

Annexes

Annexe 1

Les 10 commandements de la rédaction d'un article de recherche

1. Tu choisiras une revue adaptée aux thématiques de ta découverte.
2. Tu appliqueras les instructions aux auteurs à la lettre.
3. Tu focaliseras ton article sur un seul point nouveau.
4. Tu dessineras une figure parfaite montrant l'innovation majeure avant de rédiger l'article.
5. Tu expliqueras la nouveauté dans le résumé, les discussions et la conclusion.
6. Tu supprimeras les observations non expliquées et les résultats trop éloignés.
7. Tu distingueras bien tes résultats de ceux de la littérature.
8. Tu introduiras une bonne dose d'éducation et de vulgarisation.
9. Tu reliras et feras relire ton manuscrit au moins cinq fois avant de le soumettre.
10. Tu livreras un manuscrit en anglais parfait.

Le non respect de ces conseils entraîne des pertes de temps pour la dizaine de personnes de la chaîne éditoriale. C'est pourquoi la plupart des éditeurs en chef des bonnes revues déclinent d'emblée les articles non conformes.

Annexe 2

Les étapes de rédaction d'un article de recherche

1. Avant l'expérience, le chercheur rédigera le contexte, les enjeux, le manque de connaissance et l'hypothèse de travail.
2. Pendant l'expérience, le chercheur notera soigneusement non seulement les résultats prévus mais aussi toute observation secondaire.
3. Après l'expérience, le chercheur identifiera un seul point fort, représentant une avancée notable vis-à-vis des connaissances existantes par analyse et confrontation de ses résultats. Il sélectionnera un résultat innovant et deux résultats d'appui parmi l'ensemble des résultats de son expérience.
4. Le chercheur dessinera une figure claire démontrant le point fort de l'article.
5. Il rédigera un micro-article pour cristalliser les points essentiels autour desquels seront élaborés les sections de l'article définitif.
6. Il choisira une revue adaptée à son sujet et lira ses thématiques spécifiques et ses instructions aux auteurs avec la plus grande attention.
7. Il commencera la rédaction de l'article par la section expérimentale en ne décrivant que les expériences qui livrent le résultat innovant. Puis, il rédigera la section Résultats et discussion dont les conclusions partielles seront rassemblées en fin de résumé et dans la conclusion finale. Il rédigera ensuite l'introduction qui sera synthétisée au début du résumé. Il complètera alors les autres sections de l'article.
10. L'article sera, ensuite, relu et corrigé au moins cinq fois par l'auteur ainsi que par des personnes externes pour identifier les ambiguïtés d'écriture et les défauts de compréhension, d'éducation et de vulgarisation.

11. L'auteur soumettra son article accompagné d'un message expliquant clairement les enjeux de l'étude et l'innovation du résultat majeur en prenant appui sur les connaissances existantes.

Annexe 3

How to write consistently boring scientific literature *



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Although scientists typically insist that their research is very exciting and adventurous when they talk to laymen and prospective students, the allure of this enthusiasm is too often lost in the predictable, stilted structure and language of their scientific publications. I present here, a top-10 list of recommendations for how to write consistently boring scientific publications. I then discuss why we should and how we could make these contributions more accessible and exciting.

“Hell – is sitting on a hot stone reading your own scientific publications”

Erik Ursin, fish biologist

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Turn a gifted writer into a dull scientist

A Scandinavian professor has told me an interesting story. The first English manuscript prepared by one of his PhD students had been written in a personal style, slightly verbose but with a humoristic tone and thoughtful side-tracks. There was absolutely no chance, however, that it would meet the strict demands of brevity, clarity and impersonality of a standard article. With great difficulty, this student eventually learned the standard style of producing technical, boring and impersonal scientific writing, thus enabling him to write and defend his thesis successfully (fig. 1).



Fig. 1 – “Congratulations, you are now capable of writing technical, impersonal and boring papers like myself and the other gentlemen – welcome to Academia”. Drawing by Sverre Stein Nielsen.

Why are scientific publications boring?

I recalled the irony in this story from many discussions with colleagues, who have been forced to restrict their humor, satire and wisdom to the tyranny of jargon and impersonal style that dominates scientific writing.

Personally, I have felt it increasingly difficult to consume the steeply growing number of hardly digestible original articles. It has been a great relief from time to time to read and write essays and books instead.

Because science ought to be fun and attractive, particularly when many months of hard work with grant applications, data collections and calculations are over and everything is ready for publishing the wonderful results, it is most unfortunate that the final reading and writing phases are so tiresome.

I have therefore tried to identify what characteristics make so much of our scientific writing unbearably boring, and I have come up with a top-10 list of recommendations for producing consistently boring scientific writing (Table 1).

Table 1 - Top-10 list of recommendations for writing consistently boring publications.

- Avoid focus
- Avoid originality and personality
- Write l o n g contributions
- Remove implications and speculations
- Leave out illustrations
- Omit necessary steps of reasoning
- Use many abbreviations and terms
- Suppress humor and flowery language
- Degrade biology to statistics
- Quote numerous papers for trivial statements

Ten recommendations for boring scientific writing

1. Avoid focus

“There are many exceptions in ecology. The author has summarized them in four books”

Jens Borum, ecologist

Introducing a multitude of questions, ideas and possible relationships and avoiding the formulation of clear hypotheses is a really clever and evasive trick. This tactic insures that the reader will have no clue about the aims and the direction of the author’s thoughts and it can successfully hide his lack of original ideas.

If an author really wants to make sure that the reader loses interest, I recommend that he/she does not introduce the ideas and main findings straightaway, but instead hide them at the end of a lengthy narrative. The technique can be refined by putting the same emphasis on what is unimportant or marginally important as on what is really important to make certain that the writing creates the proper hypnotic effect which will put the reader to sleep.

2. Avoid originality and personality

“It has been shown numerous times that seagrasses are very important to coastal productivity (Abe 1960, Bebe 1970). It was decided to examine whether this was also the case in Atlantis”

Fictive Cebe

Publications reporting experiments and observations that have been made 100 times before with the same result are really mind-numbing, particularly when no original ideas are being tested. Comparative science requires that particular measurements be repeated under different environmental and experimental conditions to reveal patterns and mechanisms. Therefore, results should be writ-

ten in a way that does not explain the experimental conditions. This will insure that repetitious experiments remain uninteresting and no synthetic insight can be generated.

I also recommend that these studies be reported with no sense of excitement or enthusiasm. Nowhere in the approach, analysis and writing should there be any mention of the personal reflections leading to this intensive study that robbed five years of the author's youth. This is beyond boring; it is truly sad.

3. Write long contributions

“A doctoral thesis is 300 pages reporting something really important and well reasoned-out – or 600 pages”

Erik Ursin, fish biologist

One should always avoid being inspired by short papers, even if they are written by famous Nobel laureates and are published in prestigious journals like *Science* and *Nature*. One should insist that the great concepts and discoveries in science can not be described in relatively few words.

Scientists know that long papers display one's great scientific wisdom and deep insight. A short paper should, therefore, be massively expanded from its original two pages to its final 16-page layout by including more and more details and mental drivel.

4. Remove most implications and every speculation

“It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material”

James Watson and Francis Crick (1953)

This famous closing sentence suggested a perfect copying mechanism for DNA. Had the implication of their DNA model not been included, Watson and Crick could have prevented its rapid acceptance.

In many other instances, reluctance to state the obvious implications of important findings has successfully delayed their recognition. This has generated room for repeated rediscoveries and insured that the person finally being honored was often not the original discoverer.

Thus, enjoyable speculations on possible relationships and mechanisms and presentation of interesting parallels to neighboring research areas should be dismissed from the paper's discussion. This will stifle the creative thought process and prevent the opening of new avenues for research, thereby securing the research field for that author alone, while retaining the paper's necessary boring tone.

5. Leave out illustrations, particularly good ones

Examiner: "What can't you identify on this microscope picture of a cell lying in front of you"? Resigned student: "A tram car"

Jens Borum, former student

Poetry stimulates our imagination and generates pictures for the inner eye. Scientific writing, on the other hand, should not be imaginative, and the immediate visual understanding should be prevented by leaving out illustrations.

Scientific papers and books can be made impressively dull by including few and only bad illustration in an otherwise good text. Because illustrations, which are fundamentally engaging and beautiful, can often portray very complex ideas in forms that are easy to visualize but impossible to explain in thousands of words (Fig. 2), boring science writing should not use them.

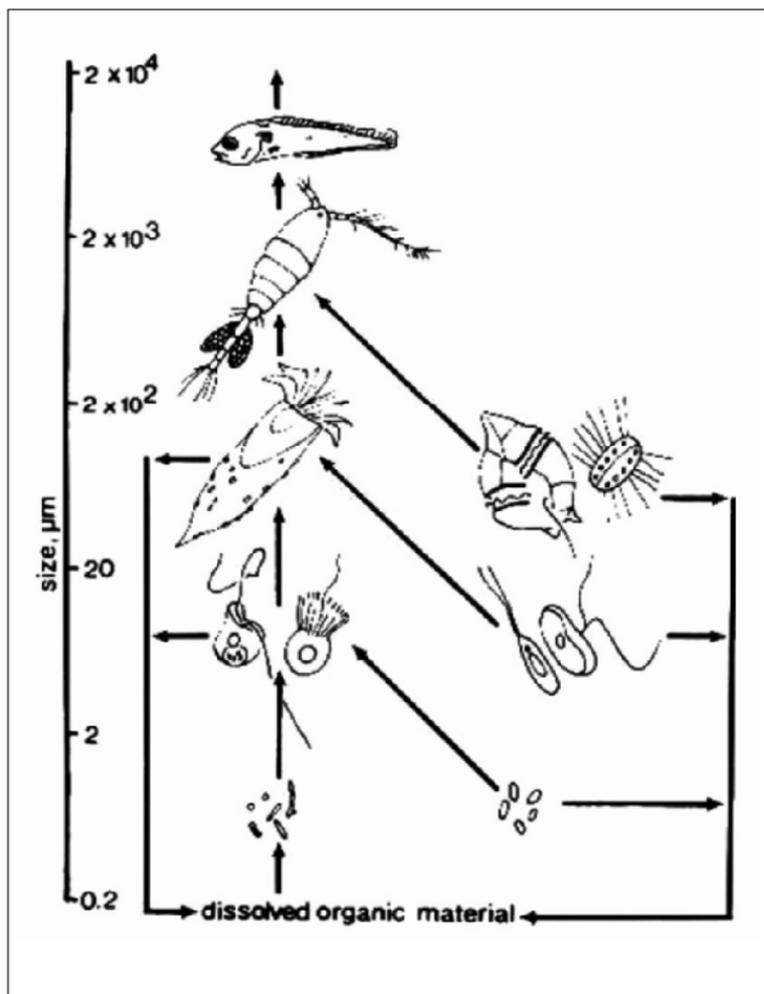


Fig.2 – A drawing can say more than a thousand words; the marine plankton food web – including the microbial loop. After Fenchel (1998).

6. Omit necessary steps of reasoning

“I once knew a man from New Zealand who did not have a single tooth left in his mouth. Nonetheless, I have never met anyone like him that could play the drums”

Freely after Mark Twain, journalist

Sentences that are needed in an ordinary text to gradually unfold the necessary steps of reasoning and insure the logic of an argument should be omitted in the scientific writings by members of the chosen clerisy of a particular science discipline.

If restricted reasoning is practiced in textbooks, the authors are content to educate only a very small but elite group of students who may guess the meaning of these words, while the majority of readers will be lost. The style will also effectively prevent communication with ordinary people – a process which is far too time-consuming.

7. Use many abbreviations and technical terms

“When I started my geology studies in 1962 what we learned above the level of minerals and fossils was absolutely nonsense. The poor teachers did not understand what they were lecturing, but hid their ignorance behind an enormous terminology. All this changed with the theory of plate tectonics”

Finn Surlyk, geologist (2006)

Scientists train for many years to master a plethora of technical words, abbreviations and acronyms and a very complex terminology which make up the “secret language” of their specialized scientific discipline. I recommend this approach for all scientific writing, because it tends to enhance the author’s apparent wisdom and hide his/her lack of understanding. The approach makes the field of study inaccessible to outsiders who are unfamiliar with the termino-

logy. After all, since we went through all the trouble to learn this “secret language”, we must make sure that the next generations of students suffer as well.

This practice will also prevent breakthroughs and interdisciplinary understanding without a massive investment in cooperative translations between jargon-ridden scientific disciplines. It must remain mentally overwhelming for readers to cross the borders between disciplines on their own.

8. Suppress humor and flowery language

“We found a new species of ciliate during a marine field course in Rønberg and named it Cafeteria roenbergensis because of its voracious and indiscriminate appetite after many dinner discussions in the local cafeteria”

Tom Fenchel, marine biologist

Naming a new species *Cafeteria*, or for that matter calling a delicate, transparent medusa *Lizzia blondina*, shows lack of respect and will prevent us from ever forgetting the names. I highly discourage creating these kinds of clever names, because science writing should remain a puritanical, serious and reputable business.

Fortunately, scientists that do not have English as their mother tongue are reluctant to use this wordy language of science to write funny and/or natural flowery narratives. Furthermore, many Englishmen who enjoy this precise and flexible language as their native tongue also regard it as bad taste to use fully in their professional writing the language’s potential for poetic imagery and play-on-words humor.

9. Degrade species and biology to statistical elements

A very special beech forest, located 120 km away, houses numerous rare plant species. There is no reason to make a fuss about this particular forest because the number of common species in a nearby forest is not significantly different.

Our scientific writing in biology should reduce all species to numbers and statistical elements without considering any interesting biological aspects of adaptation, behavior and evolution. The primary goal of ecological study should be the statistical testing of different models. This is especially true because, on further examination, these models are often indistinguishable from each other, and many have no biological meaning. Hence, writing about them will inevitably produce dry, humorless, uninspired text.

10. Quote numerous papers for self-evident statements

When all else is lost, and one's scientific paper is beginning to make too much sense, read too clearly, and display too much insight and enthusiasm, I have one last recommendation that can help the author to maintain the essential boring tone. My advice is to make sure that all written statements, even trivial ones, must be supported by one or more references. It does not matter that these statements are self-evident or that they comply with well-established knowledge, add a reference, or preferable 3-5, anyhow.

Excessive quotation can be developed to perfection such that the meaning of whole paragraphs is veiled in the limited space between references. This technique maintains the boring quality of scientific publications by slowing down the reader, hiding any interesting information, and taking up valuable space. When authors are unsure of which paper to cite, they should always resort to citing their own work regardless of its relevance.

Alternative writing style and variable outlets

There are movements among scientists and editors which are in direct opposition to the disgraceful advices in Table 1. They have the alternative goal of producing exciting and attractive publications for a wider audience.

Many journals do in fact insist that articles must be original, focused, brief and well motivated, and that technical terms and concepts are fully explained. Very few journals and editors, however, endorse the idea that flowery language and poetic description promote readability or that thoughtful speculations advance the science.

While the original article continues to be the most standardized and efficient (albeit puritanical) outlet of all science contributions, books can, in contrast, provide an alternative venue that encourages personal and entertaining styles of scientific writing that may include humor, poetry and speculations. For example, zoologist Steven Vogel (1994) has combined humor and clear explanations in his books on the application of fluid dynamics to biology. Other exceptional books have played a similar catalytic role in the education of new generations of students and the development of ecology (Warming 1896, Odum 1971).

Over ten years, ecologist John Lawton's (1990-1999) informal essays entertained numerous readers. The basic idea of essays is that they should have few restrictions to their form, but be brief, personal and humoristic. Essays have the additional advantage that they can treat important aspects of scientific activity in the fields between science and politics, science and culture, science and ethics and, the renewed battle field, science and religion. These topics are not normally covered by articles, reviews and textbooks.

Journals should encourage discussion and debate of timely issues and synthesis of ideas within and across disciplines by combing reviews, synthesis, short communication of viewpoints, reflections and informed speculations (Lundberg 2006). In an atmosphere of increasing competition among educations and scientific disciplines,

I argue here that we desperately need more accessible and readable scientific contributions to attract bright new scientists and produce integrated understanding.

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