

Publication Ethics: An Examination of Authorship Practices

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Objective: To review health behavior research policies and practices related to authorship credit and responsibilities and to develop an authorship policy for the *American Journal of Health Behavior*. **Methods:** Research on authorship criteria and byline placement was reviewed and the *American Journal of Health Behavior* Ethics Work-

ing Group made recommendations to the editor regarding an authorship policy. **Results:** A new authorship policy was adopted by the editor. **Conclusions:** The new policy clarifies the position of the journal regarding authorship issues.

Key words: publication ethics, authorship

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The issue of publication ethics applied to research is a multidimensional concern as well as one that affects a wide array of groups – authors, editors, reviewers, researchers and other scholars, learned societies and organizations, policy makers, practitioners and clinicians, funders, and numerous other stakeholders. Every journal that is an outlet for research findings and the dissemination of other new knowledge must, therefore, assume as much responsibility as possible for assuring that the papers it publishes represent high quality and integrity. In this particular paper and others expected to follow, it is the intention of the *American Journal of Health*

Behavior Ethics Working Group to identify the scope of the publication ethics challenge and to propose mechanisms that establish and enforce practices of quality assurance for the stakeholders for whom health behavior research is so vital. In this first paper of a series, the issue of determining authorship is explored, and a new *American Journal of Health Behavior* policy addressing issues of authorship is presented.

The Office of Research Integrity (ORI) of the Department of Health and Human Services (HHS) defines research as “a systematic investigation, including research development, testing and evaluation, designed to contribute to generalizable knowledge.”¹ Implicit in this definition is the responsibility to share newly created generalizable knowledge through scholarly presentations and publications.² The ORI also specifies ethical conduct regarding the manner in which research should be shared. “Research results should be shared honestly, efficiently, and without bias. Dishonesty and bias undermine the usefulness of research publications; inefficiency (publishing the same research several times) wastes public funds and the valuable time of the reviewers and journal editors.”³ Professional codes of conduct and editorial policies affecting health behavior research-

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ers (eg, Office of Research Integrity [ORI],³ Coalition of National Health Education Organizations [CNHEO],⁴ International Committee of Medical Journal Editors [ICJME],⁵ American Psychological Association [APA],⁶ Committee on Publication Ethics [COPE],⁷ Council of Science Editors [CSE],^{8,9} American Sociological Association [ASA],¹⁰ World Association of Medical Editors [WAME],¹¹ and National Academy of Sciences [NAS]¹²) address publication ethics, but such guidelines are generally vague, and enforcement has been inconsistent.

According to the ORI, “research has no value if it is not made public.”³ Without detailed reports available in a retrievable format, scientists cannot assess the value of research findings, nor can they build on what has been learned. A comprehensive collection of knowledge is the core of any academic discipline, and an open exchange of information is a crucial part of the process used to build the body of knowledge in any field of study.

The gold standard for open exchange of information is publication in prestigious, peer-reviewed professional journals. These journals are indexed in databases commonly used by researchers (eg, Medline, PsycInfo, Institute for Scientific Information [ISI]), thereby making retrieval of research findings straightforward. In addition to building the body of knowledge, publication “documents who is first with new ideas or discoveries, shows productive use of research funds, and provides a record by which a research career can be judged.”¹³ In a publish-or-perish world, where promotions, merit raises, and professional advancement are based in large part on one’s publication record, it is unfortunate that ethical principles and professional guidelines for authorship have not been delineated more clearly.

Recent events¹⁴⁻¹⁷ have spotlighted some chronic publication ethics issues in health journals. Front and center topics include authorship credit, various forms of plagiarism, peer review, selective reporting, and open access. Professional codes vary in the degree to which they address these areas. Editorial groups (eg, ICMJE, COPE, CSE, and WAME) have taken the lead in addressing these issues, but there appears to be a lack of awareness of these evolving standards among some researchers.¹⁸ There is also

a general lack of agreement about some aspects of the standards and their interpretation.

It is, perhaps, no compliment to the state-of-the-art of preparing researchers and scholars that so many students (and even more established scientific investigators) are ignorant of publication standards and protocols that one might simply describe as professional courtesies or common sense ethics. We hope that an outcome of this and other papers of a similar theme advances both the education and the dialogue around publication ethics and affirms the need for their rigorous monitoring. To enable the dialogue, we introduce the issue of authorship determination using a question-and-answer format.

Are there guidelines to help determine who should be listed as an author?

In 1978, a group of medical journal editors met informally in Vancouver, British Columbia, to establish publication guidelines for authors and editors. This group evolved into the 13-member International Committee of Medical Journal Editors (ICMJE), which developed the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication*, updated most recently in October 2004. Uniform requirements were created “primarily to help authors and editors in their mutual task of creating and distributing accurate, clear, easily accessible reports of biomedical studies.”¹⁹ The standards set forth in the uniform requirements have been adopted by over 500 journals worldwide.^{18,20}

The uniform requirements are an attempt to balance the privilege of authorship credit for “important new contributions to the scientific literature” with an assumption of “responsibility for the integrity of what is being published.”¹³ According to the ICMJE, the requirements differentiate between contributors, who should be listed in an acknowledgments section, and authors, who meet all three of the following criteria:

- “substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content; and

· final approval of the version to be published.”⁵

These criteria are the clearest, widely accepted authorship guidelines to date. Nevertheless, the terms substantial and critically, key elements of these criteria, are vague and leave much to the interpretation of individual researchers who are not disinterested parties. The ICJME requirements offer a bit more specificity with the following examples:

· “Acquisition of funding, collection of data, or general supervision of the research group, alone, does not justify authorship.

· All persons designated as authors should qualify for authorship, and all those who qualify should be listed.

· Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content.”⁵

The ORI’s review of medical school research guidelines²¹ sites the following activities as examples of activities that do not qualify individuals for authorship:

· “providing laboratory space or use of instrumentation,

· providing funding, involvement in patient care or providing patient samples, routine technical work, proofreading or editing of manuscripts,

· having a supervisory position, or

· providing encouragement.”

The article²² “The Matter of Publication Credit: A Survey of APA Members” was rejected twice by leading psychological journals prior to being published in a less widely read journal in 1981. The author reported that when his manuscript was rejected by a prominent journal, the editor stated that “decisions about authorship, like those about sex in previous eras, should remain intimate rather than being matters of discussion.”²³ This behind-closed-doors attitude is not as prevalent as it once was, but authorship credit is still a controversial topic, and there is little agreement about how to make the process more equitable and transparent.

As the number of authors per article has increased over the years, so have questions about the meaning of authorship order. The ICMJE authorship criteria have gained widespread acceptance by journal editors, but researchers remain confused about expectations because definitions of the quality and quantity of work that qualify someone for au-

thorship are “scant and inconsistent.”¹⁸ In a 1995 survey of journal editors, only 7 of 39 editors indicated that they understood the meaning of the order of authors. The 7 editors who stated that they understood the meaning of byline order indicated that their journals had specific policies covering the issue. However, the journal policies varied widely, and systems included listing senior authors to students, listing the person who did the most work to the least, and listing the order specified in the study protocol.²⁴

Some authors have attempted to develop Likert-type scales to assess contributions to papers as a method for determining order of authorship.²⁵ In this scaled system, points are awarded for conception (development of the initial idea for a project), design (contributions to setting up the study), implementation (participation in an array of activities from attending meetings to allocating resources and solving logistical problems), data analysis and interpretation, writing the first draft of the article, review and revision of the article, and public responsibility (accountability for the research and content being reported).

Although authors are apparently applying their own idiosyncratic criteria in determining authorship order,²⁴ one study of 6 months of research articles published in *Lancet* found that the number of contributions made by the first author was significantly greater than were those made by the other contributors. The first author was twice as likely as others to have coordinated the study. The first and last authors were more likely to have written the paper, designed the study, and analyzed the data. The second and third authors were twice as likely to have managed the data and were more likely to have performed clinical statistical or laboratory assessments.²⁴ On the other hand, Mouloupoulos et al²⁶ were unable to develop a model that captured the individual contributions to multiauthored papers. Similarly, Shapiro et al²⁷ reviewed 200 articles in 10 leading science journals and found that the order of persons in the author byline was inconsistent with their contributions.

Perhaps because authorship disputes are so common^{28,29} and time-consuming, the ORI explicitly excludes authorship issues from its official purview.¹⁸ Nevertheless, the ORI has issued advisory

guidelines acknowledging that although the ICJME requirements are influential, “most of the responsibility for decisions about authorship” rests with the “researchers who participated in the work.”³ Disputes can be minimized if the criteria used to identify and rank contributing authors are clarified early on.^{3,30} The ORI recognizes that “there are no clear rules for determining who should be listed as first author or the order in which other authors should be listed,” but “authors are usually listed in their order of importance, with the designation first or last author carrying special weight.”³ It is primarily a European style to use the last author position to acknowledge the second lead on a paper. The ICMJE requirements state that “the order of authorship on the byline should be a joint decision of the co-authors.

Authors should be prepared to explain the order in which authors are listed.⁷⁵ Hwang et al³¹ suggests including a sentence at the beginning or end of an article describing the meaning of the order of authorship. Examples include “Except for the first author, author order in the byline was arranged alphabetically by last name” or “The order of authorship was based on the number of contributions made by each.”³¹

Collaborative, multicenter research trials have dramatically increased in recent years. For example, 6% (10/172) of the original articles published in *JAMA* in 1991 specifically identified a study group in the byline, but by 2001, that number had risen to 22% (41/185).³² Group attribution recognizes the cooperative, interdisciplinary nature and complexity of such investigations, but credit and responsibility are difficult to attribute when only a study group is listed (eg, the Women’s Health Initiative). Research groups can include hundreds of people, and it is doubtful that every member of large research teams can meet all of the criteria for authors.

Several approaches have been used to address the dilemmas inherent in authorship attributions for major clinical research investigations. In the interest of transparency and the promotion of a balance between authorship credit and accountability, we recommend using the byline to list the names of all those who meet authorship criteria in the order of their contributions. In all of the options,

the authors listed in the byline must meet the full criteria for authorship and must complete the journal specific authorship forms including conflict of interest and copyright waiver forms. Journals will generally list other members of the group in acknowledgments.⁵ Journals endorsing the ICMJE uniform requirements⁵ view acquisition of funding, collection of data, and general supervision of the research group as insufficient to justify authorship. Approaches to authorship attribution for multisite investigations include

1. Listing all of the names of the research team in the byline. MEDLINE used to limit the number of authors to 25, but that restriction was lifted in 2000, and currently there is no MEDLINE limit to the number of authors. Recently, the National Library of Medicine has adopted a practice of indexing the group name and the names of individuals the group has identified as being directly responsible for a manuscript.⁵

2. Listing the names of the individuals who meet the ICMJE criteria for authorship in the byline with a designation that these authors are writing “for” the research group. Alternately, use “and” before the name of the research if each member of the group as well as those specified in the byline qualify for authorship. If only the name of the writing committee is used in the byline, the names of the writing committee may be listed in the affiliation footnote on the first page or at the end of the article.

3. Listing the name of the research group as the author. Include the name of the corresponding author in the byline or the affiliation footnote as the person to whom questions may be addressed.

The ICMJE uniform requirements state that “when a large, multi-center group has conducted the work, the group [emphasis added] should identify the individuals who accept direct responsibility for the manuscript.”⁷⁵ Unfortunately, industry-sponsored research teams are seldom allowed to identify those who should prepare the manuscript; the sponsor does. Industry-controlled authorship allocation can lead to contentious authorship battles, inequitable attribution of credit, and perhaps inappropriate industry control of scientific literature. Most publication ethics guidelines have evolved from editor groups in an effort to diminish issues

they face. Clearly, more effort is needed to clarify authorship allocation issues and gain greater buy-in by noneditor groups.

Who should be listed in the Acknowledgments section?

The Acknowledgment section was designed to credit the contributions made by persons and institutions that do not meet the criteria for authorship. Unfortunately, despite various ethical standards and guidelines, the lack of general agreement among researchers as to who qualifies as an author has resulted in a blurring of the line between the contributions that have been deemed sufficient to warrant a byline and those that have been relegated to the acknowledgment list.²⁴

What are "honorary authors," "gift authors," "ghost authors," and "guest authors"?

The ICMJE guidelines attempt to ensure that authorship credit is given only when it is due and that no one who qualifies for authorship is omitted.³³ All of these authorship categories are considered to be at best misattribution of authorship credit and, at worst, fraud.³⁴

Honorary

Honorary authorship is a type of gratuitous authorship that encompasses both the guest and gift categories. It includes any author who does not meet ICJME authorship criteria.^{35,36} The practice of listing honorary authors is "widely condemned and in the extreme considered by some to constitute a form of research misconduct."³³ According to the ORI, "honorary authorship is not honorable."³⁷

Gift

Gift authors are listed on manuscripts out of a sense of obligation. Persons designated as "gift authors" generally have not contributed directly to the research or writing. They may hold positions such as mentor to the primary author or director of the lab where the research was conducted. Possibly, they provided reagents, equipment, or work space or obtained funding for the research and, thus, feel entitled to authorship.^{18,38,39} This category also includes students who are inappropriately included on manuscripts as a gift to help them get started in their career. Rather than offering undeserved career boosts, mentors should foster research

experience and authorship integrity by actually involving their students in the research and manuscript development process.

Ghost

Ghost authorship is the practice of failing to list, as an author, individuals who have made substantial contributions to the research or writing of a manuscript.³⁶ This practice occurs for a variety of reasons. Some common examples of ghost authorship are when listed authors fail to acknowledge the extent of participation of graduate students, junior faculty, professional writers, or sponsor employees. The problems related to students and their mentors in determining authorship credit and authorship order prompted Fine and Kurdek⁴⁰ to review a series of hypothetical cases and make relevant recommendations.

Guest

Guest authorship is sometimes offered to experts in a field of study even though the "guest" neither conducted the research nor wrote the manuscript. Those who engage in this practice often do so because they believe it will increase the likelihood that the manuscript will be accepted for publication or published in a more prestigious or rigorously refereed journal. In addition, the practice of guest authorship may be a part of a reciprocal agreement, usually with one's coworkers or close colleagues, because the practice increases the size and scope of each researcher's bibliography on the curriculum vitae. The temptation to engage in such reciprocal practices is substantial, at least in part, due to the atmosphere found in many universities and funding agencies that may encourage quantity over sustained quality in academic work.

Are these practices harmful?

Authorship is the mechanism researchers use to establish credit and accountability for the integrity of the research including freedom from fraud, misrepresentation, and errors. Misattribution of authorship undermines the integrity of the system, the prestige of the scientific community, and the public trust. In academic settings, authorship, particularly first authorship, in peer-reviewed journals is the currency used to achieve promotion and tenure, merit pay, professional pres-

tige, and competitiveness for research funding. Misattribution is “a personal failing that can damage an individual researcher’s reputation and career.”¹⁸ It is always a breach of professional ethics.

Nevertheless, the practice has become so egregious that many journal editors are convinced that as currently constituted, the system of authorship attribution is inadequate and in serious need of refinement.^{18,41} One study of articles published in *Lancet* found that 44% of the individuals listed in the author bylines failed to meet even a lenient interpretation of the ICMJE criteria for authorship.²⁴ A *Journal of the American Medical Association* article reported that 26% of authors of research papers did not contribute significantly to the work, and one third of these credited individuals were department chairs or heads of labs or research groups.²⁷ Bates et al⁴² reported that between 20% and 50% of authors do not meet all 3 of the ICMJE criteria. A survey of postdoctoral research fellows by Eastwood et al⁴³ found that 32% of 324 respondents said they would be willing to list an undeserved author if it would make publication of their work more likely or benefit their research career. In the same study, what is even more revealing of the depths to which publication ethics have sunk, is the fact that of those who had personally observed or experienced authorship abuse, 75% said they would be willing to list an undeserved author.

Clearly, the current system of authorship used by most journals is not a reliable measure of actual intellectual contribution or achievement.⁴⁴ Yet, as Reynolds⁴⁵ pointed out in the online CSE Authorship Task Force Forum, the ICMJE criteria are seriously flawed and “doomed to failure.” Reynolds went on to say that

for a senior/principal investigator, even though they may not have done most, or often any, of the execution of the research project, and even though they may have had only editorial comments on the manuscript, is their role less important than that of the graduate student or postdoctoral fellow who took the lead on the project? What value does one assign to the PI’s [principal investigator’s] role when that person has established a research program over many years and is still the guiding force behind the program?

What is a contributorship and how is it different from guarantorship?

Although published guidelines on authorship have existed for decades, investigations reveal that they are not followed consistently, and many researchers remain unaware of them.^{18,46} Studies of authorship in science suggest that traditional criteria for authorship no longer reflect the way research is actually done. In a climate in which the meaning of the byline order is not readily apparent to the reader, the ICMJE guidelines encourage journal editors to develop and implement policies about the collection and publication of the specific contributions of each author and acknowledged individual or group. Contributors include all of the people who have provided elements leading to production of a specific manuscript -- authors as well as acknowledged individuals or groups.

As Rennie stated in the *CSE Task Force on Authorship White Paper*,⁴¹ a system of contributorship is an “essential practical step” to “link credit and accountability, specifically, tightly and publicly.” Some journals (eg, *British Medical Journal*) publish statements written by the authors about their role in the research and preparation of the manuscript, and others provide a list of contributions from which authors may select (eg, *Annals of Internal Medicine*) or require authors to complete a structured checklist (*Journal of the American Medical Association*). Still others are in the process of developing contribution checkoff lists or rubrics.^{47,48} Systems of acknowledging delineated contributions offer a level of transparency that is relatively new, but is being praised as the next necessary step in research accountability.⁴⁹ In a Council of Science Editors online discussion, one researcher stated, “Listing the actual roles of the authors in a project/manuscript is a SUPERB IDEA... Only those with something to hide would not favor this idea.”⁵⁰ Another contributor to this same dialog objected to reporting contributions and stated, “How often is authorship inappropriately ascribed that so much effort is now going to correct it? It seems rather cumbersome and somewhat intrusive under most circumstances.”⁵¹

Accuracy in bestowing credit for research productivity is important, but like insurance, authorship systems also must assign accountability for a kind of “after-

care once a paper has been published.”¹⁸ Failure or inability to be accountable for the integrity of all aspects of a published work is considered a far more serious failing than misattribution of authorship. Some journals require one or more authors to be listed in the journal as guarantors. These people “take responsibility for the integrity of the work as a whole, from inception to published article.”³³ The Council of Science Editors (CSE) has gone on record with its concern that “guaranteeing the correctness of the results and interpretation ... goes beyond a rational requirement.”⁴⁷ The CSE Task Force on Authorship takes issue with the assumption that any individual could be omniscient to the point of taking responsibility for a team’s work. The task force has stated “omniscient authors wouldn’t need collaborators to begin with.”⁴¹ Friedman⁴⁷ suggests that “scientists stake their reputation on the honesty of what they publish” and incorporate the responsibility for each aspect of the project into the detailed contribution list. Some authorities have suggested that author bylines be replaced by a detailed report of contributions. So far, omitting author bylines has met considerable resistance.

American Journal of Health Behavior Policy on Authorship

The *American Journal of Health Behavior* endorses the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication*⁵ and encourages academic institutions to promote awareness of these requirements. Whereas the *American Journal of Health Behavior* acknowledges the complexity inherent in determining the order of authorship, nevertheless, all authors should meet ICMJE qualifications for authorship, and all those who qualify should be listed. To be more specific, the author who contributes the most should be listed first, and the author contributing the least should be listed last. The criteria for the byline order should be discussed and agreed upon in advance by all coauthors. It should not be in the hands of industry sponsors. Moreover, beginning January 1, 2006, the primary author of manuscripts submitted to the *American Journal of Health Behavior* will be required to identify the contributions made by each author and to justify the order of authorship. This description of contribu-

tions will be included in published manuscripts. Contributors who do not meet ICJME qualification for authorship should be listed in an Acknowledgements section.

The *American Journal of Health Behavior* considers the following misattributions of authorship credit to be unethical: honorary authorship, gift authorship, ghost authorship, and guest authorship. Rather than fostering accuracy and honesty, hallmarks of the conduct of good science, such practices obfuscate the truth. The *American Journal of Health Behavior* strives for transparency and considers misattribution of credit to be an ethical violation. Anyone determined to be in violation of this policy will be censured by the *American Journal of Health Behavior*. The nature and extent of this censure will be recommended by the *American Journal of Health Behavior* Ethics Working Group to the Editor-in-Chief.

CONCLUSIONS

The standards for accuracy, ownership, and accountability for a published manuscript are no less important than those related to the performance of the research itself, the preparation of data for analysis, and the interpretation of findings. In a time when common-sense ethics that governed the performance and reporting of research through publication in bygone eras are no longer “common,” expectations and responsibilities of authors must be stated, regulated, and enforced. Whereas the practices of the vast majority of scholar-researchers are presumed to be true and honorable, those persons who are gatekeepers of the publication outlets (ie, editors and editorial boards) must strive to minimize the likelihood of the few who would commit ethical violations from surfacing and threatening the integrity of the rest of the scientific community. Thus, the *American Journal of Health Behavior*, relying on its appointed Ethics Working Group, anticipates continuing to bring relevant publication ethics issues to the attention of readers and endeavors to uphold the most rigorous of standards.

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