

OPINION ARTICLE

Highly prolific authors in medical science: from charisma to opportunism

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Summary

In medical science, publication record is considered to be a fundamental criterion to evaluate the cost-effectiveness and the reputation of institutions and individual scientists. In current academia, thousands of scientists demonstrate a hyperprolific academic behavior that is the resultant of multiple individual characteristics that can vary from extraordinary ability and teamwork to unjustified and unethical

co-authorship. Editors, reviewers and readers should have high expectations from these authors in terms of research quality and ethos.

Key words: *academic productivity, hyperprolific, authorship, research, scientist*

Introduction

Over the last many decades there has been a progressive increase in academic productivity, as measured by published works in the peer reviewed literature [1]. Especially in medical science, the concept, “more is better,” appears to be the notion that publication volume is an adequate criterion to evaluate the cost-effectiveness and reputation of institutions and individual scientists [2].

Assessing medical scientists based on their publication volume can be applied in multiple ways, reflected in hiring decisions, academic promotion and tenure [3]. There is also a direct link to personal remuneration in some institutions [4]. Significant debate has long existed regarding the link between quality and quantity as effective measures of scientific value [5,6]. Yet, the administrative requirements to evaluate, promote and reward scientific faculty is a time consuming and laborious process for academic assessment committees, and institutions increasingly have to justify their decisions in objective and quantifiable ways [3].

In most things, people naturally measure that which is most easily measured. Accordingly, in medical science, the number of publications, citations and amounts of funded grants are easily measured, documented and objectively compared. Clinical competency and skills are less easily assessed, particularly when there are general safety standards that limit severe incompetency, and arguable limits to how “cured” a patient can be. As such, case volume and revenue similarly take on a dominant role in the decision-making process to hire or promote clinician-scientists [7]. Some institutions reward or even require additional research or clinical training at prestigious institutions, or board certifications. Regardless, even considering readily measurable metrics, the criteria used for assessment and decisions vary widely across academic settings and institutions and often are applied inconsistently even within the same institution.

This article specifically looks at hyperprolific authorship as one of many extremes along the quantifiable phenotypes of academic productivity.

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To date, there is no clear definition on what should be considered as hyperprolific authorship. A recent survey suggested high productivity using the arbitrary cut-off of 72 publications in a calendar year, excluding case reports and letters to the editor [8]. This, like all arbitrary definitions, is problematic, as it fails to consider contextual aspects of the scientist's environment (supportive or constraining) and field (obscure or ubiquitous).

The central thesis of the article is that being a hyperprolific author is the resultant phenotype of many diverse characteristics varying from merit, dedication and extraordinary ability, to vanity, insecurity and questionable behavior. Strategies to differentiate and better evaluate highly prolific medical scientists in our current era are suggested.

How reliable are the bibliometrics to reflect the academic value of a scientist?

There are no ideal metrics to assess individual researcher achievements. Journal Impact Factor and citation indicators such as the h-index and i-10 index are becoming highly popular as scientific quality metrics [9,10]. However, Journal Impact Factor can also be affected by highly cited, outlier articles. Also, the discrepancies between publications and citations counts in different databases due to their differential structures and inputs should be taken into consideration when evaluating the effect of publications. In this vein, indices capturing the number of cites that an article received in the year it was published can reflect the impact of a publication. Also, due to the lag-effect with citations and publications, indices such as h- and i-10 increase with a researcher's years of activity in the field, and cannot decrease, even if productivity later declines. Thus, these indices are unfair and inappropriate when used to compare researchers at different career stages, or those early in their career.

While they can be reflective of academic quality, metrics can also be influenced by a subject's novelty, popularity and other opportunistic qualities. A highly novel idea can generate many citations even if wrong [11], and once an idea is established as a new paradigm, its mere mention will generate considerable attention [12]. Also, we have seen manuscripts that summarize the literature on a specific field in a systematic or narrative manner and can sometimes generate more citations than the individual original articles included in these reviews -an exploitation of the general preference for prepackaged and processed information over true awareness of the nuances of the primary literature. Indeed, writing reviews that effectively address literature gaps is a time-honored strategy

for increasing citations, both for the author and for the journal in which the review is published. One can evoke the responsibility of the readership to be able to recognize, appreciate the scientific value of and appropriately cite the original contribution. Besides being scientifically correct and accurate, authors have an ethical commitment to recognize the original research products. However, as the complexity and volume of the scientific literature grows, some level of synthesis is pragmatically required for progress, thus there will increasingly be legitimate needs for reviews.

In this setting, it is easy to understand that a hyperprolific author has higher chances of getting cited, since there are more papers during a larger time scale available to be cited [13,14]. The latter can have an impact on the h- and i-10 indices, as well. Understanding metrics is of fundamental importance to funding bodies that drive the future of research, tenure and promotion committees and more broadly for providing insights into how to recognize and value the work of science and scientists.

Is being a hyperprolific author a violation of the ethics of scientific discovery?

Philosophically, the ultimate purpose of research is the discovery of truth and the contribution and service to the society. Being a highly productive author does not necessarily imply non-adherence to the realistic and philosophical requirements of research. There is no question that focusing exclusively on the volume of publications may lead to compromise in terms of scientific quality or impact, and hyperprolific authors are more at risk of that. Though, articles of questionable quality can be published even by less prolific authors. Overall, the expectations from highly productive authors should be higher from all involved in the publication process, including reviewers, journal editors, scientists and readers. Though hyperprolific authorship should not imply unethical or invalid science, increased scrutiny is warranted, particularly when the volume falls far outside the norms.

The phenotypes of hyperprolific authors

Highly productive scientists have higher chances to become ones since they usually work at prestigious institutions. Similarly, prestige of academic institutions is related to most measures of the quantity and quality of the scholarly outputs of their faculty [15]. It is well reported in the literature that faculty at more-prestigious institutions produce more of the scientific literature and

receive more citations [15], that can be attributed to the selection of scientists with known reputation and record of past academic productivity, including their publication and citation records.

Scientific reputation and academic productivity may be explained by meritocratic characteristics, such as individual skills, extraordinary ability and effort, as well as natural potential and talent but also by non-meritocratic characteristics such as age, gender and “family tradition” or by external factors such as team effort, work environment, social connections, or even chance events [16-18]. The contribution of individual characteristics is difficult to capture due to “endogenous cumulative advantage”, in which past achievements are generally correlated with future achievements [18].

All hyperprolific authors do not have the same phenotype due to different mixture of individual characteristics. Some authors tend to have many publications in one field. This phenotype shows a scientific commitment and often leads to early recognition and expertise. Other authors tend to have publications in different fields. This phenotype might imply an inherent curiosity for discovery and science but also might reflect an opportunistic strategy to increase the pool of potential citations. The development of a mechanism of untangling these characteristics would help clarifying differences in scholarly output at individual and institutional level and can shed some light on the degree to which academia operates according to meritocratic principles. The assumption that academic productivity mainly reflects the scientific skills is not always true and many times the individual productivity is driven by non-meritocratic causes such as honorary co-authorship that will be discussed in detail below.

In order to make a substantial contribution to a field, authors should demonstrate commitment to a direction and serve a linear scientific theme. Avoiding fragmentation and specializing can lead to scientific expertise, that in turn can facilitate research integration into practice. It would also make expertise more visible and accessible, that consequently enables medical scientists to provide an authoritative voice to research policy makers, funders and readership. Finally, specialized prolific authors are more likely to be organized and ascend in the hierarchy of scientific communities and societies in the field of their expertise. Authorship that exhibits deep specialization might reflect a strong goal-oriented research attitude. On the contrary, prolific authorship in many different scientific fields might indicate interest in learning new things, crossing disciplinary boundaries and thinking outside silos but they can be costly in terms of time and pro-

fessional advancement. The latter might partially explain why publishing in highly specialized journals that advance knowledge in a specific subfield is more often rewarded by academic development and promotion. By default, most scientists tend to capitalize on existing specialized expertise since it is safer and more efficient to exploit and refine current knowledge over exploring [19]. Most scientist find tough to investigate an altogether new question on a different topic requiring new learning, along with a longer path to a publication. A part of this phenomenon might be indicative of personality traits but also it might reflect the academic environment where a scientist grows. Researching and publishing should be intrinsically appealing and rewarding for the scientist. Thus, it should be welcomed when authors decide to change their publishing behavior towards greater breadth (or depth) in future projects.

Highly prolific authorship and honorary co-authorship

A recent survey showed that 33.4% of corresponding authors admitted that they had added authors in their manuscripts who did not justify co-authorship credit. Of interest, studies from Europe and Asia ($p \leq 0.001$ and 0.005 , respectively) and study type as case report/case series ($p = 0.036$) were found to be the contributed factors to this phenomenon. The striking finding of the survey was that the reasons for adding honorary co-authors were complimentary (39.4%), to avoid conflict at work (16.1%), to facilitate article acceptance (7.2%), and other (3.6%) [20].

Unjustified honorary co-authorship might contribute to a highly prolific academic behavior that -in general- should not be encouraged or accepted [21]. The rationale behind this practice might vary from political motivations such as career advancement, to attempts to enhance the prestige of a manuscript and attain publication in high-tier journals. Despite well-established criteria to justify authorship, such co-authorship practices, jeopardize the integrity of publishing process [22]. Authorship that is “gamed, secured through coercion or provided as a favor” [8] can reflect an unwholesome academic environment where meritocracy does not govern the scientific discovery. The main idea behind authorship is to confer credit for the scientific contribution but also requires responsibility and accountability from all authors listed in a publication [23].

Of interest, teamwork research model appears to have had a positive effect on publishing productivity [24], quality [25], as well as visibility and

prestige. In the same frame, eminent hyperprolific scientists can have a positive effect on the productivity and impact of young faculty, as well as on the likelihood that these young researchers to become leading personalities in science, since they can play a prime role in the development of a scientific system that will support the academic productivity and visibility of science. A recent study showed that scientists who enter the system by the hand of a highly productive researcher increased their productivity on average by 28% and the ones that did it by the hand of a highly visible scientist received on average 141% more citations than vis-à-vis scholars who did not published their first manuscripts with an eminent scientist. Furthermore, scholars that enter the system by the hand of a highly productive researcher were on average 2.5 more likely to also become an eminent scientist [26].

Final remarks

Hyperprolific authors can definitely be astute scientists and they can be useful in rapid promotion of scientific discovery. Such mode of publishing might reflect extraordinary skills, great teamwork or even charisma. High academic productivity does not come for free since it generates high expectations from readers, reviewers and editors. Unjustified co-authorship along with loose definitions of authorship should not be accepted at scientific and ethical basis. Since no established definition for high productivity exists, total publishing output should be benchmarked against norms for their field and career level.

Conflict of interests

The author declares no conflict of interests.

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