Letter to the Editor-in-Chief of the Journal of Informetrics

The Illusion of Scientific Talent Identification Through Publication Counts

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Abstract

This letter responds to Haunschild and Bornmann article, published in the Journal of Informetrics, that proposes a bibliometric framework for identifying promising early-career scientists based on three indicators: the number of publications in high-impact journals, total publication output, and corresponding authorship. Using these metrics, the authors compile a dataset of 46,200 individuals classified as “potentially talented,” which they suggest could support peer review and possibly inform hiring decisions. While the objective of identifying emerging scientific talent is legitimate, the methodological assumptions underlying this approach raise significant conceptual, empirical, and ethical concerns. This commentary critically examines the reliance on publication counts and journal prestige as proxies for scientific ability and future impact. Drawing on existing research on research assessment, it highlights well-known limitations of journal impact factors, including their inability to measure the quality of individual contributions and their susceptibility to ecological fallacies. Empirical evidence suggesting that high-impact journals may also exhibit higher rates of retractions due to misconduct further complicates their use as indicators of excellence. The analysis also discusses broader systemic consequences of metric-driven evaluation, including incentives for excessive publication output, the proliferation of hyperprolific authorship, and the potential reinforcement of structural inequalities in the global research system.

Keywords: Bibliometrics; Research evaluation; Early-career researchers; Journal impact factor; Citation analysis; Responsible research assessment; Publication metrics

1. Bibliometric Indicators and the Limits of Publication-Based Evaluation

The article by Robin Haunschild and Lutz Bornmann, titled *Identification of Potential Young Talented Individuals in the Natural and Life Sciences: A Bibliometric Approach*, published in the *Journal of Informetrics*, proposes a bibliometric method for identifying promising early-career scientists based primarily on early publication performance. The authors rely on three indicators: the number of papers published in high-impact journals, the total number of papers produced, and the number of publications in which the researcher appears as corresponding author. Using these indicators, they compile a dataset of 46,200 individuals identified as "potentially talented," which they suggest could support informed peer-review processes and potentially assist hiring or evaluation decisions. Although the motivation to identify emerging scientific talent is understandable, the methodological assumptions underlying this proposal raise significant conceptual, empirical, and ethical concerns. In particular, the article reinforces a model of scientific evaluation that equates talent with publication productivity and journal prestige—two indicators whose limitations have been widely documented in the literature on research assessment. By reducing the complex phenomenon of scientific creativity and intellectual contribution to a small set of easily measurable outputs, such approaches risk oversimplifying the dynamics of scientific development and academic career trajectories. A first concern involves the use of publication in high-impact journals as a signal of scientific quality or individual potential. Journal impact factors are aggregate, journal-level metrics that do not measure the quality of individual articles or the specific contributions of researchers. Long-standing critiques of impact factors emphasize that they are highly skewed, field-dependent, and vulnerable to manipulation. Using them as a proxy for individual talent risks committing a well-known ecological fallacy: inferring the value of an individual contribution from the average citation performance of the journal in which it appears. In practice, highly cited journals may publish articles that receive few citations, while influential articles may appear in journals with more modest impact metrics. Consequently, equating publication venue with research quality introduces substantial noise into evaluation processes. Moreover, empirical evidence suggests that the prestige associated with high-impact journals does not necessarily correlate with research reliability or integrity. Arturo Casadevall and Ferric C. Fang (2014), in an analysis published in *mBio*, found that articles retracted due to data falsification or fabrication are disproportionately concentrated in high-impact journals. This observation highlights a striking paradox: the same journals often used as indicators of excellence in evaluation systems may also be environments where intense competition and strong career incentives increase the risk of problematic research practices. When evaluation frameworks place excessive weight on publication in prestigious venues, they may inadvertently reinforce incentives that distort scientific behavior rather than reward genuine intellectual merit. Similarly, Grimes et al. (2018) argue that the contemporary scientific reward system—particularly the strong emphasis on publishing—can generate incentives for careless or even fraudulent research practices. Leading journals frequently prioritize novel and positive findings over studies reporting null results, a tendency that may contribute to the broader reproducibility crisis and ultimately undermine public trust in science. Concerns about publication inflation have also been raised by prominent scholars. Uta Frith, Emeritus Professor of Cognitive Development at University College London, has argued that calls for "quality over quantity" in scientific publishing often ring hollow in a system where successful researchers may accumulate dozens—or even hundreds—of papers. As a provocative thought experiment, she suggested limiting researchers to one scholarly publication per year as a way to address the growing problem of publication overload (Pacheco-Torgal, 2019). While clearly radical, the proposal underscores the perceived imbalance between the volume of scientific output and the careful evaluation of its quality. Criticism of publication-based metrics has also been articulated by leading figures in the technological and scientific community. Vladlen Koltun (2021)—Distinguished Scientist at Apple, former Chief Scientist at Intel, and previously a professor at Stanford University—has argued that both publication counts and journal impact factors are fundamentally flawed indicators that should not be used to evaluate researchers (Pacheco-Torgal, 2021). His critique reflects a broader skepticism among scientists regarding the reliance on simplistic quantitative metrics to assess complex intellectual contributions. Increasingly, scholars across disciplines emphasize that meaningful evaluation requires careful reading of research outputs, sensitivity to disciplinary norms, and recognition of diverse forms of scientific contribution. Beyond their conceptual limitations, metrics that equate talent with publication volume may contribute to broader systemic distortions within the scientific ecosystem. When academic evaluation systems reward quantity of output, researchers are incentivized to maximize publication counts rather than pursue riskier, potentially transformative research. This dynamic contributes to the accelerating expansion of the scientific literature, a phenomenon that has itself become the subject of critical investigation. In a large-scale study examining 1.8 billion citations across 90 million papers in 241 subject areas, Chu and Evans (2021) concluded that "a deluge of papers does not lead to turnover of central ideas in a field, but rather to ossification of canon." In other words, the rapid proliferation of publications does not necessarily foster intellectual renewal; instead, it may entrench established paradigms by overwhelming the scholarly attention required to identify genuinely novel contributions.

2. Systemic Consequences and Ethical Implications of Metric-Driven Talent Identification

The strong emphasis placed on publication counts in many research evaluation systems may also contribute to the emergence of hyper-prolific authorship. In a widely cited analysis, Ioannidis et al. (2018) defined hyper-prolific scientists as those publishing approximately one paper every four days—and identified more than 9,000 authors worldwide who met this threshold during the period analyzed. Such extraordinary publication rates raise important questions about authorship practices, the distribution of intellectual contribution within large research teams, and the incentives embedded in contemporary academic reward structures. Concerns about extreme publication productivity have been raised by several scholars. For example, Steven L. Salzberg has argued that the unusually high output of the microbiologist Didier Raoult was partly explained by the practice of attaching his name to nearly every paper produced by his institute—a practice Salzberg characterized as "grossly unethical"

(Pacheco-Torgal, 2021a). While such cases may represent extreme examples, they highlight broader concerns about the dilution of authorship criteria in environments where publication metrics are heavily rewarded. Evidence from the research evaluation industry also underscores the tension between publication volume and meaningful scholarly contribution. A report by Clarivate noted that authors publishing at rates of two or three papers per week challenge conventional understandings of authorship and credit allocation within the scientific community (Halevi, 2022). Evaluation systems that prioritize numerical output risk legitimizing practices in which authorship becomes strategically distributed across large collaborative networks, thereby complicating the attribution of intellectual responsibility and weakening traditional norms of scholarly accountability. Another important concern involves the structural inequalities that bibliometric indicators may reinforce. Access to prestigious publication venues is often mediated by institutional resources, mentorship networks, and geographic location. Researchers working in well-funded laboratories or internationally recognized universities typically benefit from stronger collaborative infrastructures, greater visibility within global scientific networks, and better support for publication activities. Consequently, bibliometric indicators may capture institutional advantage as much as individual talent. Without careful normalization and contextual interpretation, such metrics risk amplifying existing disparities between institutions, countries, and research systems. At the same time, it is important to recognize that contemporary academic reward systems increasingly rely on mechanisms of recognition associated with scholarly influence rather than simple productivity counts. Lauren M. McIntyre, Editor-in-Chief of the journal Cell, has emphasized that citations constitute one of the primary mechanisms through which the global scientific community acknowledges intellectual contributions (McIntyre, 2024). Citations represent a form of epistemic recognition, indicating that a given piece of research has informed or shaped subsequent work. Although citation-based indicators are themselves imperfect and subject to disciplinary variation, they attempt to capture the diffusion and influence of knowledge within the scientific community. Consistent with this perspective, a recent study reported in Nature analyzing the careers of more than 40,000 researchers across eight scientific disciplines found that securing a research or faculty position at a top-tier university in a developed country is strongly associated with publishing at least one article among the top 5% most-cited papers during postdoctoral training (Ryan, 2025). This finding illustrates how citation-based prestige—not simply the number of publications—plays a significant gatekeeping role in academic career trajectories. It suggests that influence and recognition within the scientific community may be more consequential for career advancement than the mere accumulation of publications. The public release of a dataset labeling 46,200 individuals as "potentially talented" therefore raises important epistemic and ethical questions. Bibliometric indicators, particularly those based on early-career publication patterns, are inherently noisy and context-dependent. Numerous influential scientists produced relatively modest publication records during the early stages of their careers, while others with strong early productivity did not necessarily go on to generate transformative contributions. Classifying individuals as "potentially talented" on the basis of a limited set of quantitative indicators therefore risks generating both false positives and false negatives. Moreover, such classifications may carry reputational consequences if used by institutions, funding agencies, or hiring committees as informal signals of merit. The suggestion that such a dataset could inform hiring or evaluation decisions is therefore particularly problematic. Academic recruitment processes ideally rely on expert peer judgment capable of assessing the intellectual substance, originality, and broader significance of a candidate's work. The introduction of algorithmically generated lists of "potentially talented individuals" may inadvertently shift attention away from substantive evaluation toward metric-based screening tools. These concerns do not imply that bibliometric analysis has no legitimate role in the study of scientific activity. On the contrary, bibliometrics has proven highly valuable for examining collaboration networks, disciplinary evolution, and the diffusion of knowledge. However, a critical distinction must be drawn between using bibliometric methods to analyze the structure and dynamics of science and using them to rank or classify individual scientists. The latter application carries significant risks when based on narrow indicators that fail to capture the multifaceted nature of scientific talent, including creativity, mentorship, collaboration, and long-term intellectual influence. For these reasons, the framework proposed in the article warrants careful scrutiny. Rather than reinforcing an evaluation model centered primarily on publication counts and journal prestige, future research in the field of Scientometrics could contribute more constructively by developing approaches that integrate qualitative assessment, field-normalized indicators, and contextual information about research environments and career trajectories.

Conclusion

The proposal to identify promising early-career researchers through bibliometric indicators reflects a broader trend toward the quantification of scientific evaluation. While such efforts are often motivated by the desire to improve transparency and efficiency in assessment processes, the framework proposed by Haunschild and Bornmann illustrates the limitations of relying on narrow quantitative indicators to capture a complex and multidimensional phenomenon such as scientific talent. The analysis presented here highlights several major concerns. First, the use of publication in high-impact journals as a proxy for quality rests on problematic assumptions about the relationship between journal prestige and individual contribution. Impact factors are journal-level averages that cannot reliably measure the value of specific articles or the intellectual role of individual researchers. Second, the emphasis on publication counts contributes to systemic distortions in the research ecosystem. Evaluation systems that reward numerical productivity encourage strategies aimed at maximizing output rather than fostering deep, innovative, or risky research. This dynamic is associated with the rapid expansion of the scientific literature and the emergence of hyperprolific authorship patterns that challenge traditional understandings of authorship responsibility and intellectual contribution. Third, bibliometric indicators based on publication venues and output volumes may reinforce structural inequalities within the global research system.

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