Popular science writing[1]

The text below is a translation of the chapter on popular science writing in Susanne Pelger's book about science writing, *Kommunikation för naturvetare* (Lund: Studentlitteratur, 2007). The text was translated by the author and is reproduced on the AWELU platform by kind permission of Studentlitteratur.

As an academic, there will be times when you need to explain your subject matter to a non-specialist audience. If you are working in industry, you may have to keep the company board and the investors informed about your research results. Working in the public sector means that you are likely to communicate to the general public. And, as a scientist, you are sometimes expected to write about your research in the lay press.

Catch the reader

The most crucial thing to remember when writing popular science is that the intended reader is not an expert. Think of the reader as a person with a good all-round education, but with no specialised knowledge and no exceptional passion for the discipline. That means readers have to find your article appealing to start reading. The next challenge for you is to maintain their interest until the very end.

The first thing to do is to find an attractive and catchy title. Compared with the title of a scientific paper, the popular title should be kept short. You are allowed to simplify as well as to generalise, and you do not have to provide all the details in the title. For example, you may well write *mite* instead of *two-spotted spider mite*.

The most interesting part should be presented at the beginning of the article, and not held back until the final sentence. Otherwise the reader may give up. A good idea is to let a *lead paragraph* follow after the title; a few lines acting as a teaser. There you can highlight the key message, and give the reader a hint of what will follow in the article.

The aim of a particular project may not always be obvious to a non-specialist. Help the reader by putting your own piece of work into a larger context. A broadened perspective on the subject will make it easier to understand the point of your study.

Also help your readers understand what your results mean. Explain what makes them interesting and how they might be used. Details about methods are less relevant – the reader will probably not try to repeat your experiments anyway.

It might be tempting to tell the reader that your study or your results are interesting. Of course, this is the opinion to be expected from every author, which makes such a statement completely unnecessary. Instead of writing "This is an interesting result" your article should show what makes the result interesting.

The disposition of a popular science article differs from that of a traditional scientific paper, at least in the hard sciences where the various sections, presenting the introduction, material and methods, results and discussion, are separated from each other. In the popular science article, the various parts are integrated instead, and you, as the author, is the one to choose the best way to communicate your message. It is your task to make the contents of the article understandable as well as interesting to a layperson.

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[1] Taken from http://awelu.srv.lu.se/genres-and-text-types/writing-in-academic-genres/popular-science-writing/

Stylistic devices

A common way to make a science subject more lively is to tell a story about the people involved. The researchers' lives and work can help the reader to understand the circumstances that led to a certain discovery, as well as the significance and consequences of the findings. Some other stylistic devices and rhetorical devices commonly used in popular science will follow.

Concrete example

One of the most common stylistic devices is the *concrete example*, in which a specific example is pointed out to illustrate a more general phenomenon. Starting with something concrete, you can then go on to argue your claims at a more general and abstract level. The evolution of the eye can, for instance, serve as an example to explain Darwin's theory of evolution.

Metaphor

Another rhetorical device that is often used in popular science is the *metaphor* or *analogy*. It relates to something ordinary that is already familiar to the reader. Drawing a parallel to well-known matters, the metaphor makes new concepts easier to grasp.

(1) Rain forests are the lungs of the Earth.

(2) Cyanobacteria work like hydrogen factories.

Thought experiment

You can also let the reader perform a *thought experiment* where different premises are given. Then you can speculate freely without bothering about actual limitations.

(3) Imagine there is no oxygen in the atmosphere …

(4) If we could travel through time …

Narration and fictitious conversation

If you want to go even further to find an evocative way of explaining complicated matter, you can tell a fictitious story, a narration. In its oldest form, this type of story was built on a fictional conversation to illustrate a phenomenon. This form of popular science rhetoric dates back at least to 400 BC when Plato's *Dialogues* were written.

Dialogue

Another kind of *dialogue* is when the author addresses the reader to comment on her own writing strategy. In this way, you can make the reader feel more involved and active as a receiver.

(5) By now, you have probably discovered that there is a fourth alternative...

(6) Here, I will in turn go through ...

Personification

To make your article more interesting and vivid, you can allow abstract phenomena to acquire human traits, so called *personification*.

(7) Cancer cells are put on a diet.

(8) This article will discuss ...

The title

A popular science title should also attract non-specialist readers. Avoid words like investigation and study. It is obvious that the results were obtained that way. Avoid technical terms as well. Usually they repel more than they attract, though there are exceptions. Combining difficult terms with easy ones may sometimes make the reader curious:

(9) Protoporphyrin–the pigment of life

Below, you will find some more examples of rhetorical devices that are particularly useful when writing a title.

Metaphor

The metaphor may well be part of the title:

(10) Membrane proteins–Saint Peter of the cells

(11) Superantigens make the immune system lash out

Quotations and proverbs

Well-known quotations and proverbs express something that we all recognise as true. They can therefore create a link to concepts already familiar to the reader:

(12) Indeed you can see the wood for the trees!

(13) Birds of a feather - do they always flock together?

(14) And God said: Let there be light - preferably modulated light.

Allusion

An allusion is a phrase that makes reference to a common cultural background, e.g. a passage from the Bible or other literary works familiar to the reader:

(15) En eye for an eye, a gene for a gene

(16) To flee, or not to flee–that is the question of the newt

Rhyme and alliteration

The sound techniques of rhyme and alliteration can help you to create emphasis. The rhyme repeats similar sounds at the end of words, whereas the alliteration repeats the beginning:

(17) Genetics and gene-ethics

(18) Callous carnivores compete crazily

Question

You can also arouse the reader's curiosity by posing a question in the title of your article.

(19) Can you control the genes or do the genes control you?

(20) What has 24 eyes but no brain?

The latter, which has the character of a riddle, could also be classified as an allusion.

Threat and danger

Yet another strategy could be to send a message that makes the reader feel worried:

(21) Toxic algae invade our lakes

(22) Soon the antibiotics may not help you

The recipient might then read your article hoping to learn how to avoid danger.

There are stylistic devices that are less suitable for use in popular science. Any ambiguity, irony and sarcasm could be misconceived, especially in the written text, so it may be wise to avoid them.

Winding up nicely

Just as important as the beginning of your article is the end. An article with no clear conclusion might pass unnoticed. Some kind of punch line is thus needed to wind the article up nicely, preferably one that reflects the introduction.

A good way to conclude could be to look ahead and tell the reader what issues remain to be answered. You can also speculate on the implications that your findings might have. Or you can state what you have learned and what experience you have gained yourself.

Are technical terms allowed?

When writing for a wider audience, we must remember that the reader may not be familiar with all the concepts and terms that we mention. The meaning of *concept* is the internal image that we have of a phenomenon, whereas *term* means the word that refers to a particular concept.

Although technical terms are not banned in popular science they should not be overused. All too many unfamiliar words might make the reader lose interest and stop reading. Hence, choose only the most central terms, and consider whether they need to be explained and illustrated.

A strategic move may also be not to introduce the unfamiliar terms at the very beginning of your article. Also avoid using various terms to refer to the same concept (e.g. use only the term *protein*, rather than both *protein* and *albumin*). In popular science, concepts may well be simplified. Instead of *alcaliphilic cyanobacteria*, the more general term *bacteria* (or maybe *cyanobacteria*) might be preferable.

A good term should be

- unambiguous
- self-explanatory
- adapted to the language used
- precise and not misleading
- preferably short

(Teknologicentrum TNC. (2004). *Fackspråk eller fikonspråk? Om naturvetares språk*. Stockholm)

Some concluding advice

- Make sure that the contents and language of the popular article are suited to a wider circle of readers. Think of the reader as a person with a good all-round education, who is not an expert in your field.

- Make the title short and catchy.

- Begin with a general introduction where you give some background information about your project. This will help the reader understand the idea of your work.

- Describe the methods and techniques only briefly. If the objective of the study is to test or develop a method, make it clear to the reader what purpose the method can be used for.

- When describing your results, focus on what they mean and how they can be applied.

- Write an article that is easy to understand and enjoyable to read. Use as few technical terms as possible, and avoid excessively long sentences with many subordinate clauses.

- Ask a friend (who is not an expert in your field) to read and give honest comments on the first draft. Also ask your friend to correct the language. Rewrite and ask for new comments.