**Elaboration of "14 Steps to Writing Clearly"**

Writing clearly is a worthwhile goal for any scientist, at least any scientist who expects to be published in a major journal.

Writing well means presenting your argument and evidence in a **clear**, **logical**, and **creative** way. An interesting argument hidden in flowery prose is of no use to anyone. In particular,

* a clear presentation is essential to share the content in an easy (also for the reviewer) way
* a logical presentation comes from a sound argumentation, and is only possible if you have clear in mind the line of reasoning you are bringing your reader on, in order to convince her/him that what you are writing is worth publishing
* a creative presentation (e.g., nice acronyms, involving examples, ...) contributes to make people remembering what you have written: the success of many scientific proposals comes also from the fact that you have stimulated curiosity (the main driver for learning) and people can easily remember something of your work.

Clear writing **takes effort**. Besides requiring knowledge of basic grammar and syntax, it requires a good ear, a sense of proportion, and an ability to critique oneself.

Ultimately, anyone who wants to write clearly needs to develop a critical sense. You need to be able to judge your own writing objectively and, putting aside the brilliance of the content, honestly evaluate its ability to communicate. If your colleague can appreciate it is nice, if your mother can, it is really on the success way.

Below are a few tips useful to anyone writing for scientific journals.

By critiquing your papers with the following ideas in mind, you’ll definitely sharpen your writing and improve your odds of publication.

1. Determine what you’re trying to communicate before writing it. Figure out precisely what you want to say and what you want the reader can appreciate. This may sound obvious, but many do not bother to do it. Knowing what you want to say beforehand maximizes the odds of producing an organized, persuasive paper.

2. Think in terms of an outline. To ensure a logical flow, start by making an outline (even if it’s in your head). Please see “Eight Steps to Developing an Effective Outline”, here below.

3. Write direct sentences. Have only one idea or point per sentence. Keep sentences simple and short. Use two sentences rather than joining them with “and”.

4. Be brief. Conciseness is important in writing research papers. Learn to look for long phrases that can be shortened.

5. Organize your thoughts. Be sure that every paragraph has a clear topic sentence and that the paragraph content supports the topic. Remember, the goal is to report your findings and conclusions clearly, with as few words as necessary.

6. Substitute action verbs for "to be". "To be" is an important verb, but it weakens the text when used excessively. For example, think about changing "is a summary of" to "summarizes".

7. Be sparing with adjectives & adverbs. Try to remove unspecific modifiers such as "very," "extremely," and "highly". When you do use modifiers, make them as specific as possible. For example, try changing "a very good response" to "the expected response".

8. Be as precise as possible. Avoid phrases such as "a number of" and "a quantity of". If you can, replace these with a word such as "many," "few," or "some," or, even better, the actual number.

9. Avoid unnecessary constructions and prepositions. Phrases such as "It is clear that" and "The fact is that" are empty verbiage. Assuming you believe what you are about to say, just say it. The same is true for prepositional phrases such as "In order to" or "In an attempt to." "In order to understand this reactions, we . . . " is better said as "To understand this reaction, we. . . ."

10. Look for omissions. Did you forget an essential sentence or two in your conclusion that explains your thought processes to someone who doesn’t think about these issues every day?

11. Look for repetitions. When you see the same word used repeatedly, consider using synonyms, except when it is a technical word. In this case, it is better to keep the word to avoid possible confusion in the reader: no two words have exactly the same meaning. Although repeating a word or phrase is sometimes effective rhetorically, it can also make your sentence structure clumsy.

12. Write as you speak. Wherever possible, use words you ordinarily speak and hear. If you can't hear yourself saying it, then don't see yourself writing it.

13. Leave it alone for a while. Of course, there’s not always time, but do this whenever you can. You will be surprised how many flaws will appear in your manuscript when you put it aside for a while.

14. Edit, edit, edit.

Elaboration of "Eight Steps to Developing an Effective Outline"

originally by [San Francisco Edit](http://www.sfedit.net/) elaborated by [Andrea Bonarini](http://airwiki.ws.dei.polimi.it/index.php/User:AndreaBonarini)

Preparing an outline is the most important step in the process of producing a manuscript for publication in a journal. The outline bears roughly the same relation to the final manuscript as an architectural blueprint does to a finished house. Its purpose of an outline is to divide the writing of the entire paper into a number of smaller tasks. A good outline will organize the various topics and arguments in logical form. By ordering the topics you will identify, before writing the manuscript, any gaps that might exist. There is no single best way to prepare a scientific manuscript, except as determined by the individual writer and the circumstances. You should know your own style of writing best. Whatever you decide to do, you should follow at least these steps before beginning to write your manuscript. Remember, at this stage, you are only constructing an outline. You are not writing; you just need to put down some notes to guide your thinking.

1. Develop a central message of the manuscript. Prepare a central message sentence (20-25 words). If you were asked to summarize your paper in one sentence, what would you say? Everything in the manuscript will be written to support this central message.

2. Define the materials and methods. Briefly state the materials you used (e.g. a population, a tool, ...), and most importantly, the methods you used to carry out the study

3. Summarize the question(s) and problem(s). What was known before you started the study? What answers were needed to address the problem(s)? List the key points pertaining to the question(s) and problem(s). What did you do to answer the question(s)?

4. Define the principal findings and results. Your central message sentence probably encapsulates the most important findings. There may be others that you feel ought to be included. List these in note form. Don't worry about the order or about how many you put down.

5. Describe the conclusions and implications Make brief notes on each of the implications that arise from your study. What are the principal conclusions of your findings? What is new in your work and why does it matter? What are the limitations and the implications of your results? Are there any changes in practice, approaches or techniques that you would recommend?

6. Organize and group related ideas together List each key point separately. Key points can be arranged chronologically, by order of importance or by some other pattern. The organizing scheme should be clear and well structured. You can use a cluster map, an issue tree, numbering, or some other organizational structure. Identify the important details, describe the principal findings, and provide your analysis and conclusions that contribute to each key point.

7. Identify the references that pertain to each key point.

8. Develop the introduction Before beginning on the introduction, read through the notes you have made so far in your outline. Read them through and see whether there is a coherent and cohesive story and a unifying theme that runs through the outline. Your introduction outline should start with the main message, describe what the purpose or objective of your study was, how you went about doing the study, what you found and what are the implications of what you found.

**"Twelve Steps to Developing an Effective First Draft of your Manuscript"**

originally by [San Francisco Edit](http://www.sfedit.net/)

You should now have detailed notes you can use to write your draft paper. If you don’t have one already, it may help to prepare an outline for each section which includes a number of major headings, sub-headings and paragraphs covering different points. At this point you will need to convert your notes and outline into narrative form. Some people recommend that you begin with the Introduction and continue in order through each section of the paper to help ensure flow. Others suggest that you begin with the easiest sections, which are usually the Methods and Results, followed by the Discussion, Conclusion, Introduction, References and Title, leaving the Abstract until the end. The main thing is to begin writing and begin filling up the blank screen or piece of paper.

1. Consolidate all the information. Ensure you have everything you need to write efficiently, i.e., all data, references, drafts of tables and figures, etc.

2. Target a journal. Determine the journal to which you plan to submit your manuscript and write your manuscript according to the focus of the targeted journal. The focus may be clearly stated within the journal or may be determined by examining several recent issues of the targeted journal.

3. Start writing. When writing the first draft, the goal is to put something down on paper, so it does not matter if sentences are incomplete and the grammar incorrect, provided that the main points and ideas have been captured. Write when your energy is high, not when you are tired. Try to find a time and place where you can think and write without distractions.

4. Write quickly. Don't worry about words, spelling or punctuation at all at this stage, just ideas. Keep going. Leave gaps if necessary. Try to write quickly, to keep the flow going. Use abbreviations and leave space for words that do not come to mind immediately.

5. Write in your own voice. Expressing yourself in your own way will help you to say what you mean more precisely. It will be easier for your reader if they can “hear” your voice.

6. Write without editing. Don't try to get it right the first time. Resist the temptation to edit as you go. Otherwise, you will tend to get stuck and waste time. If you try to write and edit at the same time, you will do neither well.

7. Keep to the plan of your outline. Use the headings from your outline to focus what you want to say. If you find yourself wandering from the point, stop and move on to the next topic in the outline.

8. Write the paper in parts. Don't attempt to write the whole manuscript at once, instead, treat each section as a mini essay. Look at your notes, think about the goal of that particular section and what you want to accomplish and say.

9. Put the first draft aside. Put aside your first draft for at least one day. The idea of waiting a day or more is to allow you to "be" another person. It is difficult to proofread and edit your own work; a day or more between creation and critique helps.

10. Revise it. Revise it and be prepared to do this several times until you feel it is not possible to improve it further. The objective is to look at your work not as its author, but as a respectful but stern critic. Does each sentence make sense? In your longer sentences, can you keep track of the subject at hand? Do your longer paragraphs follow a single idea, or can they be broken into smaller paragraphs? These are some of the questions you should ask yourself.

11. Revise for clarity and brevity. Revise sentences and paragraphs with special attention to clearness. For maximum readability, most sentences should be about 15- 20 words. For a scientific article, paragraphs of about 150 words in length are considered optimal. Avoid using unnecessary words.

12. Be consistent. Often a manuscript has more than one author and therefore the writing may be shared. However, the style needs to be consistent throughout. The first author must go through the entire manuscript and make any necessary editorial changes before submitting the manuscript to the journal.