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Editorial: Avoidance of plagiarism

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Editor-in-Chief

Plagiarism is in the news. Last year, the German defense minister, Dr. Karl-Theodor Maria Nikolaus Johann Jakob Philipp Franz Joseph Sylvester Freiherr von und zu Guttenberg, had to renounce his doctorate after credible allegations of plagiarism surfaced. Twelve months later, the President of Hungary, Dr. Pál Schmitt, was stripped of his doctorate by the Semmelweis University for plagiarism. Both politicians also lost their jobs.

The issue of plagiarism has risen during the last decade in the arena of technoscientific research. Stories on widespread plagiarism in Chinese academic institutions have made headlines in the news worldwide.^{1,2} The science minister of Iran has been known to plagiarize in at least two papers published in technical journals,³ and the science advisor to the prime minister of India has recently apologized for a similar act of plagiarism.⁴ Several egregious acts of plagiarism committed by US researchers are detailed in an excellent book devoted to many kinds of research misconduct.⁵

Although dictionary definitions of plagiarism are supposedly very clear, the widespread incidence of plagiarism—perhaps a consequence of the global spread in technoscientific research activities⁶—suggests that confusion abounds in the minds of many researchers.⁷ No wonder, the US National Science Foundation now requires every university desirous of research funding to certify that it will train its students on “responsible conduct of research.”⁸

While journal editors are probably becoming adept at sniffing submissions for plagiarism,⁹ authors too have an obligation to learn what can be considered as plagiarism and then act accordingly. But I have found that helpful guides provided on university websites¹⁰ are largely targeted towards the humanities. These guides are very pertinent to those technoscientific disciplines in which most research publications are highly descriptive, but not to those that rely significantly on the manipulation of mathematical formulas and numerical data (which should not be confused with *anecdotal data*).

Conversations with graduate students in my department have led me to formulate a simple guide for them to avoid plagiarism when drafting a manuscript for possible publication in a research journal or conference proceedings.

First, the description of a basic phenomenon, a standard experimental technique, a fundamental analysis, or a commonly used numerical method should never be copied from any source—be it a book, a journal article, a website, or even someone else’s presentation at a seminar or a conference. Instead, you must write a description in your own words. Although common phrases need not be enclosed within quotation marks, copying someone else’s description—even with cosmetic changes—amounts to plagiarism. The citation of informative sources for such material depends on its antiquity, context, and readership. There is no need to cite a historical work such as *Principia* for Newton’s laws of motion, unless a historical issue is being discussed.¹¹ Citation of a widely used textbook is advisable if most readers are expected to be novice researchers, but it is essential in a journal that usually caters to a different discipline. Recently published review papers may also be cited to assist readers.

Descriptions of new phenomena, analyses, and techniques must also be paraphrased rather than reproduced from other sources. Care must be taken to cite primary references, even if that involves consulting several journals and monographs. The convenient practice of citing secondary references to the exclusion of the primary reference is not recommended. Definitely cite the primary reference, and also cite secondary references if they provide additional illumination. Cite only those papers that you have read. Read a lot.

Next, a wholesale change of notation—just to avoid future allegations of plagiarism—is ill advised. Standard terminology and standard symbols for basic quantities must be used. The form of an equation must not be distorted, unless a significant new relationship is being discussed.

Again, there is no need to cite Newton for $F = dp/dt$ in a physics journal, but the primary reference must be provided for an equation derived within the last three or four decades. Commonly used textbooks should be cited for standard equations if the readership is expected to comprise mostly either novice researchers or researchers from other disciplines.

Presentation of previously published data, either in tables or graphs, must be accompanied by citations to the relevant publications. If a figure or a table is reproduced from a published source, permission must be taken from the copyright holder (usually, the publisher) and at least one co-author of the source. Often, the copyright holder's permission may not be necessary when a figure or a table first appeared in a publication of your own, because many publishers return reproduction rights to the authors; but, do check the copyright conditions.

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Finally, in a manuscript you must report and analyze only those data that are neither misleading, nor stolen, nor acquired by coercion. All experimental procedures used to obtain the data must be legal. Particularly, if the data are acquired from human subjects, then the informed consent of every human subject is essential. A responsible institution is likely to have a review board to monitor the acquisition and restricted uses of such data by researchers. You must never use data that has been improperly acquired by others, even with their permission.

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