Novel citation-based indices exacerbate privilege gaps in academic publishing

Matthew R. Kerr[1#] (he/him), André M. Bellvé[2, 3] (he/him), Emma-Liina Marjakangas[1] (she/her)

[1]Center for Ecological Dynamics in a Novel Biosphere (ECONOVO), Department of Biology, Aarhus University

[2]Department of Evolution Ecology and Organismal Biology, The Ohio State University, Columbus, Ohio, U.S.A.

[3]School of Environment, The University of Auckland, Auckland, New Zealand

#Corresponding author: matthew.kerr@bio.au.dk

Abstract

An undeniable fact of modern academia is that it is metric-driven, a landscape in which researchers are narrowly defined by their publication output and citations. The demand for simple methods for defining our output has led to many popular citation-based metrics, used as shorthand for academic output both at higher levels of funding and day-to-day assessments. Despite the flaws being highlighted in scientific discourse, there are continued proposals for additional metrics to measure and assess scholarly productivity. We argue that the problems with existing citation-based metrics cannot be solved with the addition of more indices. Instead, this practice only serves to widen existing academic privilege gaps. Academia should instead be exploring alternative pathways for recognizing scientific contributions.

Keywords

Academic justice, Contributorship, Equality, Ethics, Responsibility

Positionality Statement and Acknowledgment of Privilege

We acknowledge that our perspectives are influenced by our positions as early-career researchers who have been based in the Global North and therefore do not cover all experiences related to the injustices discussed in the paper. Most importantly, our identities do not reflect many disadvantages associated with geography, language, race, and institutional resources that influence authorship and citation metrics. We recognize that this limits our ability to fully represent all forms of privilege and disadvantages existing in the academic publishing system.

Introduction

In theory, the concept of academic metrics sounds like an easy solution for comparing researchers using a currency that is transferable across countries and subdisciplines – papers and their wider scientific impact. However, these metrics inherently invite research practices that 'game' the system, rewarding metric optimisation rather than improving publishing practices or producing quality science (Elton,

2004; Fire and Guestrin, 2019). For example: the popular *h*-index, designed to promote consistency in publication impact, can reward an unethical researcher who is able to selectively self-cite their own lower ranked papers regardless of the relevance (Purvis, 2006). This gamification extends to all parts of the academic publishing pipeline, including the promotion of self-citation via peer-review (Thombs and Razykov, 2012) and the creation of "citation circles" which trade citations as a form of internal currency. These problems have led to the continued proposal of novel metrics, each of which attempt to fix some inherent flaw – be it authorship contribution weighting (Karthik et al., 2025), measuring contributions beyond citations of papers (Arts et al., 2025; De Cassai et al., 2025; Heo et al., 2023), categorising citations by sentiment and value (Hariri, 2026), or amending the calculation of the metric to reflect different biases or improve comparison between fields (Rodriguez-Navarro, 2024; Ruiz-Castillo and Waltman, 2015).

We are not the first to note these problems for existing citation metrics (Amano et al., 2025), although criticism has focussed on commonly used metrics and not those that are being discussed as viable alternatives. For example, Altmetric, a measure of online and media attention used as an alternative to citations, also rewards those with existing large social media platforms, favouring established researchers with a high level of influence – most commonly older, male scientists from the Global North (Chapman et al., 2022) – in a "rich get richer" scheme. Other "social influence" based metrics are even found to correlate with the *h*-index (Hassan et al., 2020), suggesting they have similar biases. As such, while the diversity of metrics is increasing, the pool of beneficiaries may not.

We argue that the continued use of these metrics has exacerbated existing privilege gaps within academia through differential access to authorship inclusion, recognition, and citation share. The continued promotion of novel citation indices only serves to widen these privilege gaps, harming disadvantaged groups and promoting negative and unethical behaviours within the system. As citation metrics are commonly used for hiring and funding decisions, they filter into issues in hiring and retention faced by the same groups (Spoon et al., 2023), particularly as hiring committees often show high levels of survivor bias. As a result, these metrics can directly and indirectly punish those who are already disadvantaged in academia. In this paper, we briefly review the privilege gaps in current metrics, outline how a new metric both worsens and expands the problem, and identify potential avenues for a more equitable academic landscape.

The injustices of citation metrics

In general, citation metrics are strongly impacted by gender, name, location, career stage, and language (Fox et al., 2018), and are governed by two publishing processes: how many papers are you an author on, and how many citations do each of those papers have? To improve your score, you therefore need to be included on papers, your contribution needs to be appropriately recognised, and your work needs to be visible and incorporated into the wider academic literature. We briefly summarise some of the

pathways by which privilege can impact the citation indices of a researcher here; however, this is not an exhaustive literature review, and we acknowledge the long history of researchers who have recognised and studied these impacts across many fields in science and beyond.

Firstly, the issue of inclusion, which has the strongest measurable impact on disadvantaged groups – if you are not included on a paper, your metrics cannot improve. This disproportionately affects under-privileged groups: women, for example, are less likely to be invited to contribute or submit a paper (Loder and Burch, 2019). The well-known issue of parachute science, wherein local collaborators who have contributed time, expertise, and resources do not get included as authors on a paper, results in researchers from the Global South being unable to contribute to science about their own region (Stefanoudis et al., 2021). This often exacerbates funding and infrastructure limitations (Nuñez et al., 2021), and reinforces existing neocolonial structures in the perceived value of research (Nakamura et al., 2023). Inclusion can also work in reverse to promote those with existing privilege – so-called "gift authorships", where an author receives credit for work that they have made either no or little contribution to (Feeser and Simon, 2008; Teixeira da Silva and Dobránszki, 2016), perhaps against their will (Gerken, 2025). These authorships tend to be gifted to authors who are more senior or "famous" in an attempt to boost citations through name recognition (Sandler and Russell, 2005; Valderas, 2007) or intuitional reputation (Macfarlane, 2017).

Secondly, contributions are unevenly recognised between groups of authors. Men more often occupy "valuable" authorship positions (first and last) and author more single-author papers than women (West et al., 2013), absorbing more of the visible contribution space. Women and early-career researchers, particularly undergraduate researchers, also experience a lower perceived value of their contributions (Ezsias, 1997; Ni et al., 2021). Power dynamics play a large role in this aspect (Ezsias, 1997); those in positions of academic power take visible authorship positions and dictate the authorship list and order (Goddiksen et al., 2023), with women reporting more disagreements in decisions than men (Ni et al., 2021). How contributions are communicated and quantified also varies across journals, cultures, and fields – and is likely to take a prominent position in the use of citation metrics moving forward (Karthik et al., 2025).

Finally, the impact of the work is mediated by the authors' identities and origins. As papers tend to cite other papers within the same language or country, biases are introduced for countries with lower paper outputs (Pasterkamp et al., 2007) or that do not publish in English (Liang et al., 2013), with the perceived value of the work lower for those from particular institutions and backgrounds (Addaquay, 2026). Geographic biases extend to the country level, with lower citation rates in developing countries (Akre et al., 2011) and are related to field-specific issues, such as national conservation needs (Meijaard et al., 2015). Even in research that is highly similar, inequalities in the production of scientific knowledge result in lower citations for developing nations (Gomez et al., 2022). Citations for women

are lower than for men (Wu, 2024), reflect lower academic recognition, even in fields considered women-dominated (Sá et al., 2023), and the fact that men tend to self-cite their own papers to a greater degree than women (Chawla, 2016). Even the gender coding of a name has an impact, with masculine coded author names receiving a higher share of citations (Sainte-Marie and Larivière, 2025) – likely related to how gender influences on how professionals are discussed (Atir and Ferguson, 2018). This issue also extends to the name itself, individuals with lower alphabetical names are less likely to be cited (Cai et al., 2025; Stevens and Duque, 2019), and how names are translated may impact consistency in receiving recognition (Puniamoorthy et al., 2008; Qiu, 2008).

New metrics widen the gap

Given the aforementioned problems with existing metrics, it is no surprise that new metrics are proposed regularly. Each novel metric tends to focus on selectively fixing one aspect of the system; however, these do little to fix the privilege issues inherent in citation patterns. Instead, they only serve to reward those with existing power in academia.

To highlight how the introduction of a new metric can be harmful, we use the example of the recently proposed Sh-index (Karthik et al., 2025). Based on the *h*-Index, it normalises citations by authorship position. On the surface, this seems to be a step towards an equitable publishing landscape, even addressing the parallel problem of authorship contributions. However, it displays the many privilege biases of other citation-based metrics: i) by weighting purely on authorship position, it is still strongly influenced by gender and geography (Fox et al., 2018); ii) by still considering the number of papers an author is outputting it will favour those who have already privileged status in academia and who are able to have very high outputs; and iii) by treating all contributions as position-dependent, misses the nuance of how the work was divided between authors – down-weighing, for example, the contributions of local researchers who have contributed to a paper.

In fact, such a metric may create additional problems. While the Sh-index may somewhat suppress the benefits of senior investigators who can contribute to many projects simultaneously (or are ‘gifted’ authorship), they are still often awarded valuable authorship positions (e.g., last author, which has a high weighting in the proposed system), and with a higher paper output, they will start at a much higher value. In contrast, early career researchers will have their metrics squashed at the most vulnerable point in their career – both by being often relegated as middle-authors, irrespective of their actual contributions, and punished for gaining valuable collaborations, which often end up as second or middle author positions and therefore do little to benefit their own metrics.

The Sh-index does not currently have support as a metric without further improvement, and we note that the creators of the metric acknowledge this fact, but it is the most prolific of many citation-based metrics recently proposed (Singh Chawla, 2025). Other metrics, such as the more recently proposed

Dongbi Index, based on journal tiers and citation networks, or the ρ-Index, which scores an academic based on the citations of papers they reviewed, can contribute to the same problems they aim to fix. Even if offering some small step forward, these metrics are only being criticised for not capturing impact nuance and are not debated within the context of academic publishing privilege. Their continued promotion could therefore have wider ramifications in the future, if not given careful scrutiny.

Equitable pathways are possible

Instead of introducing additional citation-based metrics into an already bloated system, academia should explore recognition systems that highlight and value contributions independent of citations or paper tallies. Some funding institutions are beginning to downweigh the contribution of citation-based metrics for evaluations, in favour of more holistic measures.

For instance, the creation of visual academic profiles that limit the number of citations-per-paper and include other metrics independent of citation count, such as policy impact and research independence, offer an alternative for scholars to present themselves (Crameri, 2023). Similarly, narrative CVs give researchers the chance to showcase their contributions and the personal context of their research, with process-based indicators allowing ongoing work and data practices to be included alongside finished projects. Both methods allow the inclusion of "grey literature", normally not included in citation counts for metrics (Cordes, 2003), but is particularly important in fields such as conservation biology.

Papers can also be recognised for value beyond academic citations, such as the generation of novel ideas over reviewing existing literature (Arts et al., 2025), or their use within policy documents (Newson et al., 2018). Moving beyond impact factors also highlights the important role of local and regional studies, which tend to get published in journals that do not traditionally rank as highly (Choi et al., 2024). The individual contributions of authors can also be quantified, something that is currently done via statements such as CRediT (Larivière et al., 2021) but not utilised in formal metrics or in applications.

For any impact to be felt, widespread adoption of alternative recognition systems would be required at the international institutional level. Citation-based metrics are no longer sufficient, and while they are still used to promote a researcher's value, there is little room to address the wider problems in academic publishing. An open dialogue across journals, editors, funders, and researchers is important to help fix the broken system in which we work, and we hope that future discussions will consider the implications of using and creating more metrics for academic performance.

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