It used to be common for articles in The American Journal of Occupational Therapy® (AJOT) to be authored by a single person. Now, multiple authorship is the rule rather than the exception. In 1973, an AJOT article averaged 1.49 (SD = .73) authors, with 70% of the articles being written by one person (Ottenbacher & Petersen, 1985). In 1998, the average number of authors on an article was 2.23 (SD = 1.29), with only 37% of the articles being authored by one person. In addition, the numbers of articles with three or more authors rose appreciably (see Figure 1). This growth in multiple authorship is not unique to AJOT. Indeed, it is more dramatic in biomedical journals, where an increasing number of coauthors led the U.S. National Library of Medicine to adopt a policy of printing only the first 24 authors plus the last author in its MEDLINE listings (New England Journal of Medicine, 1997).

Several factors may be contributing to the growing numbers of AJOT articles with multiple authors. An increase in interdisciplinary collaboration typically leads to more names on associated articles. In addition, an increase in shared student projects increases the tendency of several students and faculty advisors to coauthor works. Lastly, the imperative to publish that is associated with promotion and tenure may be stronger now than it was in the early 1970s, making it less likely for faculty members to forego authorship.

There is nothing inherently wrong with a rise in multiple authorship. However, problems do surface when authorship ceases to be an accurate record of participation or when multiple authorship dilutes individual accountability. Such problems were brought to the fore in 1981 when it was discovered that John Darsee, a medical researcher, had falsified data in several multiple-authored articles (Lock, 1996). When the work was exposed as fraud, some of Darsee’s eminent coauthors argued that their names were on the work only because of editorial contributions or to add their prestige to the work as a favor. Though all had agreed to being listed as authors, several disavowed any accountability for the fraudulent publication (LaFollette, 1996). Because the National Institutes of Health had funded the project, the media coverage led the U.S. House of Representatives to hold hearings on federal funding, oversight, and ethics in research and publication. At these hearings, many in the political, public, and scientific communities were distressed to hear esteemed scientists defending “honorary” or “gift” authorship, where a person is included as an author without having had substantial participation. They argued that persons were commonly listed as authors for limited contributions such as reading and approving an article’s final draft or providing funding, lab space,
equipment, or referrals of participants. When senior researchers claimed that such pro forma authorship carried no accountability, researchers, editors, and readers were left wondering who was accountable in a multiple-authored work.

AJOT’s Editor recently reported that an increasing number of recent graduate student article submissions listed graduate faculty members as coauthors without the faculty member’s knowledge or input (Hassellkus, 1999). We may hope that “surprise authorship” (being listed on a work without one’s knowledge) and gift authorship are the exception rather than the rule in occupational therapy, but it seems reasonable to work proactively to keep such incidents rare.

Unlike medicine and nursing where issues surrounding multiple authorship have been discussed at great length, little has been written to guide occupational therapists’ decisions on the matter. This article is intended to open a dialogue regarding (a) models of authorship, (b) alternatives to authorship, and (c) recommendations for the AJOT editorial board’s consideration.

Models of Authorship

Much of any discussion regarding multiple authorship revolves around the concepts of credit and accountability. It is exciting and rewarding to have one’s name associated with written work. It is also a major responsibility because authorship carries accountability for the work’s accuracy and integrity.

AJOT follows American Psychological Association (APA, 1994) guidelines, which require that all authors make meaningful professional contributions to a written work. According to those guidelines, such a contribution might include formulating the problem, developing the study’s design, organizing and conducting statistical analyses, interpreting results, and writing large parts or all of the work. Other contributions—such as designing or building instruments, advising regarding statistical analysis, collecting or entering data, writing computer programs, or recruiting subjects—may, in combination, also justify authorship. In addition, APA publication procedures require that the corresponding author (i.e., the person who submits the work for publication) gain each author’s consent before including his or her name on the byline.

The American Medical Association Manual of Style (1998) and more than 500 journals have adopted the International Committee of Medical Journal Editors (ICMJE) criteria for authorship (New England Journal of Medicine, 1997). The most recent update of the ICMJE criteria permits a person to be listed as an author only if he or she has participated sufficiently in the work to take public responsibility for the content. To do this, the person must have made “substantial contributions to (a) conception and design, or analysis and interpretation of data; and to (b) drafting the article or revising it critically for important intellectual content; and on (c) final approval of the version to be published [emphasis added]” (New England Journal of Medicine, 1997, p. 311). Persons whose sole contributions are related to funding, collecting data, or supervising the research group are explicitly eliminated from authorship.

On the surface, it would appear that such widely adopted and unequivocal standards would reduce the instance of gift authorship, surprise authorship, and inappropriate exclusion from authorship. Studies, however, indicate that the ICMJE criteria are not being followed. In an early, small survey of multiple authorship, first authors indicated that 36% of their coauthors did not contribute substantially to the intellectual content (Goodman, 1994). More recently, a large study of multiple-authored articles in ICMJE journals found that 19% had at least one “gift” authorship (Flanagin et al., 1998).

One study of medical publications found that as the numbers of coauthors increased, the percentage of articles deemed to have at least one “undeserved author” also increased (Slone, 1996). When only three authors were listed, approximately 25% of the first authors thought that they had included at least one “undeserved author.” The percentage rose to 74% when more than seven coauthors were listed. Interestingly, 33% of the first authors thought that there would be fewer coauthors listed if each author’s specific contribution to a work was documented on the manuscript.

In another study, Shapiro, Wenger, and Shapiro (1994) surveyed 184 first authors of multiple-authored biomedical research regarding their coauthors’ contributions. These first authors indicated that less than a third of the middle authors (i.e., persons not listed first, second, or last on the byline) contributed to design or analysis and interpretation of the data. Eleven percent of these middle authors and 10% of the last authors were reported to have made no substantial contributions to any of the major elements of the research.

More recently, Hoen, Walvoort, and Overbeke (1998) reported that persons might not be the best judges of their own fulfillment of authorship criteria. In that survey, although 224 (64%) of the authors believed that they met the ICMJE criteria, a majority of their coauthors disagreed in 46 (21%) of the cases.

Bhopal et al. (1997) surveyed research faculty and staff at a British medical university to clarify the reasons for this noncompliance. They found that although most of the researchers agreed with the ICMJE’s individual criteria for authorship (i.e., sections a, b, and c), only 30% believed that all three of the criteria should have to be met to be included as an author. The authors concluded that ICMJE authorship criteria were ineffective, in large part because they were overly stringent and failed to conform to the expectations of actual researchers. The editor of the Medical Journal of Australia echoed that message when he called for a definition of authorship “developed from the ‘inside,’ by the constituency most affected—academics and researchers” (Van Der Weyden, 1997, p. 623).

Gift authorship for administrative assistance and for provision of subjects, equipment, funding, or small amounts of data should be challenged. However, in an effort to end misattribution of authorship, the ICMJE has established criteria that treat the contribution of data collection as a disposable commodity, inherently underserving of authorship. Not all data collection is the same. Some types require professional, even expert, judgment and investment. Untrained technicians can gather other types competently, with little involvement or investment in a study. This point was made in a large survey of psychologists, 35% of whom believed that the sole contribution of “testing and interpreting projective tests (or other highly specialized testing) to be used as data” was worthy of authorship but that unskilled data collection, such as paper-and-pencil testing, was not (Spiegel & Keith-Spiegel, 1970). In a survey of postdoctoral bio-
medical research fellows, 85% indicated that persons who "performed the experiments or collected the data reported in the paper" should also be listed as author (Eastwood, Derish, Leash, & Ordway, 1996).

Alternatives to Authorship

Authors are listed on published work to provide a historical record of those responsible for the work. Right now, the relative placement in the author's byline implies the level of accountability of each author, with first author making the greatest contribution to the work and, therefore, holding the greatest accountability for the work (Ahmed, Maura, Engle, Uddin, & Glaus, 1997; Riesenb & Lundberg, 1990). Though researchers often assume that a single criteria is accepted regarding author order, the meanings associated with author order have many variations (Rennie, Yank, & Emanuel, 1997). The APA, among others, suggests that authors should be listed in order of contribution, with the first author being the primary contributor, the second author the next important, and so forth (Ahmed et al., 1997; APA, 1994; Riesenb & Lundberg, 1990). However, in some professional cultures the corresponding author (i.e., the one who sent the article) is the major contributor, regardless of his or her relative placement in the authors' byline. Authors may also be listed by seniority, with the first author being most senior (Rennie et al., 1997), or conversely, the most senior member (presumed to be the mentor of the project) may be listed last, in the so-called "anchor" position (Hulley, 1991). Some settings have specific conventions, for example, automatically placing the statistician in the second author's position (Rennie et al., 1997). As Savitz (1999) noted, "information about the nature of the collaboration is encrypted in the sequence of authors, obvious to some readers and certain to be misunderstood by others" (p. 401). It is clear that author order cannot clarify who made what contribution, nor can it clarify accountability.

Rennie et al. (1997) proposed that the concept of authorship, inexorably linked as it is with "writing," be replaced by one of contributorship. Under this paradigm, a notation of each person's contribution is published as part of that person's author information. This reporting of individual contributions to research articles has been adopted by The British Medical Journal (Smith, 1997), The Lancet (Horton, 1997), Orthopaedic Nursing (Nativio, 1994), and Physical Therapy (Rothstein, 1999), among others. It is hoped that the practice will (a) reduce gift authorship because persons will be unwilling to have the paucity of their contribution made public; (b) clarify the historical record by informing readers of each person's contributions to a work; and (c) make abuses of authorship more detectable, clear cut, and actionable when they do occur. Although contributorship is often analogized to the credits at the end of a film, its notations are meant to describe persons' contributions (e.g., collected data), not job categories (e.g., principal investigator, mentor) (Rennie et al., 1997).

Rennie et al.'s (1997) second suggestion of guarantorship has been less heartily endorsed. Guarantorship requires that at least one author take overall responsibility for the project as a whole. The Lancet editor declined to include guarantorship in that journal's policy, noting that although a guarantor is expected to be accountable for all parts of a research work, no one can really oversee every part of a large study. As such, he rhetorically asked whether it is "realistic to identify one or more people as theoretical guarantors" (Horton, 1997, p. 6) of the work as a whole.

Recommendations

This article was meant to initiate discussion on issues of authorship. I would, however, suggest that the editorial board of AJOT consider the following:

- Publishing the APA criteria for authorship in AJOT's Authors Guide. AJOT follows APA guidelines, and publishing these criteria would ensure better understanding of policies related to authorship and acknowledgment. APA criteria are more adaptable than those of the ICMJE, while still offering clear limits. The record of poor adherence to ICMJE's authorship criteria does not appear to support its adoption, in spite of the growing numbers of medical journals that have embraced its rules.
- Publishing the AJOT editorial board's recommendations regarding author order as part of AJOT's Authors Guide. Regardless of whether the board adopts the APA convention of descending order of contribution, or that of mentor listed last as "anchor," it would be helpful to have consistent application of a rule. If author order is academic "coin of the realm," let us all use the same currency.
- Adding to the APA criteria the explicit requirement that all authors be able to explain and defend the published work. This requirement seems inherent to the responsibility of having one's name associated with a work.
- Requiring that authors document their compliance to APA authorship rules as part of submission. "Statements and forms give notice (authors cannot later plead ignorance), draw attention, and so educate" (Rennie et al., 1997, p. 582). The process offers the greatest benefit if the forms are required at the time that an article is submitted for review rather than after its acceptance for publication.
- Publishing a concise notation describing each author's contribution(s) to the work. Signing a statement, as suggested in the previous recommendation, does not inform the readership regarding an author's contribution to the project. A short citation in the authors' information portion of an article would clarify each author's role. Such a notation may also help less powerful authors (junior faculty, graduate students) diplomatically address whether would-be coauthors' contributions truly warrant authorship.
- Requiring that the first author verify that all persons named in the acknowledgment have given permission for their names to appear because such acknowledgment may be construed as endorsement of the work.

I would also urge occupational therapy faculty and clinical researchers to identify their institution's existing standards for authorship and, absent these, to establish and publish their own. Unwritten policies on authorship should be put into print, where their logic, fairness, and ethical strength can be examined. Written
rules clarify expectations for faculty, staff, and students and help structure discussions among collaborators.

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