



Writing and Publishing Scientific Papers

A Primer for the
Non-English Speaker

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6. The Delicate Art of Deciding about Authorship

An author, by definition, is a person who brought the work into existence. Given the importance of the first publication of new scientific results, authors of important papers (in other words, discoverers of notable new facts) gain respect in the eyes of their peers and indeed (although not always) the wider world. Scientific publications constitute what matters in science, and thus it is not surprising that scientists care a lot about authorship.

We suggest that any aspiring author should tackle the question of authorship as early as practicable in the publication writing process.

Co-authorship is almost inevitable today; a scientist working alone is a rarity. The average number of authors of a paper in biology was about 2.4 in the 1980s, 4.5 in 2000 and by 2017 it had grown to 6.2 (Kelly, 2018). Publishing as a sole author rarely occurs in a scientist's career.

Several authorship ranking systems are in use even today, but the view that the first author should be the one who did most of the work that led to the paper is gradually gaining prominence. In some fields, or in groups lead by very strong personalities, the situation might still be different, but the trend to list authors according to their contribution to the paper is gaining ground: the first author should have done most of the work, followed by others who were actively involved. Sometimes the first author is called the "senior author" - — perhaps a remnant of the times when seniority indeed decided the authorship sequence.

This principle also means that supervisors or group leaders (managers) should not be automatically credited with authorship on papers. This is a tricky issue because of the kudos associated with authorship — people in power are often unwilling to give up this

“privilege”. They rarely contribute much, but they use their power, openly or not, to be credited with authorship on papers emerging from “their” laboratories. The argument mentioned most frequently in these cases is that “otherwise nothing would have happened”, the opportunity to do the work would not have occurred and, thus, the results could not have been achieved. Following that logic, you might include your parents as co-authors as, very obviously, without them, “nothing would have happened”, either. The real involvement becomes obvious when it comes to light that one team member did something wrong, or, worse, falsified data. In those cases, it quickly turns out that the boss “was not really involved in that particular paper”. No more needs to be said on this matter.

However, this does not make the matter of authorship, and authors’ rank, an easy one. Just as with many aspects of group activity, giving credit to one’s own work is a matter of personal judgement. One tends to overestimate the importance of one’s own contribution. Conflicts usually arise not when someone gets undeserved credit for something, but when one does not get, in that person’s view, the recognition they should receive. Many long-running co-operations and partnerships have broken up due to neglecting this aspect of the publication process. As is often the case with human conflicts, the root of the problem often lies in assuming things and not discussing them. The remedy is simple: openly discuss this issue. Expectations can only be met when they are known. Discussing authorship early will generally smooth relationships and ease co-operations.

This does not mean that the circle of authors and their rank on future papers should be decided even before the work has started. The team, however, can agree on certain principles, or rules, that are accepted by all. For example, the plant ecology unit at the University of Sheffield, UK, published their co/authorship scoring system (Hunt, 1986), which divided the different phases of the work leading to a paper, and assessed individual contributions to each one of these, allocating points to contributing individuals.

Box 6. The co-authorship scoring system used by the plant ecology group at the University of Sheffield, UK

1. Intellectual input (planning/designing/interpreting)

no contribution	0
one detailed discussion	5
several detailed discussions	10
correspondence or longer meetings	15
substantial	20
closest possible involvement	25

2. Practical input: data capture (setting-up, recording, observing/abstracting)

none	0
small	5
moderate indirect	10
moderate, direct	15
major indirect	20
major direct	25

3. Practical input after data capture: data processing/ organising — but not interpreting see 1.

no	0
minor or brief assistance	5
substantial or prolonged	10

4. Specialist input from related fields

none	0
brief or routine advice	5
specially tailored assistance	10
whole basis of approach (but advice only)	15

5. Literary input (contribution to first complete draft of Ms)

none	0
edited others' material	5
contributed small sections	10
contributed moderate sections	15
contributed majority	20
contributed virtually all	25

The group requires a minimum sum of 25 points to become an author, and authorship sequence is decided by the number of points. insufficient number of points are taken over to the next paper — i.e. a colleague who does not accumulate enough points to become an author on a paper, has a “head start” at the next one, as the accumulated points are credited for the new one.

When a paper is ready for submission, all contributors are scored following the system in Box 6. Anyone with a score of over 25 gets co-authorship. The sequence is according to score rankings; scores below 25 are carried over to a subsequent paper.

Authors can also be listed in alphabetical order if no sequence is desired, or authorship can be decided by the toss of a coin. In these cases, this fact is usually mentioned in a footnote on the first page of the manuscript. If two or more authors contributed equally to the paper, this can also be mentioned in a footnote.

The main advantage of developing an authorship sequence decision system is transparency. Everyone in the team knows the criteria, and this channels otherwise potentially disruptive conflicts onto a manageable path. Potential conflicts are not eliminated, but the procedure provides a structured way to handle, discuss, and resolve them. Such a system also places the authorship criteria firmly into the domain of the work done. It is strongly advocated that research groups develop their own authorship decision system. The potential benefits are significant.

The trend “authorship equals real contribution” is reinforced by the recent requirement of having to specify, in detail, each author’s contribution to the paper. Several journals (for example *PLoS One*) have developed detailed criteria for authorship.

The expected combined effect of these developments is that, more and more, authorship will reflect real contributions, and not power relations in science. The suggestion that teams should identify the mechanism for how authorship was decided (Tscharrntke et al., 2007) seems a sane one and it, at least, provides some information about allocating authorship. However, it does little to clarify principles, nor does it move the field towards the desirable status of preventing colleagues in power abusing their influence to gain authorship.

What Does Co-Authorship Mean?

Co-authors may only have contributed to certain parts of the work on the paper, but all authors bear collective responsibility for the total content of the paper. This must usually be declared at submission. If you are a co-author, you are supposed to know, and agree to, everything the paper contains. When a manuscript is revised, it is also

assumed that all co-authors agreed to the suggested changes and the responses to the editor's, and reviewers' comments. As a co-author, this is not only your responsibility, but also your right (to know and agree to the above) — exercise it. Always ask for the complete copy of the manuscript before submission, and read it. Similarly, contribute to, obtain and read the revised versions and the response, and make your opinion known, especially if you disagree. If you do not do this, you have no one to blame but yourself. In a very grave case of disagreement, you can withdraw your authorship (before acceptance, naturally).

In a submission letter, if there is more than one author, it is to be clearly stated that the content of the paper is known and agreed in all respects by all the authors. No-one should then enter into any argument about apportioning merit or blame, should any question emerge about the paper's contents. In a submission letter, if there is more than one author, it is to be clearly stated that the content of the paper is known and agreed in all respects by all the authors.

Consequently, it is unwise to accept authorship, even if offered, on any paper to which one did not contribute. If you are a corresponding author, or the one who is organising the writing of a paper by a team, make sure that all the authors receive and read the manuscript before submission (or, at the very least, they declare that they have). In the case of any later dispute, you are then free of any eventual accusation. All this may sound paranoid, but very bitter stories have ensued because these aspects were neglected. Also, make sure that all the co-authors are fully informed about the development of, and eventual changes to, the manuscript.

The Corresponding Author's Role

In the case of a team co-authoring a manuscript, the editor always corresponds with only one of the authors. This author is called the "corresponding author". This is a service that can be performed by any of the authors, and is not linked to, nor attracts, any rank among the authors. It is not necessary, although it often happens, that the first author is also the corresponding author. There are many exceptions. The identity of the corresponding author should be agreed on before submission by the authoring team. This author provides a clerical

service for the team and is the contact point for the editor and, upon publication, the outside world. However, the role is not merely clerical. The corresponding author often organises necessary revisions and, upon acceptance, submits the final copy. Page proofs are also sent to the corresponding author only.

Junior first authors sometimes shy away from this role. However, corresponding with editors and seeing the publication through to print is a skill that must be learned. It is a good idea to allow a young author to take this role, with senior, more experienced authors giving support as needed.