Academe's unspoken ethical dilemma: author inflation in higher education

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ABSTRACT

Tenure, promotion, significant salary increases, let alone stature and recognition in one's field, are often dependent on the quantity and quality of research articles faculty members produce. In addition, research grants, text and professional publications may be dependent upon intellectual contributions and often equated with research published in professional journals. These pressures, along with accreditation requirements, often force faculty members to place greater emphasis on research rather than teaching or service responsibilities. Administrators sometimes also coerce senior faculty members to "help out" junior faculty members achieve tenure by including them in their research endeavors. In response to such pressures more and more research articles have an increasing number of authors on the publication byline. This poses ethical concerns regarding author validity and legitimate individual contribution to research that helps to advance the profession.

Key words: higher education, authorship, ethics, hyper-authorship

INTRODUCTION

An academic commonly moves up the faculty hierarchy by being favorably evaluated by colleagues and administrators for their triadic responsibilities of teaching, service, and scholarly/ creative activity. The ways in which faculty members meet these three accountabilities vary from department to department, school to school, and may differ throughout a faculty member's career. Faculty members are often evaluated on each of these three work roles annually and commonly before being considered for tenure and/or promotion in rank.

THE SOARING IMPORTANCE OF SCHOLARSHIP

Although there is no general specific weight assigned to each of the these three key areas of responsibility, results from a number of national studies over several decades show the increasing influence of scholarship—which has become synonymous with research and publication (Boyer, 1990; Fairweather, 1993, 1996)—in determining faculty rewards (Blackburn & Bentley, 1990; Fairweather, 1996). More recently, Green (2008) noted in his survey of 130 deans and directors that the scholarly activity role has become more salient than ever in tenure and promotion decisions and that teaching and service roles have become less influential. He found that the hierarchical weighting in which scholarship is more important than teaching and teaching is more valuable than service was the most frequent pattern of weighting in tenure and promotion decisions for all graduate faculties for all ranks: assistant professor, associate professor, and full professor.

Similarly, Scarlett (2004) noted that institutional reward systems—tenure, promotion, significant salary increases—in a great many institutions are based on scholarship and creative activity rather than teaching and service. Miller and Sedlin (2014) likewise found in their survey responses regarding promotion and tenure criteria from deans at 410 four-year liberal arts colleges that value increasingly is being placed on scholarship—even for professors at teaching-oriented liberal arts institutions. Specifically, the number of deans citing research as a major factor in overall faculty evaluation rose between 2000 and 2010 from 40.5 to 51.8 percent with an emphasis on publication increasing from 30.6 percent in 2000 to 39.6 percent in 2010.

Authoring publications is significant because the "publish or perish" culture of science today places enormous value on how many papers academics have authored and in which journals those reports appear. It has become a form of "scientific currency" (Louis, Holdsworth, Anderson, & Campbell, 2008) which could result in academic authors boosting authorship recognition (Bennett & Taylor, 2003). Research and publications today are considered key in becoming successful in an academic career, which then leads to "prestige, promotion and pay" (Mitcheson, Collings, & Siebers, 2011) as well as recognition for creativity, peer recognition, superior evaluations, and better positions elsewhere. Likewise, Borry, Schotsmans, and Dierickx (2006) wrote that "Publications in peer reviewed journals are proof of academic competence, are used as evaluation criteria for academic promotion and fundraising and increase the prestige of research universities" (p. 213). These observations are consistent with the oft-heard observation that faculty members are paid to teach but are rewarded for their research and publications. Consistent with such a reward structure many tenure-track faculty members spend as much as 80% of their time on research work, with very little time committed to teaching or service work (Kezer & Maxey, 2015).

Not only do many higher education institutions emphasize research and publication but so do outside accreditation agencies. In the business disciplines, for example, the Association to Advance Collegiate Schools of Business (AACSB; n.d.)—is widely considered the leading accrediting body for

colleges and universities with business programs. Historically, institutions seeking AACSB accreditation would hire graduates from research doctoral programs who were capable of producing quality research. Publication in high quality journals became the standard used to measure schools for accreditation purposes. Faculty publications in practitioner journals, academic proceedings, less respected academic journals, and non-refereed publications including conference presentations, books, and other scholarly works were most often considered not as favorable (Spritzer & Billings, 2005). AACSB standards and the accreditation visitation teams expected business schools attain a faculty research profile typical of doctoral institutions.

Research and publications in much of higher education, then, seem to trump classroom and service obligations from a number of perspectives. Because the criteria for institutional rewards increasingly focus on research, the pressure in academia to rapidly and continually publish academic work has become a reality at many 4-year colleges and universities—not just elite research institutions (Fotion & Conrad, 1984). While teaching and service are encouraged, they are often not rewarded and new faculty members who show a serious concern about their teaching and/or service commitments are often warned about their "misplaced priorities" and reminded of the significance of publishing (Sharpe & Bolton, 2016).

Faculty members have responded and there has been a significant increase in publications. One way they have done this is through "salami-style" publication behavior which involves the "slicing" of research or breaking up or segmenting data that would normally form one meaningful paper and creating several different manuscripts for publication (Abraham, 2000; Angell & Relman, 1989). Salami slicing can lead to a distortion of the literature by leading unsuspecting readers to believe that data presented in each salami slice (i.e., journal article) is derived from a different subject sample (U. S. Department of Health & Human Services, n. d.). Another approach, and the topic of this paper, involves attaching numerous authors to a single paper, some of whom have done little to no work on the paper itself. In some cases, faculty themselves offer their low producing publication colleagues an opportunity to join them on articles in hopes that they will learn the research and publication process or to help these faculty retain their positions. Frequently, however, these low producers are given a paper and return it to their publishing colleagues and offer, "It looks good to me." After such a questionable contribution, the low producer's name is still added to the article and he or she is given the same credit for scholarship as the other researcher/s who contributed significantly to the paper; that is, they reap the benefits of the publication without contributing a fair share of the costs (Arneson, 1982).

Who is an author?

Due to the increasing number of authors, research authorship has become a hotly discussed topic (Cronin, 2001; Rahman & Muirhead-Allwood, 2010; Regalado, 1995). In theory, authorship seems simple enough—list major contributors only and list them in descending order of involvement in the project, right? The problem is that there are almost as many views on how to assign authorship as there are scientists! But in practice, questions of authorship often create difficulties. There are indications that many do not clearly understand what constitutes authorship when multiple authors are credited (Erlen, Siminoff, Sereika, & Sutton, 1997; Mitcheson et al., 2011; Pignatelli, Maisonneuve, & Chapuis, 2005).

Typically, authorship guidelines include a cautionary note that definitions of authorship often vary between academic disciplines and that no common standard exists. Nevertheless, the International Council of Medical Journal Editors (ICMJE) authorship rules appear to be developing into the new international standard. Although the code started in 1978 in the field of biomedical sciences, it appears to be becoming the new standard in a number of academic disciplines by many of the significant

research universities (e.g.Washington University in St Louis, 2009) in addition to higher education systems, including in Australia (e.g. Universities Australia, 2007). The ICMJE recommends that authorship be based on the following four criteria that have been acknowledged by numerous journals:

1) Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2) Drafting the work or revising it critically for important intellectual content; AND
3) Final approval of the version to be published; AND
4) Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved (ICMJE, 2016).

The ICMJE also notes that an author must have made "substantive intellectual contributions" to the manuscript. Creative input is thus more valued for authorship than purely mechanical work. Authors should also be able to indicate co-authors responsibility for their contribution to the research.

The National Institutes of Health (NIH) defines authorship a bit more flexibly than the ICMJE. According to the NIH (2016), "For each individual the privilege of authorship should be based on a significant contribution to the conceptualization, design, execution, or interpretation of the research, as well as to the drafting or substantively reviewing or revising the research article. Authorship also conveys responsibility for the study" (p. 9).

Similar guidelines are offered by the Council of Science Editors (CSE) that indicate all persons who "contributed sufficiently" be listed as an author, and each author approve the paper prior to publication. More specifically CSE (2016) indicates that "Authors are individuals identified by the research group to have made substantial contributions to the reported work and agree to be accountable for these contributions. In addition to being accountable for the parts of the work he or she has done, an author should be able to identify which of their co-authors are responsible for specific other parts of the work. In addition, an author should have confidence in the integrity of the contributions of their co-authors. All authors should review and approve the final manuscript."

It is noteworthy that some research institutions, national academies, professional societies and journals also have their own authorship guidelines. Sixty percent of biomedical journals (Wager 2007), 53% of science journals, 32% of social sciences journals and 6% of arts and humanities journals have authorship guidelines and 11% of professional societies provide guidelines for authors within their code of professional ethics (Bošnjak & Marušić, 2012). In summary, the main requirements for authorship seem to be the three S's of significant, sufficient, and substantial. Questions of authorship arise mainly as a result of different interpretations of what qualifies as a significant, sufficient, or substantial contribution.

While such terminology remains open to interpretation, it seems that most often envisioning the research topic, research design, and writing the article appear to be the most significant criteria warranting credit for authorship (Lozano, 2014; Macfarlane, 2015; Marušić, Bošnjak, & Jerončić, 2011). By consensus, some contributions in and of themselves do not justify authorship. For example, "in-house" editors and reviewers, professional writers who simply drafted the manuscript would not be considered authors. Additionally, general supervision of a research group or general administrative support; supplying statistical or computer support; acquisition of funding and other similar activities would not warrant authorship (ICMJE, 2016; Lozano, 2014; Macfarlane, 2015). Minor contributions to the research or to the writing for publications may be acknowledged appropriately, such as in footnotes or in an introductory statement, but not in authorship.

Hyper-authorship

While there was probably far too little recognition of colleagues' contributions early on in science, today's rise in number of authors per paper is probably exaggerated. From the late 17th century to until about 1955 sole authorship was the standard practice in scientific research (Green, 2008; Rennie, 1997). Since that time, there seems to be a significant increase in the use of multiple authors (Burman, 1982; Khan, Nwosu, Khan, Dwrakanath, & Chien, 1999; Onwude, Staines, & Lilford, 1993). Aboukhalil (2014) obtained metadata for all ~24 million papers listed in Pubmed as published between 1913 and 2013 and found that the average number of authors per paper has increased more than 5-fold over the last 100 years, going from one author per paper in 1913 to approximately 5.4 authors per paper in 2013. Additional support for this trend was reported by Onwude et al. (1993) who noted that every 15 years between 1945 and 1988 that medical publications in prestigious journals such as the *British Medical Journal*, *Lancet*, *Journal of the American Medical Association*, and the *New England Journal of Medicine* increased by 1.26 authors at the same time articles in other areas of science increased by ed 0.41 authors.

This rise of multiple authors in academic research papers has been dubbed "Hyper-authorship" (Cronin, 2001, p. 558). For instance, a physics paper by Aad et al. (2015) was authored by 5154 researchers (9 pages to describe the research and 24 pages to list all authors) while a paper on the genetic make-up of a fruit fly was credited to 1,014 authors (Leung et al., 2015). In addition to many authors listed on a single paper can be questionable, overly-productive authors raise red flags regarding their authorship contributions (Wager, Singhvi, & Kleinert, 2015). Claxton (2005) found that in one field over a ten- year period, twenty authors were found to have published 32 papers on average or more each year (this would be equal to publishing a research article every 11.3 days). These examples raise important questions regarding what counts as authorship.

To show changes over time, King (2013) graphed the percentage of single-author papers in 21 disciplines from 1981 to 2012. The main field of Social Sciences had the most lone-authored articles, according to both the 1981 and 2012 measurements, with Economics, Business and Mathematics following closely. The greatest percentage drop in single authored articles occurred in Economics and Business (42 points). Overall, in 1981 more than 30% of papers in Economics and Business listed a single author. By 2012, the percentage had shrunk to 11%. Similarly, Gazni and Didegah (2011) examined 22 different fields of science and found that in all these fields, at least 60% of publications were co-authored.

Business schools reflect other fields. Multiple authorship within management publications increased significantly from 18.3% in the 1960's to 47.7% in just ten years and then again from the 1970's to 60.1% in the 1980's (Floyd, Schroeder, & Finn, 1994). Manton and English (2007) found an increasing number of authors per article, while at the same time a significant decrease in single-author articles. Thus, today shared authorship is common in most academic fields but there are differences across disciplines. This trend of multiple authors does not appear to be decreasing (Rahman & Muirhead-Allwood 2010; Bebeau & Monson 2011) and is not simply the result of greater multi-disciplinary work and more complex research (Papatheodorou, Trikalinos, & Ioannidis, 2008).

Why author inflation?

Research today, it seems, is primarily a collaborative and often an interdisciplinary endeavor, more common in each area of technical and scientific research. Bozeman and Boardman (2014) use the term "collaborative imperative," suggesting that in many cases scientific collaboration is essentially a

prerequisite of contemporary research. The rise of shared authorship has been attributed to Big Science—scientific experiments that require cooperation and the specialization of many individuals (de Solla Price, 1986). Indeed, one academic noted "If you want to push the limits and answer a great question, you need to collaborate" (Youtie & Bozeman, 2016, p. 4). Many university researchers tend to think of collaboration in terms of co-authorship. For this reason, and also because co-authorship is conveniently measured, much of the published work about research collaboration focuses on co-authorship (Bozeman, Fay, & Slade, 2013). As Katz and Martin (1997) point out in one of the best known and most comprehensive reviews of research collaboration the co-author concept of collaboration has several advantages, including verifiability, stability over time, data availability, and ease of measurement.

During the past several decades researchers, especially those in the biomedical sciences (e.g., Cohen, Tarnow, & De Young, 2004; Rennie, Flanagin, & Yank, 2000), have begun to focus on ethical issues and the "dark side" of collaboration (Bozeman, Youtie, Slade, & Gaughan, 2012). Far from being restricted to biomedical fields, problems in scientific collaboration are ubiquitous in science. Some of these problems are ethical (Shrum, Chompalov, & Genuth, 2001), others practical (Bozeman & Corley, 2004), some pertain to collaboration among individuals (Katz & Martin, 1997), and some to collaboration among institutions (Chompalov & Shrum, 1999).

Authorship is becoming an increasingly complicated issue and Lagnado (2003) argues that trust in the meaning of co-authorship has eroded. Allocation of credit and responsibility for authorship is an important issue and it must be resolved if research results are to be managed and used effectively (Devine, Beney, & Bero, 2005). The assignment of authorship for publication is multifaceted and sometimes confusing and scholars and policy-makers have expressed concerns about the crediting of coauthors in research publications. In addition, the critical need for research publications has created authorship abuse (Borry et al., 2006). Most such problems fall into one of two categories, excluding deserving contributors or including undeserving ones (Albert & Wager, 2003; Committee on Public Ethics, 2015a, b; Davidoff, 2000). Because of space limitations, we focus on the later—listing names of people who took little or no part in the research and what is frequently called honorary authorship.

Honorary authorship

Honorary authorship, also known as guest authorship or gift authorship occurs when individuals are listed as an article author without having met the criteria for authorship criteria. Honorary authors also may not have reviewed the final version submitted to the journal editor is incapable of defending the article (Bennett & Taylor, 2003; Lozano, 2014; Rennie, Yank, & Emanuel, 1997). One form, *gift authorship*, is defined as granting authorship out of appreciation to an individual. In different countries around the world, cultural norms might require respect and appreciation for leaders in the organization and require recognition in all research published by members in their department. For example, in Asian cultures, departmental heads or senior researchers may be added to a paper regardless of their involvement in the research as a courtesy out of respect for, or gratitude to the gift recipient. Gift authorship may involve reciprocating favors for previous co-authorships (*quid pro quo*), helping a colleague obtain tenure or promotion, for romantic favors extended, or to assist the graduate student who might have only provided minimal administrative assistance to assist the student's job search. In some cases, a colleague's name is added on the understanding that s/he will do the same simply to swell an individual's publication list. Authorships are more often gifted to colleagues with lower academic rank or to those with fewer publications, than to the departmental heads (Eisenberg, Ngo, Boiselle, & Bankier, 2011). They are also given to those performing various non-author tasks such as reviewing or

approving a manuscript before submission, recruiting study subjects, supervising or recruiting co-authors, and contributing illustrations (Eisenberg et al., 2011).

Another form, *guest authorship*, may be used for multiple purposes, including the belief that by adding a well-known name the guest will increase the likelihood of publication, credibility, or status of the work, 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 senior faculty in positions of authority. This is referred to as the "White Bull" effect (Kwok, 2005) and occurs when senior researchers claim first author credit while junior faculty members and students are excluded from the list of authors or receive credit that reflects their intellectual contribution. Interestingly, research conducted by Eastwood, Derish, Leash, and Ordway (1996) found one-third of respondents would credit an author who had not contributed to the publication. Typically, this is done in order to increase the likelihood of the research being accepted for publication or in other cases, as a means to promote their career. Surprisingly, this number swelled to 75% among authors who indicated that they had experienced unfair authorship or had an undeserving co-author, or pressured to list a co-author on a paper although that co-author might not have contributed to the research article. For ease of discussion all these forms of authorship are referred to as honorary authorship.

Several researchers have expressed dismay at the proliferation of honorary authorship (Bennett, & Taylor, 2003; Seeman & House, 2010). Surveys find, for example, that 10% of grant recipients from the National Institutes of Health admitted to inappropriately assigning authorship credit (Martinson, Anderson, & de Vries, 2005). Similarly, a survey of non-first authors in the "basic" and medical sciences revealed that 26% admitted to not contributing substantially to the paper (Shapiro, Wenger, & Shapiro, 1994), and in the business literature 35% of authors surveyed reported assigning authorship to someone who had done little very little work on a published article and 10% responded that they had a coauthor on a publication who had done no work (Manton & English, 2008). A survey of chemists in the United States resulted in 20% reporting finding they were listed as authors of a research paper publication (Seeman & House, 2010). Al-Herz, Haider, Al-Bahhar, and Sadeq (2014) reported that 33.4% of authors admitted to adding people who did not merit authorship. O'Brien, Baerlocher, Newton, Gautam, and Noble (2009) reported that at some time in their career, an honorary coauthor had been listed with 52% of authors with 18% of authors implying some degree of coercion. In another study, Eisenberg, Ngo, and Bankier (2014) reported that 27.7% of first authors perceived that at least one coauthor did not make sufficient contributions to merit authorship, while 50.3% stated that one or more coauthors had only performed "non-author" tasks. Honorary authorship has been reported to occur in 17-33% of articles (Flanagin, Carey, Fontanarosa, Phillips, Pace, Lundberg, et al., 1998; Huth, 1986).

Over the years, then, there has been significant honorary authorship. Unsurprisingly, articles with over five authors are more likely to have honorary authors than those with three or fewer number of authors (Slone, 1996). The number of what Slone (1996) described as *undeserved authors* ranged from 9% in articles naming three authors to 30% in articles listing six or more authors (averaging 17%). Slone (1996) also related that manuscripts with undeserved authors were most likely to include non-tenured staff unable to meet authorship criteria. Slone also stated the most common reason for including undeserved authors in manuscripts was the wish to help others get promoted.

Ethical considerations of honorary authorship

Today, expectations for research productivity seems to be increasing at a rapid pace, especially with regard to decisions regarding promotion and tenure, perhaps causing some faculty members to

consider disregarding authorship ethics guidelines and bestow authorship to unworthy individuals and even considering the act a "victimless crime" (Osborne & Holland, 2009, p. 7). However, granting tenure or promotion centered on work the faculty member did not produce an individual did not do is sticky. Ethical concerns became particularly problematic in the 1980s. John Darsee falsified studies at Emory and Harvard Universities and in doing so, violated the trust of co-authors and readers. The studies included well-known department heads who although did not fabricate data, they did agree to receive credit for work they did not contribute to (Kassirer & Angell, 1991; Smith, 1994). This academic scandal highlighted the possibility of false authorship.

Many faculty members consider honorary authorship intellectually dishonest and deceptive. Further, honorary authorship is often considered an unethical practice. Others also argue that honorary authorship dilutes credit of scientific research and calls into question the validity of the research (Bhopal, Rankin, McColl, Thomas, Kaner, Stacy et al., 1997; Rennie, 1997). In addition, management abuse of power occurs when an administrator or senior faculty member misuses their authority to pressure faculty members to include them as authors without participating in the research.

Honorary authorship is a misrepresentation, implying a substantial intellectual contribution that was not made. It also distorts the publication record, making it a less reliable measure of productivity. Additionally, free riding on the provision of a collective good is often characterized as morally wrong. Hart (1955) says that, "if others are cooperating for mutual benefit and I benefit from their cooperation, then I have an obligation to do my share" (pp. 185-186). Eminent ethicist, John Rawls cites this argument favorably ([1971] 1999).

There are three reasons why honorary authorship is regarded as unethical. First, a publication that is not genuinely earned may falsely represent the individuals' expertise. Second, due to the gift, the person is perceived as being more skilled than his or her colleague who has not published. This gives the person an unfair advantage professionally over their colleague while applying for jobs or appearing for an interview or for promotion. Third, such an individual is perceived to have a false level of competence and will be expected to accomplish tasks that may be outside the range of their expertise. By accepting such authorship, several researchers have suffered the embarrassment of knowing little if anything about the data it included, or worse, of being associated with fabricated data. For example, Geoffrey Chamberlain, the then President of the Royal College of Obstetrics and Gynecology, was cited as a co-author in a paper by Malcolm Pearce, the obstetrician who falsely claimed to have performed the first intra-uterine transplant of an ectopic pregnancy. In his defense, Chamberlain stated that "the head of department's name is always put on reports out of politeness. I was not part of this work, but I have always trusted Mr. Pearce" (Sheikh, 2000, p. 426). More recently, another example would be the concern regarding a possible link between autism and diseases including measles, mumps, and rubella vaccine story here in the United Kingdom (Deer, 2011; Fitzpatrick, 2008).

Many journal editors have called for honorary authorship's elimination, appealing to researchers both on deontological grounds--that the practice is fraudulent--and on consequentialist considerations--which the practice may be something of a poisoned chalice--as was the case with Geoffrey Chamberlain's much publicized fall from grace (Smith, 1994). Researchers have typically based their defense on the morally suspect argument that the utilitarian ethic is at work and that the end justifies the means.

Although honorary authorship is generally frowned upon, there is a counter-view as well. Some researchers believe that today, research groups have a complex and tangled structure. When some individuals are working on research and publication, others in the group are carrying out their routine duties and responsibilities (basically non-author tasks), allowing the authors to carry on leisurely with research and writing work. For example, a faculty member agrees to advise all students in the

department so that a colleague can publish a paper that includes the faculty member as a co-author. This, they think, should be construed as a "passive contribution" to overall scientific goal and should be rewarded with authorship (Athanasoulis, 2000).

SUMMARY AND CONCLUSION

The number of multi-authored journal articles has significantly increased. Although author inflation has been ascribed to several factors which include fostering collegiality, improving research methods, and expanding cross-disciplinary research and developing collaborative international research opportunities accelerated by Internet use, the simplest explanation for such an increase is the increased pressure on publication (Woods, Youn, & Johanson, 2010). Nowadays, publication often defines success in ones' academic career. College administrators demand an increasing number of research publications from faculty members, resulting in scholars forming teams to roll out articles at a faster rate. As pressure publishing increases in importance, misconduct also increases (Bennett & Taylor, 2003). The increase in multiple authorships in combination with the pressure to publish within academia has precipitated various unethical authorship practices.

One major disreputable activity discussed here is honorary authorship in which a person (or persons) is listed as an author but has not provided any significant assistance to a study. Such publication misconduct is widespread among the scientific community and tales of bogus authorship often occur in the sciences (Sokol, 2008) in part because there is not one universally recognized authorship standard for all of disciplines. It may not be uncommon for one person to do virtually all the work, another to give useful feedback, another to glance at the final version, while yet another would be just someone who worked in the same department and did not contribute to the study but who needed a publication because of an upcoming tenure review—and all could be co-authors of the published manuscript. "It happens all the time" (Sokol, 2008, p. 336) and it appears to be happening more frequently as the number of authors per paper indicates.

Most would consider it fair that only those who have actively participated in the work to a significant degree should benefit from being an author. Research by Bozeman and Youtie (2015) shows that there is no consensus on who deserves authorship or on what type of contribution suffices for co-authorship award. Far from being a simple decision, authorship has become an increasingly complicated issue as research collaborations proliferate, the importance of citations for tenure and grants persists, and no agreement on what constitutes authorship continues.

To address these issues a number of authorship guidelines have been developed. Perhaps the most widely recognized code is that of the ICMJE described earlier. Adherence to the ICMJE criteria has been found to result in lower levels of honorary authorship (Eisenberg et al. 2011, 2014). Unfortunately, specific rules can be difficult to implement and there can still be a uncertainty in determining the scope and degree of the faculty members' contribution. In spite of an increasing number of research protocols, the problem persists (Goodman, 1994; Smith, 1997). Lozano (2014) believes it is because guidelines not the same as regulations and practically impossible to enforce (Lozano, 2014).

Beginning in the 1990s difficulties describing authorship in scientific fields resulted in some scientific publishing participants to advocate the "contributorship model" whereby published articles include a list of contributors instead of the typical author byline (Akhabue & Lautenbach, 2010). Proponents of the contributorship model believe that the model enables editors to bring out genuine contributions from researchers more accurately communicate each author's contribution to the study. Similar approaches have been used to overcome social loafing in organizations. Social loafing may occur when people feel they can get away with "taking it easy"—namely, under conditions in which

each individual's contributions cannot be determined. A variety of studies on the practice of public posting supports this idea (see Nordstrom, Lorenzi, & Hall, 1990). This research has found that when each individual's contribution to a task is displayed where it can be seen by others, people are less likely to free ride than when only overall group performance is made available. In other words, the more one's individual contribution to a group effort is highlighted, the more pressure each person feels to make a group contribution. Thus, social loafing can be overcome if one's contributions to a task are identified and potential slackers are not likely to loaf if they fear getting caught.

An author contribution statement serves at least two useful purposes: it clearly defines each author's role in the research and hence to some extent also their responsibility in the case of misconduct, and also serves to discourage honorary authorship. The level of detail varies; for example, Bates, Anić, Marusić, and Marusić (2004) noted that one journal asks authors to describe research contributions in their own words whereas another journal requires authors to code their participation in a study into 11 categories: (1) conception and design of the study, (2) analysis and interpretation of data, (3) collection or assembly of data, (4) statistical expertise, and (5) provision of study material. While contributor models show promise, research indicates that co-authors only agree about 30% of the time with regard to each other's contribution to the research (Ilakovac, Fister, Marusic, & Marusic, 2007) and Bozeman and Youtie (2016) point out that so far, the contributorship route has not been shown to make much difference to serious problems.

Given that national guidelines and the contributorship model have had modest success; institutions must consider other measures to address author inflation and the accompanying ethical lapses. One such effort involves university-wide codes. Research integrity has received considerable attention which has led to the development of procedures at the institutional level for research proposal approval in higher education systems. Such ethical approval procedures, however, emphasize treatment of research subjects (the human subjects' research review committee) but rarely consider authorship issues. University guidelines could equate honorary authorship with research misconduct and therefore need to clarify and develop codes of conduct and work to safeguard that scientists, particularly those at the beginning of their careers, are aware of research and authorship procedures.

A second measure is that the culture stressing publication and citation metrics (i.e., "publish or perish") must be reassessed. Changing an institution's culture is a long and difficult process. Institutional culture resists change for all the reasons that it is a powerful influence on behavior—it embodies the institution's basic values, it is often taken for granted, and it is typically most effectively communicated through stories or other symbols. When administrators attempt to change their culture, they are attempting to change faculty's basic assumptions about what is and is not appropriate behavior in the university.

As more universities adopt the post-tenure review process, there will likely be additional publishing pressures beyond the often-dreaded tenure process. The emphasis on publications in obtaining funding, in achieving academic career success, and the importance given to them by accrediting bodies must change however, in the foreseeable future it is doubtful that such change will become a reality. This could possibly be best addressed by the various accrediting agencies.

Finally, as part of the organizational change in culture, Deans and Department Chairs could require a certain number of articles be "sole author" publications. So, for example, if a department required seven publications for tenure and promotion to Associate Professor, the department might require two of those to be written solely by the faculty member applying for tenure and promotion. Of course, administrators should be prepared for faculty backlash complaining that they are encouraged to collaborate and yet sole authorship papers run counter to the emphasis on collaboration and teamwork emphasized by most administrators.

Obviously, there is no clear-cut solution to this issue. However, the authors see this as an ethical issue that has not been dealt with (or rarely even discussed) that should be addressed. Perhaps as this issue emerges, a model approach will develop and become standard practice in academia.

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