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An offending survey

When junior physicists decide who deserves to share authorship on their scientific papers, sometimes politics is more important than work.

By Eugen Tarnow

It was a Catch-22, they told me: "They say that if you do find something problematic they would be shooting themselves in the foot, and if you don't find something problematic it would seem self-serving." This was the explanation I got from a member of the Publications Oversight Committee of the American Physical Society when I learned that they had decided not to help sponsor my proposed survey about scientific authorship.

One of the attractions of the scientific community, and possibly the reason for its great success, is the ethical, egalitarian ideal it purports to offer. Reputable scientists presumably work according to certain ethical principles. For example, you don't falsify your evidence to prove your hypothesis. You place credit where credit is due; you don't claim that other people's discoveries and findings are your own either by plagiarism or by undeservedly appearing on the byline of a research paper. Entwined in this process is the network of professional journals that publish scientists' findings -- not for the entertainment of the masses but for the scrutiny and appraisal of other scientists. In the papers published in such journals, scientists learn about not only the substance of the findings but also who in the field is pursuing which kinds of research.

I had decided to find out how accurate such information was. Did the list of authors in such papers actually reflect the truth about who in fact contributed to them? More specifically, I set out to ask junior physicists with Ph.D.s, so-called postdocs: How do you make up your authorship lists? Are there any guidelines? Do you list your boss? Do you list undeserving, "honorary" authors? And if so, why?

My investigation took me where few had gone before. Out of the 8.6 million scientific papers from the last 10 years in a database called "Current Contents,"

there were only three studies surveying the actual procedure of assigning authorship credit. I soon found out the reason: nobody wants to know.

As a first step, I asked the American Physical Society (APS) to sponsor the study. I wanted the support -- both for its prestige and its funding -- from a recognized institution. This is particularly important for survey research, because you want as many respondents as possible to answer the survey; scientists would be more likely to participate if the project had institutional support. A former APS president, Brian Schwartz, shepherded my proposal to three different committees. But even with such a powerful scientist extending his help, the process proved difficult.

A technicality prevented the survey from being sponsored by the first committee. Before the proposal was taken to the second committee, certain members began to voice concern about the touchiness of the subject. I was asked to promise not to include any "politics" in the scientific paper (which presumably meant that I should avoid formulating a theory that might taint the powers that be); to submit the paper to the publications committee of the American Institute of Physics before submitting it for publication elsewhere; and, should the information reach the newspapers, to refer exclusively to material in the scientific paper when talking to reporters. I hesitantly consented.

Unfortunately, the second committee did not find the proposal appropriate for their agenda. It was then taken to the Publications Oversight Committee, which presented the Catch-22 argument with which this article begins.

I went ahead with the study without an APS sponsorship and I published the results this year in *Science and Engineering Ethics*. Subsequently, it also appeared in *Nature* and *American Physical Society News*. The survey produced some surprising results. Almost no postdocs author papers by themselves. In many ways this reflects the evolution of the sciences as increasingly collaborative, but it also means that the system somehow discourages single-authored publications by junior scientists. And despite the existence of an APS ethical statement on what constitutes appropriate authorship, I found that the procedure for assigning other authors is generally ill-defined. In fact, most respondents claimed that they had never seen the APS ethical statement; nor had most of them ever discussed what constitutes appropriate authorship with their supervisors. Ultimately, the survey showed that within physics, inappropriate authorship is common, if not prevalent. According to the APS ethical statement on authorship, which requires contributions to be "significant," (but neither intellectual nor original,) every eighth paper has an inappropriate supervisor on the byline; among papers with more than the postdoc and the boss as authors, every third paper credits one or

more inappropriate authors.

The reasons reported for inappropriate authorship fell into four groups:

- One claim -- from both postdocs and supervisors -- was that explicit concern for relationships had influenced the decisions to include certain people in the authorship lists. For example, the postdocs need letters of recommendation from their supervisors and want to stay in their good graces. Both postdocs and their supervisors admitted that relationships with other scientists in the field could be enhanced by giving them honorary authorship. Sometimes, too, the postdoc and supervisor add a well-known name in the hope of gaining prestige or expediting publication of their work.
- Others claimed that they had included names of people who had made minor contributions more appropriate for acknowledgement than authorship.
- Some respondents said that they included scientists as authors on their papers based on their previous work in the field or expected contributions which never materialized.
- A smaller group of postdocs opted to credit staff who had no actual part in the product but were socially close or simply worked in the same research group.

But such explanations don't necessarily give as clear a picture of what postdocs face as do some of the written comments by respondents. One scientist summed up the situation succinctly: "1) Supervisors do not read your papers unless they are coauthors. 2) Supervisors cannot say anything about your work unless they read your papers. 3) Thus supervisors have to be named as coauthors." Another respondent had decided to include the name of a well-known researcher after a couple of discussions about the work in order to "honor" him. Another postdoc wrote that although some of the coauthors never made any contribution at all, they had been expected to, so he felt it necessary to leave their names on the list.

After the survey's publication, the first unsolicited comment I received came from Stuart Trugman, a senior physicist at Los Alamos National Laboratory who also volunteers as a postdoc ombudsman. Calling the survey "nasty," he wrote that: "There is another possible approach to publishing, physics and life, which is to try to be generous and nice."

Yet such "generosity" in awarding honorary authorship credit is rarely extended to junior scientists. The postdocs found themselves inappropriate authors only 1 percent of the time, more than 10 times less often than the supervisors. Indeed, as a form of ethical misconduct, inappropriate authorship would not be tolerated from young people. One investigation by Swazey, Anderson and Lewis published in *American Scientist* found that inappropriate authorship among science faculty is as common as plagiarism among students. The message is loud and clear: If you are young, know your place. If you are old, you deserve some "generosity."

Sometimes the profession seems to extend this generosity beyond belief. A junior physicist, on the average, authors two papers a year. Some senior physicists are able to be authors on many more papers. Particularly prolific are K.H.J. Buschow and F.R. de Boer at the University of Amsterdam, who in a single year published 54 and 37 papers respectively. This proliferation was matched by A.R. Bishop at Los Alamos National Laboratory, who in addition to his busy publication schedule also has considerable administrative duties. No comments were received from these prolific authors after requests by fax and e-mail.

Is it just that young scientists feel the need to credit the people who mentored them, and the people who pay their rather modest salaries with grants and provide them with labs in which to work? Certainly, the web-like structure of many authorship lists reflects not only the work and ideas of the primary researchers but the entire infrastructure which allowed their work to come into being. Since so much science functions according to a mentorship hierarchy and through complicated collaborative exchanges, is it so inaccurate for many authorship lists to have more entries than a weekly grocery list? Perhaps not -- but one expects scientists, who thrive by defining and scrutinizing nature, to at least try to examine their own publication process. But the opposite is true. In fact, the "generosity" of the physics community toward some of its senior scientists can only continue because of there is no consistent criteria for assigning authorship. In studies by R. Vasta, by Kalichman and Friedman and by Eastwood, Derish, Leash and Ordway, researchers discovered similar situations in psychology and in biomedical sciences.

It's understandable that scientists generally avoid discussing the nuances of authorship, because within a research collaboration there is every reason to avoid conflict. And it may be particularly important for the postdocs not to challenge their supervisors' right to coauthorship, since postdocs consider their recommendation letters to be as important to future job prospects as publication histories.

But the potential for conflicts within research groups cannot explain why science policy makers refuse to address the issue of authorship. In fact, there are at least two obvious options that would make the assignment of authorship more

meaningful while completely avoiding the possibility of such collaborative conflicts. Researchers could follow the patent authorship model and have an attorney, or another disinterested party, inquire into the research work and, according to existing legal standards for patent authorship, determine the list of authors. A second option would be to add an authorship section at the end of each paper, in which each coauthor would have an opportunity to explain what he or she contributed.

So why all the reluctance to address such issues? Perhaps it's because scientific communities usually consist of two groups with distinct interests and very different powers. The likely victims of misappropriation of authorship are the junior scientists with no power to legislate the rules of authorship. The senior scientists, on the other hand, might change the system, but in the sense that it clearly benefits them, they have little incentive to do so. Since senior scientists no longer have a supervisor who can easily appropriate authorship from them, and no longer need famous honorary names to help grease the wheels of publishing, they have no reason to perceive the issue as a problem.

A few weeks ago, the premier trade publication, "Physics Today," had one of its journalists interview me for an article on scientific misconduct and review the survey results. After telling me the material I provided had been "helpful for researching [her] story," she decided against including my findings in the article. Instead she found a senior scientist whom she quoted as saying: "There are no statistics on misconduct in physics." It seemed, after all our discussion, as if the survey never existed.

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