

Authorship and Contributorship in Scholarly Journals

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Currently science editing is a discipline which covers various issues in science writing, ethical editing, peer review, publishing and scientometrics. Authorship in scholarly journals, and its abuses, is one of the key topics in this discipline and shapes its core values. The basic principles of authorship underlie the foundations of research, academic promotion and advancement in science. It's hardly possible to create knowledge and scientific products without following fair authorship criteria.

Though a universally acceptable definition of authorship does not exist, there are two main components of any definition which have gained wide recognition - credit and responsibility. Journal publications are the end result of creative work of individuals, or increasingly multi-expert research teams, who are aiming to gain credit from the scientific community and to contribute to knowledge creation. Traditional authorship models, largely based on the criteria of the International Committee of Medical Journal Editors (ICMJE), consider the authors' byline in the papers as the key for attributing credit. Securing a place in the byline is itself a credit, whilst taking the first place is often the reward for contributing the most to the multi-authored work (1). However, credit brings with it responsibility, which is straightforward in solo work but quite complicated for multi-authored publications, the hallmark of science communication in our time.

A recent essay in *European Science Editing* questioned the objectivity of attributing responsibility based on the traditional model of authorship (2) and favoured the model of contributorship, originated 15 years ago by the former deputy editor of *JAMA*, Drummond Rennie, and strongly supported by the former editor of *BMJ*, Richard Smith (3, 4). Apparently, the contributorship model fits well the current trends in multi-expert research cooperation and publishing, where contribution and responsibility are to be shared by generators of ideas, technical staff, research supervisors, and professional writers. Perhaps it can be the best option for fair and transparent authorship in papers on large trials, quantitative systematic reviews and meta-analyses. This alternative model disfavors instances of guest, gift and honorary authorship and encourages honest listing of all contributors, including those who might refrain from putting their names in the papers (ie ghost-writers).

Both traditional and alternative models emphasise responsibility as the virtue of research integrity. In most research institutions in the mainstream science countries the main responsibility is often attributed to the corresponding author or authors, predominantly principal investigators or senior researcher coordinators, permanently available for communication before and after publication. These are usually listed last in the traditional authors' bylines or named as guarantors in the

contributorship model. Responsibility, however, should be shared by all contributors, and this is why recent guidance from learned associations suggests that each author should take responsibility for a specific part of the work and, at the same time, should be familiar with the whole paper (5). Collective responsibility may prevent instances of research misconduct, such as plagiarism, early in the process of research and writing.

Despite the undisputed advantages of the alternative model, some principal issues with authorship remain unresolved. First of all, the extent of minimal and substantive contributions warranting credits remains poorly distinguished. How do you credit those who do not meet criteria of authors and substantive contributors but help produce a good quality article? Originators of research ideas give a start to the process of research. Laboratory technicians perform laboratory tests and supply a wealth of essential raw data for original research papers, despite the lack of theoretical knowledge and capacity to interpret the data. Skilled statisticians merely analyse the raw data but transform elementary facts into statistically significant results and evidence, a cornerstone of a publishable scientific article. Professional writers rectify writing and make the manuscript attractive for potential readers and future authors. Peer reviewers comment on the whole manuscript and suggest changes, increasing the chances of publication in a high-impacting journal. Do they deserve a mere acknowledgement or a place in the authors' byline? Will they all agree to accept a credit of minor contribution and continue working in a research team thereafter? A recent suggestion of movie-style listing of all contributors as a way-out is an option which stemmed from the contributorship model (6), but it is definitely not suitable in scholarly publications.

It should be stressed that there are different types of scientific articles. The traditional authorship model is still suitable for editorials, narrative reviews, small original papers, case reports and letters written by one or a few authors. Is it then necessary to "scrap" this model entirely for all types of articles? Is it possible to have both models as an interim measure, or to move gradually to the alternative model and eventually adopt it as the only option? To answer these questions, we will need yet another 15 yr, if not more. In the meantime, inappropriate authorship will continue to blossom, devaluing the essence of authorship and distorting science.

Current authorship patterns are widely confounding the assessment of research performance and give credit to those who obtain funding and research grants, allowing individuals and research teams to survive and reshape scientific landscapes. A prime example is the *h* index, a reflection of research productivity and citability, increasingly accept-

ed as a research performance indicator for individual authors, research groups and institutions in most countries (7). The traditional model with its limitations and particularly with the uncertainties of substantive contribution in multi-authored articles complicates the interpretation of the *h* index. The alternative model is not capable of providing a solution either. As a result, we still witness the growth of unjustifiably multi-authored articles of all types. In fact, recent evidence from pharmacy and pharmacotherapy, a rapidly developing and influential field of science, indicates that the prevalence of honorary authorship is 14.3%, reaching 29.4% with articles authored by five or more individuals (8).

Awarding undue credits to those who attain (honorary) authorship by merely holding a senior research post and obliging subordinates to put their names in potentially citable papers drives a circle of misconduct. Honorary authors benefit from the paper by artificially boosting their scientometric profile, obtaining new funds and perpetuating the vicious circle.

Is there a way out of the current situation? Authorship issues may find a solution if all individuals and professional bodies involved in scientific publishing stick to the rules of honest and transparent research reporting. Research institutions should accept policies encouraging fair authorship. Authors should avoid misconduct by familiarising themselves with the accepted rules and by adhering to their institutions' strategies. Editors and reviewers are in a position to spot instances of inappropriate authorship in journal submissions and suggest corrections. The latter is particularly possible when small papers with unreasonably long authors' lists enter the editorial process (eg case reports, editorials, narrative reviews and short communications). Publishers and editors may further improve authorship patterns by adopting available guidelines, publicising acceptable criteria in the instructions for authors, and requiring authorship statements from each author. Finally, regional and international learned associations may take the lead in resolving the issues by developing or updating editorial policies. Currently, most biomedical journals accept the ICMJE criteria of authorship, a part of the Uniform Requirements for Manuscripts Submitted to Biomedical Journals, last updated in 2009 (9). Further guidance for medical editors is available from the policy statements of the World Association of Medical Editors (WAME, 2007) (10), The American Physical Society (APS, 2002) (11), and The Ecological Society of America (ESA, 2000) (12), who have adopted their field-specific guidelines.

Position statements on authorship and acknowledgements, adjacent to the ICMJE criteria, are also clearly presented in the EASE guidelines (EASE, 2011) (1) and in the editorial policy paper of the Council of Science Editors (CSE, 2012) (13). The adherence to the general and field-specific guidelines on authorship may be instrumental in curbing the conflicts globally and particularly in the emerging science countries, where a large proportion of journals still lack authorship policies and do not adhere to the accepted criteria (14).

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Each author should take responsibility for a specific part of the world