Publication

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Summary

Research is incomplete until reported.
Published reports are a necessary step in the dialogue with other scientists about the approach and significance of research studies.

Publication is not merely a matter of credit.
Publications should present some substantive and new result or analysis, and should not serve merely to increase the author's number of publications.

There are significant responsibilities in publishing.
Although errors can occur, authors should endeavor to publish accurate, complete, clear, and unbiased representation of their work, including the background, the methods used, the findings, and the significance and contributions of the work, as well as fair assignment of authorship and credit.

Background

In academic life, it is said, one must publish or perish. Publication facilitates the open exchange of information among researchers and exposes research methods and findings to the scrutiny of the larger scientific community. It also documents who is first with new ideas or discoveries, demonstrates productive use of research funds, and provides a record by which a research career can be judged. For these reasons, publication has a prominent role in advancement, promotion, and continued research funding.

In pursuit of publication and, more specifically, of credit, prospective authors can have serious differences of opinion about when to publish, what to publish, and how credit should be apportioned. Some of these issues are discussed below. Ultimately, the centrality of publication in academic life means that it is implicated to some degree in nearly all aspects of the responsible conduct of research.

Regulations and Guidelines

Other than copyright law and federal definitions of research misconduct, nearly all aspects of authorship and publication are covered only by guidelines and unwritten standards. While many professional societies, scientific journals, and institutions have guidelines for publication, the depth and scope of these are quite variable.

Publication Guidelines

One of the most widely cited guidelines for publication is a document from the International Committee of Medical Journal Editors (ICMJE). In 1978, a group of medical journal editors met in Vancouver to establish guidelines for the format of manuscripts submitted to their journals. A product of that meeting was the ICMJE guidelines, Uniform Requirements for Manuscripts Submitted to Biomedical Journals. These guidelines have periodically been expanded and revised to address ethical questions, including authorship (ICMJE, 2006). These guidelines have been adopted by more than 500 biomedical journals, although adherence to these guidelines is not necessarily consistent or reliable.

Copyright Law

Extensive international and U.S. copyright laws regulate protection for written works, including research publications. For most published articles and book chapters, authors are required to transfer the copyright to the publisher. In practice, this means that authors of a published paper are in violation of federal law, not just ethical standards, if they attempt to re-publish without first getting permission from the copyright holder, the publisher. Therefore, unless one is legally advised otherwise, it is best to assume *that it is never acceptable to reproduce previously published work without permission from both the author(s) and the publisher.*

Discussion

Case Study 1[i]

A postdoc and his mentor have co-authored a paper describing their research results. This paper has appeared as a preliminary report in a copyrighted monograph. One of the figures in this paper is a computer-generated graph that describes data on a series of bacterial growth curves. The postdoc and mentor presently are preparing a major paper for submission to a peer-reviewed journal. They both agree that the growth curve data in the monograph article are crucial to the story they're telling in the present manuscript. Accordingly, they decide that this same figure must be included in their present writing. Because they are aware of potential copyright violations, they generate the exact same figure using different type face fonts and different line thicknesses for the ordinate and the abscissa. They have decided that since this is not the exact same figure which appeared in their monograph article the use of it will not constitute a copyright infringement. They also plan to indicate in their manuscript that this figure has been "adapted from" the one initially published in the monograph article.

Case Study 2[ii]

Marvin Brian, a faculty member at a major research university was funded by a contract to conduct work within a relatively well defined work-scope. Brian was the advisor of an advanced doctoral student, Henry Ruth, and a beginning master's student, Mark Butterworth. Henry served as the lead investigator, including preparing and presenting reports to the funding agency. Mark worked on the same project, sharing his data with Dr. Brian and Henry. After working on the project for about two years, Mark submitted his thesis which was reviewed and approved by Dr. Brian, but not seen by Henry. A year or so later, when Henry was finishing the text of his doctoral dissertation, he discovered that Mark's thesis contained at least one complete table representing his work in exactly the format that Henry had used to express his results. The master's thesis contained a general acknowledgement of Henry, among others, but there was not specific attribution associated with the verbatim table. All parties were aware that this research was supported by a contract with a defined work-scope. Does this sponsorship justify duplicative "publication" in a master's thesis and doctoral dissertation without explanation? If not, how should the matter have been handled? Once duplicative "publication" occurred, what should be done and who is responsible for initiating remedial action?

Case Study 3[iii]

Helen Louis has published the description of 3 new bacterial mutants in a peer-reviewed journal. Mutants 1 and 2 were exhaustively characterized and described in the report, but mutant 3 was only briefly mentioned. Larry Savage writes her requesting mutant 3. Larry clearly describes his intended use for the mutant in studies which are presently underway in his laboratory. Helen refuses to release the strain. Helen affirms that mutant 3 was only described in a preliminary way in the paper. She mentions that another major manuscript is in preparation in which mutant 3 will be the central focus of the report. She says she will be happy to release the mutant after the second manuscript has been accepted for publication. Larry refuses to accept this rationale and presses his request for the mutant strain.

Discussion Questions

1. For your field of research, list and describe criteria that have an impact on: (a) when work is ready to be published and (b) which data or work should be included in a publication.
2. What are the costs and benefits to you in choosing to publish fewer, higher quality papers, rather than many smaller publications? What are the costs and benefits to science?
3. Define and give examples of plagiarism and redundant publication. Under what circumstances, if any, can plagiarism be acceptable conduct? Under what circumstances, if any, can redundant publication be acceptable conduct?

Additional Considerations

There are several things to keep in mind when publishing research data, not the least of which is the central importance of publication to the integrity of the scientific enterprise as a whole. No simple formula can determine the point at which a body of data warrants publication, but the quality of the scientific literature depends on publications that represent new and substantial findings. In short, publication should represent a significant contribution to the literature.

Avoid fragmentary publication.
Dividing research findings into the smallest publishable units might increase an investigator's total number of publications, but works against the interests of science. Minimally, this is an inefficient use of scarce resources, including space in journals and the time of authors, editors, and reviewers. Furthermore, fragmentation of one study into many small publications can give the false impression that a line of research has been more extensively pursued than is actually the case.

Avoid duplicative publication.
Publication of data in more than one location gives the findings more visibility, but it may also mislead readers into believing that the publications represent distinct data sets. In the case of clinical findings, this could contribute to a false impression of the number of patients actually studied. In the case of basic research, readers might mistakenly conclude that the study had been successfully replicated. Any data set, either in whole or in part, should not be published twice without making explicitly clear which of the data have been published previously and where and when the work was published.

For the submission of papers, most journals require that the work not be submitted simultaneously elsewhere for consideration. Submission of a paper is tantamount to provisionally giving the selected journal copyright to the work, and it initiates considerable expense of time and effort in reviewing the manuscript. Only when an article has been rejected by or withdrawn from consideration in one journal may it be submitted elsewhere.

Some exceptions to the injunction against redundant publication may be justified. It's acceptable to publish a paper that was published previously only as an abstract, although authors should disclose the prior publication and avoid the suggestion that the two represent distinct results. In some circumstances, the case can be made that two completely different audiences can be reached only by separate publications: for example, when a work warrants publication in two or more languages. Even in such cases, however, the editors, publishers, and all authors for the duplicate papers must approve the arrangement. In all such cases, it is essential that the later publication make clear reference to the earlier work. Without such reference, the duplication of publications constitutes a falsification of the research record.

Plagiarism
Authors take responsibility for both the ideas and words in a publication. For this reason, co-opting someone else's manuscript is a clear example of research misconduct.

While taking credit for research findings that are not your own is clearly a greater wrong than copying a methods section written by someone else, both are examples of plagiarism-- taking personal credit for someone else's words or ideas. To use the words of another author, either state where the original words can be found or reproduce the original text with clear and well-cited attribution to the original author. Even with proper citation, repeating the words of other authors is constrained by the fair use provisions of copyright law.

Plagiarism is especially difficult when it occurs between colleagues. When text has been co-authored, the question of ownership may be a matter of dispute. In some, but not all, research groups, jointly written text is assumed to be shared property available for use by any of the original authors. Opinions about the extent of collective ownership of jointly written materials vary and it may be impractical to determine when plagiarism has occurred (e.g., Office of Research Integrity, 1994). Because it should never be assumed that it is acceptable to take credit for words written by someone else, this issue should be openly addressed among collaborators.

Citation

The references cited in a research publication form the path that connects new work with the work on which it is built. Just as a thorough literature search is the foundation for responsible research, appropriate reference citation is the foundation for responsible reporting. Because future readers will rely on the references listed, an author has additional responsibilities to assure the accuracy of each citation so that readers can locate the referenced work, to include adequate references that document the origins of ideas, to verify that referenced works are consistent with the ideas and information credited to them, and to cite original sources whenever possible.

Statistical methods

Statistical methods are often used to describe data samples, to summarize results and relationships, and to test hypotheses. Usually, readers will not have access to the raw data and, therefore, will base any conclusions on the outcome of the statistical analyses. Because the assumptions and meaning of statistical tests vary widely, simply reporting, for instance, a final P value (the probability of a false positive) tells readers very little unless they also know the methods of data collection and analysis. For these reasons, it is essential that authors not only design and analyze experiments appropriately, but also that they clearly and openly describe their methods (American Statistical Association, 1999).

Errata, corrections, and retractions

The integrity of the scientific literature is best served by rapid correction of misleading or mistaken information. A decision to submit a correction or retraction should not be taken lightly and should involve all authors of the paper. However, despite any perceived risks, there are advantages to an appropriate correction or retraction. Admitting error is typically perceived as a sign of integrity and concern for the highest standards in work entered into the published record. Conversely, failure to admit to an

error can be embarrassing if the problem with the manuscript is first discovered or reported by others.

Errata: If one or more minor errors are found to have been included in a manuscript, then a letter describing the error(s) should be submitted to the journal that published the article.

Correction: If unintentional errors are great enough to undermine part of a report, then the authors should submit a letter to the journal explaining the errors as a correction to the publication.

Retraction: If unintentional errors are of such a magnitude as to invalidate or seriously undermine the entire report or if misconduct affecting the work on the part of one or more authors is found to have occurred, then the authors should retract the paper by writing to the editor of the publication.

Resources

American Statistical Association. (1999). Ethical Guidelines for Statistical Practice. Prepared by the Committee on Professional Ethics. http://www.amstat.org/about/ethicalguidelines.cfm

International Committee of Medical Journal Editors (1997). Uniform Requirements for Manuscripts Submitted to Biomedical Journals. *Journal of the American Medical Association*, *277*: 927-34 http://www.icmje.org

Office of Research Integrity. (1994). Working definition of plagiarism. *Office of Research Integrity Newsletter*, *3*(1). http://ori.hhs.gov/policies/plagiarism.shtml

Endnotes

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