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Second Edition

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Chapter 5

How to Prepare the Abstract

Good my lord, will you see the players well bestowed? Do you hear, let them be well used; for they are the abstracts and brief chronicles of the time: after your death you were better have a bad epitaph than their ill report while you live.

—WILLIAM SHAKESPEARE

Definition

When I was very young, my daddy told me: "If you can't be an athlete, be an athletic supporter." I was never quite sure what that meant, but perhaps a similar philosophy can be applied to the writing of abstracts: If you can't write a full exposition because of the 250-word limitation, try to uphold the germinal plasm. In other words, forgetting all of the experimental detail, omitting all of the references to previous work (even the critically important papers that you have published), and avoiding all of the lengthy exposition of your detailed knowledge of the general and specific problems investigated, you should limit yourself to a short description of the problem and its solution. As Houghton (20) put it, "An abstract can be defined as a summary of the information in a document."

"A well-prepared abstract enables readers to identify the basic content of a document quickly and accurately, to determine its relevance to their interests, and thus to decide whether they need to read the

document in its entirety" (3). The Abstract should not exceed 250 words and should be designed to define clearly what is dealt with in the paper. Many people will read the Abstract, either in the original journal or in *Biological Abstracts*, *Chemical Abstracts*, or one of the other secondary publications.

The Abstract should (i) state the principal objectives and scope of the investigation, (ii) describe the methodology employed, (iii) summarize the results, and (iv) state the principal conclusions. The importance of the conclusions is indicated by the fact that they should be said three times: once in the Abstract, again in the Introduction, and again (in more detail probably) in the Discussion.

The Abstract should never give any information or conclusion that is not stated in the paper. References to the literature must not be cited in the Abstract (except in rare instances, such as modification of a previously published method).

Types of Abstracts

The above rules apply to the abstracts that are used in primary journals and often without change in the secondary services (*Chemical Abstracts*, etc.). This type of abstract is often referred to as an *informative* abstract, and it is designed to capsulize the paper. It can and should briefly state the problem, the method used to study the problem, and the principal data and conclusions. Often, the abstract supplants the need for reading of the full paper; without such abstracts, scientists would not be able to keep up in active areas of research.

Another common type of abstract is the *indicative* abstract (sometimes called a descriptive abstract). This type of abstract is designed to indicate the content of a paper, essentially serving as a table of contents, making it easy for potential readers to decide whether to read the paper. However, because of its descriptive rather than substantive nature, it can seldom serve as a substitute for the full paper. Thus, indicative abstracts should not be used as "heading" abstracts in research papers, but they may be used in other types of publications (review papers, conference reports, the government report literature, etc.); such indicative abstracts are often of great value to reference librarians.

An effective discussion of the various uses and types of abstracts was provided by McGirr (23), whose conclusions are well worth repeating: "When writing the abstract, remember that it will be published by itself, and should be self-contained. That is, it should contain no bibliographic, figure, or table references . . . The language should be familiar to the

potential reader. Omit obscure abbreviations and acronyms. Write the paper before you write the abstract, if at all possible."

Economy of Words

Occasionally, a scientist omits something important from the Abstract. By far the most common fault, however, is the inclusion of extraneous detail.

I once heard of a scientist who had some terribly involved theory about the relation of matter to energy. He then wrote a terribly involved paper. However, the scientist, knowing the limitations of editors, realized that the Abstract of his paper would have to be short and simple if the paper were to be judged acceptable. So, he spent hours and hours honing his Abstract. He eliminated word after word until, finally, all of the verbiage had been removed. What he was left with was the shortest Abstract ever written: "$e = mc^2$."

Today, most scientific journals print a heading Abstract with each paper. It is printed (and should be typed) as a single paragraph. Because the Abstract precedes the paper itself, and because the editors and reviewers like a bit of orientation, the Abstract is almost universally the first part of the manuscript read during the review process. Therefore, it is of fundamental importance that the Abstract be written clearly and simply. If you cannot attract the interest of the reviewer in your Abstract, your cause may be lost. Very often, the reviewer may be perilously close to a final judgment of your manuscript after reading the Abstract alone. This could be because the reviewer has a short attention span (often the case). However, if by definition the Abstract is simply a very short version of the whole paper, it is only logical that the reviewer will often reach a premature conclusion, and that conclusion is likely to be the correct one. Usually, a good Abstract is followed by a good paper; a poor Abstract is a harbinger of woes to come.

Because a heading Abstract is required by most journals and because a meeting Abstract is a requirement for participation in a great many national and international meetings (participation sometimes being determined on the basis of submitted abstracts), scientists should master the fundamentals of Abstract preparation. A recent book by Cremmins (14) can be recommended for this purpose.

When writing the Abstract, examine every word with care. If you can tell your story in 100 words, do not use 200. Economically, it doesn't make sense to waste words. It costs about 12 cents a word to publish a scientific paper and another 12 cents every time that word is reprinted

in an abstracting publication, and the total communication system can afford only so much verbal abuse. Of more importance to you, the use of clear, significant words will impress the editors and reviewers (not to mention readers), whereas the use of abstruse, verbose constructions is very likely to provoke a check in the "reject" box on the review form.

Or, in Napoleon's last words: "Make mine a short bier."