

Six communication rules for scientific presentations and writing



Christian Kressmann¹ and Stefan Lang²

¹ Kressmann-Coaching, Berlin, Germany

² Scientific-Medical-Writing, Marloffstein, Germany

Correspondence to:

Stefan Lang
Ringstraße 7
D-91080 Marloffstein, Germany
+49 (0) 9131 6103 623
info@scientific-medical-writing.de

Abstract

In our daily work as coaches and writing trainers, we often work with young scientists who are at the beginning of their careers. When they want to publish their first scientific research paper or when they decide to give their first lecture at an international congress, they perceive these challenges as hurdles that need to be overcome separately. They might think that each of these tasks, writing and presenting, has its own rules and requirements that need to be learned and internalised. In our consulting practice, however, we often feel that the same principles apply to both scientific writing and presenting. Therefore, we have defined the following six communication rules.

1. Winning the start with the first impression

With a successful start, you win the audience over to your side. With a bad entry, you might scare them away. It is just like a dating situation: the first impression influences whether you will get a chance to make a second impression. The introduction determines the way in which people will experience your text or talk. It influences whether your listeners and readers expect an interesting or a boring story.

A successful introduction always piques the readers' and listeners' curiosity and their desire for more. Hence, you should not begin your text or talk with commonplace information that medical students have already learnt during their first term – for example, “Parkinson’s disease is a chronic and progressive neurodegenerative disease.” It is more appropriate to emphasise the focus and significance of your specific research project – for example, “Heterozygous glucocerebrosidase mutations have emerged as the leading genetic risk factor for Parkinson’s disease.”

In a lecture, this content level is augmented by the personal level: Only those who are enthusiastic and motivated when entering the stage can inspire and motivate their audience. How does one get to be enthusiastic and motivating? A piece of advice that might initially appear ridiculous is to smile. According to the facial feedback hypothesis, smiling for one

minute can enhance your mood demonstrably.¹

² Another and perhaps more sustainable method is to focus your mind on the following questions:

- What inspires me – in general and in my research?
- What is the benefit of my work?
- What does it make possible, easier, or better?

These questions help you to focus on the positive aspects of your work. In addition, the third question might lead to an interesting opening to your lecture or text.

2. Keep the story simple

Both presentations and research papers must not be overloaded with details or aspects that contribute nothing to the story of your project. The easier and more straightforward your data are explained, the more inviting your story will be to the audience. On the contrary, if a presentation or text is too complicated and difficult to understand, the listener or reader will intuitively suspect methodical weakness and poor data.

In typical lines of reasoning in both scientific writing and presentations, a question leads to an answer or a problem leads to its solution. Especially in a lecture, things should be explained as simply as possible ($x = 2$ instead of $2x = 4$) as the listener, in contrast to the reader, cannot page back. Once the connection between speaker and audience is lost, it is difficult for your audience to

keep up with the presentation. Therefore, you should deliberately use the stylistic means of repetition, because key words and key phrases help the listener to keep on track. It might be additionally useful when things are illuminated from different angles because two different perspectives create multidimensionality.

3. Structuring

Structuring and outlining is essential when you prepare the storyboard of your text or presentation. IMRAD is the most common macrostructure for scientific articles and presentations (Introduction, Methods, Results, and Discussion). SCORE³ is another method for scientific presentations: Symptoms: What is the problem? Cause: What is its cause? Outcome: What is my goal? Resource: How do I solve the problem? Effect: What is possible now? Both macrostructures lead the reader and listener through the story of a scientific text or presentation in a logical way.

In addition to the macrostructure of texts and presentations, there is a microstructure equally important for comprehension and convincibility for both texts and presentations. This microstructure refers to both paragraphs and presentation slides. It starts with the topic providing an overview of the details that follow, then presents the details supporting the topic, and ends with an optional summary or concluding remark. In both scientific writing and presentations, the topic might be a message or question. Details are then presented in supporting sentences, bullet points, or figures. At the end of the paragraph or presentation slide, the information may be summarised in simple words to move from one paragraph or slide to the next. Another principle that applies equally to both texts and talks is that each paragraph and slide must be limited to one single major point or idea. Any deviation from this principle would mislead the reader or listener and ruin your main point.

4. Keeping the audience's attention

Your audience is like a tender plant that needs to be sheltered and maintained by, for example, simple linguistic means. Thus, authors and speakers should avoid the passive voice, excessive nominalisations, and negative expressions.

In contrast, they should write and speak in the active voice and use lively verbs. A pause can also stimulate the tension and alertness of the audience. This pause can be a moment of silence during your talk or a dash in your text.

Another tool to grab the attention of the audience is images. These are not only real pictures such as illustrations and tables, which are known to tell more than a thousand words, but also linguistic images. If you think that these metaphors are a taboo for scientists, you are wrong. Think of the “lock and key” complementarity of antigen-antibody reactions, the sugar-phosphate “backbone” of DNA, and the so-called “housekeeping” genes. These metaphors have long been a part of the scientific language – many of them are even more effective in communication than a stylish and fancy presentation slide.

In a lecture, emotions can additionally capture attention – by inspiring, amusing, or surprising. Why not present the story of your project like a movie? Was it a drama? Did you feel lost, like in *Cast Away*? Alternatively, was it an action movie, like *Outbreak*? Only those who are emotionally involved can take their audience on a long journey.

To illustrate this journey during your talk, do not be too static and do not stick to the lectern. Just take a few steps towards the audience, then perhaps to the left, to the right, and finally back to the lectern – but stay authentic. It helps to place the flip chart at the opposite end of the stage or to use your hands instead of the laser pointer to indicate the points of interest on your slide.

5. Check the tech

Familiarise yourself with the technical requirements before you start your lecture or your writing project. It is annoying to have to postpone your talk because the data source, laser pointer, microphone, or whiteboard marker does not work. It is equally annoying when the submission of your manuscript is delayed because the software does not do what it is supposed to do.

6. Practice, practice, practice

One day you wake up and overnight you have become a gifted speaker or talented writer – that

is not likely to happen. Both presenting and writing need to be trained and practised constantly – not only when the writing project or the lecture is imminent. Regular training, such as the writing of protocols and laboratory notebooks as well as regular presentations in front of your colleagues, will improve your skills and enhance your self-confidence. Additionally, the feedback from friends and colleagues or by means of a video recording will help.

If scientific writing and presenting were sports, these six communication principles presented here would certainly be part of the training. So, stay tuned; it is worth it.

Conflicts of interest

The authors declare no conflicts of interest.

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Author information

Stefan Lang is a scientific and medical writer. He offers scientific and medical writing services as well as training in scientific communication. He holds a PhD in molecular biology. In 2016, he published “Das Paper-Protokoll”, a straightforward guide to biomedical writing (available in German; ISBN Paperback: 978-3-7345-4167-4).

Christian Kressmann is a coach and Germany's youngest certified NLP Instructor by the DVNLP e.V. He offers coaching services to scientists and personnel development workshops to high-tech companies. He studied chemistry and physics at Humboldt University in Berlin. Find out more about him at www.kressmann-coaching.com.