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CHAPTER 7

How to Prepare the Title

First impressions are strong impressions; a title ought therefore to be well studied, and to give, so far as its limits permit, a definite and concise indication of what is to come.

—T. Clifford Allbutt

IMPORTANCE OF THE TITLE

In preparing a title for a paper, you would do well to remember one salient fact: That title will be read by thousands of people. Perhaps few people, if any, will read the entire paper, but many people will read the title, either in the original journal or in one of the secondary (abstracting and indexing) databases. Therefore, all words in the title should be chosen with great care, and their association with one another must be carefully managed. Perhaps the most common error in defective titles, and certainly the most damaging one in terms of comprehension, is faulty syntax (word order).

What is a good title? We define it as the fewest possible words that adequately describe the contents of the paper.

Remember that the indexing and abstracting services depend heavily on the accuracy of the title, as do individual computerized literature-retrieval systems. An improperly titled paper may be virtually lost and never reach its intended audience.

Some authors mistakenly sacrifice clarity in an attempt to be witty. The title of a paper need not, and generally should not, be clever. It must, however, be clear. An example (adapted from Halm and Landon 2007): “Association between Diuretic Use and Cardiovascular Mortality” could be an adequate title. The authors should resist the temptation to use instead “Dying to Pee.”

LENGTH OF THE TITLE

Occasionally, titles are too short. A paper was submitted to the *Journal of Bacteriology* with the title "Studies on *Brucella*." Obviously, such a title was not very helpful to the potential reader. Was the study taxonomic, genetic, biochemical, or medical? We would certainly want to know at least that much.

Much more often, titles are too long. Ironically, long titles are often less meaningful than short ones. A century or so ago, when science was less specialized, titles tended to be long and nonspecific, such as "On the addition to the method of microscopic research by a new way of producing colour-contrast between an object and its background or between definite parts of the object itself" (Rheinberg J, *J. R. Microsc. Soc.* 1896: 373). That certainly sounds like a poor title; perhaps it would make a good abstract.

Not only scientists have written rambling titles. Consider this one from the year 1705: *A Wedding Ring Fit for the Finger, or the Salve of Divinity on the Sore of Humanity with directions to those men that want wives, how to choose them, and to those women that have husbands, how to use them*. Ironically, this title appeared on a miniature book (Bernard, A. Now all we need is a title: famous book titles and how they got that way. New York: Norton, 1995, p. 58).

Without question, most excessively long titles contain "waste" words. Often, these waste words appear right at the start of the title, words such as "Studies on," "Investigations on," and "Observations on." An opening *A*, *An*, or *The* is also a waste word. Certainly, such words are useless for indexing purposes.

NEED FOR SPECIFIC TITLES

Let us analyze a sample title: "Action of Antibiotics on Bacteria." Is it a good title? In *form* it is; it is short and carries no excess baggage (waste words). Certainly, it would not be improved by changing it to "Preliminary Observations on the Effect of Certain Antibiotics on Various Species of Bacteria." However (and this brings us to the next point), most titles that are too short are too short because they include general rather than specific terms.

We can safely assume that the study introduced by the above title did *not* test the effect of *all* antibiotics on *all* kinds of bacteria. Therefore, the title is essentially meaningless. If only one or a few antibiotics were studied, they should be individually listed in the title. If only one or a few organisms were tested, they should be individually listed in the title. If the number of antibiotics or organisms was awkwardly large for listing in the title, perhaps a group name could have been substituted. Examples of more acceptable titles are the following:

"Action of Streptomycin on *Mycobacterium tuberculosis*"

"Action of Streptomycin, Neomycin, and Tetracycline on Gram-Positive Bacteria"

"Action of Polyene Antibiotics on Plant-Pathogenic Bacteria"

"Action of Various Antifungal Antibiotics on *Candida albicans* and *Aspergillus fumigatus*"

Although these titles are more acceptable than the sample, they are not especially good because they are still too general. If the "Action of" can be defined easily, the meaning might be clearer. For example, the first title might have been phrased "Inhibition of Growth of *Mycobacterium tuberculosis* by Streptomycin."

Long ago, Leeuwenhoek used the word "animalcules," a descriptive but not very specific word. In the 1930s, Howard Raistrick published an important series of papers under the title "Studies on Bacteria." A similar paper today would have a much more specific title. If the study featured an organism, the title would give the genus and species and possibly even the strain number. If the study featured an enzyme in an organism, the title would not be anything like "Enzymes in Bacteria." It would be something like "Dihydrofolate Reductase Produced by *Bacillus subtilis*."

IMPORTANCE OF SYNTAX

In titles, be especially careful of syntax. Most of the grammatical errors in titles are due to faulty word order.

A paper was submitted to the *Journal of Bacteriology* with the title "Mechanism of Suppression of Nontransmissible Pneumonia in Mice Induced by Newcastle Disease Virus." Unless this author had somehow managed to demonstrate spontaneous generation, it must have been the pneumonia that was induced and not the mice. (The title should have read: "Mechanism of Suppression of Nontransmissible Pneumonia Induced in Mice by Newcastle Disease Virus.")

If you no longer believe that babies result from a visit by the stork, we offer this title (*Am. J. Clin. Pathol.* 52:42, 1969): "Multiple Infections among Newborns Resulting from Implantation with *Staphylococcus aureus* 502A." (Is this the "Staph of Life"?)

Another example (*Clin. Res.* 8:134, 1960): "Preliminary Canine and Clinical Evaluation of a New Antitumor Agent, Streptovitacin." When that dog gets through evaluating streptovitacin, we've got some work we'd like that dog to look over.

As a grammatical aside, please be careful when you use “using.” The word “using” might well be the most common dangling participle in scientific writing. Either there are some more smart dogs, or “using” is misused in this sentence from a recent manuscript: “Using a fiberoptic bronchoscope, dogs were immunized with sheep red blood cells.”

Dogs aren't the only smart animals. A manuscript was submitted to the *Journal of Bacteriology* under the title “Isolation of Antigens from Monkeys Using Complement-Fixation Techniques.”

Even bacteria are smart. A manuscript was submitted to the *Journal of Clinical Microbiology* under the title “Characterization of Bacteria Causing Mastitis by Gas-Liquid Chromatography.” Isn't it wonderful that bacteria can use GLC?

THE TITLE AS A LABEL

The title of a paper is a label. It normally is not a sentence. Because it is not a sentence, with the usual subject, verb, object arrangement, it is simpler than a sentence (or, at least, shorter), but the order of the words becomes even more important.

Actually, a few journals do permit a title to be a sentence. An example of such a title: “Phosphatidic Acid Is a pH Biosensor That Links Membrane Biogenesis to Metabolism” (*Science* 329:1085, 2010). One might object to such a title on two grounds. First, the verb (“Is”) is a waste word, in that it can be readily deleted without affecting comprehension. Second, inclusion of the “Is” results in a title that now seems to be a loud assertion. It has a dogmatic ring to it because we are not used to seeing authors present their results in the present tense, for reasons that are discussed in Chapter 30. Rosner (1990, p. 108) gave the name “assertive sentence title” (AST) to this kind of title and presented a number of reasons why such titles should not be used. In particular, ASTs are “improper and imprudent” because “in some cases the AST boldly states a conclusion that is then stated more tentatively in the summary or elsewhere” and “ASTs trivialize a scientific report by reducing it to a one-liner.”

The meaning and order of the words in the title are of importance to the potential reader who sees the title in the journal table of contents. But these considerations are equally important to *all* potential users of the literature, including those (probably a majority) who become aware of the paper via secondary sources. Thus, the title should be useful as a label accompanying the paper itself, and it also should be in a form suitable for the machine-indexing systems used by *Chemical Abstracts*, MEDLINE, and others. In short, the terms in the title should be those that highlight the significant content of the paper.

As an aid to readers, journals commonly print *running titles* or *running heads* at the top of each page. Often the title of the journal or book is given at the top of left-facing pages and the article or chapter title is given at the top of right-facing pages (as in this book). Usually, a short version of the title is needed because of space limitations. (The maximum character count is likely to be given in the journal's instructions to authors.) It can be wise to suggest an appropriate running title on the title page of the manuscript.

ABBREVIATIONS AND JARGON

Titles should almost never contain abbreviations, chemical formulas, proprietary (rather than generic) names, jargon, and the like. In designing the title, the author should ask: "How would I look for this kind of information in an index?" If the paper concerns an effect of hydrochloric acid, should the title include the words "hydrochloric acid" or should it contain the much shorter and readily recognizable "HCl"? The answer seems obvious. Most of us would look under "hy" in an index, not under "hc." Furthermore, if some authors used (and journal editors permitted) HCl and others used hydrochloric acid, the user of the bibliographic services might locate only part of the published literature, not noting that additional references are listed under another, abbreviated entry. Actually, the larger secondary services have computer programs that can bring together entries such as deoxyribonucleic acid, DNA, and even ADN (*acide deoxyribonucleique*). However, by far the best rule for authors (and editors) is to avoid abbreviations in titles. And the same rule should apply to proprietary names, jargon, and unusual or outdated terminology.

SERIES TITLES

Many editors are opposed to main title-subtitle arrangements and to hanging titles. The main title-subtitle (series) arrangement was quite common some years ago. (Example: "Studies on Bacteria. IV. Cell Wall of *Staphylococcus aureus*.") Today, many editors believe that it is important, especially for the reader, that each published paper "present the results of an independent, cohesive study; thus, numbered series titles are not allowed" (instructions to authors, *Journal of Bacteriology*). Series papers, in the past, have tended to relate to each other too closely, giving only bits and pieces with each contribution; thus, the reader was severely handicapped unless the whole series could be read consecutively. Furthermore, the series system is annoying to editors because of scheduling problems and delays. (What happens when IV is accepted but III is rejected or delayed in review?) Additional objections are that a series

title almost always provides considerable redundancy; the first part (before the roman numeral) is usually so general as to be useless; and the results when the secondary services spin out an index are often unintelligible. (Article titles phrased as questions also can become unintelligible, and so they probably should not be used.)

The hanging title (similar to a series title but with a colon instead of a roman numeral) is considerably better, avoiding some of the problems mentioned above. Some journals, especially in the social sciences (Hartley 2007), seem to favor hanging titles, presumably on the grounds that it is helpful to get the most important words of the title up to the front. (Example: “Global Warming Coverage in the Media: Trends in a Mexico City Newspaper”—*Science Communication* 32:143, 2010). Occasionally, hanging titles may aid the reader, but they may appear pedantic, emphasize the general term rather than a more significant term, necessitate punctuation, and scramble indexes.

Use of a straightforward title does not lessen the need for proper syntax, however, or for the proper form of each word in the title. For example, a title reading “New Color Standard for Biology” would seem to indicate the development of color specifications for use in describing plant and animal specimens. However, in the title “New Color Standard for Biologists” (*Bioscience* 27:762, 1977), the new standard might be useful for study of the taxonomy of biologists, permitting us to separate the green biologists from the blue ones.