

Deciding First Authorship

Deciding the order of authors on a manuscript is one of the most common problems occurring in research, and here is a personal example.

This event occurred early in my graduate school career when one of my first projects was working alongside Jim, who had been doing graduate work for some time. Well before I arrived in the lab, Jim and his advisor had outlined and launched a series of experiments. I then became involved in working on these experiments, first by acquiring, analyzing and interpreting data and then by designing some of the final experiments in the study. Subsequently, Jim wrote the majority of the first draft of a paper we submitted, with him as first author and me second.

While the paper was under review, Jim surprised everyone by abruptly quitting the graduate program altogether, getting married and moving to a distant city. A few weeks after his departure, the peer reviews of the paper arrived with the provisional decision to accept the paper but with major revisions requested. I contacted Jim, who was now living on the other side of the U.S. He told me he was entirely disinterested in the project and said he would be unable to contribute to the revision. So, I completed all the requested revisions, which were quite substantial and included re-analysis and interpretation of the data (which required some acquisition of new data as well).

At this point, Dr. Simmons who was Jim's advisor, offered me first authorship on the paper because of my substantial contributions to its reworking and Jim's inability to do it. I was nevertheless reluctant to accept because the initial conception and design of the study was Jim's. I discussed this matter with my advisor, who concurred with me that I should remain second author (which is how the matter ended).

Although I think I made the right decision on this matter, can ethics shed any particular light on this situation? Jim was responsible for most of the design and conception of the experiments, ran most of the initial ones and composed most of the first draft of the paper. But I followed with a tremendous amount of revision and added new data. While a set of guidelines for authors can be helpful, I'm wondering if such a set can be particularly helpful in a case like this.

Expert Opinion

The International Committee of Medical Journal Editors' "Uniform Requirements" are probably the ones most commonly and consistently cited for determining authorship and the ordering of authors. While the "Requirements" document itself is wide-ranging—covering issues like editorial freedom, conflicts of interest, privacy and confidentiality, protection of human subjects and animals, etc.—the statements that are of particular relevance to this dilemma assert that "An 'author' is generally considered to be someone who has made substantive intellectual contributions to a published study" and that:

Authorship credit should be based on 1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2)

drafting the article or revising it critically for important intellectual content; and 3) final approval of the version to be published. Authors should meet conditions 1, 2, and 3.¹

Importantly, the “Requirements” also mention that “Acquisition of funding, collection of data, or general supervision of the research group, alone, does not justify authorship.” Harvard’s authorship guidelines are very similar:

Everyone who is listed as an author should have made a substantial, direct, intellectual contribution to the work. For example (in the case of a research report) they should have contributed to the conception, design, analysis and/or interpretation of data. Honorary or guest authorship is not acceptable. Acquisition of funding and provision of technical services, patients, or materials, while they may be essential to the work, are not in themselves sufficient contributions to justify authorship...Authors should specify in their manuscript a description of the contributions of each author and how they have assigned the order in which they are listed so that readers can interpret their roles correctly.²

Now, the point of citing these various passages is that if we would strictly apply them to the case at hand, one might judge that Jim (who was the original author) ultimately should not be listed on the rewrite as an author *at all*. The reason is that the Uniform Requirements require *all three* criteria—i.e., conception/design contribution, drafting or rewriting of the article, and final approval—to be met for an individual to qualify as author. According to the case report, however, Jim only completed half of them. He had nothing to do with the extensive rewrite—and recall that the rewrite included a re-analysis and re-interpretation of the data—so that Jim’s “final approval” (i.e., accommodating authorship criterion #3) of the redraft would be in name only. How could Jim “approve” something in whose compilation and analysis he played no role whatsoever and, therefore, whose substantive accuracy or quality he cannot begin to assure or guarantee?

On the other hand, denying Jim authorship altogether seems unjust. After all, it was his conception and design that propelled the experiment forward; he collected and analyzed the bulk of the first batch of data; and he wrote the majority of the first manuscript. Also, the graduate student probably benefited from Jim’s leadership and energy, such that the idea of denying Jim authorship would seem remarkably callous (although, arguably, legalistically correct).

This case is a good example of the way any research project that involves multiple persons participating in the collection and interpretation of data according to an experimental design might encounter problems in estimating the nature and scope of each one’s ultimate contribution in deciding the order of authorship. As Bates et al pointed out, any individual among multiple authors might contribute to any of the following categories in developing a research publication:

1. conception and design of the study
2. analysis and interpretation of data
3. collection or assembly of data
4. statistical expertise
5. provision of student material or patients

6. drafting of the article or part of the article
7. critical revision of the article
8. obtaining funding.
9. administrative, technical or logistic support
10. guarantor of the study
11. study supervision or coordination³

Now, while certain of these categories by themselves would not qualify one for authorship, suppose Researcher A claims a contribution of 20 percent to category #1, 10 percent to category #6, and 40 percent to category #7, while Researcher B claims 80 percent to category #1, 15 percent to #2, and so on. If they would clash over whose name should have precedence on the authors' list, ethics would have very little to say about how that precedence should be specifically determined. There is no objective metric that can consistently and decisively adjudicate disputes over ordering the authorial pecking order.

The Harvard criteria recognize this by noting that "it is not possible to interpret from order of authorship the respective contributions of individual authors." So, the Harvard guidelines recommend that "The authors should decide the order of authorship together...(and) specify in their manuscript a description of the contributions of each author and how they have assigned the order...so that readers can interpret their roles correctly." Importantly: "Research teams should discuss authorship issues frankly early in the course of their work together."

In the above case, no authorship problems appeared until the first draft was returned with the demand for major revisions. It was at that point, when Jim refused to participate in the rewrite, that authorship issues became problematic. Once the quantity of work required by the rewrite became apparent, the grad student should have contacted Jim and prepared to have a conversation that would probably not be without some emotional discomfort. As initiated by the grad student, the conversation might have proceeded like this:

Jim, this is a bit difficult for me to tell you, but in view of your inability to assist with the massive revisions that the manuscript's resubmission will require, Dr. Simmons and I believe that you should be second author with me first. I want to tell you this before we go too far, so you can mull it over and give us your thoughts. Certainly your initial contributions were considerable, but the rewrite will so dramatically change the manuscript from its original form that we believe the order of authorship has to reflect that. Also, if you would insist on remaining first author, there's no way you could legitimately approve the rewrite as you will have overseen none of it. So, we'd have a real ethical problem there.

This last point seems conclusive. The fact that Jim was ultimately retained as first author, while certainly respectful of his original thoughtfulness and energy, misrepresents his accountability for the revised submission. After all, the first author should be able to guarantee and stand behind the article as a whole by way of his or her familiarity with, if not input into, each of its elements. Jim's removing himself from those tasks therefore serves to displace him as first author.

Summary: While criteria whereby authorship ordering might be imprecise, any designated first author should be able to stand behind and justify a research publication's various findings and claims. In this scenario, the original first author would not have been able to perform these functions as his contribution to the much revised resubmission was nil. Although his contribution to the original research design and data collection was crucial and fundamental, it was not enough to sustain a claim to first authorship of the revision.

References

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