Research as an open enterprise: an editor’s perspective

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• Other publishers, in collaborations and their own initiatives
My roles

My roles include:
- oversee cross-company editorial policies and standards;
- develop cross-company initiatives directed at the SDGs.

This talk reflects on openness as seen through these lenses.
Contents

• OA principles
• Policies for openness: integrity
• Policies for openness: disaggregation
• Multidisciplinary and multi-sector openness
• The rise of the machines
• The moral
Springer Nature and open access models
Springer Nature’s OA principles

• Springer Nature is committed to a future of full and immediate open access.
• Green open access is only for the transition stage
• During the transition, SN intends to highlight the benefits of OA prospectively and retrospectively in all its subscription and hybrid journals.
A faster path to an open future

At Springer Nature we want to find the fastest and most effective route to immediate open access (OA) for all primary research. This blog describes a potential significant way to progress it and we are asking other interested stakeholders to read, consider and comment on this LinkedIn post so all can see if this would receive widespread support.

In February, along with many others, we responded to the consultation request from cOAlition S on its implementation guidance. In our submission, we expressed continued strong support for hybrid journals, given they currently publish most of the world’s research and their proven ability to enable growth in OA take-up, particularly as part of transformative read and publish deals where we have seen 73-90% success rates. In light of the evidence we presented, we asked Plan S to think again. Similarly, we explained why Plan S’s proposed zero embargo green OA, immediately utilising a CC BY license, would...
Promoting open components of research
Open research is not just about published papers

SCIENTIFIC DATA

BMC

Research Notes

figshare

credit for all your research

(GIGA)\textsuperscript{n}

SCIENCE

DataCite

Helping you to find, access, and reuse data

DRYAD

Data available in Dryad
Mandating a data availability statement

Many journals, including Nature and BMC, require all authors to tell readers how they can get hold of their data.

Data availability statement:

• The datasets generated during and/or analysed during the current study are available in the [NAME] repository, [PERSISTENT WEB LINK TO DATASETS].
• The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.
• All data generated or analysed during this study are included in this published article (and its supplementary information files).

As the research community embraces data sharing, academic journals can do their bit to help. Starting this month, all research papers accepted for publication in Nature and an initial 12 other Nature titles will be required to include information on whether and how others can access the underlying data.

These statements will report the availability of the ‘minimal data set’ necessary to interpret, replicate and build on the findings reported in the paper. Where applicable, they will include details about publicly archived data sets that have been analysed or generated during the study. Where restrictions on access are in place — for example, in the case of privacy limitations or third-party control — authors will be expected to make this clear.

Nature 536, 138 (20016). To learn more go to http://go.nature.com/2bf4vqn
Sharing code and materials is equally important

“A condition of publication in a Nature journal is that authors are required to make unique materials promptly available to others without undue qualifications.”
http://www.nature.com/authors/policies/availability.html

Code share

Papers in Nature journals should make computer code accessible where possible.

A theme in Nature’s ongoing campaign for the replicability and reproducibility of our research papers is that key components of publications should be available to peers who wish to validate the techniques and results.

A core element of many papers is the computer code used by authors in models, simulations and data analysis. In an ideal world, this code would always be transportable and easily used by others. In such a world, our editorial policy would be to insist on sharing to allow free use, as we already do (as far as is practicable) with data and research materials.

Unfortunately, such an ideal is not easy to attain owing to the amount of extra funding and effort it would require to render some major pieces of code shareable. Nevertheless, we at Nature and the Nature research journals want to encourage as much sharing as possible.

Climate modellers have made some strides in this regard. The journal Geoscientific Model Development has a good example of such a policy (see go.nature.com/jv8glw), and an article in Nature Geoscience discusses some of the opportunities presented by code sharing, as well as the obstacles (S. M. Easterbrook Nature Geosci. 7, 779–781; 2014).

As a leading example of transparency policies in other disciplines, the data journal GigaScience requires code used in its papers to be available, and hosts it in a way that allows others to analyse the data in publications. One point made by Easterbrook is that even if the code is shared, others might often make little or no use of it, but on some occasions the take-up will be large.

Nature and the Nature journals have decided that, given the diversity of practices in the disciplines we cover, we cannot insist on sharing computer code in all cases. But we can go further than we have in the past, by at least indicating when code is available. Accordingly, our policy now mandates that when code is central to reaching a paper’s conclusions, we require a statement describing whether that code is available and setting out any restrictions on accessibility. Editors will insist on availability where they consider it appropriate; any practical issues preventing code sharing will be evaluated by the editors, who reserve the right to decline a paper if important code is unavailable. Moreover, we will provide a dedicated section in articles in which any information on computer code can be placed. And we will work with individual communities to put together best-practice guidelines and possibly more-detailed rules.

For full details, see our guide for authors at go.nature.com/0sykje. For an archive of our content and initiatives concerning reproducibility, see http://www.nature.com/nature/focus/reproducibility.
Open research components:
Supporting reproducibility
Raise standards for preclinical cancer research

C. Glenn Begley and Lee M. Ellis propose how methods, publications and incentives must change if patients are to benefit.

Efforts over the past decade to characterize the genetic alterations in human cancers have led to a better understanding of molecular drivers of this complex set of diseases. Although we in the cancer field hoped that this would lead to more effective drugs, historically, our ability to translate cancer research to clinical success has been remarkably low. Sadly, clinical trials in oncology have the highest failure rate compared with other therapeutic areas. Given the high unmet need in oncology, it is understandable that barriers to clinical development may be lower than for other disease areas, and a larger number of drugs with suboptimal preclinical validation will enter oncology trials. However, this low success rate is not sustainable or acceptable, and investigators must reassess their approach to translating discovery research into greater clinical success and impact. Many factors are responsible for the high failure rate, notwithstanding the inherently difficult nature of this disease. Certainly, the limitations of preclinical tools such as inadequate cancer-cell line and mouse models make it difficult for even
Raising reporting standards in life sciences

18-point checklist of reporting standards for life science papers, key methodological and analytical parameters including statistics, statement of in-lab replication, mandatory reporting on blinding, randomisation, sample size estimation

• Raise standards on reporting of statistics, and scrutiny during peer review
• Eliminate length restrictions for methods sections
• Encourage linked step-by-step protocols
83% of surveyed Nature authors felt that the checklist had significantly improved reporting of statistics within papers published in Nature journals. Roughly a quarter stating they were using it to a large extent.

78% of surveyed Nature journal authors continue to use the checklist at least to a small extent with their continued work.
Minimum standards working group

• Multi-publisher collaboration: Group of journal editors and experts in reproducibility and transparent reporting (December 2017)

• Nature Research (Springer Nature), PLOS, Science (AAAS), Cell Press (Elsevier), eLIFE, Wiley, Malcolm MacLeod (Univ of Edinburgh); David Mellor (Centre for Open Science)
Minimum standards working group

• New draft framework and checklist, and encouraging results of pilot tests to be communicated this month, for further consultation.
• Final publication in early 2020.
Minimum standards working group

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- Final publication in early 2020.

Reproducibility takes time spent by researchers and by editors.
How to grow a healthy lab

A healthy research environment is fundamental to good science. But it is an aspect that is rarely discussed. That’s partly because a lab’s ‘health’ is complex and difficult to assess — it is the product of a whole host of factors, such as inclusivity, communication,...

Some hard numbers on science’s leadership problems

A Nature survey of 3,200 scientists reveals the tensions bubbling in research groups around the world.

Richard Van Noorden

Nine pitfalls of research misconduct

Academic leaders must audit departments for flaws and strengths, then tailor practices to build good behaviour, say C. K. Gunsalus and Aaron D. Robinson.

C. K. Gunsalus & Aaron D. Robinson

Go beyond bias training

Ambiguity in expectations and evaluations harms progress, say Rodolfo Mendoza-Denton and colleagues.

Rodolfo Mendoza-Denton, Colette Patt & Mark Richards

Health tips for research groups

Nature asked scientists to recommend one thing that institutional and laboratory leaders could do to make science more productive, rigorous and happy.

David Norris, Ulrich Dinndag — Tracy T. Chow
Lab culture matters more!

Funders and universities need to be proactive and transparent about how they foster a healthy research culture
Disaggregation of the research publishing process
Recognising the value of preprints

http://www.nature.com/authors/policies/preprints.html

“Nature Research journals support posting of primary research manuscripts on community preprint servers such as arXiv and bioRxiv. Preprint posting is not considered prior publication and will not jeopardize consideration at Nature Research journals. Preprints will not be considered when determining the conceptual advance provided by a study under consideration at Nature Research.”

Preprints under peer review

“We are now offering authors whose submitted manuscript has been deposited in a preprint server, and is selected for peer review, the option of including their paper on a public list of articles under review at Nature Communications. The list, which will appear on our dedicated website and will be freely accessible to all without registration, will provide a link to the preprint on the recognized preprint server. We hope that by offering additional visibility to preprints that are under consideration in our journal, we will not only be able to accelerate the dissemination of potentially exciting science, but also complement our peer review process by promoting wider scrutiny of preprints and thus a more holistic review procedure.”
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Our commitment to research in progress and openness inspires us to think about how to help our authors in new ways. So, together with our partners at Research Square, we've added a new option for you when you submit to select Springer Nature Journals. This new option, called In Review, gives you insight over your manuscript's editorial progress; even while it's out for review.

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- Demonstrate the integrity of your work with a transparent editorial checklist
- Benefit from early sharing, such as more collaboration opportunities and earlier citations

Your peers will be able to:

- Comment on/see emerging science in full HTML format
- Find new discoveries with fully-indexed search
- Note which editorial checks the manuscript has already passed
- Gain insight into the peer review pipeline of particular manuscripts at the given journals

See the articles that are In Review—now including every BMC Series journal
Hundreds of articles are undergoing peer review on the In Review platform—now including almost every journal in the BMC Series
Disaggregation that opposes post-hoc bias: pre-registered reports
Pre-registered reports workflow

1. **DEVELOP IDEA**
2. **DESIGN STUDY**
3. **WRITE UP INTRO, METHODS, ANALYSIS PLAN**
4. **COLLECT & ANALYSE DATA**
5. **WRITE UP RESULTS & DISCUSSION**
6. **PUBLISH REPORT**

**STAGE 1**
Peer Review

**STAGE 2**
Peer Review
Stage 1
Exogenous testosterone increases sensitivity to moral norms in moral dilemma judgements

Skylar M. Brannon, Sarah Carr, Ellie Shuo Jin, Robert A. Josephs & Bertram Gawronski

Abstract
Moral dilemma judgements frequently involve decisions where moral norms and the greater good are in conflict. The current preregistered study tested the effect of the steroid hormone testosterone on moral dilemma judgements using a double-blind administration of testosterone or placebo. Counter to predictions, testosterone administration led to increased inaction in moral dilemmas where harmful actions prohibited by moral norms increase overall well-being. Using a mathematical model to disentangle sensitivity to consequences, sensitivity to moral norms and general preference for inaction versus action, analyses further revealed that testosterone administration influenced judgements by increasing sensitivity to moral norms. Exploratory analyses suggested the opposite pattern for endogenous testosterone measured at baseline, in that higher levels of endogenous testosterone were associated with lower sensitivity to moral norms. The results indicate that the role of testosterone in moral judgements is more complex than suggested by previous findings.

Protocol registration
The stage 1 protocol for this Registered Report was accepted in principle on 13 November 2017. The protocol, as accepted by the journal, can be found at https://osf.io/rysbe/1.
“We have received more than 130 Stage 1 submissions since the journal launched in January 2017. Although our initial submissions were mostly in psychology and neuroscience, we are now receiving submissions from a number of different fields, including genetics, economics, and political science. This suggests that their appeal is increasingly spreading beyond the disciplines where the format originated.”
Multidisciplinary, multi-sector benefits of openness
UN Sustainable Development Goals

1. No Poverty
2. Zero Hunger
3. Good Health and Well-being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice and Strong Institutions
17. Partnerships for the Goals
Growing Better:
Ten Critical Transitions to Transform Food and Land Use

The Global Consultation Report
of the Food and Land Use Coalition
September 2019
Growing Better: Ten Critical Transitions to Transform Food and Land Use

1. Nutritious Food
2. Nature-based Solutions
3. Wider Choice & Supply
4. Opportunity for All

- Healthy Diets
- Nutritious Food
- Nature-based Solutions
- Wider Choice & Supply
- Opportunity for All
**Economic Prize**
$5.7 trillion economic prize by 2030 and $10.5 by 2050 based on avoided hidden costs

**Investment Requirements**
$300-$350 billion required each year for the transformation of food and land use systems to 2030

**Business Opportunity**
$4.5 trillion annual opportunity for businesses associated with the ten critical transitions by 2030

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**Cross Cutting Reforms to Transform Food and Land Use**

**Government:** Establish targets; break down governmental silos; put a price on carbon; land use planning; repurpose agricultural support and public procurement; massively increase R&D and target it on healthy, natural solutions.

**Business & Farmers:** Organise pre-competitively to support government reform agendas and set internal standards for specific sectors; establish true cost accounting for food and land use.

**Investors & Financial Institutions:** Build on the Task Force on Climate-related Financial Disclosures to cover nature; develop a set of financing principles for food and land use; develop innovative finance instruments, including blended finance, to manage risks and leverage opportunities.

**Participants in multilateral processes and multi-stakeholder partnerships:** Raise ambition in the United Nations Framework Convention on Climate Change 2020 stock-take and ensure an ambitious outcome in the 2020 Convention on Biological Diversity in Kunming, China.

**Civil Society:** Drive information campaigns for food and land use reform and direct campaigns against serial offenders (public and private).
Solutions-oriented content types, which deserve more support and prestige
Case studies
Learning about urban climate solutions from case studies

William F. Lamb, Felix Creutzig, Max W. Callaghan and Jan C. Minx

Climate mitigation research puts increasing emphasis on cities, but much more could be learned from urban case studies. The overall size, geographic scope and topic content of cases remains unknown, resulting in few attempts to synthesise the bottom-up evidence. Here, we use scientometric and machine-learning methods to produce a comprehensive map of the literature. Our database of approximately 4,000 case studies provides a wealth of evidence to search, compare and review. We find that cities in world regions with the highest future mitigation relevance are systematically underrepresented. A map of the evidence allows case studies to be matched with urban typologies in new and more ambitious forms of synthesis, bringing together traditionally separate strands of qualitative and quantitative urban research.

City-scale reforms in transportation, building design and urban form have substantial potential for reducing energy demand and achieving sustainability co-benefits. But when it comes to learning about appropriate policies, the key questions are: what works, for whom, under what conditions, and why? With no consistent epistemology, enormous variety in boundaries of analysis and a lack of formal research synthesis, urban mitigation solutions remain diffuse and poorly understood.

Systematic learning hinges on aggregating information about individual cities. Recent work emphasises a quantitative direction to this work, using ‘big data’ and typologies to identify structural similarities and matches across cities and developments. In this paper, we use such methods to explore how cities might be categorised and how case studies might be systematically reviewed.

Overall we identify a large and varied case literature, albeit one with regional and topic biases. To bring the policy relevance of cases to the forefront, we discuss the different opportunities they present for learning. We argue for more ambition in comparative studies, the need for systematic reviews of cases, and the potential to organise case study insights using quantitative typologies of cities.

As a starting point to our analysis, we obtain a sample of urban mitigation articles using a search query that combines synonyms for ‘urban’ and ‘mitigation’ in the Web of Science and Scopus literature databases (see Methods). Our interpretation of case study research is straightforward: if an article mentions a city name in the abstract or title, we assume it is a case study located in the city (positive).
Expert elicitations
Climate as a risk factor for armed conflict


Research findings on the relationship between climate and conflict are diverse and contested. Here we assess the current understanding of the relationship between climate and conflict, based on the structured judgments of experts from diverse disciplines. These experts agree that climate has affected organized armed conflict within countries. However, other drivers, such as low socioeconomic development and low capabilities of the state, are judged to be substantially more influential, and the mechanisms of climate–conflict linkages remain a key uncertainty. Intensifying climate change is estimated to increase future risks of conflict.
Systematic reviews
Social Systems Evidence | Monthly update

Content for August 2019

During the past month, the systematic reviews listed below were added to Social Systems Evidence, which is the world’s most comprehensive, free access point for evidence about strengthening 16 government sectors and program areas, and achieving the Sustainable Development Goals. Note that this page serves as a temporary placeholder to highlight monthly update content until the email service functionality is added to Social Systems Evidence.

We have identified the following 'hot docs' as being of interest to a broad array of social-system policymakers and stakeholders:

- Community-based supplementary feeding for food insecure, vulnerable and malnourished populations - An overview of systematic reviews
- Developing young men's wellbeing through community and school-based programs: A systematic review
- Effectiveness of home fire safety interventions. A systematic review and meta-analysis
- Help-seeking by male victims of domestic violence and abuse (DVA): A systematic review and qualitative evidence synthesis
- The role of academic partnership in disaster risk management: A systematic review
- What factors are associated with resilient outcomes in children exposed to social adversity? A systematic review

Children and youth services

- A critical review of qualitative research into the experiences of young adults leaving foster care services
Harvesting the literatures in depth: Rise of the machines
Innovative book prototype provides a compelling machine-generated overview about the latest research on lithium-ion batteries, automatically compiled by an algorithm developed in collaboration with the Applied Computational Linguistics lab of Goethe University Frankfurt/Main (Germany).

London | Heidelberg, 02 April 2019

Springer Nature published its first machine-generated book in chemistry. The book prototype provides an overview of the latest research in the rapidly growing field of lithium-ion batteries. The content is a cross-corpus auto-summarization of a large number of current research articles in this discipline. Serving as a structured excerpt from a huge set of papers, the innovative pipeline architecture aims at helping researchers to manage the information overload in this discipline efficiently.

In close collaboration between Springer Nature and researchers from Goethe University Frankfurt/Main, a state-of-the-art algorithm, the so-called Beta Writer, was developed to select, consume and process relevant publications in this field from Springer Nature’s content platform SpringerLink. Based on this peer-reviewed and published content, the Beta Writer uses a similarity-based clustering routine to arrange the source documents into coherent chapters and sections. It then creates succinct summaries of the articles. The extracted quotes are referenced by hyperlinks which allow readers to further explore the original source documents. Automatically created introductions, table of contents and references facilitate the orientation within the book.

Niels Peter Thomas, Managing Director Books at Springer Nature, said: “Looking back to a long tradition and expertise in academic book publishing, Springer Nature is aiming at shaping the future of book publishing and reading. New technologies around Natural Language Processing and Artificial Intelligence offer promising opportunities for us to explore the generation of scientific content with the help of algorithms. As a global publisher, it is our responsibility to take potential implications and limitations of machine-generated content into consideration, and to provide a reasonable framework for this new type of content for the future.”

Henning Schoenenger, Director Product Data & Metadata Management at Springer Nature, added: “We are thrilled to finally publish this new type of research content and make it available for the global research community. While research articles and books written by researchers and authors will continue to play a crucial role in scientific publishing, we foresee many different content types in academic publishing in the future: from purely human-created content creation to a variety of blended man-machine text generation to entirely machine-generated text. This prototype is a first important milestone we reached, and it will hopefully also initiate a public debate on the opportunities, implications, challenges and potential risks of machine-generated content in scholarly publishing.”
Machine-based search of scholarly and other literatures

• Search will be fast, broad and deep
• Excludes human bias
• Great for multidisciplinary themes
The moral of all this is:
The moral of all this is:

Making the literature trustworthy and useful takes more effort and investment by researchers, funders, institutions and publishers than is currently happening, with results that are less easy to measure and celebrate than hiring yet more postdocs and publishing yet more (too often shoddy) papers.
The moral of all this is:

Making the literature trustworthy and useful takes more effort and investment by researchers, funders, institutions and publishers than is currently happening, with results that are less easy to measure and celebrate than hiring yet more postdocs and publishing yet more (too often shoddy) papers.

These are major challenges, and we are all in this together!
Happy birthday to EPFL (50)
Happy birthday to EPFL (50) and Nature (150)

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