Doing Science: Writing conference abstracts

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Doing Science: Writing conference abstracts

Statement of Interest
None declared.

In this edition of Doing Science, we will address abstract writing, with a focus on conference abstracts.

By providing an opportunity for discussing your work with your peers in specialised meetings, writing and submitting an abstract is often the very first step when you want to show the world the results of your work; be it your research, a clinical case or a review of the literature [1]. However, it can be be a daunting task to condense hours and hours of hard work into abstract format. But fear not! This edition of Doing Science will give you several approaches to writing abstracts, using your own data as well as that of others.

Before we begin, a key message: always remember that writing an abstract follows typically the same path as writing a paper [2]. Begin by planning it, before actually writing it, proofreading it, sharing it with colleagues and finally doing the final revision and editing before you submit. In most cases, the keys to success are an important research question and interesting material to analyse in the hope of answering it. That being said, good abstract writing skills will increase your acceptance rate even for data of moderate importance, or seemingly complicated research ideas. So let's begin...

The function of a typical scientific meeting abstract

As every researcher knows, the function of a scientific abstract is to provide an overview of your work. But keep in mind that the abstract is what the referees will use to decide whether your work is accepted or rejected for presentation on the meeting. Also, have you remembered that the abstract is the only part of a paper that is published in conference proceedings [3]? Many researchers will even acknowledge that when they scroll through a conference programme, they look only at the titles of the abstracts. If a title seems interesting, they glance through the abstract. Thus, for the majority of readers, a paper does not exist beyond its abstract. When you're writing your abstract, then, keep in mind two very important things: 1) the abstract should show that you have something to say (the data you want to present); and 2) the abstract should attract readers to attend your presentation – it is your only chance to reach most of the delegates.

Writing a typical abstract

A typical scientific abstract (both for papers and for meetings) contains four basic parts

Table 1 *The parts of an abstract*

Title Short, descriptive and interesting
Background (optional) • What is already known about the subject of your work? • What is not known about the subject? In most cases, the background can be framed in just a few sentences, with each sentence describing a different aspect of information
Objective/Question/Hypothesis State either a question or a hypothesis, or describe your specific research objective to clearly state the purpose of your work.
Methods • Describe the subject(s) you studied (molecules, cell lines, tissues, organs, animal or human population). • State the experimental approach or the study design, including your variables. The methods section should contain enough information to enable the reader to understand what was done, and how. But, take care to mention only important details of materials and methods.
Results Include only results that answer your question, and only the most important data, in a logical order! Data in an abstract can be presented as a table or graph. The only difference from a graphical presentation in a paper is that in abstracts no title is given for tables (usually) and no legends are included for graphs. Place the table or graph after the sentence that states the results, not instead of the results sentence.
Conclusions • What is the primary take home message/answer to your question? • Additional findings of importance (other than the primary outcome) are optional. It is customary, but not essential, to express an opinion about the implications of your findings. Try to place your findings in perspective.

[4]. It describes the objectives of the study (*i.e.* what hypothesis you tested or what question you attempted to answer); the methods used; the major results; and your interpretation. Additionally, your abstract may begin with some very brief background information to help the reader understand the question, and may end with a sentence stating implications or a recommendation based on the answer. Since the abstract must make sense on its own, your abstract should not include citations of the scientific literature. Table 1 explains the parts of the abstract in more detail

Alternative approaches

Each author conceptualises writing in their own way. The previous section took an approach centred on the final product; however, some writers may prefer to think about how this end-product comes about: the writing process [5]. The abstracts from a ''product''-focused writer and a ''process''-focused writer may well look the same, but they are conceived and crafted differently. Regardless of your personal preferences, trying out different styles of writing is challenging and stimulating.

Working around a graphic support such as a flow chart or mind map (fig. 1) is perhaps the most common way to aid the writing process. A flow chart can be used to illustrate the hierarchy of your ideas or key findings, or to display how to move from (for instance) your key findings to conclusions in a fluent and intuitive way.

Another method that has gained popularity in recent years is to first identify key sentences, and then build the abstract around them. Once you have your research ideas and data analysis settled, write the sentences below [6]. (See table 2 for some examples.)

1. Summarise your findings in one 10–14-word sentence that contains one verb, is not a title and is not a question [7]. If you find this hard, your results may be too diverse or your research question too broad.
2. Answer the question ''What's the topic?'' in one sentence. You can assume that your readers know the field and thus move straight into your specific topic.
3. State your key research question. This is the single most important point for the rest of your writing. An obscure or very complicated research question is a warning sign in any part of research.
4. Summarise why you think your research question has not been adequately answered in previous research.
5. Describe how you addressed your research question. This may be both a new idea and the methods used may be novel. If a chain of methods was used, focus on the key steps. Methodological details are matters for a scientific presentation, not the abstract.
6. In one sentence, summarise the key findings of your research.
7. Conclude the impact of your research. This is sometimes not always easy in basic science, but should be attempted by any serious researcher.

In some cases, by the time you have written sentences 2–7 above, you will have something that approximates to a complete

abstract. Commonly, however, you will need to explicitly state your aim (which is often more narrow than 3. above), and give some concrete data to bolster 6. Either way, having clearly stated the sentences 1–7 above will have facilitated your thought process.

Writing a non-typical abstract: review or editorial

Although not as often requested, you may occasionally be asked to prepare a more general abstract about a specific topic within your field. Covering a whole field rather than your own work only might appear difficult at first [9]. Writing a non-typical abstract will require more preparation, for one thing: you will need to familiarise yourself thoroughly with the most recent and important work on the given topic. Most likely, however, you are already acquainted with much of that work anyway because this is the reason why you were asked to write a review abstract in the first place! So consider it an honour and privilege and use this opportunity to also refresh and update your knowledge. Writing a review abstract is also an excellent chance to incorporate your own work and statements into those of the hotshots within the field. But how?

1. As a start, clearly and concisely phrase the topic of the abstract for yourself so that you know exactly what aspects you want to address.
2. Second, define what you want to tell your audience about the topic. Do you want to sum up what has already been done regarding this topic, give a clear message about the state of the field, or maybe even suggest future research directions?
3. Once you have defined what you want to tell your audience, make a short working summary of the state-of-the-art literature. Keep in mind that this summary only serves as a writing aid and will thus not be part of your actual abstract. Use bullet points or mind maps and don't forget to write down the corresponding references.
4. If appropriate, add your own work to this summary. Do not talk exclusively about your work, but blend it in for a smooth and coherent summary.

Now it is time to start writing the real abstract! (In reality, you are almost done already.)

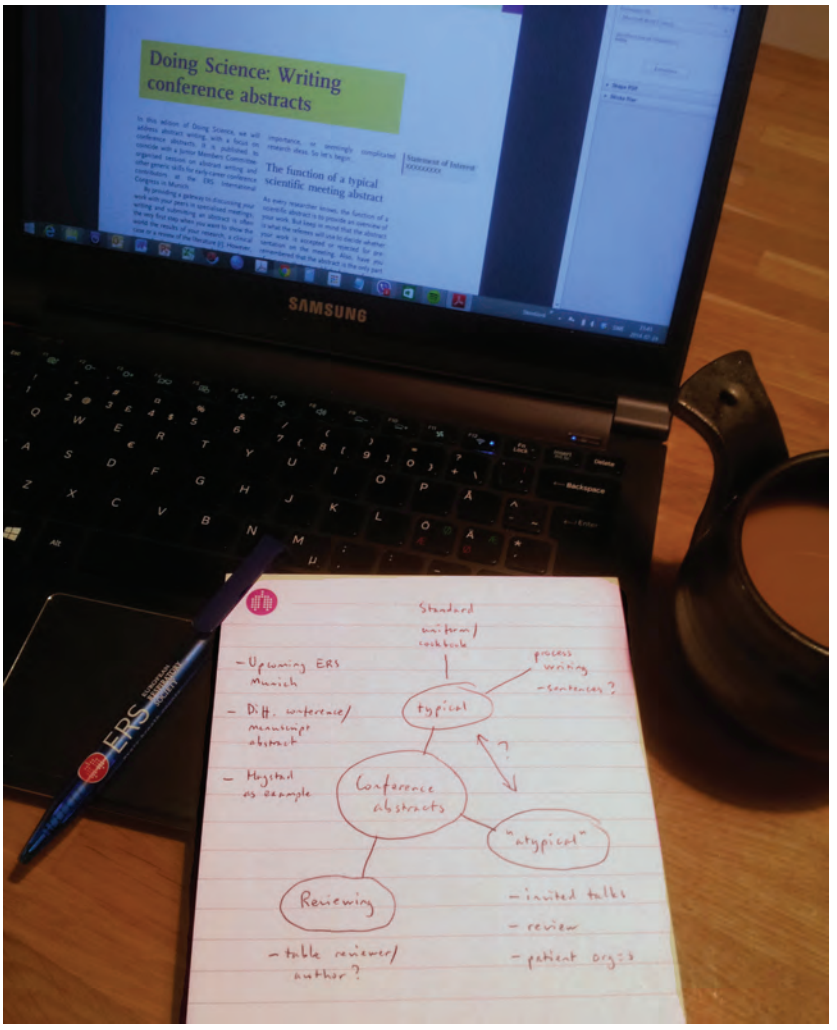

Figure 1
Using a mind map to plan this article.

5. The "topic phrase" will be the heart of your introduction paragraph, with a few more sentences to introduce the topic and highlight its importance.
6. Instead of the typical methods and results sections, this abstract contains only one mid-section, consisting of the literature overview including your own work. Make sure to use your bullet-point summary to generate a coherent and logical written summary in which you also address contradictory findings. Give the authors credit by mentioning their name or study when summarising their results.
7. The message phrase will be the centre of your concluding paragraph and can be supplemented with a few sentences regarding future directions and new possibilities.

Table 2 *Sample sentences for writing a typical abstract, based on a real research paper [8]*

1. ''Passive smoking increases the risk of COPD in never-smoking subjects.''
2. ''In the Western world, smoking is the leading cause of COPD.''
3. ''Whether passive smoking causes COPD is yet unknown.''
4. ''Previous studies have included both smoking and never-smoking subjects, and have not measured post-bronchodilator spirometry.''
5. ''A random sample of 2118 lifelong never-smokers completed spirometry with reversibility testing and questionnaires.''
6. ''We found that exposure to passive smoking in multiple settings was an independent predictor of COPD in never-smoking subjects.
7. ''Our findings strongly advocate measures against smoking in public places.''

Writing a non-typical abstract: invited talk

One of the signs that your scientific career is evolving is receiving invitations to speak. Like an invitation to write a review abstract, this is an excellent chance to show your potential as a scientist and to share your work and views. One difference is that the provided topic will be less defined, and thus more open for additions and changes from your side, as well as your personal opinions as a scientist. Take a few days to think about possible topics and approaches. It might also be useful to test and discuss them with your colleagues to sharpen your final choice of topic and approach. After setting out your goal for the talk, ''all'' you have to do is follow the guidelines given above for the non-typical review abstract. While preparing and writing, keep in mind that this abstract will be the roadmap for your talk as well. So for your own sake, make sure to include only studies and data you will present and do not make life too difficult for yourself!

Formatting your abstract

Although every abstract you write will contain basic parts as mentioned above for the typical and non-typical variants, the format will vary depending on the specific requirements of the meeting. An abstract is always short and is frequently written as a single paragraph [1]. You write your abstract for the same audience as your final presentation, so use the same level of technical language. Regardless of which of the above writing approaches you choose, the formatting reference in table 3 will come in handy in the final preparations.

Once you have written the first draft, it is time to begin the editing process. Often the abstract will benefit from discussions with your colleagues. Make yourself a promise to start writing in good time before the submission deadline, with regard to your own health as well as that of the conference database server.

Table 3 *Quick reference for conference abstracts*

- Be concise: abstracts usually have no more than 250 words
- Plan the abstract as a single paragraph that is unified (one topic) and coherent (*i.e.* ideas flow continuously)
- Edit it carefully for grammar, punctuation, typos, *etc.*
- Ensure your abstract conforms to the conference ''house style''

Adapted from [10], with permission from Prof. Barbara Milech (Curtin University, Perth, Australia).

This article is published to coincide with a Junior Members Committee-organised session on abstract writing and other generic skills for early-career conference contributors at the ERS International Congress in Munich.

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