applications. New York: Springer; 2015: 20–21.
23. Guston D. Sarewitz D. Real-time technology assessment. Technol Soc 2013; 24: 93–109.
24. Responsible research and innovation (RRI), Science and technology. Report. Special Eurobarometer 401 [online] [cit. 10.03.2016]. Available from URL: http://ec.europa.eu/public_opin ion/archives/ebs/ebs_401_en.pdf.

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