Whose Paper Is It Anyway? Authorship Criteria According to Established Scholars in Health Professions Education

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Abstract

Purpose
The health professions education (HPE) community is a crossroad of scholars from various disciplines with potentially conflicting views on who qualifies as author. Established HPE scholars are expected to model ethical research conduct, but no research has investigated the extent to which authorship criteria are understood and applied by leaders in the field. This study investigated what leading scholars consider appropriate criteria for authorship and how often these criteria are ignored.

Method
Directors of research and editors of HPE journals completed an anonymous

survey between September 2015 and August 2016 with questions about authorship practices they experienced and recommended, common authorship criteria, and how often they had encountered unethical authorship decisions.

Results
Out of 82 invited scholars, 46 participated in the survey (response rate = 56.0%). They reported a stark contrast between current and recommended authorship practices. Twenty-two (51.2%) had experienced unethical pressure regarding authorship order, 15 (34.9%) had not been included as author when they qualified, and 25 (58.1%) had seen

authors included who did not qualify. A slight majority (n = 25; 58.1%) correctly identified authorship standards widely adopted by biomedical journals.

Conclusions
A surprising proportion of leaders in the HPE field had encountered unethical authorship practices. Despite widely disseminated authorship criteria, the findings suggest that offering authorship to those who do not qualify, or arguably worse, excluding those who should have been included, remains a common practice. The authors offer strategies to scholars, editors, and tenure and promotion committees to combat these practices.

Health professions education (HPE) is a relatively new field of scientific inquiry in which scholars from various disciplines collaborate, including clinical, basic,

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and social sciences, as well as education and the humanities. While this diverse group of scholars contributes a rich array of perspectives and methodologies to HPE, they also bring the customs and traditions of their respective fields, potentially resulting in conflicting views of who qualifies for authorship.[1] In fact, Bosnjak and Marusic[2] compared authorship definitions of 185 scientific journals and concluded that "the lack of and variety of authorship definitions in journals and professional organizations across scientific disciplines may be confusing for the research and lead to poor authorship decisions."[(p751)] Similarly, Wager[3] reported in her review of the authorship guidelines of 234 biomedical journals that 41% did not include any authorship criteria and 29% endorsed, paraphrased, or made reference to the International Committee of Medical Journal Editors (ICMJE) criteria, while 28% provided their own criteria.

There are several reasons why appropriately assigning authorship matters. First, peer-reviewed scholarship is an essential mechanism for advancing knowledge in a field. Second, such scholarship is also an important vehicle

for professional advancement of authors because the number of publications is typically the primary currency for academic promotion and a proxy measure with which promotion and tenure committees gauge faculty members' contributions to and impact on the field. Third, a portfolio of publications is used as evidence of expertise and of one's ability to bring research to full fruition, and thus helps with obtaining grant funding. When the stakes are high, investigators may feel pressured to grant or deny authorship to others who may or may not qualify. Indeed, authorship controversies and unethical practices have long been reported in the biomedical literature, including reports of honorary or gift authorship and ghost authorship.[4–6] Gift authorship is granted as a favor to someone who does not meet authorship criteria. Honorary (or guest) authorship is given as a courtesy to senior individuals or to add prestige to the paper. Conversely, ghost authorship refers to the practice of denying authorship to a contributor who should have been included.[7]

To clarify what constitutes authorship and to mitigate unethical practices, the ICMJE recommends that authors meet

the following criteria for authorship[8]: substantial contributions to the conception of the research or to the collection, analysis, or interpretation of data; drafting or revising important intellectual content of the manuscript; final approval of the published version; and accountability for all aspects of the work. Many HPE journals, including *Academic Medicine*, require that authors meet all ICMJE criteria; those who meet some but not all should be acknowledged. Authorship guidelines have been published by professional organizations (e.g., American Education Research Association,[9] American Psychological Association[10]), and guiding principles and decision tools for determining authorship continue to be disseminated.[7,11,12] Furthermore, some HPE journals (e.g., *Medical Education*) do now require that authors explicate their contributions in the author byline.

Previous investigations[13,14] found evidence that scientists struggle with decisions related to authorship and may experience unethical pressure as to whom should and should not be included as authors. Furthermore, we ourselves have seen anecdotal evidence that, despite ICMJE criteria, even senior scholars in HPE do not always follow guidelines or have accepted honorary authorship. Established HPE researchers (e.g., full professors, journal editors, directors in research in medical education) are well positioned and expected to promulgate ethical authorship decisions. If they are not sure about criteria for authorship or do not apply them consistently, that is problematic, because they commonly serve as mentors to junior investigators and thus may model undesirable authorship practices. To our knowledge, no systematic research has been done investigating the extent to which these criteria are understood and applied by experienced scholars and leaders in HPE or how commonly they are overlooked.

This study investigated what senior HPE scholars consider appropriate criteria for authorship; the frequency with which they have encountered deviation from these criteria; and their ability to correctly identify authorship criteria used by most HPE journals. We hypothesized that discrepancies between published authorship guidelines and actual practice continue to persist even among the most senior scholars in our field.

Method

We designed a survey instrument based on previous studies[14–17] that highlighted principles or practices related to authorship qualifications; these were used as the stem for a number of our questionnaire items. The questions were grouped in four sections: experienced and recommended practices of determining authorship; recognition of ICMJE authorship criteria; the frequency with which violations of criteria for authorship were encountered in the past two years; and demographic information. The survey instrument is available in Supplemental Digital Appendix 1, available at http://links.lww.com/ACADMED/A525.

We intentionally sought to explore the tension between what is current practice and what is optimal practice. Using a four-point Likert-like scale (never, sometimes, often, always), respondents indicated how often, in their experience, a principle had been applied or should be applied. Furthermore, respondents were asked to report the frequency with which they had encountered or participated in unethical authorship practices during the prior two years (e.g., "In the past two years I have granted authorship on a paper to a collaborator who did not meet the criteria for authorship"). For the latter questions, we recoded frequency responses into "yes" or "no" as follows: "Rarely," "sometimes," "often," and "always" were recoded as "yes," and "never" as "no."

This study involved two groups of HPE thought leaders: the 45 members of the Society of Directors of Research in Medical Education (SDRME), a prominent advocacy organization for educational research and scholarship that seeks to influence national research policy; and the 39 members of the International Editors Group of Health Professions Education Journals. SDRME represents "highly respected collaborating units of research in medical education" (http://SDRME.org) whose directors are among the most senior scholars in our field. The International Editors Group consists of the editors and other editorial board members of the leading journals in HPE: *Academic Medicine*, *Advances in Sciences Education*, *Medical Education*, *Medical Science Educator*, *Perspectives in Medical Education*, and *Teaching and Learning in Medicine*. The three of us (S.U., B.M., and S.J.D.) were members of the SDRME at the time of the study. S.J.D. is also a member of the International Editors Group and, as such, completed the survey. After careful consideration, we decided to include his record; removing it did not affect the results in a substantive manner.

We invited all SDRME members to participate in our anonymous survey via e-mail between September 2015 and March 2016, with two follow-up reminders using Qualtrics (https://www.qualtrics.com). After making a few minor edits in the wording of the survey, we then invited all members of the International Editors Group between May and August 2016. They also received two reminders. Individuals who were members of both groups were instructed to complete the survey only once. This project was approved by the Michigan State University institutional review board for human subjects research. Descriptive statistics were generated with SPSS statistical software, version 24 (IBM Corp, Armonk, New York).

Results

As anticipated, preliminary analyses showed no substantive differences between the two groups of thought leaders (SDRME and International Editors Group). Thus, we pooled the data from both groups. We received 32 responses from SDRME members and 14 from the International Editors Group. To calculate response rate, we took into account that two individuals belonged to both groups and adjusted the denominator accordingly. The resulting response rate was 56.0% (46/82) or, without the record of one of the authors, 54.8% (45/82). The results reported below are for the full set of 46 respondents.

Demographic information (Table 1) confirmed that our sample consisted of established HPE scholars. Most had been involved in HPE for two decades or more, had a large body of published work in HPE (median number of publications: 50; mean: 68.6; range: 4–250), and had senior professorial ranks (9 associate professors [19.6%] and 28 full professors [60.9%]).

Table 2 contrasts what authorship rules HPE scholars experienced in actuality and what they found desirable. Most

Table 1

Demographic Characteristics of Survey Participants (Members of the Society of Directors of Research in Medical Education and International Editors Group of Health Professions Education Journals), From a Study of Authorship Criteria and Health Professions Education Publications, 2015–2016

Characteristic	Value
Number of years involved in medical education, average (median, range)	23.6 (23, 5–45)
Number of publications related to medical education, average (median, range)	68.6 (50, 4–250)
Rank of assistant professor, no. (%)	4 (8.7)
Rank of associate professor, no. (%)	9 (19.6)
Rank of professor, no. (%)	28 (60.9)
Doctoral degree(s), no. (%)	42 (91.3)

respondents (n = 29; 63.0%) reported that senior-level administrators were sometimes or often listed as coauthors on publications of faculty in their units, whereas most respondents thought this to be an undesirable practice (n = 34; 75.6%). Most respondents (n = 27; 60%) reported that they had seen gift authorship being granted out of a sense of obligation to someone who had not contributed to the work, while none believed that this was ever an appropriate practice. Similarly, most had encountered gift or honorary authorships (n = 31; 68.9%), but only two individuals believed that this practice was sometimes appropriate. Also, several respondents have seen the practice in which the person who conceived of the study was not given the opportunity to author a manuscript (never: n = 1; sometimes: n = 7); some (n = 6; 13.3%) believed that offering such an opportunity should never or only sometimes be applied.

A slight majority (n = 25; 58.1%) of these senior HPE scholars correctly identified ICMJE criteria for authorship (Table 3). Two respondents incorrectly determined that obtaining funding for a project was an ICMJE authorship criterion. Several more (n = 6; 14%) incorrectly believed that supervision or leadership of a research team is an authorship qualification. The same number (n = 6; 14%) did not choose "contribution to drafting a manuscript" as a criterion, and 12 (27.9%) did not consider review and approval of the final draft an authorship requirement.

In response to questions regarding unethical authorship practices encountered during the previous two years, many had experienced unethical pressure regarding authorship order (n = 22; 51.2%). Some (n = 9; 20.5%) were granted authorship when authorship criteria were not met, and most (n = 34; 77.3%) were offered, but declined, authorship when criteria were not met. Conversely, 15 (34.9%) were denied authorship when in fact they felt that they met authorship criteria. In the previous two years, 25 (58.1%) had experienced that others were inappropriately included as authors. Several of our respondents themselves (n = 15; 34.9%) had granted authorship to others who did not qualify.

Table 2

Experienced ("Has Been Applied") and Recommended ("Should Be Applied") Authorship Decisions as Reported by Members of the Society of Directors in Medical Education and the International Editors Group of Health Professions Education Journals, From a Study of Authorship Criteria and Health Professions Education Publications, 2015–2016

Questionnaire item	No. (%) of responses		
	Never	Sometimes	Often/always
An associate dean, department chair or other senior administrator is listed as an author on the medical education publications of all faculty within their units			
Has been applied (n = 46)	17 (37.0)	22 (47.8)	7 (15.2)
Should be applied (n = 45)	34 (75.6)	9 (20.0)	2 (4.4)
The person who originally came up with the idea for the study is given the opportunity to be an author on the manuscript resulting from the study			
Has been applied (n = 46)	1 (2.2)	7 (15.2)	38 (82.6)
Should be applied (n = 45)	2 (4.4)	4 (8.9)	39 (86.7)
Gift authorship is offered out of a sense of obligation to someone who has not contributed to the work			
Has been applied (n = 45)	18 (40.0)	19 (42.2)	8 (17.8)
Should be applied (n = 43)	43 (100.0)	0 (0.0)	0 (0.0)
Authorship is granted out of appreciation, respect, or as a courtesy to an individual who has not actively contributed to the current work			
Has been applied (n = 45)	14 (31.1)	24 (53.3)	7 (15.6)
Should be applied (n = 43)	41 (95.3)	2 (4.7)	0 (0.0)

Discussion

We sought to describe what thought leaders in HPE research perceive as common, desirable, and undesirable practices when it comes to making authorship decisions. Our hypothesis was that despite the proliferation of criteria and decision tools, senior scholars would report undesirable practices. This hypothesis was confirmed, although we underappreciated the frequency of undesirable practices.

Inappropriate authorship decisions included both listing individuals as authors who did not qualify by current guidelines and not including individuals who should have been given the opportunity to contribute to authorship. The former suggests that honorary or gift authorship unfortunately persists, even among senior HPE scholars. The latter finding's frequency, excluding qualifying individuals,

Table 3

Proportion of 43 Survey Participants Correctly Identifying International Committee of Medical Journal Editors (ICMJE) and Other Criteria for Authorship, From a Study of Authorship Criteria and Health Professions Education Publications, 2015–2016[a]

Authorship criterion	No. (%) of participants
Acquisition of the funding for project[b]	41 (95.3)
Substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data	42 (97.7)
General supervision or leadership of the collaborative team[b]	37 (86.0)
Contribution to drafting of the manuscript	37 (86.0)
Review and approval of the final version of the manuscript	31 (72.1)
Identified all criteria correctly	25 (58.1)

[a]Question was phrased: "According to the International Committee of Medical Journal Editors (ICMJE) the criteria for determining if a project collaborator merits the designation of author are (check all that apply).…" Note that we did not include the criterion "be accountable for all aspects of the work" because *Academic Medicine* and other health professions education journals do not stipulate the requirement.
[b]Is *not* an ICMJE authorship criterion.

was unexpected and suggests that more guidance at the outset of the study (e.g., during the manuscript planning phase) is needed so that individuals, especially those who conceived of the research, are invited to participate in the authoring process. Indeed, one-third of respondents stated that they were not included on a paper when they met authorship criteria, raising significant concern. We need to ensure that appropriate attribution for ideas is given to support and build a thriving community of scholars.

It is noteworthy that several respondents, most of whom are prominent scholars, did not identify all ICMJE authorship criteria used by many journals, including *Academic Medicine.* We believe that a lack of awareness of these criteria is likely contributing to ongoing discrepancies between current and best practices for authorship. We recognize, however, that some scholars are aware of the ICMJE criteria but do not necessarily endorse them, as some investigators[16] have reported. We do not know the extent to which this was the case among our survey respondents (which we acknowledge is a limitation of our study). Nonetheless, we believe that providing education to both senior and junior scholars on the topic and dissemination of ethical authorship practices that are consistent across HPE journals could improve current practice.

The number of authors on scientific papers increased dramatically from an average of two in the 1930s to seven in the 1970s.[18] As interinstitutional and interprofessional work is increasingly

valued, the size of HPE research teams is unlikely to diminish. This poses additional challenges when authorship decisions are made. Typically, one or a few individuals write the initial draft, while others may review and edit it, leaving little left for the remainder of the team. Applying ICMJE criteria blindly may lead to decisions that many among us would deem unfair. Thus, it is conceivable that the "violations" of authorship criteria we report here may have been in reality the result of what some may find reasonable and fair interpretations of these criteria. Whether ICMJE criteria are increasingly difficult to uphold or inappropriate is a question the HPE field needs to examine.

Although consensus and dissemination regarding criteria and guidelines are undoubtedly helping, our findings suggest that this is not enough. Here we pose a number of potential implications for authors, editors, and promotion and tenure committees.

Regarding authors, consideration should be given to "training the trainers"—deliberate efforts to disseminate best practices to senior researchers with the hopes that the current and next generation of scholars in HPE will be affected. Such faculty development efforts could be done at national and international conferences as well as locally at institutions. Additionally, degree-granting programs in HPE could more explicitly incorporate responsible conduct of

research into their curricula so that those who will be expected to become leaders in HPE (through receiving a master's or PhD in HPE) understand that unethical authorship practices erode the fair and transparent discourse among HPE scholars. Finally, and most important, individual authors need to both know authorship best practices and be willing to speak up when guidelines are not followed. We understand that the latter may be particularly challenging and requires courage given how such discussions could potentially affect promotion and tenure as well as future collaboration with a group of authors. Many of the senior scholar respondents (58%) acknowledged that some individuals on a recent paper did not meet authorship criteria. This suggests opportunities to improve publication practices if they speak up. Some of our survey participants both implicitly (aware of others who did not meet authorship on papers for which they served as coauthors) as well as explicitly (granting coauthorship when they were aware that it was not earned) violated authorship criteria. This speaks to the need to embolden our leaders to intervene when needed.

Journal editors could also play a role in improving these practices. First, postpublication discussions through blogs, letters to the editor, and public comments provide individuals who have been affected by suboptimal authorship decisions an opportunity to voice their concerns. Journal editors could also leverage technology used by some journals whereby all coauthors are sent an e-mail about a manuscript being submitted with their name listed and the opportunity for the author to confirm (or bow out of) their participation on the paper. Furthermore, HPE journals could require that the lead author specify the roles of each author to help ensure that all listed coauthors meet criteria. As others[16] have pointed out, this would help editors identifying "gift" authors (who do not merit authorship) and help prevent honorary authorship. Finally, journal editors could consider limiting the number of authors on HPE publications, as has been done by some high-impact journals, to curtail "author inflation"[17] and to combat gift and honorary authorship practices.

A recent effort,[18] called Project CRediT, has proposed a taxonomy of research roles with which individuals' contributions can be endorsed. The classification includes a wide range of roles including conceptualizing the study, program and software development, providing resources, supervision/ mentorship, and writing and editing, among other roles. As the developers of CRediT point out,[19] electronic editorial management systems and submission software could facilitate the assignment of these roles. Although such an approach may not address all issues regarding authorship, it would ensure that all forms of contributions are recognized. For instance, a research mentor often plays a critical role in bringing research to fruition, but is not easily recognized on an individual paper for which he or she provided guidance yet did not meet authorship criteria. Perhaps being acknowledged on a paper, rather than being listed as an author, could be given greater stature, as some[20] have suggested. Thus, promotion and tenure committees could move from "counting" publications to considering other forms of scholarly contributions and academic success, and to assessing the value of research with some of the 100 metrics recently proposed by the RAND Corporation and the Association of American Medical Colleges.[21] Future research could examine the extent to which the CRediT taxonomy is relevant to HPE research and how promotion and tenure committees, who are steeped in academic tradition, could evaluate faculty members' contributions in a manner that better reflects current, highly collaborative research practices.

Limitations of this study include findings based on self-report (vs. objective measures), our good but not optimal response rate, and potential for nonresponse bias, as well as our relatively small sample size. We engaged an international sample of 46 individuals from a population (the most senior thought leaders and scholars in our field) that is inherently small. Nevertheless, future studies involving larger samples should explore the prevalence of suboptimal publication practices in the community at-large. Finally, some individuals belonged to both the SDRME and the International Editors Group; it is conceivable (but unlikely) that they participated in our survey twice.

This study surveyed senior scholars' experiences and opinions regarding publication practices. Although we confirmed our hypothesis that suboptimal practices continue, the prevalence was greater than expected. Our findings suggest some directions that the HPE scholarship community may take to address questionable authorship decisions.

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