

Open, transparent and honest – the way we practice research

By Bertil F. Dorch*

Abstract

This paper makes the case for Open Science as a means to support and practice Responsible Conduct of Research. Responsible and ethical research practices imply research integrity in terms of transparency, honesty and accountability in all parts of research, be it when attaining funding for research, collecting and analyzing research data, collaborating on research, performing scholarly communication, e.g. authoring and disseminating research etc. Likewise, the topics normally associated with Open Science directly support responsible conduct and in fact, one can argue that Open Science is a ubiquitous prerequisite for good research practice.

Keywords:

Research integrity; RCR; Open Science; research policy

1. Introduction: Good research practice

In its introduction to Responsible Conduct of Research (henceforth RCR) the U.S. Office of Research Integrity (ORI) summarizes that "in general terms, responsible conduct in research is simply good citizenship applied to professional life" (Steneck 2007). ORI oversees and directs Public Health Service research integrity activities on behalf of the U.S. Secretary of Health and Human Services, and as such is concerned with both how public funding is spent on research, as well as with the general ethos of that research.

Similarly, in the U.S. the National Science Foundation¹ provides resources on NSF's implementation of U.S. law on RCR, recognizing that "responsible and ethical conduct of research is critical for excellence, as well

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¹ <http://www.nsf.gov/bfa/dias/policy/rcr.jsp>

as public trust, in science and engineering. Consequently, education in RCR is considered essential in the preparation of future scientists and engineers”.

Internationally, the Singapore Statement² on Research Integrity represents “the first international effort to encourage the development of unified policies, guidelines and codes of conduct, with the long-range goal of fostering greater integrity in research worldwide.” The Singapore Statement, released in 2010, is the product of the collective effort and insights of hundreds of individuals from a large number of countries including researchers, funders, representatives of research institutions and research publishers.

The key principles of the Singapore Statement are:

- *Honesty* in all aspects of research
- *Accountability* in the conduct of research
- *Professional courtesy and fairness* in working with others
- *Good stewardship* of research on behalf of others.

The Singapore Statement lists 14 responsibilities of both researchers and research institutions with respect to RCR, including researchers’ responsibilities regarding keeping research records for verification purposes, openly sharing their data, and taking responsibility for “their contributions to all publications, funding applications, reports and other representations of their research.”

Hence, it is evident that RCR requires researcher and research institutions to practice and support research in an honest, transparent and accountable way.

2. Background: Transparency in research

In Denmark, the recently published Danish Code of Conduct for Research Integrity³ was drafted by a working group established by the Ministry of Higher Education and Science and Universities Denmark. As policy document or guideline the code is not unique but it represents a case that I will examine here in further detail.

² <http://www.singaporestatement.org>

³ <http://ufm.dk/publikationer/2014/filer-2014/the-danish-code-of-conduct-for-research-integrity.pdf>

The overall purpose of the Danish Code is to ensure and strengthen high-quality research, and as integrity should pervade all research phases the code establishes three key principles of research integrity:

- Honesty – to ensure the trustworthiness of research
- Transparency – to ensure the credibility of scientific reasoning
- Accountability – to ensure the reliability of research.

Recently, LIBER has issued the LIBER Statement on Enabling Open Science,⁴ formulating a relation between the openness of Open Science and transparency of research: “We believe that the move towards openness will lead to increased transparency, better quality research, a higher level of citizen engagement, and will accelerate the pace of scientific discovery through the facilitation of data-driven innovation.”

The term Open Science has been coined by quantum physicist and science writer Michael Nielsen as “the idea that scientific knowledge of all kinds should be openly shared as early as is practical in the discovery process.” (Nielsen 2011).

Wikipedia⁵ describes Open Science as the “movement to make scientific research, data and dissemination accessible to all levels of an inquiring society, amateur or professional. It encompasses practices such as publishing open research, campaigning for open access, encouraging scientists to practice open notebook science, and generally making it easier to publish and communicate scientific knowledge.”

The European-funded project Facilitate Open Science Training for European Research (FOSTER) has developed an open science taxonomy as an attempt to map the open science field (Pontika et al. 2015): on the basis of the taxonomy and other similar works, it is evident that Open Science is a conceptual frame for addressing a wide range of scholarly communication-related practices or principles such as Open Access, Open Data, Open Source, Open Peer Review, Open Methodology etc. (cf. Fig. 1).

⁴ http://libereurope.eu/wp-content/uploads/2014/09/LIBER_Statement-on-open-science-final.pdf

⁵ https://en.m.wikipedia.org/wiki/Open_science

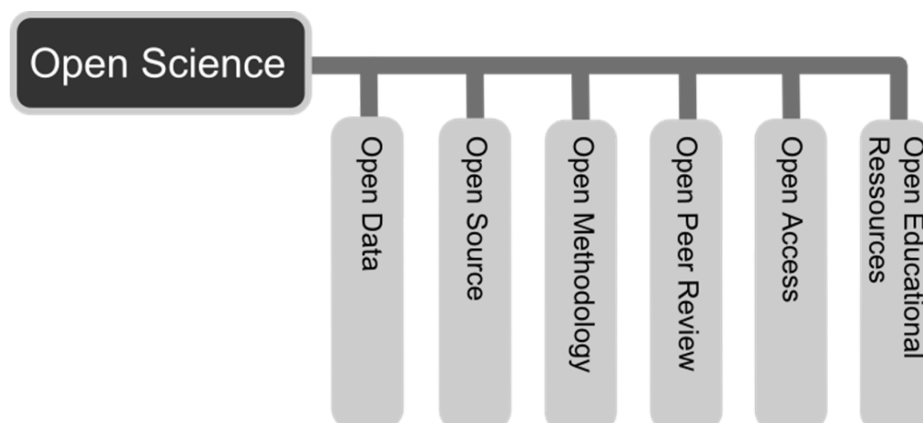


Figure 1: The six principles of Open Science (adapted from Neuhold 2014).

3. Discussion and conclusions

Coming back to the Danish Code of Conduct for Research Integrity as a case of a RCR guideline, we should note that the code invokes transparency in research in order to ”ensure the credibility of scientific reasoning and to ensure that academic reflection is consistent with practice in the relevant field of research, all phases of research should be transparent.” More specifically, the code concludes that ”this requires openness when reporting on conflicts of interest, planning of research, research methods applied, results and conclusions.”

Topic	<i>Data</i>	<i>Source</i>	<i>Methodology</i>	<i>Peer Review</i>	<i>Access</i>	<i>Education</i>
<i>Research planning and conduct</i>	X	X	X		X	(X)
<i>Data management</i>	X	X	X			
<i>Publication and communication</i>				X	X	X
<i>Authorship</i>	X	X	X	X	X	X
<i>Collaborative research</i>	X	X	X		X	
<i>Conflicts of interest</i>	(X)	(X)	(X)	X		

Table 1: Connecting the dots. Crosses “X” indicate how Open Science relates to Responsible Conduct of Research in the Danish Code of Conduct. Bracketed crosses (X) indicate a relation depending on the definition of Open Science.

The Danish code contains detailed chapters on research planning and conduct, data management, publication and communication, authorship, collaborative research, and conflicts of interest (cf. the leftmost column in Table 1).

In Table 1 typical topics of RCR guidelines are listed, exemplified by the Danish Code of Conduct, as well as six typical principles of Open Science: The Table is marked with crosses “X” in the cases where a clear correspondence exists between RCR topics and Open Science principles and bracketed crosses when the relation is less clear and depends on the detailed definition of the Open principle. E.g. when embarking on the activity of research planning and conduct, the RCR code states that “research projects should be planned, conducted and documented in a manner that allows the research to be examined and – when relevant – reproduced”. Practicing Open Data, Open Methodology and Open Access would immediately mean living up to the key principles of transparency and accountability with respect to planning and conducting research (Table 1, first row). Additionally, practicing e.g. Open Source and Open Education principles simply lend further to transparency. Another example is the topic of conflicts of interest, where the principle of Open Peer Review naturally leads to a declaration of conflicts of interest related to the editorial refereeing process, it is less clear – though entirely possible – that principles of Open Data, Source and Methodology can lead to a disclosure of conflicts based on increased transparency natural to these principles, as well as the increased easy access to the relevant documentation, rights etc.

Consequently, practicing openness in research in terms of Open Science principles result in transparency and accountability with respect to data management, publishing and authoring and collaborating. Therefore I conclude that furthering Open Science agendas are simply a way and a means to support and improve responsible and ethical research practices – and hence the ethos and integrity of research.

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Web links in footnotes: Date of access was October 12th 2015.

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