



OPINION ARTICLE

REVISIED Grant writing and grant peer review as questionable research practices

[version 2; peer review: 2 approved]

Stijn Conix ¹, Andreas De Block ¹, Krist Vaesen²¹Centre for Logic and Philosophy of Science, KU Leuven, Leuven, Vlaams Brabant, 3000, Belgium²Philosophy & Ethics, Eindhoven University of Technology, Eindhoven, The Netherlands

V2 First published: 08 Nov 2021, 10:1126
<https://doi.org/10.12688/f1000research.73893.1>
 Latest published: 24 Dec 2021, 10:1126
<https://doi.org/10.12688/f1000research.73893.2>

Abstract

A large part of governmental research funding is currently distributed through the peer review of project proposals. In this paper, we argue that such funding systems incentivize and even force researchers to violate five moral values, each of which is central to commonly used scientific codes of conduct. Our argument complements existing epistemic arguments against peer-review project funding systems and, accordingly, strengthens the mounting calls for reform of these systems.

Keywords

peer review, grant review, project funding, research ethics, ethics of funding, science funding



This article is included in the **Research on Research, Policy & Culture** gateway.

Open Peer Review**Approval Status**

	1	2
version 2		
(revision)		
24 Dec 2021		
version 1		
08 Nov 2021		

1. **Lambros Roumbanis** , Stockholm University, Stockholm, Sweden

2. **Tamarinde Haven** , Charité, Berlin, Germany

Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Stijn Conix (stijn.conix@kuleuven.be)

Author roles: **Conix S:** Conceptualization, Writing – Original Draft Preparation, Writing – Review & Editing; **De Block A:** Conceptualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Vaesen K:** Conceptualization, Writing – Original Draft Preparation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

Copyright: © 2021 Conix S *et al.* This is an open access article distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Conix S, De Block A and Vaesen K. **Grant writing and grant peer review as questionable research practices [version 2; peer review: 2 approved]** F1000Research 2021, 10:1126 <https://doi.org/10.12688/f1000research.73893.2>

First published: 08 Nov 2021, 10:1126 <https://doi.org/10.12688/f1000research.73893.1>

REVISED Amendments from Version 1

Multiple small changes were made to the original manuscript on the basis of the suggestions of the reviewers. These changes are described in detail in our responses to the reviewers.

Any further responses from the reviewers can be found at the end of the article

1. Introduction

In industrialized societies, a large fraction of the governmental budgets for research is allocated through competitive peer review of project proposals. This popular mode of funding allocation has been criticized for not delivering the scientific goods it was intended to deliver. Evidence has shown that grant peer review is costly, that the ranking it produces lacks validity, and that it does not promote novel views (Guthrie, Ghiga, and Wooding 2018; Herbert *et al.* 2013; Link, Swann, and Bozeman 2008 and other references below). But whereas the epistemic defects of peer-review project funding (PRPF) have been extensively studied, its ethical shortcomings have received little scholarly attention. This is surprising, as there has been a strong increase in attention for the prevalence of misconduct and questionable research practices in other parts of science over the past decade (Xie *et al.* 2021). It is these ethical shortcomings of PRPF that the current paper is concerned with. More specifically, we will argue that PRPF systems prompt behaviour that violates moral values and norms that, according to prominent scientific codes of conduct, scientists, funding agencies and other stakeholders of PRPF are expected to conform to.

As we will see, PRPF systems exert a whole range of different pressures on applicants, reviewers and funders to behave unethically. Importantly, these pressures vary in strength. Sometimes, the pressures are best thought of as (mere) incentives. Those incentives make it more likely that individual researchers will act unethically, primarily because such morally questionable behaviour will increase their chances of success in grant acquisition. Yet, such incentives do not really *require* researchers to engage in unethical practices. On the other hand, there are also what we will call ‘forces’. Because of these forces, researchers who want to apply for research funding or who agree to serve as a grant-decision maker *are required to* behave in a way that most researchers deem ethically questionable.

The conclusion of this paper is that the academic community should reconsider its widespread use of PRPF systems, not just because of these systems’ (alleged) inefficiency and epistemic shortcomings, but also because they almost inevitably promote ethically questionable behaviour.

In the next **section**, we briefly discuss the background, prominence and epistemic shortcomings of PRPF. The **third section** analyses prominent scientific codes of conduct (CoC) to identify the ethical values that are supposed to guide the behaviour of researchers. The **fourth section** then argues that PRPF systems come with a whole range of incentives and forces that prompt violations of these values. Finally, the **fifth section** discusses what is needed to make the allocation of research funding more ethical.

2. PRPF: background, prominence and epistemic shortcomings

Since the 1970s, governments have distributed an increasing fraction of their resources for research on the basis of competition, following a model that the American National Science Foundation (NSF) put in place in the 1950s (England 1982). These governments urged funding agencies to organize competitions among researchers, such that project proposals are assessed by academic peers, in a way analogous to the peer review of scientific articles.

At present, science funding agencies in industrialized societies allocate much of their funding through PRPF.¹ In the US, for example, the National Institutes of Health (NIH) annually invests over \$30 billion in basic and applied biomedical research. All of that money is allocated through PRPF. The same holds true for the budget that the NSF spends on basic research (about \$8.8 billion per year).² The European Union, finally, allocated about €60 billion through PRPF between 2014 and 2020 with its Horizon 2020 programme (Schiermeier 2020). Typically, these PRPF funding schemes have very low success rates, making them highly competitive.³

¹Throughout this paper, we use the term ‘science’ to refer to all academic disciplines.

²These numbers are for 2020, see <https://www.nih.gov/grants-funding> and <https://www.nsf.gov/about/glance.jsp>

³This high degree of competition is not inherent to PRPF, and it is perfectly possible to use PRPF with moderate or low levels of competition. As it is our aim to evaluate PRPF as it currently functions, we evaluate the system in its current highly competitive form.

The current widespread reliance on highly competitive PRPF has a series of consequences for researchers. Trivially, peer review of grant proposals influences what kind of research will be done, and who gets to do it. Successful applications also come with prestige, both within and outside the research community (Coate and Howson 2016). Relatedly, research careers can be made or broken by grant applications. Many research institutions now make tenure, promotions and salary raises dependent on a researcher's success in prestigious calls (Dunn, Iglewicz, and Zisook 2020; Joiner and Wormsley 2005) and success in grant funding competitions is one of the most common criteria that institutions use for review, tenure and promotion (Rice *et al.* 2020). For example, several European universities give a substantial salary supplement to successful ERC-applicants for the duration of their project. In Germany, there is a bonus system for professors that regularly includes targets for grant acquisitions (Erina 2015).

Given its crucial role in today's science, one would expect that PRPF reliably and efficiently selects the best scientific projects. Yet, the literature on research funding has raised serious doubts about this. Several studies indicate that peer review is not a very reliable or valid method for evaluating research proposals. Regarding reliability, Kaplan *et al.* (2008), for instance, argue that for the mandated level of precision in reviewers' scores, the NIH needs as many as 40,000 reviewers per project instead of the 4 reviewers it now aims for. Moreover, biases such as cronyism are pervasive in grant funding (van den Besselaar 2012; Guthrie, Ghiga, and Wooding 2018).

Since low reliability is typically associated with low validity, it should not come as a surprise that reviewers often fail to predict the scientific success of the proposals they evaluate. For instance, there is no or only a weak correlation between the review score of a project and its eventual bibliometric impact (Doyle *et al.* 2015; Fang, Bowen, and Casadevall 2016; van den Besselaar and Sandström 2015). Plenty of anecdotal evidence suggests that review panels do a poor job at predicting success: Nobel Prize laureates have repeatedly complained about the difficulties they have experienced in getting their award-winning work past grant review committees (Bendiscioli 2019; Johnson *et al.* 2010; Kim 2006; Marshall 2005; Taubes 1986).

Other epistemic problems relate to the types of knowledge that are generated by PRPF funded projects. Although many funding agencies emphasize that their aim is to fund innovative research, PRPF systems might instead be conservative, and favour well-established views rather than radically new ideas (see Nicholson and Ioannidis 2012; and reviews by Guthrie, Ghiga, and Wooding 2018; Guthrie *et al.* 2019).

These epistemic problems might be justifiable if the costs and impacts of the system were relatively low. Yet, the costs of PRPF turn out to be very high. Link *et al.* (2008) show that researchers at R1-universities in the United States spend on average more than four hours a week writing project applications. Similar studies were conducted for the National Health and Medical Research Council, a major funding organization for biomedical sciences in Australia. The results of these studies indicate that the time investment in 2009 was as much as 180 years of research time to fund 620 projects, and by 2013, the costs had gone up to more than 500 years of research time – equivalent to € 41 million in salary – to fund approximately 700 projects with a total value of € 226 million (Herbert *et al.* 2013).

3. Ethical values and norms associated with research integrity

Individual ethical behaviour co-varies with situational factors and with personality traits (Bruton *et al.* 2020). Here, we will be concerned with the role of situational factors, and more specifically with how institutional and structural aspects of research environments prompt unethical behaviour. Our focus on systemic incentives fits today's scholarship on research integrity. For example, in a recent consensus study report of the National Academies of Sciences-Engineering-Medicine (NAS 2017, 208), it is noted that “patterns of funding and organization that have emerged over the past few decades in the United States have created environments increasingly characterized by elements [...] that are associated with cheating, such as very high stakes, a very low expectation of success, and peer cultures that accept corner cutting” (NAS 2017, 98). We concur, and analyse the characteristics of PRPF that lead to unethical behaviour below. Before doing this, we first identify the core principles of research integrity.

Scientists are bound by a number of science-specific norms and values. These norms and values are frequently made explicit in scientific CoCs. Such CoCs are almost invariably based on, or derived from, the five norms developed by Robert Merton (Radder 2019).⁴ CoCs are a good starting point for our analysis because they are the result of extended debates among a wide variety of stakeholders. They function as consensus statements, reflecting an overall agreement

⁴This is not to say that the Mertonian norms haven't been criticized (See Knuuttila 2012 for an overview). For one, there seems to be a disconnect between the norms and actual scientific practice, especially in the context of commodified science. In this sense, the ethos of science conflicts with the organization of science. In fact, our arguments about PRPF illustrate that the organization of science indeed is difficult to bring into accord with the regulative ideals formulated by Merton.

Table 1. Mapping of the new list of values (shaded grey) onto Codes of Conduct (CoCs, shaded black). The CoCs are, in order, the European Code of Conduct for Research Integrity (ECCRI), Doing Global Science (DGS), Fostering Integrity in Research (FIR), the Singapore Statement on Research Integrity (SSRI) and Ethical Guidelines for Peer Reviewers (EGPR).

	ECCRI	DGS	FIR	SSRI	EGPR
Accountability	Accountability	Reliability, Accountability	Openness, Accountability	Accountability	Accountability, Professional responsibility
Honesty	Reliability, Honesty	Honesty, Objectivity, Reliability, Skepticism, Openness	Honesty, Openness	Honesty	Honesty, Professional responsibility
Impartiality	Reliability, Honesty	Fairness, Objectivity, Scepticism	Objectivity, Fairness	Professionalism	Honesty, Accountability, Being unbiased
Responsibility	Respect		Stewardship	Stewardship	
Fairness	Honesty, Respect	Fairness, Openness	Fairness, Stewardship	Professionalism, Stewardship	Accountability, Confidentiality

among these stakeholders about the norms that should guide research, and present both minimal conditions for ethical research practices and aspirations. In addition, institutions and funding agencies often adopt these CoCs as a framework for their own policies and regulations on research integrity.⁵ Hence, if we can show that PRPF threatens the core values of the CoCs, we have a strong case for urging these academic institutions and funders to revise their policies on PRPF.

We analyzed the following five CoCs: the *Singapore Statement on Research Integrity* (Resnik and Shamoo 2011) that was written at the second World Conference on Research Integrity, the *European Code of Conduct for Research Integrity* (2017), developed by the European Science Foundation and All European Academies, *Doing Global Science: a guide to responsible conduct in the global research enterprise* (IAP 2016) written by a committee of leading scholars on research ethics, *Fostering Integrity in Research* (NAS 2017), a consensus document published by the National Academy of Sciences, and *Ethical Guidelines for Peer Reviewers* (COPE 2013), drafted by the Committee on Publication Ethics. These CoCs were selected because of (1) their geographical focus (EU, USA, world), (2) their generality (not about one discipline or aspect, but about science in general), and (3) their authoritative status within the scientific community. We also analyzed *Ethical Guidelines for Peer Reviewers* (COPE 2013), because peer review is central to PRPF.

The selected CoCs differ somewhat in their definitions of integrity and misconduct. They also vary in their approach. Some CoCs are more value-based, and state which values (e.g. honesty) should guide research. Other CoCs are more norm-based, and primarily indicate which behaviours need to be sanctioned or stimulated (Godecharle, Nemery, and Dierickx 2014). The CoCs also vary with regard to the values and norms they include. This variation is largely due to the inevitable vagueness associated with the formulation of values and norms, and due to the different objectives of the CoCs. Still, the differences do not reflect deep disagreements on what constitutes misconduct or about the core values.

In order to facilitate our assessment, we have extracted from the CoCs one list of values and norms. This list ignores the subtle differences just mentioned, and captures what the CoCs have in common. Table 1 summarizes how our list maps onto the values prioritized by the various CoCs.

Our list comprises the following values and norms:

- *Accountability* entails that scientists should be able to explain and justify their claims and actions.
- *Honesty* obliges scientists to be accurate, transparent and clear in all their communication. Researchers violate this value when they fabricate or falsify data, when they present findings in a misleading way, and when they are insufficiently open about the uncertainty of their claims.

⁵See e.g. the list of stakeholders in the European Code of Conduct for Research Integrity (2017).

- *Impartiality* means that researchers do not let their personal opinions, interests, preferences prejudices or the interests of the bodies commissioning their work influence their decisions and judgements. Rather, researchers' decisions and judgements should serve the aims of science (e.g., truth, instrumental value).
- *Responsibility* requires researchers to take into consideration the broad interests of society. Researchers should spend their resources on research that benefits society, that does not violate the ethical guidelines for activities involving human subjects and animals, and that properly mitigates possible harms and risks.
- *Fairness* implies that scientists should show due respect to everybody they interact with in a scientific context, and sufficiently acknowledge the work of others. This applies to interactions with fellow-scientists, but also to interactions with participants in experiments, the readers of scientific publications, administrative staff, students and funders.

We acknowledge that there is some overlap between some of these values (as there is in the CoCs) and that alternative categorizations are possible. For example, the problem of double dipping (i.e. researchers using the same project in different funding schemes) is as much a violation of norms like solidarity or generosity as it is a violation of honesty. Thus, an alternative classification that includes solidarity and generosity would be viable as well. Still, our categorization fits our purposes, as it captures the main ways in which PRPF invites ethically questionable practices, and helps us (in [Section 4](#)) in structuring them.

Importantly, on a final note, in the remainder we will construe the five values of research integrity primarily as *ethical* values. We acknowledge, though, that each of them is directly or indirectly related to epistemic values. Consequently, many of the problems we discuss are epistemic as well as moral problems. It is no coincidence that this is so: research integrity is concerned with scientific research, and society values such research primarily because of the epistemic goods it delivers. Given this entanglement of ethical and epistemic considerations, our focus on the ethical aspects of PRPFs is inevitably somewhat artificial. However, such a focus is useful here, as it more clearly brings out an important point that has not received due attention: the ethical dimension of the problems that PRPF systems give rise to. In any case, to the extent one regards these values as merely epistemic, our paper complements the epistemic worries about PRPF raised and reviewed in [Section 2](#).

4. PRPF prompts violations of research integrity

This section argues that PRPF forces or incentivizes researchers to violate each of the five aforementioned values. Many ethically questionable practices can be categorized as a violation of more than one value. When that is the case, we just place and discuss it under one value. Our focus will be on ethical problems that arise for *individual researchers* who apply for, evaluate and receive research grants. System-level moral issues, such as the inefficiency of PRPF systems, which are primarily associated with policy-makers and funding organizations, fall outside our scope.

Before we turn to these practices, it is good to note that most of them have not, or only rarely, been studied. We refer to empirical work whenever it exists, but this is unfortunately not the case for all practices. Even though this means that there is not always published evidence that backs up our claims that these practices are prevalent, we believe that most people familiar with academia and its funding processes will recognise the practices we discuss and know how common they are. We too have at some point engaged in some of these practices, and we expect that most readers of this paper also either engage in them or know of colleagues who do.

4.1 Accountability

Scientists are bound by the norm of accountability: they should only make claims that are justified to the degree that is appropriate for the context in which they make these claims. As both funding applications and review reports consist in claims about future research, this norm is directly relevant to the way PRPF distributes research funding. We argue that PRPF commonly forces both applicants and reviewers to make claims they cannot sufficiently justify.

First, consider applicants. Most grant applications require applicants to develop detailed timelines, and to describe expected milestones, results and applications. However, the outcomes and course of scientific research are notoriously difficult to predict ([Carrier 2008](#); [Mallapaty 2018](#); [Sinatra et al. 2016](#)). Indeed, scientists have been quite wrong about the future impact of, among others, Mendelian genetics, Pasteur's fermentation theory, continental drift, the idea of Australopithecus being ancestral to Homo, the prion theory (concerning the causes of BSE or "mad cow disease"), and bacterial infection as the cause of stomach ulcers ([Benda and Engels 2011](#); [Gordon and Poulin 2009](#)). Because making predictions of future success or listing project deliverables is a mandatory part of project applications, researchers are thus *forced* to make claims that they cannot sufficiently justify. Note that some projects (viz., risky ones) might be subject to

this worry more than others. But even the success of allegedly fail-safe projects depends on various factors that are not under the control of the researchers who write the grant applications, including, among others, fluctuations in the supply of qualified labour, political and economic developments, changes in institutional policies, contingencies in the poorly understood process from invention to innovation, and personal and inter-personal issues arising within the project team.

Grant-decision makers (grant committee members and peer reviewers), too, are forced by PRPF to make claims they cannot justify. Note that their decisions require a high degree of justification, as they decide over large amounts of money and their decisions have a great impact on the careers of researchers, the course of science, and the people potentially affected by the outcomes of the proposed research. One reason why it may often be impossible for grant-decision makers to meet the required high degree of justification is that in many funding competitions there are far more high-quality applications than there is money to distribute. Because scientific success is difficult to predict (see above), grant-decision makers lack grounds for choosing between these high-quality applications (Kaplan *et al.* 2008). Because of this, there is a push to generate unjustified reasons and to overemphasize tiny or even insignificant differences between granted and rejected proposals. Another reason why the required degree of justification is rarely met is that grant-decision makers typically do not get all the relevant information that is needed to make a proper judgment. For example, grant-decision makers are often asked to give scores to applicants but due to differences in experience and context are likely to work with a different reference class (e.g., an applicant might be judged top-5% by one reviewer, but top-20% by another because the reviewers come from different fields). In addition, grant-decision makers often have to evaluate projects that fall outside their direct area of expertise. This is the case, for instance, when they serve in interdisciplinary grant committee panels (Bromham *et al.* 2016).

In light of the above, grant-decision makers are *forced* to make unjustified evaluations. In addition to these forces, there are also various incentives that give rise to violations of accountability. For instance, the large review burden and time-pressure of PRPF may incentivize some reviewers to deliver low-quality reports, and, hence, to make judgments that are insufficiently justified (Publons 2019). Reviewers in grant panels typically have to read thousands of pages of applications, review reports and researcher profiles. Even the most diligent among them are unlikely to have the time to thoroughly read all these materials. This means they either have to skim through projects, or select a few that are closest to their expertise. In this light, it is also no surprise that reviewers admit that irrelevant factors, such as spelling errors, play a role in their grant decisions (Inouye and Fiellin 2005; Porter 2005).

4.2 Honesty

Norms of honesty demand researchers to not intentionally make false claims. Some indirect implications of these norms are that researchers should not withhold crucial information, include irrelevant information, or use other methods of deception. In the context of research funding, this norm is primarily relevant for project proposals and evaluation reports.

First, PRPF systems strongly incentivize researchers to violate authorship norms. Because of low success rates, the increasing dependence of academic institutions on external grant acquisition, and the prestige derived from successful applications, scientists are strongly encouraged (or obliged by their institutions) to take part in as many funding competitions as possible (Fang and Casadevall 2016). Because the applicant's profile plays an important role in the evaluation of grant proposals, senior scientists are most likely to be successful. However, senior scientists rarely have the time to write (many) grant applications. Accordingly, they may be tempted to delegate some or even most of the work of grant writing to their junior staff, and submit the application under their own name. At the same time, there are plenty of funding schemes for which junior researchers (e.g., PhD students, postdocs) are not eligible, even if these schemes are primarily used for funding work carried out by such junior staff (e.g. postdocs and PhDs hired on a project). To the extent that junior researchers contribute to writing such grants, the eligibility criteria of PRPF systems induce them to write applications under a different name. Relatedly, it is a public secret (although how pervasive it is has not been investigated yet) that junior researchers sometimes submit proposals under their own name that they have not written themselves. Grants for junior researchers are then used to pursue the research goals of others (senior researchers, labs). Such practices violate the norm of honesty in that the work of the actual author(s) is not acknowledged, and this for the purpose of deceiving grant-decision makers.

An *incentive* to withhold crucial information is the risk that reviewers will steal the ideas of the applicants they are assessing—and there is usually plenty of time for this to happen, given the typically substantive time delay between application and funding decision. Accordingly, it is no surprise that applicants have characterized their own application strategy as follows: “you only show them [reviewers] enough to get it [your project] funded”, otherwise they will “kill your grant, and then take and do it” (interviewee in Anderson *et al.* 2007a, 425).

Another salient incentive for PRPF systems to be dishonest relates to so-called ‘grantsmanship’. This term generally refers to the art of writing successful funding applications, but is typically used to single out those aspects of the

application that are not scientific but rather formal, stylistic and rhetorical. Indeed, many guides of grantsmanship emphasize that grants are in the first place pieces of advertising (e.g., [Koppelman and Holloway 2012](#); [Rasey 1999](#)). Because the review process should primarily evaluate scientific merit (rather than formal or stylistic qualities), grantsmanship adds noise to the evaluation system. Such noise is particularly harmful because funding competitions are a zero-sum game: successful applicants win *at the expense of* other applicants. Superior grantsmanship may thus push equally good or better applicants below the funding threshold. Because it is unlikely that reviewers are fully insensitive to factors that are unrelated to scientific merit ([Inouye and Fiellin 2005](#); [Porter 2005](#)), PRPF systems plausibly reward grantsmanship. This is illustrated by the staggeringly high success rates of some grant writing consultants:⁶ being supported by people with no background in the proposed research dramatically increases the chances of getting money for that research.

Another practice that PRPF incentivizes concerns ‘double-dipping’, the practice of submitting the same research project in multiple funding calls without proper acknowledgement. The reasons researchers are incentivized to engage in double-dipping have been mentioned above: low success rates, academic institutions’ increasing dependence on external funding, prestige and so forth. That double-dipping is common is suggested by [Garner et al. \(2013\)](#). In their study of U.S. funding in the biomedical sciences, these authors found that, between 2007 and 2011, over \$20 million was allocated to projects that had already attracted funding before. Although this amounted to only a small percentage of the total budget that was distributed, [Garner et al. \(2013\)](#) suggest it probably is an under-estimation, given the difficulties in finding duplicates. In any case, it *is* research money that cannot be spent on other research projects. Double-dipping includes several dishonest practices, such as, withholding relevant information, self-plagiarism and, plausibly, the use of grant money for purposes other than those for which it was intended.

Finally, PRPF also incentivizes the dishonest practice of applying with research that has already partially been done ([Anderson et al. 2007a](#), 448). In a longitudinal study of grant applications from the *Deutsche Forschungsgemeinschaft*, [Serrano Velarde \(2018\)](#) observes that decreasing success rates have made applicants increasingly concerned with portraying their research projects as certain to be successful. Arguably, they share this concern with funding agencies, that, in light of the demand for greater public accountability, typically ask applicants to specify clear, demonstrably feasible and measurable targets (deliverables, outputs, milestones) ([Frodeman and Briggie 2012](#)). Reviewers, too, seem biased towards success, for they appear to reward projects that are highly likely to achieve what they promise ([Inouye and Fiellin 2005](#)). Because of this, portraying an ongoing or finished research project as if it is merely a research plan, is an effective and – according to interviewees in [Anderson et al. \(2007a\)](#) – popular strategy. In that light, it is not surprising that 27% of early-career scientists and 72% of all midcareer scientists in a survey admitted to improper use of funds such as using money from one project in another ([Anderson et al. 2007b](#)).

4.3 Impartiality

Impartiality means that researchers should aim their decisions and judgements to primarily serve the interests of science. Accordingly, their decisions and judgements should not be led by prejudices, the interests of their sponsors, or any other bias.

There are at least two senses in which PRPF schemes *force* researchers to violate norms of impartiality. First, there is solid evidence that the judgements of grant-decision makers are subject to various biases ([Boudreau et al. 2016](#); [Guthrie et al. 2019](#); [Nicholson and Ioannidis 2012](#); [van den Besselaar 2012](#)). Thus, at least given the way that PRPF schemes are currently set up, serving as a reviewer presently means engaging in a practice that is known to violate norms of impartiality. Surely, full impartiality is too stringent a demand for many scientific activities—for instance, such a demand would make carrying out research virtually impossible. But in the case of distributing research money, there *do* exist alternatives that fare much better than PRPF when it comes to impartiality (e.g., lotteries, egalitarian sharing, see [Section 5](#)).

A second sense in which PRPF schemes force researchers to transgress norms of impartiality relates to the political context that the schemes operate in. In some cases, grant decision-makers might be requested to take into account such things as the geographical and institutional distribution of the grants they award and the political sensitivities of the governments they work for. [Hegde \(2009\)](#) and [Batinti \(2016\)](#), for instance, found that working in a U.S. presidential swing-voter state or in a state of certain congressional appropriators increases applicants’ likelihood of success up to 10.3%. Grant-decision makers thus seem to be compelled to let the interests of the bodies commissioning their grant reviewing work interfere with their judgment. As a result, projects might get funded that are optimal in political terms, but sub-optimal in scientific terms.

⁶These success rates are advertised on the websites of grant writing consultants. We do not refer to specific websites here, because we think some of their practices are unethical.

Turning to the *incentives* to act against the norms of impartiality, the track record of applicants is an important consideration in grant-decision making.⁷ Together with the pressure to be successful in grant applications, PRPF might thus indirectly invite applicants to engage in practices that boost their publication record (in terms of number of publications, citation counts, or journal impact factors) but fail to serve the interests of science (Bouter 2015; Tjldink, Verbeke, and Smulders 2014). Furthermore, to reduce the workload of grant committee members, many PRPF schemes allow applicants to indicate potential reviewers of their proposal; applicants thus get the opportunity to increase the likelihood of receiving a favourable review (Severin *et al.* 2019). They can further increase this likelihood by selective citing (e.g., citations of possible reviewers, no citations to hostile reviewers), which, according to a survey with experts on research integrity, occurs relatively frequently (Bouter *et al.* 2016). Similar incentives to violate the norm of impartiality also arise because, unlike reviewers, grant-decision makers will often come from the same country as applicants. For example, up to two thirds of all panel members for the Flemish Research Council (FWO⁸; Belgium) can have an appointment at a Belgian University.⁹ Especially in smaller countries like Belgium, these decision makers often participate in applications of their friends (or enemies) and favourite (or disliked) colleagues. Under these circumstances, cronyism is to be expected (van den Besselaar 2012).

4.4 Responsibility

Norms of responsibility require researchers, in their work, to take into account the broad interests of society. This norm is particularly salient in the case of publicly funded research.

Being responsible to taxpayers implies that the returns of public funding bodies' investments should be public. However, the 1980 Bayh-Dole Act established a legal framework in the U.S. that encourages recipients of public research money to derive patents from their publicly funded research results (Rai and Sampat 2012). The increasing emphasis that public funding agencies' place on valorization drives scientists towards research that directly creates economic returns (De Jonge and Louwaars 2009), and to exploit the commercial opportunities created by the Bayh-Dole Act. Proponents of the act (and of academic patenting more generally) point out that academic patenting benefits society because it promotes commercial development of otherwise purely academic knowledge. Their arguments have been repeatedly criticized on empirical and epistemic grounds (Mirowski 2011; Radder 2019; Sterckx 2010). But on whatever side of the debate one stands, academic patenting does push publicly acquired knowledge out of the public domain. So at least in this sense, U.S. funding agencies incentivize practices that go against public interests. The same holds true for funding agencies that work for governments that have adopted (*viz.*, Japan) or are in the process of adopting (*viz.*, the E.U.) Bayh-Dole-type legislation (Lynskey 2006; Mirowski 2011).

Another worrisome practice that researchers participating in PRPF schemes are strongly encouraged to engage in pertains to hiring. PRPF schemes are by definition project-based, and thus only provide funding for the duration of the project. Accordingly, grantees are pressurized to hire, as project collaborators, cheap *temporary* staff (PhD students, Postdocs), even if that staff carries out work that, in the long run, would in a more cost-effective way be carried out by specialized, permanent staff. The considerable costs for society do not stop there: the reliance of grantees on temporary labour presumably also contributes to the mismatch between the production of PhDs and the availability of jobs in the academic sector that industrialized societies are currently facing (Gould 2015). Although part of the costs of this mismatch can be compensated for by the training that temporary grants may provide for jobs outside academia, the mismatch probably also exacerbates many questionable research practices (Smaldino and McElreath 2016).

Weaker, but still significant incentives relate to project budgets. For one, various *incentives* invite applicants to apply for more research money than needed, including minimum and maximum budget clauses in grant applications, a lack of institutionalized differentiation with respect to grant size between resource-intensive and less resource-intensive disciplines (for all of these see e.g. the FWO), and pressure from researchers' home institutes. Further, funds are typically to be spent within the intended timeframe of the project in question; it is an open secret that many researchers are tempted to use, before the actual end of their project, estimated surpluses for purposes unrelated to the proposed research. As Brennan and Magness (2019) put it in their *Cracks in the Ivory Tower*: "If we are not rewarded for being frugal, we might as well [...] buy the nicest computers and hotel rooms our budget permits".

⁷See e.g. ERC (https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/erc/h2020-wp18-erc_en.pdf#page=34) and NSF (https://www.nsf.gov/pubs/policydocs/pappg18_1/pappg_3.jsp#IIIA2a).

⁸<https://www.fwo.be/en/fellowships-funding/research-projects/junior-and-senior-research-projects/>

⁹<https://www.fwo.be/nl/het-fwo/organisatie/fwo-expertpanels/reglement-fwo-interne-en-externe-peer-review/>

4.5 Fairness

The value of fairness requires that scientists treat everybody they interact with or affect in their work with due respect. Fairness concerns all interpersonal relationships in science, and in that sense overlaps with the other values on our list. Many of the practices we have already described under the headings of honesty, responsibility and objectivity also constitute a lack of respect for other scientists.

In addition to these, at least one other violation of fairness deserves mentioning. Most of the incentivized practices we have discussed here are commonly accepted in academia. For example, researchers write guides about grantsmanship (Koppelman and Holloway 2012; Rasey 1999), researchers are often expected to apply for more funding than they can effectively use, and at least at our home institutions the use of grant writing consultants is explicitly encouraged. We know of several postdoctoral researchers who are funded by one grant to allocate more than half of their research time to applying for other lab-level research grants. Such violations of norms of research integrity appear to be tolerated by the scientific community. Indeed, it is unlikely that commissions for research integrity would seriously investigate allegations of misconduct if the misconduct consists merely in grantsmanship or ill-justified timelines in applications.

The fact that such ethically questionable practices are widely tolerated is problematic in several ways. First, it is unfair towards those researchers that do not give in to the pushes of PRPF systems to engage in such practices. Second, it is a direct violation of the CoCs, which explicitly warn against tolerating unethical behaviour. Finally, it establishes an unhealthy research culture that makes it difficult for researchers that are not well-established, like junior scholars, to adhere to the CoCs (Roumbanis 2019).

5. Discussion and conclusions

The violations we have listed are not meant to be exhaustive, and they are unlikely to capture all the senses in which PRPF systems prompt ethically questionable research practices. In addition, some may find that most of the questionable research practices we discussed are minor issues, and it is true that none of the problems presents a clear knock-down argument against PRPF. Still, we have seen that PRPF systems force or incentivize researchers to violate, in one way or the other, each of the five norms and values commonly associated with research integrity and included by all major CoCs. And while many of these may seem like only minor violations of the COCs, some, such as double-dipping, self-plagiarism and ghost authorship, are unquestionably problematic and serious. Listing these minor and major violations side by side shows that ignoring these problems comes at a substantial ethical cost, as the issues are numerous, pervasive and unlikely to disappear on their own. In this concluding section, we briefly consider three options for reform.

The first option is to mitigate the perverse incentives associated with PRPF by eliminating or modifying those features of PRPF that prompt questionable behaviour. For instance, funding agencies could remove the demand to formulate strict timelines that indicate expected successes and measurable targets (e.g., number of papers, targeted journals, milestones). Alternatively, they could formally ask reviewers to estimate their confidence in their own reviews, and applicants to disclose any other funding schemes they have applied to with the same project. While making such changes would undoubtedly solve some of the issues we have discussed, this option will presumably remain sub-optimal. To start, many of the features of PRPF were introduced for good reasons. For example, measurable targets make it easier for reviewers to evaluate the output of the project. Second, the likely impact of some of the changes would be limited. If a funding body no longer required applicants to formulate milestones, applicants would arguably continue mentioning them, because they intuit that milestones strengthen their application. Similarly, reviewers' estimates of uncertainty would also be subject to uncertainty, thus propagating the same problem on a different level. Third, some of the incentives we have discussed seem to be intrinsic to PRPF systems and cannot be substantively modified without abandoning PRPF altogether. For instance, as long as grant decision-makers are human, the norm of impartiality will be hard to conform to.

A second option is to draft regulations for the specific context of PRPF—a 'CoC for grant writing and reviewing'—and to implement mechanisms for the enforcement of those regulations. Some funding agencies have already set steps in this direction. The [Flemish](#) and [Dutch](#) research councils, for example, require applicants in many of its funding schemes to indicate whether they have submitted or plan to submit their proposal with other funding agencies. It remains to be seen whether such measures will effectively reduce the prevalence of the practices that they target, such as double dipping. But, in any case, it is doubtful that regulatory work will be enough to address all the worries that we have raised. Indeed, as we have seen, PRPF systems are still subject to cronyism, in spite of codes of conduct that explicitly disapprove of cronyism ([van den Besselaar 2012](#)).

A final, more radical option is to put into effect alternative allocation systems. Various such systems have been proposed, primarily with the aim of addressing the epistemic shortcomings of PRPF ([Guthrie 2019](#)). These alternatives include peer-to-peer distribution ([Bollen et al. 2017](#)), allocation on the basis of past performance ([Bolli 2014](#); [Roy 1985](#)), a (modified) lottery among short project proposals ([Fang and Casadevall 2016](#)), bicameral grant review ([Forsdyke 1991](#)), using AI for

peer review (Checco *et al.* 2021), and baseline funding (Vaesen and Katzav 2017). Of these alternatives, bicameral grant review, allocation on the basis of past performance and peer-to-peer distribution are most similar with PRPF and, in that they still involve (serious) competition among applicants; accordingly, they most likely share PRPF's shortcomings. Relying on AI for peer review to increase fairness and decrease costs is a promising alternative, but does not seem possible yet. More research on this topic is needed, in particular to ensure that avoiding human biases does not come at the cost of introducing algorithmic biases (Checco *et al.* 2021). The two other alternatives, i.e. lottery-based systems and baseline funding, seem more promising with respect to research integrity. While they might suffer from different (unforeseen) moral problems, they seem less sensitive to many of the issues discussed in this paper. This is because they differ from PRPF in three crucial respects.

First, baseline funding and lottery-based systems substantively minimize reliance on judgements that we have seen to be problematic. These judgements include unjustifiable predictions in applications and review reports (violation of accountability), omitting crucial methodological details in project proposals (violation of honesty), and biased grant evaluations (violation of impartiality).

Second, baseline and lottery-based systems are relatively difficult to game. This is because they disregard many of the allegedly salient, but easily manipulated, differences among applicants that PRPF grant decisions are informed by. For instance, baseline and lottery-based systems are largely immune to grantsmanship and do not reward the many questionable practices that applicants might use to pimp their publication track record (e.g., salami-slicing, cutting corners, plagiarism, not publishing negative results).

Finally, the credit and prestige that applicants derive from a baseline or lottery-based grant would, relative to the credit and prestige derived from a PRPF grant, be minor or even nil. Indeed, there is little merit in acquiring a grant based on chance (lottery-based) or when every researcher gets one (baseline funding). An additional benefit of decoupling (alleged) merit and funding is that it would temper the Matthew effect and the overconfidence associated with repeated success in PRPF competitions. A non-merit based system would promote intellectual humility, a value that is both epistemically and ethically desirable (Alfano, Tanesini, and Lynch 2020).

A way to summarize these three differences between PRPF and the two alternatives is that only the former distributes funding on the basis of *competition* between researchers. In various ways, the competition for funding incentivizes researchers to cut corners and violate generally accepted norms of research integrity. This is interesting, as competition also seems to incentivize researchers to violate CoCs in other parts of science such as the research process and journal publications (Anderson *et al.* 2007a; Fang and Casadevall 2015; Fanelli 2010; Tjldink, Verbeke, and Smulders 2014). Our paper thus adds to these existing arguments for making science and its funding less competitive. Moreover, given PRPF's epistemic shortcomings, and the likely epistemic advantages of baseline and lottery-based funding, there are also non-ethical reasons to take these alternative systems seriously.

Data availability

No data are associated with this article.

References

- Alfano M, Tanesini A, Lynch MP: *The Routledge Handbook of Philosophy of Humility*. Routledge; 2020.
[Publisher Full Text](#)
- All European Academies (ALLEA): *European Code of Conduct for Research Integrity - Revised Edition*. All European Academies; 2017.
[Reference Source](#)
- Anderson MS, Ronning EA, De Vries R, *et al.*: **The Perverse Effects of Competition on Scientists' Work and Relationships**. *Sci. Eng. Ethics*. 2007a; **13**(4): 437–461.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Anderson MS, Horn AS, Risbey K, *et al.*: **What Do Mentoring and Training in the Responsible Conduct of Research Have To Do with Scientists' Misbehavior? Findings from a National Survey of NIH-Funded Scientists**. *Acad. Med.* 2007b; **82**(9): 853–860.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Batinti A: **NIH Biomedical Funding: Evidence of Executive Dominance in Swing-Voter States during Presidential Elections**. *Public Choice*. 2016; **168**(3): 239–263.
[Publisher Full Text](#)
- Benda WGG, Engels TCE: **The Predictive Validity of Peer Review: A Selective Review of the Judgmental Forecasting Qualities of Peers, and Implications for Innovation in Science**. *Int. J. Forecast.* 2011; **27**(1): 166–182. Group-Based Judgmental Forecasting.
[Publisher Full Text](#)
- Bendisoli S: **The Troubles with Peer Review for Allocating Research Funding**. *EMBO Rep.* 2019; **20**(12): e49472.
[Publisher Full Text](#)
- van den Besselaar P: **Selection Committee Membership: Service or Self-Service**. *J. Informet.* 2012; **6**(4): 580–585.
[Publisher Full Text](#)
- van den Besselaar P, Sandström U: **Early Career Grants, Performance, and Careers: A Study on Predictive Validity of Grant Decisions**. *J. Informet.* 2015; **9**(4): 826–838.
[Publisher Full Text](#)

- Bollen J, Crandall D, Junk D, *et al.*: **An Efficient System to Fund Science: From Proposal Review to Peer-to-Peer Distributions.** *Scientometrics*. 2017; **110**(1): 521–528.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Bolli R: **Actions Speak Much Louder Than Words.** *Circ. Res.* 2014; **115**(12): 962–966.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Boudreau KJ, Guinan EC, Lakhani KR, *et al.*: **Looking Across and Looking Beyond the Knowledge Frontier: Intellectual Distance, Novelty, and Resource Allocation in Science.** *Manag. Sci.* 2016; **62**(10): 2765–2783.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Bouter LM: **Commentary: Perverse Incentives or Rotten Apples?.** *Account. Res.* 2015; **22**(3): 148–161.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Bouter LM, Tijdink J, Axelsen N, *et al.*: **Ranking Major and Minor Research Misbehaviors: Results from a Survey among Participants of Four World Conferences on Research Integrity.** *Research integrity and peer review*. 2016; **1**: 17.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Brennan J, Magness P: *Cracks in the Ivory Tower: The Moral Mess of Higher Education*. Oxford, New York: Oxford University Press; 2019.
[Publisher Full Text](#)
- Bromham L, Dinnage R, Hua X: **Interdisciplinary research has consistently lower funding success.** *Nature*. 2016; **534**(7609): 684–687.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Bruton SV, Medlin M, Brown M, *et al.*: **Personal Motivations and Systemic Incentives: Scientists on Questionable Research Practices.** *Sci. Eng. Ethics*. 2020; **26**(3): 1531–1547.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Carrier M: **The Aim And Structure Of Methodological Theory.** *Rethinking Scientific Change and Theory Comparison: Stabilities, Ruptures, Incommensurabilities?*. Soler L, Sankey H, Hoyningen-Huene P, editors. Dordrecht: Springer Netherlands; 2008; 273–90. Boston Studies in the Philosophy of Science.
[Publisher Full Text](#)
- Checco A, Bracciale L, Loreti P, *et al.*: **AI-assisted peer review.** *Humanit Soc Sci Commun* 2021; **8**: 25.
[Publisher Full Text](#)
- Coate K, Howson CK: **Indicators of Esteem: Gender and Prestige in Academic Work.** *Br. J. Sociol. Educ.* 2016; **37**(4): 567–585.
[Publisher Full Text](#)
- COPE: *Ethical Guidelines for Peer Reviewers (English)*. Committee on Publication Ethics; 2013.
[Publisher Full Text](#)
- De Jonge B, Louwaars N: **Valorizing Science: Whose Values?.** *EMBO Rep.* 2009; **10**(6): 535–539.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Doyle JM, Quinn K, Bodenstein YA, *et al.*: **Association of Percentile Ranking with Citation Impact and Productivity in a Large Cohort of de Novo NIMH-Funded R01 Grants.** *Mol. Psychiatry*. 2015; **20**(9): 1030–1036.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Dunn LB, Iglewicz A, Zisook S: **How to Build a National Reputation for Academic Promotion.** *Roberts Academic Medicine Handbook: A Guide to Achievement and Fulfillment for Academic Faculty*. Roberts LW, editor. Cham: Springer International Publishing; 2020; 515–23.
[Publisher Full Text](#)
- England JM: *A Patron for Pure Science: The National Science Foundation's Formative Years, 1945-57*. National Science Foundation; 1982.
- Erina Y: Performance pay in academia: effort, selection and assortative matching. PhD thesis, London School of Economics and Political Science. 2015.
[Reference Source](#)
- Fanelli D: **Do Pressures to Publish Increase Scientists' Bias? An Empirical Support from US States Data.** *PLoS ONE*. 2010; **5**(4): e10271.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Fang FC, Bowen A, Casadevall A: **NIH Peer Review Percentile Scores Are Poorly Predictive of Grant Productivity.** *elife*. 2016; **5**(February): e13323.
[Publisher Full Text](#)
- Fang FC, Casadevall A: **Competitive Science: Is Competition Ruining Science?.** *Infect. Immun.* 2015; **83**(4): 1229–1233.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Fang FC, Casadevall A: **Research Funding: The Case for a Modified Lottery.** *MBio*. 2016; **7**(2): e00422–e00416.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Forsdyke DR: **Bicameral grant review: an alternative to conventional peer review.** *FASEB J*. 1991; **5**: 2313–2314.
[Publisher Full Text](#)
- Frodeman R, Briggale A: **The Dedisciplining of Peer Review.** *Minerva*. 2012; **50**(1): 3–19.
[Publisher Full Text](#)
- Garner HR, McIver LJ, Waitzkin MB: **Same Work, Twice the Money?.** *Nature*. 2013; **493**(7434): 599–601.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Godecharle S, Nemery B, Dierickx K: **Heterogeneity in European Research Integrity Guidance: Relying on Values or Norms?.** *J. Empir. Res. Hum. Res. Ethics*. 2014; **9**(3): 79–90.
[Publisher Full Text](#)
- Gordon R, Poulin BJ: **Cost of the NSERC Science Grant Peer Review System Exceeds the Cost of Giving Every Qualified Researcher a Baseline Grant.** *Account. Res.* 2009; **16**(1): 13–40.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Gould J: **How to Build a Better PhD.** *Nature News*. 2015; **528**(7580): 22–25.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Guthrie S: **Innovation in the Research Funding Process: Peer Review Alternatives and Adaptations.** 2019. November.
[Reference Source](#)
- Guthrie S, Ghiga I, Wooding S: **What Do We Know about Grant Peer Review in the Health Sciences?.** *F1000Res*. 2018; **6**(March): 1335.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Guthrie S, Rincon DR, McInroy G, *et al.*: **Measuring Bias, Burden and Conservatism in Research Funding Processes.** *F1000Res*. 2019; **8**(June): 851.
[Publisher Full Text](#)
- Hegde D: **Political Influence behind the Veil of Peer Review: An Analysis of Public Biomedical Research Funding in the United States.** *J. Law Econ.* 2009; **52**(4): 665–690.
[Publisher Full Text](#)
- Herbert DL, Barnett AG, Clarke P, *et al.*: **On the Time Spent Preparing Grant Proposals: An Observational Study of Australian Researchers.** *BMJ Open*. 2013; **3**(5): e002800.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- IAP (Interacademy Partnership): *Doing Global Science*. Princeton University Press; 2016.
[Reference Source](#)
- Inouye SK, Fiellin DA: **An Evidence-Based Guide to Writing Grant Proposals for Clinical Research.** *Ann. Intern. Med.* 2005; **142**(4): 274–282.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Johnson MH, Franklin SB, Cottingham M, *et al.*: **Why the Medical Research Council Refused Robert Edwards and Patrick Steptoe Support for Research on Human Conception in 1971.** *Hum. Reprod.* 2010; **25**(9): 2157–2174.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Joiner KA, Wormsley S: **Strategies for Defining Financial Benchmarks for the Research Mission in Academic Health Centers.** *Acad. Med.* 2005; **80**(3): 211–217.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Kaplan D, Lacetera N, Kaplan C: **Sample Size and Precision in NIH Peer Review.** *PLoS ONE*. 2008; **3**(7): e2761.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Kim K: *The Social Construction of Disease: From Scrapie to Prion*. Routledge; 2006.
- Koppelman GH, Holloway JW: **Successful Grant Writing.** *Paediatr. Respir. Rev.* 2012; **13**(1): 63–66.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Knuuttila T: **Contradictions of Commercialization: Revealing the Norms of Science?.** *Philosophy of Science*. December 2012; **79**(5): 833–844.
- Link AN, Swann CA, Bozeman B: **A Time Allocation Study of University Faculty.** *Econ. Educ. Rev.* 2008; **27**(4): 363–374.
[Publisher Full Text](#)
- Lynskey MJ: **Transformative Technology and Institutional Transformation: Coevolution of Biotechnology Venture Firms and the Institutional Framework in Japan.** *Res. Policy*. 2006; **35**(9): 1389–1422.
[Publisher Full Text](#)
- Mallapaty S: **Predicting Scientific Success.** *Nature*. 2018; **561**(September): S32–S33.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Marshall B: **Heliobacter Connections.** 2005.
[Reference Source](#)
- Mirowski P: *Science-Mart*. Harvard University Press; 2011.
- NAS, National Academies of Sciences: *Fostering Integrity in Research*. 2017.
[Publisher Full Text](#)
- Nicholson JM, Ioannidis JPA: **Research Grants: Conform and Be Funded.** *Nature*. 2012; **492**(7427): 34–36.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Porter R: **What Do Grant Reviewers Really Want, Anyway?.** *Journal of Research Administration*. 2005; **36**(1–2): 47–56.
- Publons: **Grant Review In Focus.** 2019. Accessed 30 November 2019.
[Reference Source](#)

- Radder H: *From Commodification to the Common Good: Reconstructing Science, Technology, and Society*. University of Pittsburgh Press; 2019.
- Rai AK, Sampat BN: **Accountability in Patenting of Federally Funded Research**. *Nat. Biotechnol.* 2012; **30**(10): 953–956.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Rasey JS: **The Art of Grant Writing**. *Curr. Biol.* 1999; **9**(11): R387.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Resnik DB, Shamoo AE: **The Singapore Statement on Research Integrity**. *Account. Res.* 2011; **18**(2): 71–75.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Rice DB, et al.: **Academic criteria for promotion and tenure in biomedical sciences faculties: cross sectional analysis of international sample of universities**. *Bmj.* 2020; **369**.
- Roumbanis L: **Symbolic Violence in Academic Life: A Study on How Junior Scholars are Educated in the Art of Getting Funded**. *Minerva* 2019; **57**: 197–218.
[Publisher Full Text](#)
- Roy R: **Funding Science: The Real Defects of Peer Review and An Alternative To It**. *Sci. Technol. Hum. Values.* 1985; **10**(3): 73–81.
[Publisher Full Text](#)
- Severin A, Martins J, Delavy F, et al.: *Gender and other potential biases in peer review: Analysis of 38,250 external peer review reports (No. e27587v3)*. 2019. PeerJ Inc.
[Publisher Full Text](#)
- Sinatra R, Wang D, Deville P, et al.: **Quantifying the Evolution of Individual Scientific Impact**. *Science.* 2016; **354**(6312): aaf5239.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Smaldino PE, McElreath R: **The Natural Selection of Bad Science**. *R. Soc. Open Sci.* 2016; **3**(9): 160384.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Sterckx S: **Knowledge Transfer from Academia to Industry through Patenting and Licensing: Rhetoric and Reality**. *The Commodification of Academic Research: Science and the Modern University*. Pittsburgh University Press; 2010; 44–64.
[Publisher Full Text](#) | [Reference Source](#)
- Taubes G: **The Game of the Name Is Fame. but Is It Science?**. *Discover.* 1986; **7**(12): 28–31.
- Tijdink JK, Verbeke R, Smulders YM: **Publication Pressure and Scientific Misconduct in Medical Scientists**. *J. Empir. Res. Hum. Res. Ethics.* 2014; **9**(5): 64–71.
[PubMed Abstract](#) | [Publisher Full Text](#)
- Vaesen K, Katzav J: **How Much Would Each Researcher Receive If Competitive Government Research Funding Were Distributed Equally among Researchers?**. *PLoS ONE.* 2017; **12**(9): e0183967.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Xie Y, Wang K, Kong Y: **Prevalence of Research Misconduct and Questionable Research Practices: A Systematic Review and Meta-Analysis**. *Sci Eng Ethics.* 2021; **27**: 41.
[Publisher Full Text](#)

Open Peer Review

Current Peer Review Status:  

Version 2

Reviewer Report 04 January 2022

<https://doi.org/10.5256/f1000research.79975.r118342>

© 2022 Roumbanis L. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Lambros Roumbanis 

Stockholm Centre for Organizational Research (SCORE), Stockholm University, Stockholm, Sweden

Thank you for the responses on my comments. I think you managed to revise your already very interesting and well-written article into a really fine contribution to the literature on peer review and research evaluation.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Sociology of Science; Science and Technology studies (STS); Evaluation studies; Theory of Science; Sociology of Judgment and Decision-making.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 04 January 2022

<https://doi.org/10.5256/f1000research.79975.r118341>

© 2022 Haven T. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Tamarinde Haven 

Charité, Berlin, Germany

The authors have sufficiently addressed my comments, the paper now reads (even more) nuanced and presents various new topics of interest for the scientific community at large.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: My area of interest is research integrity, in addition, I have a background in philosophy, psychology and epidemiology.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 16 November 2021

<https://doi.org/10.5256/f1000research.77582.r99420>

© 2021 Haven T. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Tamarinde Haven

¹ Charité, Berlin, Germany

² Charité, Berlin, Germany

Summary:

The authors argue that rather typical behaviours from applicants as well as reviewers in peer-review project funding (PRPF) clash with key values from research integrity codes of conduct (CoCs). After teasing out 5 key values that are shared by a varying set of CoCs, they show for that each value is harmed in the current PRPF system. I find it interesting that the authors focus on questionable research practices by the applicants as well as the reviewers, they present some behaviours that might be familiar to readers, but their interpretation of these behaviours as questionable because they harm the values in CoCs is thought-provoking.

To the questions below:

- Is the topic of the opinion article discussed accurately in the context of the current literature?

There is an increasing amount of research that investigates questionable research practices, a recent systematic review might provide some points the authors can connect to: Xie, Y., Wang, K., & Kong, Y. (2021). Prevalence of Research Misconduct and Questionable Research Practices: A Systematic Review and Meta-Analysis. *Sci Eng Ethics*, 27(4), 41.

- Are all factual statements correct and adequately supported by citations?

When the statements are not supported by citations, e.g., p. 5, paragraph 3, the authors acknowledge this, which is normal practice for a philosophical paper.

- Are arguments sufficiently supported by evidence from the published literature?

Not all, but the authors explicitly acknowledge this. That said, their argumentation for this can be substantiated at places, which I point to below.

- Are the conclusions drawn balanced and justified on the basis of the presented arguments?

Most of the authors' main conclusions are balanced and justified, but I find part of their

concluding statements unjustified. In particular, "In fact, our assessment includes many of the 'cardinal sins' against research integrity: self-plagiarism (in the form of double-dipping), taking credit for someone else's work (in cases where junior researchers write applications for their senior colleagues) and, potentially, falsification and fabrication (in cases where scientific results are adjusted to conform to promises made in the grant application)." p. 8 seems unjustified. The 'cardinal sins' indeed include plagiarism, but not *self*-plagiarism, which in various CoC is explicitly separated from plagiarising others, see e.g., Dutch CoC. Taking credit for someone else's work is guest authorship, which is related to plagiarism but often not considered a cardinal sin. In the article, the authors talk about making claims in grant applications that the grant requesters may not be able to justify, but they don't go in-depth into the pressure put on researchers *after* having received a grant, where these cases of potential falsification and fabrication should then supposedly happen. Whether the successful applicants do this seems an empirical claim to me, and one that seems rather unlikely.

Suggestions:

I have three suggestions. First, a substantial portion of the critique seems focused on the competition that is inherent in peer-review project funding, not so much the peer-review project funding system per se. The competition seems to do the heavy lifting in increasing the likelihood of researchers or reviewers engaging in questionable behaviour (at least for parts of Accountability, Honesty and Impartiality). I am aware that the authors acknowledge how PRPF is a case of organised competition, but it seems to me that PRPF in a situation of medium competition (instead of contemporary excessive competition) would be associated with less questionable behaviour or would at least be a much weaker incentive. It would be helpful to read how the authors see this, because the topic of competition has been discussed by various research integrity scholars (a great example is the paper by Anderson and colleagues from 2007).

My second suggestion is that although the authors acknowledge the inevitable overlap of epistemic and moral norms, the harm resulting from the questionable behaviours (QRPs) described seems primarily epistemic. I wonder why the authors hold on to framing their arguments as *moral*, and not classify some as *epistemic* (and hence directly supplementing existing epistemic work) and some as moral (opening a new avenue of critique)? It seemed to me that the harm to fairness (unfair of the community to tolerate some of the QRPs discussed because it puts those who do not engage in these QRPs at a disadvantage) is the only harm that seems to have no substantial epistemic component.

Third, and perhaps obvious, it seems to me that some of these practices are only questionable if *not* disclosed, e.g., for Accountability, these detailed timelines are developed (I presume) to the best of the applicant's ability, and if the applicant is successful, they need to be adjusted (perhaps in consultation with the funder) when unforeseen circumstances happen, or things otherwise turn out differently. Double-dipping is also a practice that need not be harmful, provided it is acknowledged to the funder.

Smaller remarks:

- "Since low reliability implies low validity," (p. 3) is not correct, it *could* be the other way around, but I believe the rest of the sentences then don't hold anymore or need some revisions.

- “These epistemic problems would be acceptable if the costs... were relatively low.” seems odd to me, I think the scientific community and the public at large should demand a system that gets them the truest possible knowledge and that if you end up with peer review that gets you non-innovative work and happens by luck only, then the cost aren't the greatest concern...

References

1. Xie Y, Wang K, Kong Y: Prevalence of Research Misconduct and Questionable Research Practices: A Systematic Review and Meta-Analysis. *Science and Engineering Ethics*. 2021; **27** (4). [Publisher Full Text](#)

Is the topic of the opinion article discussed accurately in the context of the current literature?

Partly

Are all factual statements correct and adequately supported by citations?

Yes

Are arguments sufficiently supported by evidence from the published literature?

Partly

Are the conclusions drawn balanced and justified on the basis of the presented arguments?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: My area of interest is research integrity, in addition, I have a background in philosophy, psychology and epidemiology.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 30 Nov 2021

Stijn Conix

Thank you for reviewing the paper, and for your very helpful comments -- they point out some of the issues we had been discussing at length before, and had difficulties resolving. We respond to your comments below.

REVIEWER:

Is the topic of the opinion article discussed accurately in the context of the current literature?

There is an increasing amount of research that investigates questionable research practices, a recent systematic review might provide some points the authors can connect to:

Xie, Y., Wang, K., & Kong, Y. (2021). Prevalence of Research Misconduct and Questionable Research Practices: A Systematic Review and Meta-Analysis. *Sci Eng Ethics*, 27(4), 41.

Thank you! As we think this might also be interesting for readers, we've added a line and this reference in the first paragraph of the paper.

REVIEWER: Are the conclusions drawn balanced and justified on the basis of the presented arguments?

Most of the authors' main conclusions are balanced and justified, but I find part of their concluding statements unjustified. In particular, "In fact, our assessment includes many of the 'cardinal sins' against research integrity: self-plagiarism (in the form of double-dipping), taking credit for someone else's work (in cases where junior researchers write applications for their senior colleagues) and, potentially, falsification and fabrication (in cases where scientific results are adjusted to conform to promises made in the grant application)." p. 8 seems unjustified. The 'cardinal sins' indeed include plagiarism, but not *self*-plagiarism, which in various CoC is explicitly separated from plagiarising others, see e.g., Dutch CoC. Taking credit for someone else's work is guest authorship, which is related to plagiarism but often not considered a cardinal sin. In the article, the authors talk about making claims in grant applications that the grant requesters may not be able to justify, but they don't go in-depth into the pressure put on researchers *after* having received a grant, where these cases of potential falsification and fabrication should then supposedly happen. Whether the successful applicants do this seems an empirical claim to me, and one that seems rather unlikely.

We agree that our statement about the cardinal sins was overstated and not fully justified, and have toned down this part of the paper. We now state (in that same paragraph, start of 'discussion and conclusions') that while many of the practices that we discuss may seem like rather minor offenses, some are unquestionably problematic and serious, such as ghost authorship (which we think is more pressing than guest authorship in the context of funding) and double dipping. This is sufficiently strong for the point we want to make.

REVIEWER: I have three suggestions. First, a substantial portion of the critique seems focused on the competition that is inherent in peer-review project funding, not so much the peer-review project funding system per se. The competition seems to do the heavy lifting in increasing the likelihood of researchers or reviewers engaging in questionable behaviour (at least for parts of Accountability, Honesty and Impartiality). I am aware that the authors acknowledge how PRPF is a case of organised competition, but it seems to me that PRPF in a situation of medium competition (instead of contemporary excessive competition) would be associated with less questionable behaviour or would at least be a much weaker incentive. It would be helpful to read how the authors see this, because the topic of competition has been discussed by various research integrity scholars (a great example is the paper by Anderson and colleagues from 2007).

This is an interesting suggestion. We agree that strong competition is not inherent to PRPF, and that lowering competition (i.e. higher success rates) would lower the

incentives to cut corners, and thus might lower some of the problems. However, as long as there is some competition -- which is inevitable in PRPF -- there will be an incentive to engage in some of the practices we discuss. How strong these are is unclear, as it may well be that those who don't get funding are even worse off than before (for instance because their failing becomes more salient), and might be more likely to engage in questionable research practices.

Thus, the precise effect of increasing success rates is hard to predict, and it is far from clear that most of the problems that we discuss would disappear. We therefore decided to focus on the current situation and assess its problems.

We do think it is important to mention this point, and now do this in section 2 (second and third paragraphs), where we introduce PRPF. We now clearly state that currently PRPF is highly competitive, and have added an endnote saying that this high level of competition is not inherent to PRPF.

REVIEWER: My second suggestion is that although the authors acknowledge the inevitable overlap of epistemic and moral norms, the harm resulting from the questionable behaviours (QRPs) described seems primarily epistemic. I wonder why the authors hold on to framing their arguments as moral, and not classify some as epistemic (and hence directly supplementing existing epistemic work) and some as moral (opening a new avenue of critique)? It seemed to me that the harm to fairness (unfair of the community to tolerate some of the QRPs discussed because it puts those who do not engage in these QRPs at a disadvantage) is the only harm that seems to have no substantial epistemic component.

We think that even fairness has a substantial epistemic component (see recent work on the epistemic importance of so-called non-epistemic values, e.g. [this paper](#), and [this book chapter](#)), and agree that it is also the case for the other values we discuss. In science, it is difficult to disentangle these two dimensions, and perhaps not always helpful. What matters most is that we highlight issues that have not been recognised before, regardless of whether they are called epistemic or moral.

The reason why we explicitly frame them as moral is that, unlike other work on this topic that focuses solely on the epistemic dimension, we start from the fact that these behaviors are violations of codes of conduct. These codes explicitly state that they want to 'guide researchers in their work as well as in their engagement with the practical, ethical and intellectual challenges inherent in research.' (see European code of conduct for research integrity cited in the paper). Thus, while clearly also epistemic, these codes claim to have a moral dimension. In addition (but one doesn't need to buy this to agree with what we state in the paper), we think that many of these behaviours (e.g. not being honest) would be wrong even if they wouldn't do any epistemic harm.

We already had a paragraph on this issue in the paper, and have added a couple of sentences in that paragraph (end of section 3) to make it more explicit.

REVIEWER: Third, and perhaps obvious, it seems to me that some of these practices are only

questionable if *not* disclosed, e.g., for Accountability, these detailed timelines are developed (I presume) to the best of the applicant's ability, and if the applicant is successful, they need to be adjusted (perhaps in consultation with the funder) when unforeseen circumstances happen, or things otherwise turn out differently. Double-dipping is also a practice that need not be harmful, provided it is acknowledged to the funder.

We agree that some of the problems can be diminished or removed by proper disclosure methods. However, even if it solves or alleviates some problems, it leaves many other problems unaddressed. In addition, we worry that for some problems proper disclosure methods are difficult to design. For example, uncertainty about evaluations of reviewers could be disclosed, but there are likely large differences between the ways different reviewers judge and represent their own uncertainty, and there is inevitably meta-uncertainty about their uncertainty. This would make the disclosed uncertainty very difficult to use, and, thus, part of the problem would remain.

We do think that this is a valuable suggestion, and have added it to the paragraph on 'minor changes' to PRPF (start of the discussion and conclusions section).

REVIEWER: "Since low reliability implies low validity," (p. 3) is not correct, it could be the other way around, but I believe the rest of the sentences then don't hold anymore or need some revisions.

This now reads 'Since low reliability is typically associated with low validity...'

REVIEWER: "These epistemic problems would be acceptable if the costs... were relatively low." seems odd to me, I think the scientific community and the public at large should demand a system that gets them the truest possible knowledge and that if you end up with peer review that gets you non-innovative work and happens by luck only, then the cost aren't the greatest concern...

We agree that this statement makes a value-judgement that many readers might not share. We've toned down the sentence: 'These epistemic problems might be justifiable if the costs...'

Competing Interests: No competing interests were disclosed.

Reviewer Report 12 November 2021

<https://doi.org/10.5256/f1000research.77582.r99418>

© 2021 Roubanis L. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Lambros Roumbanis 

¹ Stockholm Centre for Organizational Research (SCORE), Stockholm University, Stockholm, Sweden

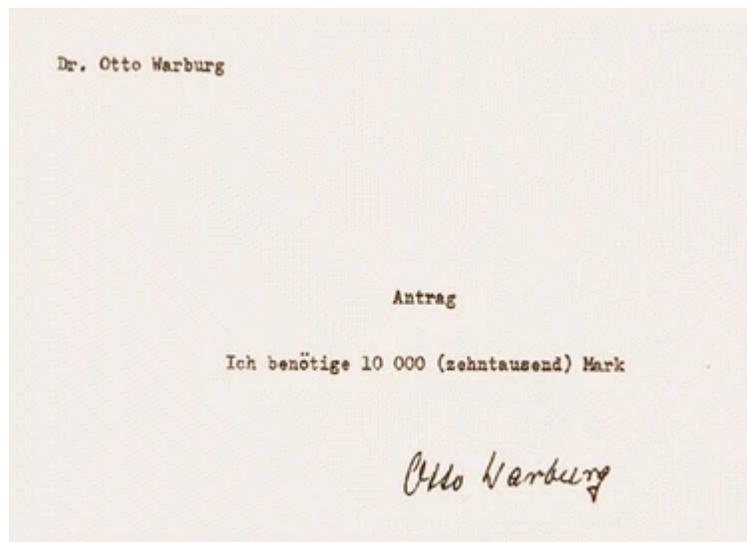
² Stockholm Centre for Organizational Research (SCORE), Stockholm University, Stockholm, Sweden

Comments by Roumbanis to Conix, De Block and Vaesen (2021) “Grant writing and grant peer review as questionable research practices”

The critical approach that you have chosen for the present paper provides the reader with a good picture of what really is at stake in grant peer review. By demonstrating how the system of competitive funding prompts ethically questionable behaviors and opportunistic strategies, I believe you hit one of the two Achilles heels of the allocation system, the ethical (the other being the epistemological). If the distribution of research opportunities within the academic communities not only generates demoralized scholars, but also ethically questionable practices, then this seems to be a case of a “tragedy of the commons.” I truly sympathize with your effort to shed new light on how the incentives of peer-review project funding (PRPF) leads to undesirable social outcomes. Your paper is well-written and perfectly clear in its general line of argumentation. I have, however, four comments that I would like to share. Hopefully, you will find them relevant for your ongoing meta-scientific investigation.

First, the Mertonian norms of science could be an important starting point for a general discussion about the ethical values that guide or at least ought to guide research. There have been a number of critical responses regarding the validity of Merton’s theoretical claims and some scholars have presented new alternative views. In any case, I interpreted your analysis of the codes of conduct (CoCs) as an implicit elaboration of Merton’s thesis about “the Matthew effects,” which you explicitly mention in the paper. In that sense, I believe your investigation makes a fine contribution to the ongoing dialogues within modern sociology of science. Yet my point is, that perhaps you should relate more explicitly to Merton for reasons of contextualization. Your study may also benefit theoretically if you dig deeper into these discussions (see e.g., Knuuttila 2012; Bielinski and Tomczynska 2019; Grundmann 2013; Stehr 2018). As I see it, when reading Merton’s own work, there certainly exists a tension between the “ethos of science” and the “organization of science” – a tension between the ideals and the realities of modern science. You show in your study how the ethos of science has been violated by the current competitive funding regimes in a way that adds a new problematic dimension to scientific progress.

From a retrospective analysis, Serrano Velarde (2018) demonstrated how “the way we ask for money” have changed dramatically over the past hundred years in Germany. She illustrates this change in her study about the institutionalization of grant writing practices by showing a picture of Noble laureate in medicine Otto Warburg’s application from 1921, which contains only one short sentence saying “Ich benötige 10 000 (zehntausend) Mark” (in English: “I need 10.000 Mark”). This is a remarkable contrast with how a proposal must be composed today to have a chance of being funded.



(Fig.1 from Serrano Velarde 2018, p.90)

Second, when I read your analysis of the scientific codes of conducts (CoCs), I was a bit surprised by the absence of concepts like *solidarity* and *generosity*, especially regarding the issue of “greedy researchers” that apply for (and receives) more funding than they really need. Why do the rules of the funding system allow researchers to get their hands on several grants at the same time? As we know, researchers do not only need to have talent and the right kind of merits, they also need valuable connections and luck in order to succeed professionally. Here, one could possibly argue for the importance of *solidarity as fairness* from a modified Rawlsian framework, and thereby view generosity as a fundamental virtue for *a future ethics of research funding*. No matter who we are as researchers or what we have achieved at a certain point, solidarity and generosity always ought to rule. There will always be competition and disagreements between scholars, this is unavoidable; yet we should try to replace the disastrous competition for economic survival in academic science, “the war of all against all” (*bellum omnium contra omnes*) with the traditional Greek ethical ideal of an honest “friendly rivalry” (ευγενής ἀμίλλα). Furthermore, if we seriously consider using another type of distribution mechanism than peer review (e.g., lottery or baseline funding), then our view of what we regard as just and fair in science, should perhaps also include the two aforementioned concepts. Now, I know that you acknowledged the possibility of alternative categorizations in your paper, and I agree that there must be overlaps between some of the values involved. For sure, the same thing goes for solidarity and generosity in relation to honesty, impartiality, responsibility and fairness.

Third, relying on recommendations based on Artificial Intelligence (AI) could also be mentioned as a radical proposal for allocating resources. Highly sophisticated and well-designed AI system with the capacity to evaluate a large number of different academic merits and values, identify promising patterns and probabilities for scientific breakthroughs, without the influence of human biases, could perhaps be a more rational and fair method in the future. Obviously, this kind of proposal needs to be properly scrutinized from an ethics of AI perspective – the risks of instead introducing algorithmic biases and discriminatory treatment in academic science must be seriously considered and tested before AI can be implemented as a decision-making technology. Still, you might want to mention AI in your paper together with lotteries and baseline funding as new possible alternatives to traditional peer review.

Finally, you analyze both the virtues and vices of the current funding regime. However, other important socio-ethical dilemmas that I myself have been thinking about are, for example, organizational side-effect like *symbolic violence*. In an observational study that I conducted some years ago (Roumbanis 2019) I analyzed the subtle form of power that senior faculty members sometimes tend to exercise on junior scholars when they hold lectures on grant writing and “the art of getting funding”. The issue of researchers having to navigate in relation to different “academic value spheres” (Ekman 2017) also demonstrates how difficult it can be for researchers to embody the codes of conduct, especially for junior scholars to avoid opportunistic actions in precarious situations. These studies, I believe, fits rather well with your own main narrative in the present paper. In addition, the issue of *hypocrisy*, generated in contemporary organizations partly because of the increasing number of conflicting demands and expectations, could also be taken into account here (Brunsson 2019). Both symbolic violence and hypocrisy could in fact be part of a general description of the problematic side-effects of the organization and culture of the current system of peer-review project funding.

To conclude: this is an inspiring and interesting paper about the ethical dilemmas in the funding system that currently dominates in most OECD countries. You have indeed highlighted some of the most notorious problems that many of us are witnessing today in academic science. In my view, this is a subject that deserves and is in great need, of further investigation in the increasingly complex research landscape. A small suggestion would be to put the word “ethically” in the title, that is, “Grant writing and grant peer review as ethically questionable research practices.”

Sincerely,
Lambros

References

1. Bieliński J, Tomczyńska A: The Ethos of Science in Contemporary Poland. *Minerva*. 2019; **57** (2): 151-173 [Publisher Full Text](#)
2. Brunsson N: The Organization of Hypocrisy: Talk, Decisions and Actions in Organizations (3rd edition). *Business School Press, Copenhagen*. 2019.
3. Ekman S: A history of vocational ethics and professional identity: How organization scholars navigate academic value spheres. *Human Relations*. 2017; **70** (4): 461-487 [Publisher Full Text](#)
4. Grundmann R: “Climategate” and The Scientific Ethos. *Science, Technology, & Human Values*. 2013; **38** (1): 67-93 [Publisher Full Text](#)
5. Knuuttila T: Contradictions of Commercialization: Revealing the Norms of Science?. *Philosophy of Science*. 2012; **79** (5): 833-844 [Publisher Full Text](#)
6. Roumbanis L: Symbolic Violence in Academic Life: A Study on How Junior Scholars are Educated in the Art of Getting Funded. *Minerva*. 2019; **57** (2): 197-218 [Publisher Full Text](#)
7. Serrano Velarde K: The Way We Ask for Money... The Emergence and Institutionalization of Grant Writing Practices in Academia. *Minerva*. 2018; **56** (1): 85-107 [Publisher Full Text](#)

Is the topic of the opinion article discussed accurately in the context of the current literature?

Yes

Are all factual statements correct and adequately supported by citations?

Yes

Are arguments sufficiently supported by evidence from the published literature?

Yes

Are the conclusions drawn balanced and justified on the basis of the presented arguments?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Sociology of Science; Science and Technology studies (STS); Evaluation studies; Theory of Science; Sociology of Judgment and Decision-making.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 30 Nov 2021

Stijn Conix

Thanks for reading our paper, and for your insightful and charitable comments! They illustrate that there is far more to be said about this topic than we managed to cover in this paper. We've made various changes on the basis of your comments, and think they have improved the paper. We respond to your comments point by point below.

REVIEWER: First, the Mertonian norms of science could be an important starting point for a general discussion about the ethical values that guide or at least ought to guide research. There have been a number of critical responses regarding the validity of Merton's theoretical claims and some scholars have presented new alternative views. In any case, I interpreted your analysis of the codes of conduct (CoCs) as an implicit elaboration of Merton's thesis about "the Matthew effects," which you explicitly mention in the paper. In that sense, I believe your investigation makes a fine contribution to the ongoing dialogues within modern sociology of science. Yet my point is, that perhaps you should relate more explicitly to Merton for reasons of contextualization. Your study may also benefit theoretically if you dig deeper into these discussions (see e.g., Knuuttila 2012; Bielinski and Tomczynska 2019; Grundmann 2013; Stehr 2018). As I see it, when reading Merton's own work, there certainly exists a tension between the "ethos of science" and the "organization of science" – a tension between the ideals and the realities of modern science. You show in your study how the ethos of science has been violated by the current competitive funding regimes in a way that adds a new problematic dimension to scientific progress.

From a retrospective analysis, Serrano Velarde (2018) demonstrated how "the way we ask for money" have changed dramatically over the past hundred years in Germany. She illustrates this change in her study about the institutionalization of grant writing practices by showing a picture of Noble laureate in medicine Otto Warburg's application from 1921, which contains only one short sentence saying "Ich benötige 10 000 (zehntausend) Mark" (in English: "I need 10.000 Mark"). This is a remarkable contrast with how a proposal must be composed today to have a chance of being funded.

We now acknowledge in the paper that CoCs are typically based on Merton's regulative ideals. And we have added that: "This is not to say that the Mertonian norms haven't been criticized (See Knuuttila 2012 for an overview). For one, there seems to be a disconnect between the norms and actual scientific practice, especially in the context of commodified science. In this sense, the ethos of science conflicts with the organization of science. In fact, our arguments about PRPF illustrate that the organization of science indeed is difficult to bring into accord with the regulative ideals formulated by Merton."

REVIEWER: Second, when I read your analysis of the scientific codes of conducts (CoCs), I was a bit surprised by the absence of concepts like solidarity and generosity, especially regarding the issue of "greedy researchers" that apply for (and receives) more funding than they really need. Why do the rules of the funding system allow researchers to get their hands on several grants at the same time? As we know, researchers do not only need to have talent and the right kind of merits, they also need valuable connections and luck in order to succeed professionally. Here, one could possibly argue for the importance of solidarity as fairness from a modified Rawlsian framework, and thereby view generosity as a fundamental virtue for a future ethics of research funding. No matter who we are as researchers or what we have achieved at a certain point, solidarity and generosity always ought to rule. There will always be competition and disagreements between scholars, this is unavoidable; yet we should try to replace the disastrous competition for economic survival in academic science, "the war of all against all" (bellum omnium contra omnes) with the traditional Greek ethical ideal of an honest "friendly rivalry" (ευγενής ἀμιλλα). Furthermore, if we seriously consider using another type of distribution mechanism than peer review (e.g., lottery or baseline funding), then our view of what we regard as just and fair in science, should perhaps also include the two aforementioned concepts. Now, I know that you acknowledged the possibility of alternative categorizations in your paper, and I agree that there must be overlaps between some of the values involved. For sure, the same thing goes for solidarity and generosity in relation to honesty, impartiality, responsibility and fairness.

We agree that a classification of values/norms that includes generosity and/or solidarity would have made a lot of sense, and now mention these two norms as good alternatives to our classification where we motivate our choice of categories (at the end of section 3). By explicitly mentioning them, we hope to increase the chance that any future work on the ethics of research funding considers them explicitly.

As you also mention, the choice of categories is a bit arbitrary, and we think that what matters most in our paper is that we find a sensible home for all the morally problematic behaviors relating to research funding. To avoid having to drastically change the paper structure, we have therefore kept the classification of norms the same as it was before. Overfunding and missing the funding sweet spot are clearly transgressions of norms like generosity and solidarity, but we think that these behaviours can also be framed as violations of responsibility, fairness and honesty.

REVIEWER: Third, relying on recommendations based on Artificial Intelligence (AI) could also

be mentioned as a radical proposal for allocating resources. Highly sophisticated and well-designed AI system with the capacity to evaluate a large number of different academic merits and values, identify promising patterns and probabilities for scientific breakthroughs, without the influence of human biases, could perhaps be a more rational and fair method in the future. Obviously, this kind of proposal needs to be properly scrutinized from an ethics of AI perspective – the risks of instead introducing algorithmic biases and discriminatory treatment in academic science must be seriously considered and tested before AI can be implemented as a decision-making technology. Still, you might want to mention AI in your paper together with lotteries and baseline funding as new possible alternatives to traditional peer review.

This is a good suggestion, thanks! We now briefly mention (in the ‘discussion and conclusions’ section, paragraph starting with ‘A final, more radical option...’) that while at the moment there are no AI-systems that work well enough (and work on this topic is still very scarce, see reference in the paper), this might well be a viable alternative in the future as long as we remain on our guard for possible algorithmic biases.

REVIEWER: Finally, you analyze both the virtues and vices of the current funding regime. However, other important socio-ethical dilemmas that I myself have been thinking about are, for example, organizational side-effect like symbolic violence. In an observational study that I conducted some years ago (Roumbanis 2019) I analyzed the subtle form of power that senior faculty members sometimes tend to exercise on junior scholars when they hold lectures on grant writing and “the art of getting funding”. The issue of researchers having to navigate in relation to different “academic value spheres” (Ekman 2017) also demonstrates how difficult it can be for researchers to embody the codes of conduct, especially for junior scholars to avoid opportunistic actions in precarious situations. These studies, I believe, fits rather well with your own main narrative in the present paper. In addition, the issue of hypocrisy, generated in contemporary organizations partly because of the increasing number of conflicting demands and expectations, could also be taken into account here (Brunsson 2019). Both symbolic violence and hypocrisy could in fact be part of a general description of the problematic side-effects of the organization and culture of the current system of peer-review project funding.

It is true that both hypocrisy and the kind of symbolic violence that you describe are part of many of the problems that we discuss: many of the practices are common and generally tolerated, and this creates a culture where adhering to codes of conduct is sometimes difficult for particular groups of researchers. Because we think that this problem is particularly pressing for junior scholars, we now mention this in the section on fairness, in the context of tolerating misconduct.

REVIEWER: To conclude: this is an inspiring and interesting paper about the ethical dilemmas in the funding system that currently dominates in most OECD countries. You have indeed highlighted some of the most notorious problems that many of us are witnessing today in academic science. In my view, this is a subject that deserves and is in great need, of further investigation in the increasingly complex research landscape. A small suggestion would be to put the word “ethically” in the title, that is, “Grant writing and grant peer review

as ethically questionable research practices.”

As the other reviewer highlighted that our points are epistemic as well as ethical, we think it better to keep the title as it is, and focus on the point that these practices are problematic.

Competing Interests: No competing interests were disclosed.

Comments on this article

Version 2

Reader Comment 12 Apr 2022

Vijay Kothari, Institute of Science, Nirma University, Ahmedabad, India

Authors have raised a very important issue with respect to grant awards in science. Throughout the globe, a major restructuring of the grant review and award system is warranted. Grant-fetching has been over-emphasized and glamourized in university systems, and unfortunately given much more importance than the research and its output (e.g. publications) itself. Since grant money is hard-earned money of taxpayers, it is extremely important to consider whether they are distributed more uniformly or most of it is getting circulated among a limited number of institutes/researchers. Is grant writing not taking too much time and effort than the research itself? Are we undervaluing the faculty/researchers with not many major extramural grants, but still consistently productive with respect to publications and thereby contributing reasonably to institute's overall citation count? Administrators of science will do good to ponder on such issues.

Competing Interests: None

Version 1

Author Response 30 Nov 2021

Stijn Conix

Dear Prof. Forsdyke

Thank you for your interest in the paper and for bringing this alternative to our attention. We've added a reference to it in the second version of the paper, but have not discussed it in detail as it still shares some of the features of PRPF that we argue are particularly problematic.

all the best,
Stijn

Competing Interests: No competing interests were disclosed.

Reader Comment 15 Nov 2021

Donald Forsdyke, Queen's University, Kingston, Ontario, Canada

BICAMERAL REVIEW

The authors might consider under the alternative allocation system option for reform, the process of bicameral grant review, a solution that took into account many of the variables they mention. It was arrived at after extensive review of the historical literature dating back many decades and pointed to the three major questions that grant reviewers are generally asked, namely *cost*, *track record* and *proposal*, of which the last is the most problematic.

Evaluation is bicameral in that the agency reviews the proposal just in relation to cost and whether it is in the general ballpark. The reviewers evaluate what is least problematic, track record *relative to the funds received*. The proposal itself is *not* evaluated, but down-the-road it influences track record relative to funds received. A brief account may be found in (1). A general account may be found in (2). There is also a wealth on information in [peer-review webpages](#) (3).

1. Bicameral grant review: an alternative to conventional peer review. Forsdyke, D. R. (1991) **FASEBJ** 5, 2313-2314. DOI: [10.1096/fasebj.5.9.1860622](https://doi.org/10.1096/fasebj.5.9.1860622)
2. **Tomorrow's Cure Today? How to Reform the Health Research System**. Forsdyke, D. R. (2000) Harwood Academic (Gordon & Breach, Amsterdam).
3. [Peer Review Reform \(archive-it.org\)](#)

Competing Interests: None

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com

F1000Research