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The values and challenges of 'openness' in addressing the reproducibility crisis and regaining public trust in social sciences and humanities

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The quality of published research in the social sciences and humanities has made many, such as Taagepera, reconsider the plausibility of obtained results.¹ A typical example is the mysterious Critical Minimum Positivity Ratio 2.9013, published by Fredrickson and Losada in 2005.² The ratio had once been a famous, greatly admired, psychological "constant" until it was shown by Brown, Sokal, and Friedman (2013) to be an unfounded, arbitrary and meaningless number.³ In the following years, the reproducibility crisis in psychological sciences has induced waves of harsh criticisms and made both academics and the public cautious of a wide range of results also outside psychology,⁴ including the social sciences and humanities.⁵ A study by Camerer *et al.* (2016) found that primary findings of 11 out of 18 experimental studies in economics were replicated,⁶ while a more recent paper by Chang and Li (2018) showed that less than half of 67 studies' findings were reproducible.⁷ In political science, Dafoe (2013) showed how the lack of replication files postponed the advancement of the field for three years in a recent famous case;⁸ in 2015, a study of how canvassers can sway voters' opinions on gay marriage was later retracted due to data fabrication.⁹ With these examples around, it is not surprising that in a 2016 *Nature's* survey of 1,576 scientists, 90% agreed that there was a reproducibility crisis.¹⁰ Even the quiet world of armchair philosophers has become less and less dependent on conventional *a priori* methods¹¹ and gradually embraced the idea of data gathering and evidence-based reasoning.¹²

Given that the social sciences and humanities are facing two major problems, one concerning reproducibility and the other public trust, this essay suggests that increasing openness through open data, open peer review, and open community dialogue could offer some solutions. Not only would the openness in academic research contribute to solving the plausibility problem but it would also help raise the overall public trust in the field.

Values and challenges of open data

As Munafo *et al* (2017) pointed out, new scientific results rely on the ability to observe unexpected patterns in data.¹³ Making the underlying data open to everybody is thus a modern way of persuading both scientists across disciplines and the public about the plausibility of the results.

Open data could increase the trust that society has in social sciences research, and it is also good for individual

researchers. For them, open data could mean increased citation rate.¹⁴⁻¹⁶ Moreover, other researchers could also reuse the shared data and produce further scientific studies. Most importantly, open data could support the verification of reported claims^{4, 6, 7}, this could force researchers to be more prudent when reporting and interpreting their results. Hence, it could prevent the future cases where raw data were carefully investigated and found too good to be true, as in the study of changing opinions on gay marriages.^{17,18}

For the researcher community, open data could enable other innovations that help improve their science, such as the implementation of “Statcheck”—a program run on R language that essentially recomputes p-values from a study to check if they match with the reported ones.^{10,19-21} For society, on the one hand, open data could sometimes decide the matters of life and death such as the real-time sharing of data related to Zika virus²² or the open publishing of draft genome of a newly appearing, dangerous strain of E coli in 201123. These examples demonstrate the potential of open data in stimulating interdisciplinary, trans-national and cross-sectoral collaborations.

On the other hand, with a major player such as *Scientific Data* committing to the idea of removing restrictions on the use of open data also for commercial purposes,²⁴ the practice of sharing data could be a force for generating economic values.

The availability of free and reliable data repositories such as Harvard Dataverse, Dryad, Figshare, Open Science Framework, Mendeley, UK Data Archive has enabled researchers to deposit data for public use and replication much easier. Still, psychological and financial barriers to open data remain.¹³ Although the idea of sharing data sounds simple, the practice of pursuing open data policy has turned out more complicated and harder to achieve, so that “nudging scientific practices toward greater openness requires complementary and coordinated efforts from all stakeholders”.²⁵ Unfortunately, the scientific community has not always taken this seriously,²⁶ forsaking the opportunity for their valuable data to stand the test of time.

As we learned from our own experience when we published datasets with *Scientific Data*,²⁷⁻²⁹ the ethical standards for open data can be difficult to meet, as we need to deal with privacy and copyrights. However, by carefully following the ethics guidelines for research with human subjects, these concerns are not impossible to overcome. Here, if researchers show their commitment to adhere to strict ethical standards and responsibility in using the personal data, they could help gain public trust to research.³⁰

Though open data present considerable benefits, they alone cannot solve problems with the study design such as outcome switching, underreported stopping rules, and outcome-dependent inclusion criteria. We will show next how the open review and open community could complement for open data’s shortcomings.³¹

Values and challenges of Open review

In the course of encouraging transparency and open science for the sake of better science for all,¹³ the open review has emerged to be a cornerstone of open science. As clarified by Ross-Hellauer in 2017, open review can refer to different

practices such as open identities of reviewers, open reports, open participation to review, open interaction of reviewers, open peer-review manuscripts, open commenting on the final-version, and open platforms.³²

The prospect of open review might sound strange to researchers in social sciences, where the double-blind peer review is the norm. However, theoretically the system possesses advantages: open review could (i) engage wider community in examining scientific works (ii) make potentially useful scientific discussions during the review available in the public; (iii) make conflicts of interests and social or publication biases apparent; (iv) provide extra incentives for scholars to engage in review as their review works are visible.³³ All of these potential benefits, if realized, could help social sciences and humanities address the plausibility problem by improving the accountability of reviewers, the accuracy of review, and the availability of various layers of quality assurance.

However, as Ross-Hellauer *et al.* (2017) pointed out, some forms of open review are more supported than others.³³ For example, the respondents in their study on attitudes toward open review showed support for most forms of the practice, specifically, open interaction, open reports, and final-version commenting, but less support for open identities. Given that open review is rather new and evolving phenomenon, there is not yet enough empirical evidence for the theorized benefits of this practice.

Yet, this does not seem to stop heavyweight funders from experiments with this new practice.³⁴ The open review platform *F1000 Research* received substantial support not long after its debut,³⁵ from Wellcome Trust in 2016³⁶ and Bill & Melinda Gates Foundation in 2017.³⁷ The support from financial sponsors and from the scientific community itself is an encouraging sign for open review to become a more established practice. When conventional practices like double-blind review have not stopped the crisis in reproducibility, the research community shows the willingness to be innovative and experiment with new forms of reviewing the research, which is in the heart of the self-correcting spirit of science.

Values and challenges of Open dialogue

Closely linked with open review is open community dialogue about the research, which consists of expert, technical discussions about scientific methods and computer codes³⁸ and the research communication processes that can be made available to the community for evaluation, critique, reuse or extension.²⁵ It is this enlarged notion of dialogue that can help solve the issue of reproducibility, like what “Statcheck” has done to help editors at *Psychological Science* during “the reproducibility crisis”.¹⁹

Recently, the active participation in PubPeer has made the issue of open community dialogue more urgent. Flagging a paper by a PubPeer user is now perceived by many as a threat, though when properly done, this practice could invite the expert community to identify and to deal with any statistical weaknesses, thus serving as the quality gatekeepers for scientific outlets. PubPeer has been pushing what Eglen *et al*³⁸ advocate: “Share the methods and computer codes.” In

social sciences, their actions help update and verify “stylized facts” in studies. in a Bayesian probabilistic world where “an erroneous argument does not necessarily lead to a wrong conclusion,” due to Gödel’s theorem.³⁹

The idea of open community dialogue presents a challenge of how to implement it effectively in the research community. The recent closure of PubMed Commons after four years in operation has struck a blow to the formal setting of open dialogue on researchers’ works. The reason for the low usage of this commenting platform appears to be that authors do not want to criticize and comment on others’ works under their name, while PubPeer allows anonymity.⁴⁰ Although this example highlights the difficulty in setting up a formal and non-anonymous channel for post-publication review, the fact that new open dialogue platforms such as the in-house commenting platform of the journals *BMJ* and *eLife* continue to emerge shows that the research community is far from giving up on the idea. Similar to open review, open dialogue needs experimentations and refinements.

It is important to note that implementing “the Three Opens” cannot fully address the problem of irreproducibility. Other measures such as Registered reports or Preregistration are also crucial. As Registered reports and Preregistration also encourage scientists to be open and transparent about their research plans, the strict implementation of these novel methods can enhance the credibility of research community.⁴¹ As Begley and Ellis’s (2012) stated that “the scientific process demands the highest standards of quality, ethics and rigour”²⁶ and conventional practices have shown to be short of those standards, “the Three Opens” are worth experimenting and refining to restore the plausibility and the public trust in social sciences and humanities.

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Meeting reports

Third international symposium of scientific journals: “How to become successful authors & editors of scientific journals”

4-5 December 2018, Trakya University, Turkey

The symposium was organised with the participation of (EASE) to increase the publishing quality of academic journals, and was held over two days at the Balkan Congress Center in Edirne: the first day with topics for the authors and the second day with topics for the



editors. The opening speeches of President Rector of Trakya University, Professor Erhan Tabakoglu, and the president of the symposium (also a Council Member of EASE) Professor Cem Uzun stated the important role of universities in academic publishing and scientific journal editorship along with the lack of education on these subjects. They introduced the teachers and speakers of the symposium: President of EASE, Pippa Smart, and Past President, Professor Ana Marušić. Professor Uzun completed his speech with “Our motto is “learn, experience and share” and this stands in the center of our studies. We are trying to contribute by sharing our experiences in the field of publishing with other journals, authors and editors”.

In the sessions followed by the opening speeches, Pippa Smart and Professor Marušić spoke on many important subjects. Topics included; editors and assistants of scientific journals, ways to increase journal quality, international publishing standards and journal structuring, good reporting rules, publication ethics, how to become included in high impact value owned indexes, how to get published in journals which have high impact value, the top 10 reasons for rejection or acceptance, communication with editors and reviewers, English language problems and how to deal with them, preventing unwanted ethical problems for new authors that use English as second language, important keys for scientific publishing and successful journal editorship, and the contribution of small scientific journals to society. At the end of the presentations, two panel discussion moderated by

Professor Uzun were held entitled “Plagiarism and Authorship” and “Meeting with Experts and Journal Evaluation”.

A total of 222 registered participants came from Turkey, Ukraine, Macedonia, Greece, Romania and Bulgaria. In addition, the symposium

was broadcast live and reached 8000 people. In one day, 1575 people watched the live broadcast on the Facebook webpage. All presentations, plus the video recordings are available on <https://journals-symposium2018.trakya.edu.tr>, for use by all scientific journal editors, reviewers and authors. At the end of the second day, Professor Tabakoglu gave prizes and certificates of appreciation to the participants of the symposium, and expressed his thanks to Pippa Smart, Professor Marušić, and Professor Uzun for their significant presentations and contribution to the symposium. He said in his closing speech: ‘I again congratulate my dear colleague Vice Rector Professor Cem Uzun for this prestigious and important symposium and humbly thank Pippa Smart and Professor Ana Marušić for their honoring presence and valuable contributions.’

The symposium ended after a social, historical and cultural city tour including visits to Selimiye Mosque, Hunkar Circle (Mahfil), Old Library, Arasta Grand Bazaar, and 2nd Bayezid Health Museum Complex. A short concert was performed by tutors and students from the university in the museum.

Cem Uzun

Vice Rector, Trakya University

The extended version of this report is published on EASE webpage: <http://www.ease.org.uk/ease-events/3rd-international-symposium-of-scientific-journals-trakya-university-turkey-2018/>

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