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Embedding a programme of open research in health science

INTRODUCTION

I am a lecturer in exercise science & early career researcher in the School of Biomedical, Nutritional, & Sport Sciences (teaching & research contract). I am also affiliated with the Population Health Science Institute and Newcastle University Centre for Cancer.

I have embedded a programme of open research within health sciences at Newcastle University that has positively impacted the wider academic community. Open research practices, and the philosophy of open science more broadly, are fundamental to the way I conduct research.

I am a committee member at the Society for Transparency, Openness, and Replication in Kinesiology (STORK). I use this platform to champion open research and support multi-national researchers, at different career stages, to integrate open science practices into their own research. I co-organised, and was a main speaker at, the international STORK summit, which aimed to provide a platform for health science researchers from around the world to engage in open science.

As standard, I make all my research data, statistical code, and supplementary materials publicly available on my Open Science Framework page (see here). I prospectively register study protocols on open trial registries, upload preprints on publicly accessible repositories, and publish exclusively in open access journals (via University open access agreements). These practices ensure my research is accessible, transparent, and reproducible.

The following text draws on **multiple case studies** to demonstrate how my open research programme has benefitted the wider academic community.

OPEN RESEARCH PRACTISES

Case study #1: I prospectively registered a systematic review and meta-analysis on the Open Science Framework Registry. This ensured the protocol and intended analyses were fully **transparent** before undertaking the review. Prior to publishing the paper in an open access, peer-reviewed journal, I submitted a preprint to an open access repository (SportRxiv). This ensured the preprint and published paper were **accessible** to all researchers and members of the public. Upon publication, I uploaded the search results, data, statistical code, and all supplementary materials onto Open Science Framework. This ensured the systematic review and meta-analysis could be fully **reproduced** by peer reviewers, editors, and researchers. In the supplementary materials of the published version, I documented and justified all changes that were made from the original pre-registered protocol, which made sure the protocol deviations were **transparent** to readers. In addition to publishing the paper in a preprint repository and in an open access journal, I disseminated the findings via social media and podcasts, maximising **accessibility and reach**.

BENEFITS

Case study #2: A research group from outside my discipline (psychology) reached out to me to collaborate on a research project. My role was to conduct the statistical analysis for a clinical trial; the paper is published open access and I uploaded the data and statistical code onto Open Science Framework. The research group, having not previously engaged in open research practices, went on to adapt my statistical code to analyse data generated from a follow-on study (here) and made the code publicly available.

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Case study #3: My research has empowered research students to engage in open research. For instance, all my 2021-22 postgraduate research students independently pre-registered their study protocols on a publicly accessible repository before undertaking their research projects (see here for an example).

Case study #4: Professor Grant Abt, a professor of exercise physiology at the University of Hull, uses the publicly available dataset and statistical code from my systematic review (case study #1) to show postgraduate research students how to reproduce research findings and to demonstrate best practice in open research.

These case studies demonstrate that my open research programme has positively impacted and empowered the wider academic community to engage in open research, including inter-disciplinary researchers and research students.

CHALLENGES

Key challenges I have faced to open research are outlined below.

Challenge	How these were handled
Additional time commitments	Creating reproducible workflows to improve efficiency
Lack of incentives	Accepting that most incentives, at present, are altruistic
Senior collaborators who do not want to engage in open research	Explaining the benefits of open research and how major funders are now mandating open research practices (e.g., UKRI)

LESSONS LEARNT

The main lessons I have learnt are:

- Engaging with open research forces you to be more rigorous and diligent in your own research.
- Open research doesn't just make research more transparent, accessible, and reproducible; it opens doors to inter-disciplinary collaboration, empowers research students, and promotes scientific progress.

CONCLUSION

In conclusion, I have developed an entire programme of open research in health science that has positively impacted and empowered the wider academic community.