

An open letter to authors whose native language is not English

KE E H D. A H E , , , D ,

Author's note: Since starting this department, I have been regularly asked to dedicate a column to authors who are struggling primarily because their native language is not English. This is my reply. My help and advice are "fixes" for common weaknesses that I have encountered in manuscripts submitted to GEOPHYSICS and other technical journals. I am not implying that all nonnative-English-speaking authors are inferior writers. This certainly is not the situation. Many have a superior command of English and are capable, accomplished technical and nontechnical writers.

Dear friends and colleagues:

Thank you for your many inquiries on preparing manuscripts for publication in English. I greatly admire your effort. English is not an easy language. As a youth, I was not very successful at foreign languages. As an adult I was totally unsuccessful, so I strongly empathize with your struggles.

Let's begin with some basics so that we're starting at the same point. A credible scientific or engineering study follows the scientific method point by point. "The steps in the scientific method are (1) statement of the problem; (2) hypotheses as to the cause of the problem; (3) experiments designed to test each hypothesis; (4) predicted results of the experiments; (5) observed results; and (6) conclusions from the results of the experiments" (*Zen and the Art of Motorcycle Maintenance* by Pirzig, Morrow, 1974). Similarly, a technical paper uses the scientific method as its foundation and backbone. Within the paper, each of the six items must be addressed clearly, concisely, and completely. If each is not properly discussed, the manuscript fails and will be rejected. This means that you must design your manuscript to include all six items. Note that to be effective, designing should be done before you write, not, like some authors do, while you write!

Elizabeth Whalen, discussing these matters in "Editors and the scientific method" (*The Editorial Eye*, September 1998), wrote: "Those of us who edit scientific writing soon learn that our responsibilities go beyond working with words. Scientists—especially university researchers—need and want to be published, but 'poor scientific design' is one of the most common reasons given for rejection of articles by peer-reviewed journals. If the findings don't prove anything scientifically, it really doesn't matter that the grammar and usage are perfect."

I concur with Whalen and find that the most common design flaw and the major reason manuscripts are rejected is item (1): failure to state the problem. Many authors write as if the problem is obvious and doesn't need stating. This is simply not true. Successful papers identify and explicitly state the problem. Unsuccessful ones don't. A paper may not completely solve the problem and may only give insight, but the value of the paper (i.e., the reason for doing the work) is an outgrowth of the problem addressed, not the effort extended. Without a statement of the problem, the remaining manuscript has been built on an incomplete foundation and easily becomes a series of empty statements, lacking purpose and value to the reader. Although it may be obvious to

you, be sure you define your problem for your readers. If you cannot clearly define and state the problem, then reexamine the reason for your work and reconsider publishing.

Let's now assume that you have begun designing your manuscript. Designing can be expedited by creating an outline. Many word processors have an outlining feature. If you don't already use the feature, consider learning it. Despite its great utility, many authors look down at outlining (but that's a topic for another column). Personally, I think that shunning outlining is a mistake and one reason why many authors write weak papers.

Whether you outline or not, make your design as detailed as possible . . . but don't begin writing. At this point your only task is to create a very detailed design. If you're concerned as to whether to include some aspect of your work, include it! You can always remove extraneous information later; now you need to include all your information. It is very common for authors to write a lot about work done recently, since it is fresh in the mind, and to be very sketchy and incomplete about work done in the past. This often causes problems for the reader (i.e., lack of needed information) and can bring into question two necessary features of (publishable) manuscripts: reproducibility and verifiability. Readers intending to use your findings must be able to reproduce and verify your work. Hence, you must give enough information to enable replication.

Now you have a design. I assume that you have worked and reworked your design to ensure that all the pieces are there and that your manuscript will flow logically and clearly. Good! Are you now ready to write? No! You still lack one more ingredient.

Sociologists tell us that perception or how we view things is in part based on language. Since your native language is not English, I assume that your perception of technical material may differ from scientists who speak English natively. I assume that this is especially true for languages that are very different than English. Because you are trying to publish in English, I strongly recommend a lesson in perception and technical writing in English. Said a bit differently, "If the reader is to grasp what the writer means, the writer must understand what the reader needs." This statement is from "The science of scientific writing" by Gopen and Swan (*American Scientist*, November-December 1990). This isn't as painful as it sounds, but it is a really necessary step. Many unsuccessful authors write weak or insufficient manuscripts because they fail to include what readers need from a manuscript, not because of poor science.

To further my point, consider another quotation from Gopen and Swan. "As critical scientific readers, we would like to concentrate our energy on whether the experiments prove the hypotheses. We cannot begin to do so if we are left in doubt as to what those hypotheses might be—and if we are using most of our energy to discern the structure of the prose rather than its substance . . . In real and important ways, the structure of the prose becomes the structure of the scientific argument. Improving either one will improve the other."

To give yourself a perception injection, get and read Gopen and Swan's article. I am not alone in saying that it is one of the best articles on technical writing ever written! If you can't get a copy, keep trying until you do! It is *must* reading. A warning, though—it is not short, and it is not simple. But it is extremely worthwhile! If after reading it once, you are confused, please read it again. Still confused? Read it a third, fourth, fifth . . . time, if necessary. Still confused? Get someone to help you with it. The effort is well worth it! If you read and absorb what Gopen and Swan are saying, you will be a greatly improved writer! This paper will give you a new perception and perspective on technical writing in English. If not, go read it again!

Are you *now* ready to write? Hopefully, yes. But, before you begin writing, let's discuss a few more issues, specifically, common pitfalls and their solutions.

In English, the order in which words and phrases appear within a sentence is critical. This ordering is called syntax. Poor or incorrect syntax is not a small flaw; it is a major problem that can totally obscure meaning. Remember the quotation from Gopen and Swan, "the structure of the prose becomes the structure of the scientific argument." To readers poor syntax = poor science. Poor syntax can cause a manuscript to be rejected. If the reviewers cannot understand what the author is trying to say, they are obligated to reject the manuscript.

One way to reduce problems with syntax is to keep sentences short. Shorter sentences have few words so the chances of disorder are reduced! Try to keep sentences to a maximum of 10-15 words. When sentences become long, word order becomes very important, and syntax can be a problem. Also try to avoid using sentences with many prepositional phrases. Recall that prepositions are those little words like *on, in, to, over, above, upon, behind, near, through, under, between*, etc. You certainly cannot avoid using prepositions completely, but using three to four or more in a sentence can create a complicated sentence, which is especially susceptible to syntax errors.

Another common pitfall is writing poor introductions. Many authors seem to feel that noting and discussing each of the 30-40 articles they read is necessary. It's not. With regard to the scientific method, the introduction is where you state the problem and give some background directly applicable to both the problem and your solution. It is not the platform upon which you discuss any and every study, no matter how remotely related. As you will learn from reading the Gopen and Swan article, give readers only the information needed to guide them directly from the problem to your solution. Don't give information that can misdirect your readers. If you want to write about the many articles related to your work, write a review article.

Another, and similar, problem for many authors is their failure to write an adequate conclusion. I have read many manuscripts that document six or more months of very hard work. Yet the conclusion is one short paragraph! How can that be? If you spent months working, you certainly learned more than one paragraph. If not, is there value in your effort? Spend the time and mental energy needed to write a complete and useful conclusion. Remember, the conclusion tells the value of your work and is the last section read. If you want your work remembered, write a useful, valuable conclusion.

OK, now that you have completed your (draft) manuscript, what should you do? Send it in for publication? No! Now you must edit! First, ask people who are very competent in English to read and critique your manuscript. Ask them to be direct and honest and not to worry

about damaging your friendship (i.e., don't let your friendship be damageable based on their comments). I recommend that you ask both scientists and nonscientists. Scientists can help with the scientific elements and its presentation. Nonscientists can help with the overall presentation. If in discussing comments with nonscientists you find yourself saying that they would understand something if they were a scientist, consider the following: The burden of creating an understandable manuscript is not the reader's, but the writer's. A reader's lack of understanding is a flag that your writing is below standard. It does not matter if the reader is a scientist or not. The proper response is to go back and rework the sections in question.

Well, that's about it. In a nutshell: (1) Prepare completely before you write; (2) write carefully watching out for pitfalls; and (3) ask good reviewers for help. I hope that my letter is an aid to you. I further hope that you continue to strive to improve your English technical writing.

P.S. In a previous column I listed some Web sites that may be useful to both native and nonnative-English-speaking authors. Here are a few more: