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WRITING TIPS SERIES

Effective writing and publishing scientific papers, part III: introduction

1. What you should know

Today many editors (and reviewers) of empirical papers prefer short and focused introductions. The purpose of the introduction is to give the reader the essential information to understand why you did the study and to state the research question. It establishes the context of the work being presented by summarizing the relevant literature to date (with references) and the current views on the problem you investigated. The introduction must allow readers to understand the biological, clinical, or methodological rationale for your study. It should be tailored to the journal you will submit the paper to. A good introduction will ''sell'' the study to editors, reviewers, readers, and sometimes even the media.

The structure of an introduction can be visualized as a funnel. The broadest part at the top (beginning) represents the general context of the study topic. It then narrows down to more topical contextual information, ending with the specific rationale of the study and, vitally, the aim, purpose, or objective. The introduction does not have a set maximum word count like the abstract but should be as concise as possible, typically not more than 10–15% of the full word count of the paper. The introduction starts the story line of your paper, so only start writing it once you have got the bigger picture of the outline of the paper.

2. What you should do

Ask yourself if you are happy with the outline. Preferably have a look at your skeleton, and choose the important lead sentences for the introduction (see the previous paper on ''How to start writing''). Take these lead sentences and develop them into four to five paragraphs, while keeping the funnel model in mind. Think about relevance, discussion of existing evidence, the gap in the evidence, and the promise (aim) of the current paper.

The introduction must not be a full review of the whole field you are researching. It should allow readers to understand why you set out to perform this study and why the specific aims are what they are. First discuss the general background, preferably stressing the magnitude of the problem or the societal burden of the disease. Then outline what is known on the specific subject and what is still unknown. This should connect with the discussion, but avoid too much overlap. Leave comparisons with other studies for the discussion. Identify the gap in the evidence and clearly explain why this knowledge is relevant. Do not hesitate to emphasize why this study is needed and important. Then proceed to the problem statement of the paper, which is the actual start of your story line. Remember that the final paragraph of the introduction will attract readers' attention. So end the introduction by stating your research question or hypothesis and explain briefly what you have done to answer this question. Try to combine this with what was done to answer the question, preferably indicating the study design. Doing so will create a nice bridge to the methods section, in which you will explain the approach in detail. Clearly separate the major (primary) from the minor (secondary) research questions. Be critical about including secondary aims, but if you want to mention them, use a separate sentence and make sure to label them as secondary aims.

Use clear, clean, and unemotional language. Try to use active verbs, and consider using signaling words (such as *to determine whether*, *to clarify this*, *to compare* …). Use present tense for established facts (e.g., ''low back pain *is* a common reason to consult physical therapists'') and past tense or present perfect for findings you do not consider established (e.g., ''two treatment sessions a week *proved* more beneficial than one session per week in a cohort study''). Back up important statements by a reference, and be sure to cite the source of the original data. Only choose those references that are truly relevant, and select the most relevant ones if you have more options. Be aware that editors appreciate citations to relevant papers in their journal as they indicate that you show an interest in its contents, and it may facilitate citation scores.

Checklist for the introduction

- Check if the introduction has a funnel shape with clear sections on
  - general background (what is this all about?);
  - what is known and what is unknown about this specific subject (why was this study needed, and why is it important?);
  - primary research question (what did we want to know?); and
  - study aim and design (what did we do to answer the research question?).
- Look at the length of the introduction (maximum 10–15% of the total word count).
- Determine if the introduction is the start of the story line of your paper by looking at your outline (skeleton).
- Ask yourself, ''Will this introduction sell my paper to editors, reviewers, readers, and the media?''

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