

CREDIT WHERE CREDIT IS DUE: BEST PRACTICES FOR AUTHORSHIP ATTRIBUTION

Authorship is becoming an increasingly complicated issue as research collaborations proliferate, the importance of citations for tenure and grants persists, and no consensus on a definition is reached. The issue is fraught with ethical implications because clearly conveying who is responsible for published work is integral to scientific integrity.

Many journals currently adhere to the guidelines of the International Committee of Medical Journal Editors (ICMJE), which has established four criteria that each author of a paper should meet:

- Significant involvement in study conception/design, data collection, or data analysis/interpretation;
- Involvement in drafting or revising manuscript;
- Approval of final version of manuscript for publication; and
- Responsibility for accuracy and integrity of all aspects of research.¹

Moreover, by the ICMJE definition, authors “should be able to identify which co-authors are responsible for specific other parts of the work... [and] have confidence in the integrity of the contributions of their co-authors.”¹ Based on this description and the fourth criterion, authorship implies not only past individual contribution to a research project but also ongoing joint accountability for that project. As a result, authors may share fame or infamy, depending on the validity of the work.

WHAT CONSTITUTES AUTHORSHIP?

The ICMJE also notes that an author must have made “substantive intellectual contributions” to the manuscript.¹

Creative input is thus more eligible for authorship than purely mechanical work. A technician merely acquiring data, a senior researcher only, obtaining funding or providing supervision, a collaborator solely providing a

new reagent or samples, and other research-related but non-creative tasks do not merit authorship on their own. These individuals and their contributions could be cited in an acknowledgments section instead.

¹ <http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html>

Despite this clearly outlined definition, numerous issues (including ethical concerns) have arisen regarding authorship attribution. These issues have emerged partly because many journals continue to adhere to their own guidelines or to various modified versions of the ICMJE criteria (see, for example, Table 2 in a recent EMBO reports article²) and partly because the ICMJE guidelines may be insufficient, as argued at the 2012 International Workshop on Contributorship and Scholarly Attribution.³ The following is a selection of authorship issues that you might encounter in scientific publishing:

CONTRIBUTION AMBIGUITY.

The specific roles of individual authors in a research project are not always clear, especially when a manuscript is attributed to a large group. To address this problem, several journals (such as PNAS and the PLOS journals) require public disclosure of the specific contributions of each author.

To further clarify the roles of authors and encourage integrity, certain journals request a public guarantor for each article, or an author who takes responsibility for the entire research project, including conception, data acquisition and analysis, and publication. Ambiguity surrounding authorship may also arise from the publication of papers by researchers with the same name, which could be minimized by the use of an ORCID digital identifier (see www.orcid.org).

AUTHORSHIP ORDER.

The meaning of the listed order of authors on a paper varies between fields. In certain areas, the list is alphabetical, whereas in others, the convention includes citing every person who contributed in some way to the

project (which may conflict with the ICMJE guidelines). In many disciplines, the author order indicates the magnitude of contribution, with the first author adding the most value and the last author representing the most senior, predominantly supervisory role. In this model, disputes may arise regarding who merits sole or shared first authorship.

The Committee on Publication Ethics (COPE) recommends that researchers discuss authorship order from project initiation to manuscript submission, revising as necessary, and record each decision in writing.⁴

HONORARY AUTHORSHIP.

Honorary authorship is given to an individual despite a lack of substantial contributions to a research project. One form, gift authorship, is bestowed out of respect for or gratitude to an individual. For example, in some cultures, departmental heads or senior researchers may be added to a paper regardless of their involvement in the research. Another form, guest authorship, may be used for multiple purposes, including to increase the apparent quality of a paper by adding a well-known name or to conceal a paper's industry ties by including an academic author. Additional issues regarding honorary authorship are the inclusion of an author on a manuscript without his or her permission (which is often prevented by journal guidelines that require the consent of all authors) and coercive authorship, which typically consists of a senior researcher (such as a dissertation advisor) forcing a junior researcher (such as a graduate student) to include a gift or guest author.

² <http://onlinelibrary.wiley.com/doi/10.1038/embor.2011.161/full>

³ http://projects.iq.harvard.edu/files/attribution_workshop/files/iwcsa_report_final_18sept12.pdf

⁴ <http://publicationethics.org/files/2003pdf12.pdf> http://projects.iq.harvard.edu/files/attribution_workshop/files/iwcsa_report_final_18sept12.pdf

Regardless of its form, honorary authorship is a major ethical concern in scholarly publication, as a BMJ study found this dishonest practice in approximately 18% of articles in six medical journals in 2008.⁵ Publishing lists of authors' specific contributions may help to deter this practice. Additionally, double-blind peer review may decrease the influence of authors' performance on journal acceptance.

GHOST AUTHORSHIP.

Ghost authorship is essentially the opposite of honorary authorship, entailing a significant contribution to a manuscript without acknowledgment of that contribution. The most well-known scenario involves a professional medical writer or an industry researcher who drafts an article on behalf of a pharmaceutical company but is not credited for this work. These *ghostwriters* may be concealed to obscure industry backing for research,

improving the apparent objectivity of a paper while maintaining the company's control over its content. This concealment is often coupled with guest authorship, using the addition of a reputable academic researcher's name to a manuscript to increase its credibility, despite little to no actual involvement.

In other cases, a scientist may employ, but not acknowledge, a ghostwriter to overcome an obstacle to publication, such as poor writing skills, limited time, or a lack of familiarity with journal requirements. Additional unattributed contributions may entail data collection or analysis or other potentially critical facets of the research process. The previously mentioned *BMJ* survey found that such ghost authorship was present in approximately one-tenth of papers published in 2008 in six medical journals.⁵

CONSIDERATIONS ABOUT GHOST AUTHORSHIP

How does ghost authorship relate to the authorship guidelines established by the ICMJE?

Based on the previously discussed criteria, solely writing or editing a manuscript, for example, does not merit author status; involvement in the study design or data collection/analysis, approval of the final draft of the paper, and accountability for the entire work are also required. Similarly, industry researchers who conduct a study and draft a report based on its results but do not approve the final version are technically not eligible for authorship. As a result, so-called "ghost authorship" may not truly

constitute authorship, although in extreme cases, a ghost author may have met all four ICMJE criteria. However, even though the ICMJE guidelines do not support writing alone and other focused activities as "substantive intellectual contributions," they do state that "writing assistance" and other non-author-level technical aid, as described above, should be cited in the acknowledgments section of a paper.¹

⁵ <http://www.bmj.com/content/343/bmj.d6128?view=long&pmid=22028479>

Nevertheless, some have argued that writing a manuscript is in fact a significant contribution, particularly because communicating complex scientific findings frequently requires understanding and interpreting the data.⁶ Based on this argument, the ICMJE definition of what merits authorship attribution would have to be revised or even replaced with a list of diverse contributions.⁷

From an ethical standpoint, ghost authorship, particularly in conjunction with guest authorship, entails deception of the research community, which may not be able to properly assess a study's validity and credibility. The named authors' integrity may additionally be eroded, including due to falsification of their publication records. In the worst instances of coupled ghost and guest authorship, when the suppression of industry ties also hides biased data collection and/or interpretation, derivative research studies and clinical care may be negatively affected. Both COPE⁸ and the World Association of Medical Editors (WAME)⁹ have thus published explicit statements against these unethical authorship types. Moreover, these practices may violate the standards of the ICMJE¹⁰ and COPE¹¹ on the disclosure of potential conflicts of interest.

Based on recommendations by COPE,⁸ WAME,⁹ and members of the research community,⁶ various journals have begun to adopt new approaches to improving transparency about contributions. As discussed earlier, upon manuscript submission, you may be required to disclose all contributors, regardless of author status, and their specific individual contributions and affiliations.

A comprehensive explanation of the writing process, including who wrote the first draft of the paper, may also be necessary. Journal editors may additionally ask you for a detailed acknowledgments section before publication.

In sum, inaccurately conveying contributions to a study is an unethical practice that runs counter to current guidelines, and it will likely be increasingly targeted by future policies. In all cases described here, more universal standards for manuscript authorship will be critical for fostering good practices. Until then, as you write your own manuscripts, try to foster these good practices and to avoid the ethical pitfalls of authorship attribution by

- Keeping a careful record of all contributors, their particular contributions, and their affiliations throughout the research process
- Maintaining open communication with your collaborators, including any technicians, about expectations for recognition
- Reviewing relevant ethical guidelines (as summarized above) and their implications
- Familiarizing yourself with your target journal's authorship and contributorship guidelines
- Crediting all contributions in your paper, whether in the authorship list, conflict of interest statement, or acknowledgments section

6 <http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.1000023>

7 <http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.1001072>

8 <http://publicationethics.org/files/short%20guide%20to%20ethical%20editing%20for%20new%20editors.pdf>

9 <http://www.wame.org/resources/policies/>

10 <http://www.icmje.org/recommendations/browse/roles-and-responsibilities/author-responsibilities--conflicts-of-interest.html>

11 http://publicationethics.org/files/International%20standards_authors_for%20website_11_Nov_2011.pdf



ABOUT THE AUTHOR

Dr. Panter is an In-House Editor at AJE and has been editing for the company since 2008. She graduated from Yale University with a BS and MS in Biomedical Engineering and a PhD in Immunobiology. Her dissertation focused on antigen presentation in human cells. Dr. Panter has also served as Editor-in-Chief of the *Yale Journal of Biology and Medicine* and as a writing advisor for graduate students in the sciences.



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