

Experimentation and evidence for responsible research funding

SUPER MoRRI Annual Event, 28 April 2022

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RoRI launches to enable more strategic, open, diverse, and inclusive research

RoRI is a partnership initiative

The Wellcome Trust, Digital Science and the Universities of Sheffield and Leiden have joined forces to create RoRI

We're thrilled to announce the launch of the Research on Research Institute (RoRI) – an international consortium of research funders, academic institutions, and technologists working to champion the latest approaches to research on research.

Co-founded by the Wellcome Trust, the universities of Sheffield and Leiden, and Digital Science, the RoRI consortium will undertake transformative and translational research on research (also known as meta-research, science of science or meta-science). By analysing research systems and experimenting with decision and evaluation data, tools



SCIENCE FUNDERS GAMBLE ON GRANT LOTTERIES

A growing number of research agencies are assigning money randomly.

By David Adam

Albert Einstein famously insisted that God does not play dice. But the Health Research Council of New Zealand does. The agency is one of a growing number of funders that award grants

partly through random selection. Earlier this year, for example, David Ackerley, a biologist at Victoria University of Wellington, received NZ\$150,000 (US\$96,000) to develop new ways to eliminate cells – after his number came up in the council’s annual lottery.

“We didn’t think the traditional process was

Partially Randomized Procedure - Lottery and Peer Review

Since 2017, the Volkswagen Foundation is testing a new selection procedure for project applications: In the funding initiative "Experiment!", part of the funded projects are selected by an independent jury. Additionally, further projects are drawn from those applications that are suitable for the program and eligible for funding. Background and reactions to a new and unusual selection procedure.



“If I look back on many years of involvement in political decision-making and policy-making around science, innovation and R&D, I am struck by how much of it tends to turn on gut feel of the individuals involved, than on hard evidence and analysis. This is ironic, since good science is all about testing hypotheses against data, empirical results and facts. I do believe there is a potential role for UKRI here - at modest cost - to take a deliberate strategic decision to sponsor and promote more good research, analysis and evidence-gathering on “what works” in policy on science, R&D and innovation. We should, in short, live by our values!”

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Drawing lots as a tie-breaker



31.03.2021

After a pilot phase, the SNSF is introducing the drawing of lots as a potential tie-breaker in all funding schemes. It may be used in cases where equally good proposals cannot be further differentiated objectively.

More Room for Flashes of Genius: FWF Launches the 1,000 Ideas Programme



Contest models highlight inherent inefficiencies of scientific funding competitions

Kevin Gross, Carl T. Bergstrom

Published: January 2, 2019 • <https://doi.org/10.1371/journal.pbio.3000065>



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 Science of Science Funding

Article	Authors	Metrics	Comments	Media Coverage
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Abstract

- Author summary
- Introduction
- A contest model for scientific funding competitions
- Analysis and numerical results
- Lotteries
- Discussion
- Supporting information
- Acknowledgments
- References

Reader Comments

Abstract

Scientific research funding is allocated largely through a system of soliciting and ranking competitive grant proposals. In these competitions, the proposals themselves are not the deliverables that the funder seeks, but instead are used by the funder to screen for the most promising research ideas. Consequently, some of the funding program's impact on science is squandered because applying researchers must spend time writing proposals instead of doing science. To what extent does the community's aggregate investment in proposal preparation negate the scientific impact of the funding program? Are there alternative mechanisms for awarding funds that advance science more efficiently? We use the economic theory of contests to analyze how efficiently grant proposal competitions advance science, and compare them with recently proposed, partially randomized alternatives such as lotteries. We find that the effort researchers waste in writing proposals may be comparable to the total scientific value of the research that the funding supports, especially when only a few proposals can be funded. Moreover, when professional pressures motivate investigators to seek funding for reasons that extend beyond the value of the proposed science (e.g., promotion, prestige), the entire program can actually hamper scientific progress when the number of awards is small. We suggest that lost efficiency may be restored either by partial lotteries for funding or by funding research based on past scientific success instead of proposals for future work.

Science of Science Funding

[BACKGROUND RESEARCH](#) |
 [RESEARCH PROJECTS](#) |
 [DATA RESOURCES](#)

Science of Science Funding is an NBER initiative, supported by the Alfred P. Sloan Foundation, which seeks to improve understanding of effective methods of supporting scientific research. Its goal is to promote analysis of the links between research funding models, management strategies, and scientific outcomes that can inform decision-making by both private and public funders. The initiative strives to nurture a community of researchers, funders, and research administrators who can interact with and learn from each other, and who can develop a research agenda in this area. The initiative convenes research meetings, disseminates research, and supports small-scale projects which further community building.

NBER WORKING PAPER SERIES

SCIENTIFIC GRANT FUNDING

Pierre Azoulay
Danielle Li

Working Paper 26889
<http://www.nber.org/papers/w26889>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
March 2020, Revised June 2021

The trouble in comparing different approaches to science funding

Michael Nielsen and Kanjun Qiu

February 9, 2022

Working notes on how to compare different approaches to science funding. Focuses on clarifying several challenges that must be addressed for such comparisons to be meaningful. We'd love to hear thoughtful comments and corrections, including pointers to related work. (Please leave comments at the bottom).

There's a striking vision, now gaining momentum, where we "turn the scientific method on ourselves"¹, in part to help improve our scientific institutions. This vision is exciting, since the quality of humanity's scientific institutions so strongly influences our collective future. It's also challenging: one major obstacle is understanding how to do experiments which figure out what works, and what does not. Informally, we've heard people advocate: "we should do lots of RCTs [randomized controlled trials] for science funding schemes!"². This seems like a promising idea, perhaps a way to develop funding approaches far better than the peer-reviewed grant approach that currently dominates.

Many people have told us system-level social changes matter little in science, that the best aspiration is to get out of the way of individual scientists.

We believe they're wrong. We believe there is extraordinary latent potential for discovery, potential that may be released through improved social processes.

Nielsen & Qiu (2022)



RoRI Working Paper No. 6

The experimental research funder's handbook

Sandra Bendiscioli, Teo Firpo, Albert Bravo-Biosca, Eszter Czibor, Michele Garfinkel, Tom Stafford, James Wilsdon and Helen Buckley Woods

December 2021



RoRI Working Paper No 7

Why draw lots? Funder motivations for using partial randomisation to allocate research grants

Helen Buckley Woods and James Wilsdon
December 2021



RoRI Working Paper No.3

The changing role of funders in responsible research assessment: progress, obstacles and the way ahead

Stephen Curry, Sarah de Rijcke, Anna Hatch, Dorsamy (Gansen) Pillay, Inge van der Weijden and James Wilsdon
November 2020

Produced in partnership with:



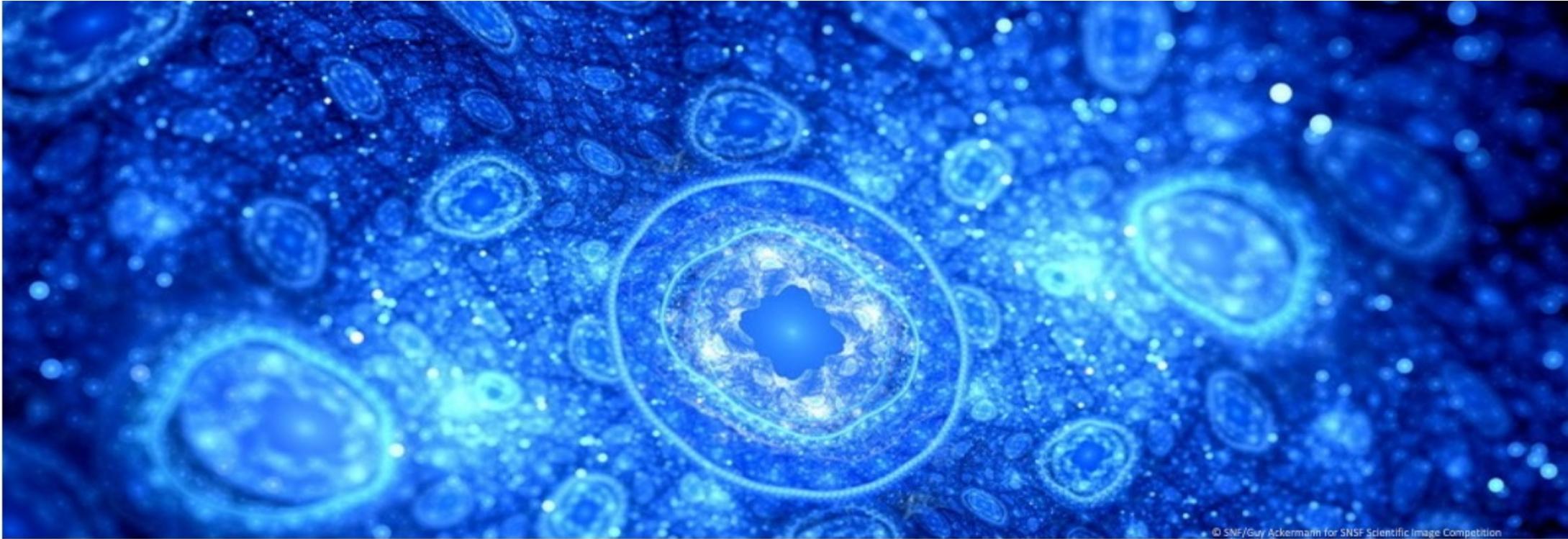
Produced in partnership with the European Molecular Biology Organisation (EMBO), the Innovation Growth Lab at Nesta and the Swiss National Science Foundation (SNSF).

Randomising in pursuit of equity & impact: experiences from NZ

Experiments in evaluation workshop: 1/2 December 2021

Lucy Pomeroy

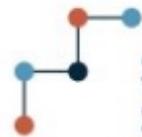
Head of Research Investments and Contracts



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Rethinking the funding line: random selection at the Swiss National Science Foundation

Marco Bieri and Rachel Heyard



Swiss National
Science Foundation



Why experiment?

- Experimentation is a cornerstone of the scientific method
- An experiment requires learning systematically
- Experiments can also be used to test and evaluate research funding processes, and **responsible research funding (RRF) processes**
- Can RRF **without** robust evaluation & experimentation really be responsible?
- Experiments can help funding organisations:
 - Explore alternatives to current approaches
 - Test the impact of interventions
 - Improve processes

Future opportunities

Experiments with research funding are growing in scale and ambition, but still have a long way to go

It can be challenging to trial novel methods of funding allocation and evaluation but a growing number of funders are now engaged in such experiments. Peer networks of funders offer support in sharing lessons and insights into these methods.

There is exciting scope to scale and build the evidence base for randomisation and other methods.

There is a need for more robust experimental studies, with defined baselines and controls—ideally involving multiple funders. The potential of early pilots by a small number of funders will not be realised if these don't mature into more ambitious experiments which can generate a compelling evidence base for the pros and cons, opportunities and limitations of specific interventions.

Future opportunities

Navigating the grey zone: Capturing reviewer uncertainty

Key question(s): How large is the “grey zone” in which reviewers and panels have trouble distinguishing which proposals to fund? It is widely accepted that unfundable proposals can be distinguished, but how clear is the “must be funded” top end? Are reviewers able to articulate certainty or uncertainty around proposal evaluation, and are we able to use this to see how elicitation of single scores can be augmented?

Potential intervention: Standard review procedure but with reviewers also asked for their confidence and/or estimated range of their scoring of proposals

Methodological considerations: Different elicitation techniques could focus on certainty vs uncertainty estimation, or the range of plausible scores a reviewer might give. A number of funders have been asking reviewers about their confidence in rating and scoring of proposals, but an analysis of the link between confidence and final scoring and of which criteria pose most uncertainties has not, to our knowledge, been conducted yet.

Future opportunities

Designing panel rules for smarter decision making

Key question(s): Small differences in evaluation rules may impact the type and quality of funded projects (e.g. the weightings given to different criteria, how scores are aggregated, consensus rules in panels). This can result in certain types of proposals – e.g. more novel ones – being less likely to obtain funding ([Franzoni, Stephan & Veugelers, 2021](#)). A number of these design features of the peer review process could be tested robustly through experiments.

Potential interventions: There are a number of options to address the questions above, including:
Gold stars. To promote riskier proposals, ask reviewers to assign a gold star to the one proposal they would definitely want funded. These may highlight projects that, while not having the overall highest scores, could have higher potential.

Changing scoring rules. For instance, using a form of quadratic voting ([Azoulay & Li, 2020](#)), where reviewers allocate a fixed number of tokens over the proposals as they please, which allows them to indicate preferences (e.g. assign more tokens to one proposal they think especially deserving, or spread them across several decent proposals).

Future opportunities

Testing effects of introducing narrative CV requirements



The screenshot shows the DORA website header with navigation links: About, Meetings, Community Engagement Grants, Contact, The Declaration, Signers, Project TARA, News and Resources, and a Sign DORA button. The main content area features a 'RESOURCE' tag and the title 'Using Narrative CVs: Process optimization and bias mitigation'. Below the title, it indicates the resource is for 'POSITION PAPERS' and 'RESEARCH INSTITUTES'. The text of the report is summarized, followed by a list of three key actions recommended by the authors. The report is attributed to Fritch R, Hatch A, Hazlett H, and Vinkenburg C. (2021).

DORA About Meetings Community Engagement Grants Contact

The Declaration Signers Project TARA News and Resources Sign DORA

RESOURCE

Using Narrative CVs: Process optimization and bias mitigation

POSITION PAPERS FOR: FUNDERS RESEARCH INSTITUTES

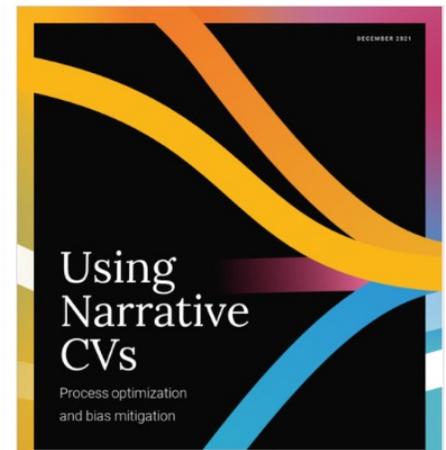
In this report, the authors consolidate the key learnings from a workshop hosted by DORA and Funding Organisations for Gender Equality Community of Practice (FORGEN CoP) on the adoption of narrative CVs for funding organizations. The workshop took place in the Fall of 2021 with more than 120 participants from 22 countries and more than 40 funding organizations.

The authors find the adoption of narrative CVs has been generally welcomed in the scholarly community because they provide a structured framework that allows for the recognition of a broader view of research achievements beyond peer-reviewed journal articles. However, narrative CVs have also generated some confusion and debate within the academic community. How are narrative CVs evaluated? Does the focus on narrative description increase gender bias or bias against non-native language applicants?

The authors recommend three key actions to move forward in the implementation of Narrative CVs:

- Creation of shared definition of what Narrative CVs are and what objectives they aim to achieve
- Train reviewers, applicants and staff at funding organizations to improve consistency in the evaluation process
- Monitor the effectiveness of narrative CVs to continually optimize their utility as a tool for robust research assessment.

Fritch R, Hatch A, Hazlett H, and Vinkenburg C. (2021). *Using Narrative CVs*.
<https://zenodo.org/record/5799414#.YeM-4110IPY>



The cover of the report features a black background with vibrant, flowing lines in yellow, orange, and blue. The title 'Using Narrative CVs' is prominently displayed in white, with the subtitle 'Process optimization and bias mitigation' below it. The date 'DECEMBER 2021' is visible in the top right corner.

Please save the date and join us for a special online event to kickstart RoRI's next phase.

Experiment, translate and transform: priorities for research on research will take place from 15:00-18:00 CEST (14:00-17:00 BST) on Monday 20 June 2022, and is co-hosted by the Swiss National Science Foundation (SNSF).

Our opening keynote speaker will be **Michael Nielsen** (Astera Institute and author of Reinventing Discovery: The New Era of Networked Science). Michael will speak about **The trouble in comparing different approaches to science funding**, building on his [recent paper with Kanjun Qiu](#) on this theme.

Other speakers include: **Prof. Sue Hartley OBE** (Vice-President for Research, University of Sheffield); **Matthias Egger** (President, Swiss National Science Foundation); **Sarah de Rijcke** (Co-Chair of RoRI & Director, CWTS, Leiden University); **Marc Schiltz** (CEO of FNR—National Research Fund of Luxembourg & President, Science Europe); **Alison Bourgon** (Director General—Science Policy, Canadian Institutes for Health Research - TBC); **Gert Balling** (Novo Nordisk Foundation); & **Brian Nosek** (Director, Center for Open Science).

<http://researchonresearch.org>
Phase 2 launch event, 20 June

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