

# Authorship: Readers and Editors Respond

## Readers Respond

### Separating Authorship Responsibility and Authorship Credit: A Proposal for Biomedical Journals

Many recent publications in medical journals have reflected on the vexed issue of article authorship. The increasing number of authors per paper<sup>1</sup> (with its consequent dilution of authorial responsibility) and the episodes of fraudulent publication that have ensued have spawned a range of proposals, including outright abolition of authorship.<sup>2,3</sup> The International Committee of Medical Journal Editors criteria for authorship<sup>4</sup> are strict, difficult to enforce, widely violated, and not reflective of current realities in collaborative research. The nub of the difficulty, in my view, is the conflict between authors' desire for credit and journals' desire for responsibility. Currently, both concepts are embedded in the idea of authorship. Separating these 2 concepts is the first step toward a solution.

A second difficulty is the evolving concept of authorship that has resulted from today's complex collaborative arrangements in research. This evolution requires that we distinguish levels of authorial contribution more carefully than by order of authorship. A recent issue of *CBE Views* (Vol. 20, No. 4, July/August 1997) debated the subject and offered the opinions of many experienced editors and authors, but the contributions tended to emphasize principles and broad guidelines rather than specific procedural reforms. My purpose here is to propose a specific protocol that clarifies the roles and responsibilities of the contributors to a scientific article with a minimum of red tape.

In the proposal that follows, I recommend the separation of the functions of the *authors* of an article and the *guarantors* of the elements upon which the validity of the

article rests. I further recommend distinguishing within the authorial category among authors, contributing authors, and acknowledged contributors, with the latter 2 categories requiring less substantial contributions to the paper than those currently required by the criteria of the International Committee of Medical Journal Editors. This schema will allow the reader to know at a glance who is responsible for which parts of the paper and which authors have contributed more than others. It will also assure the journal that all individuals named in the production of a paper have indeed fulfilled a specific role in its production. Adherence to this schema should reduce disagreements between authors as well, because it requires a detailed specification of the role that each contributor plays.

The separation of the producers of a paper into the 4 categories just listed (guarantors and 3 kinds of authors/contributors) would be determined jointly by the authors and the journal editor. The mechanism for doing so would be a requirement that the authors of an article complete 2 brief forms, one certifying credit and one certifying responsibility. Figure 1 illustrates what these 2 forms—which I have labeled the authorship credit form and the responsibility form—might look like.

#### *Authorship Credit*

The authorship credit form provides a taxonomy of the components of the production of a scientific article for which authorship is sometimes claimed. It specifies 4 main tasks: concept and design (A), research resources and data (B), analysis and interpretation (C), and writing (D). Ten subtasks are included in these 4 tasks, with the third subtask—resources—divided into 6 categories. Upon receipt of a submission, the journal editor would send authorship credit forms to the first author for each list-

ed author to complete. Each author would be required to sign his or her name next to each task to which he or she made a substantial contribution. The first author would review these forms and submit them to the editors when he or she agrees that they correctly specify each author's contributions. On the basis of the authorship credit forms, the editors decide whether authorship credit is permitted—and, if so, which of the 3 types of authorship/contribution is assigned—according to the algorithm set out subsequently. This taxonomy parallels many of the ideas implicit in the International Committee of Medical Journal Editors criteria, according to which "all authors must state that they have made substantial contributions to each of three activities: (1) conception and design or analysis and interpretation; (2) drafting the article or revising it critically for important intellectual content; (3) approval of the final version to be published."

Translating this wording into the 4 tasks, we see that item 1 includes tasks A and C and that item 2 represents task D. Item 3, an attempt to establish authorship responsibility, is too broad and is bound to be constantly violated. This requirement will be made moot by the task-linked signatures obtained on the authorship credit form and by the additional provisions proposed subsequently. Note that participation in provision of data and resources—task B—receives no credit for authorship under the criteria of the International Committee of Medical Journal Editors. This, in my view, is a mistake and a principal cause of the dissonance between these criteria and contemporary practice.

The International Committee of Medical Journal Editors criteria thus provide 2 paths to authorship via substantial participation in both group A tasks and group D tasks or via substantial participation in both group C and group D tasks. Participation in group D tasks alone, group B tasks alone,

or even both B and D tasks together does not constitute authorship according to the committee's criteria.

I propose that, to be listed as an author, one must fulfill the committee's criteria (i.e. participation in A + D or C + D). However, to be listed as a contributing author, it is sufficient to have participated in group B and group D tasks. Thus, a contributing author is an individual who may have assisted materially in the development of the tangible (as opposed to the conceptual) basis of the study and also has taken substantial responsibility for writing up the findings. Since the individual helped to write the paper, the category of author is deserved; because his or her participation in design and interpretation was not substantial, however, the adjective "contributing" modifies the authorship title. Note that the meaning of the word "author" requires participation in writing (task D). Combinations of tasks that do not include writing or editing cannot qualify one for authorship.

Participation in only 1 of the 4 tasks puts an individual in the category of acknowledged contributor. Much of what is now viewed as "gift" authorship would default to acknowledged contributor, although perhaps some giftees might make their way to contributing authorship by working on group D (writing) tasks. This is also the place to acknowledge the contributions of writers and editors (task D alone), data analysts (task C alone), and so forth. Participation in 2 task groups other than D would also lead only to acknowledged contribution.

In much collaborative research, contributions in both B and D tasks together do, in fact, lead to authorship, whether journal editors know it or not. Consider the originator of a large database who permits another investigator to use it to study a new and different hypothesis that is not part of the original study design. The originator provides the data to the investigator and, after the analyses and interpretations have been completed, helps write and edit the paper. If the originator contributed substantially to the interpretation of the results, the International Committee of Medical Journal Editors criteria for authorship are fulfilled. But participation only in B and D tasks by the originator is extremely common practice and deserves some sort of acknowledgment. This is done by providing the category of contributing author, which explicitly indicates the lesser level of participation in authorship that took place. If the originator of the data simply hands them over and washes his or her hands of any subsequent use of them, he or she defaults to acknowledged contributor (category B task only).

A. AUTHORSHIP CREDIT FORM

Authors: Please sign your name next to each task to which you have made a *substantial contribution*. If you have participated in group B, task 3, please sign next to each subtask (a-f) to which you have made a substantial contribution. This form will be checked for correctness by the first author and used to decide whether you should be listed as an author, a contributing author, or an acknowledged contributor.

FIRST AUTHOR - PLEASE INITIAL HERE WHEN YOU HAVE APPROVED THIS FORM \_\_\_\_\_

NAME \_\_\_\_\_

A. CONCEPT AND DESIGN

1. Initial conceptualization of the research hypothesis of this paper \_\_\_\_\_

2. Development of the study design of this paper \_\_\_\_\_

B. RESEARCH RESOURCES AND DATA

3. Specific resources \_\_\_\_\_

a. Provision of data \_\_\_\_\_

b. Provision of subjects \_\_\_\_\_

c. Provision of equipment \_\_\_\_\_

d. Provision of laboratory testing \_\_\_\_\_

e. Provision of or raising of funds \_\_\_\_\_

f. Provision of raw materials \_\_\_\_\_

4. Data collection \_\_\_\_\_

5. Data entry \_\_\_\_\_

C. ANALYSIS AND INTERPRETATION

6. Data analysis (including production of graphs and figures) \_\_\_\_\_

7. Interpretation of analyses \_\_\_\_\_

D. WRITING

8. Authorship of first draft \_\_\_\_\_

9. Authorship of segments of article (e.g. literature review) \_\_\_\_\_

10. Reviewing and critiquing drafts \_\_\_\_\_

B. RESPONSIBILITY FORM

Dear first author: Please have each attestation signed by the individual best positioned to do so, whether that individual is currently listed as an author of the paper or not. All signatories, whether authors or not, will be listed in the acknowledgements section as guarantors.

1. To the best of my knowledge, the conduct of this research followed the rules of my institution for the protection of human subjects.

Signature \_\_\_\_\_ Name \_\_\_\_\_

2. To the best of my knowledge, the conduct of this research followed the rules of my institution for the ethical treatment of animals.

Signature \_\_\_\_\_ Name \_\_\_\_\_

3. To the best of my knowledge, the data upon which this paper is based are valid and were legitimately obtained for use in this study.

Signature \_\_\_\_\_ Name \_\_\_\_\_

4. To the best of my knowledge, the statistical analyses presented in this paper are valid.

Signature \_\_\_\_\_ Name \_\_\_\_\_

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**FIGURE 1—Proposed authorship credit and responsibility forms.**

Large clinical trials often include an executive committee that designs the trial, a writing committee that authors the manuscript, and hosts of contributing centers. In this proposal, authors would have to participate in both the executive committee and the writing committee. Participants at centers who contribute data are acknowledged contributors, but those among them who attend the annual meeting and really do work on drafts of the paper could achieve contributing author status. All that would be required is a responsibility form signed on the appropriate lines and confirmation of the validity of same by the first author.

I imagine that authors would be listed first, followed by contributing authors (within these categories, the authors themselves could provide the order). Acknowledged contributors would be listed, as now, in the acknowledgments section. A small abbreviation could indicate the authorship category:

A: Farr W, Snow J, Simon J. CA: Nightingale F, Louis PCA. Prospects for

future employment in the discipline of epidemiology. *Am J Public Health*. . . .

### Responsibility

The responsibility form (Figure 1) requires that a signature be appended to each of 4 attestations important to interpreting the validity of a study and the ethical standards under which it was conducted. These areas are human and animal rights (if appropriate), the validity of the data used in the study (analyses of data in the public domain would be exempt from this declaration), and the validity of the analyses of the data presented in the paper. The signers of the responsibility form are the guarantors of the study, and they may be authors, contributing authors, or acknowledged contributors. A common reason for the current practice of gift authorship is to honor an individual whose only contribution has been to provide data. Such a practice also

provides an aura of legitimacy to data of whose origins the real authors know little. This proposal affords a category, that of guarantor, that provides straightforward and honest credit for this important role and also specifies precisely who is responsible for the validity of the underlying data. If questions are raised about the ethical conduct of the study, the quality of the underlying data, or the correctness of the statistical analyses, the responsible party will be clear from this form.

There may well be multiple guarantors of each attestation. In large trials, for example, the principal investigator at each center would be the guarantor of each center's data, and guarantors of human investigation would also be required. This proposal would avoid the spectacle of the leader of a several-hundred-hospital trial being held responsible for incorrect data entry for a few patients in one center. When a study is composed of several data elements, each may need a guarantor—for example, when laboratory tests are performed at an institution different from the one where patients are assembled. The attestations of the guarantors, and the signatures assembled on the authorship credit form from all authors and contributing authors attesting to their specific contributions to the paper, are sufficient to replace item 3 of the International Committee of Medical Journal Editors code.

The editor should send the responsibility form to the first author, who in turn should select the person or persons, from among the 3 categories of author/contributor, who would best be suited to sign each attestation (i.e., function as guarantor). The acknowledgments section will be required to list the guarantors of the paper, along with the acknowledged contributors (when they are different). Additional acknowledgments—to anonymous reviewers, to dedicated secretaries, to the author's mother, and to others who do not fit into any of the 4 production tasks—could, of course, also be added. Thus, a component of this proposal is an expansion and formalization of the acknowledgments section. It should become an important source of information to readers. I suggest it be organized as follows (with names to be entered):

**Acknowledgments**

Guarantors:

- Human Investigations \_\_\_\_\_
- Animal Rights \_\_\_\_\_
- Data \_\_\_\_\_
- Data Analyses \_\_\_\_\_

Acknowledged Contributors: \_\_\_\_\_

Other Acknowledgments: \_\_\_\_\_

**Advantages and Disadvantages of the Proposal**

The major advantages of this proposal are that it makes component parts of the production of a scientific paper explicit and that it allocates responsibility for the essential scientific and ethical elements of the research represented in the paper. Journals would have a record of the stated contributions of each author, which will prove useful should disputes arise later. Authors would have to discuss roles and agree among themselves before an article is published. Data stealing would be made more difficult, because a paper could not be published without a guarantor's signature attesting to legitimate use of the data. Tenure and promotion decisions could be made on a more exact basis if authors retain copies of their responsibility forms. A specific role, that of acknowledged contributor, will be carved out for contributors to research who fall short of authorship, and this category will explicitly acknowledge the importance of their contributions. Data sharing is likely to be promoted.

A major difference between this proposal and the International Committee of Medical Journal Editors criteria is the lessening of responsibility of each individual author. This proposal does not require each author to "approve the final version," which implies responsibility for the entire paper and, by implication, each item of data upon which the paper rests. But surely the current practice of collecting such certifications by editors provides no real assurance of responsibility. How many of the several dozen authors of a multicenter study could truly attest to the validity of the complex statistical analyses that are now almost universal? By attempting to have the authors assure everything, editors assure nothing. Requiring certification of responsibility in specific areas linked to the skills of the guarantor provides more tangible assurance of the validity of key components of the study.

The difference between authorship credit and authorship responsibility has been noted by Rennie et al.,<sup>5</sup> but these authors recommend combining the 2 roles into the title "contributor" and using the term "guarantor" to refer to an individual who guarantees the totality of the paper, a role that I think is unnecessary (if the key component parts are guaranteed) and, in many instances, impossible. Both Rennie et al. and a committee of the American Association of University Professors<sup>6</sup> have recommended written disclosure of authors' contributions, but in an open format that permits authors themselves to determine the

categories of effort that need to be described and reported. Other than the one presented here, I am aware of no specific format for the reporting of authorial contributions that has been published.

The only practical disadvantages I can see with this proposal are the extra paperwork burden and the extra effort required from each author to think through exactly what contributions he or she made to the paper. The paperwork burden, summarized entirely in Figure 1, is modest and would replace the current signature form used in most journals. The "thought work" is something the authors should be doing in any case. □

*Nigel Paneth, MD, MPH*

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Requests for reprints should be sent to Nigel Paneth, MD, MPH, Dept of Epidemiology, College of Human Medicine, Michigan State University, A206 East Fee Hall, Lansing, MI 48823.

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**Hemenway re: Authors and Authorship**

The issue of authorship in medicine and public health is largely one of too many authors, many of whom have not actually contributed sufficiently to justify recognition. A proposed solution has been to describe exactly what is required for authorship and to force all authors to sign solemn statements that they have made substantial contributions. This type of policing effort, however, has not worked.