

Assessment Criteria for Introduction, Results, Materials & Methods and Discussion

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CRITERIA FOR ASSESSING THE INTRODUCTION

Remember, the Introduction is where you couch your work in the context of the broader literature, establishing in the readers' minds where there are gaps in our knowledge that matter, where you carve out a particular problem of significance and how you are going to address it. Make sure that your introduction is aligned with what you decided in your scoping exercise.

Lead-in

- Does the Introduction begin by framing a broad context likely to attract the widest possible range of interest?
- Is there sufficient background provided so that the reader can appreciate the research problems that are to be tackled, the significance of undertaking the work, and the objectives of the study?

Boundary of Knowledge and Ignorance

- Does the introduction review what is currently known to enable the reader to appreciate what will be taken as given?
- Have the deficiencies in our current knowledge been clearly identified?

The Problem

- Has the author identified and clearly articulated an interesting and manageable problem? Would a reader be left thinking "Why bother?".
- Is the focus on challenging contemporary understanding rather than on confirmation?
- Has the significance of addressing the problem been established?

The Objectives

- Have the research objectives been stated with sufficient precision to enable the reader to ultimately judge whether they have been achieved or not? Is it possible NOT to achieve the objectives? If it isn't, then the objectives are not of substance. Review them.
- Is the scope of the current work clearly evident so as to avoid a mismatch in the reader's expectations and what is actually delivered?

- Do the objectives fit comfortably with (a) the introductory review, (b) do they arise naturally from the significant deficiencies in our current knowledge or understanding, and (c) do they lie within the scope of the study?

Alluding to Major Findings

- Have the principal results and conclusions been stated so that the reader knows where the paper is heading from the very beginning? Do not leave the reader in the dark.

Matters of Style

- Does the prose flow, each paragraph leading us somewhere with a point to make, and each paragraph linking to the next?
- Does the author make the common mistake of introducing authors and their areas of study in general terms without mention of their major findings? For example:

"Parmenter (1976) and Chessman (1978) studied the diet of *Chelodina longicollis* at various latitudes and Legler (1978) and Chessman (1983) conducted a similar study on *Chelodina expansa*"

compares poorly with:

"Within the confines of carnivory, *Chelodina expansa* is a selective and specialized predator feeding upon highly motile prey such as decapod crustaceans, aquatic bugs and small fish (Legler, 1978; Chessman, 1984), whereas *C. longicollis* is reported to have a diverse and opportunistic diet (Parmenter, 1976; Chessman, 1984)".

The latter is a far more informative lead-in to the literature, but more importantly it will enable the reader to clearly place the current work in the context of what is already known.

- Have the objectives been woven transparently into the prose of the introduction, rather than presented as a series of points?
- Is the reader distracted from the central argument (and “here we show” statement by irrelevancies, asides, unnecessary padding or flowery language?

CRITERIA FOR ASSESSING THE RESULTS SECTION

Remember, the Results section is where you present your data and analysis in concise form, highlighting trends and comparisons, but not discussing them.

Originality

- Are the results original, unequivocal and of substance? Will this paper make an original and substantive contribution to science?

Focus

- Are any of the results peripheral to the central message (the “here we show statement”) or equivocal with regard to establishing that central message? If so, should they be omitted, moved to supplementary materials, or are they of sufficient substance to warrant formal documentation in their own right in a second paper.
- Is the emphasis on data that challenges rather than confirms our existing understanding, wherever possible?

Argument

- Is the relationship between each item of the results and the objectives of the study clear? Indeed, have the results been written so that the development of evidence is clearly in support of the key findings or central message of the paper?

Thoroughness

- Have all the results been fully interpreted, that is, have all trends been highlighted in prose and any substantive conclusion been clearly stated? Have the data been milked for all they are worth? Have you left the reader to draw important inferences from your data unaided?

Structure

- Is the reader distracted by the belated inclusion of materials or methods? Say what you found, not how you went about it. That is for the Materials & Methods section.
- Does the author go beyond interpretation of results into the domain of discussion? Say what you found and interpret what it means, but not how it relates to circumstances outside your study or the findings of others. Discussion of results is for the Discussion section.

Style

- Are the findings clearly and simply stated, short and sweet, without verbiage?

- Are the data in tables and figures fully integrated with the text, with adequate captions, so that the reader is not expected to make judgements or interpretations from the tables and figures unaided.
- Have all the criteria for preparing tables and figures been met and, in particular, are they all necessary or could they be replaced with a few lines of text?
- Are the results presented in an order consistent with the order of presentation of the Materials & Methods?

CRITERIA FOR ASSESSING THE MATERIALS & METHODS SECTION

Remember, your Materials and Methods section is where you describe what you did in sufficient detail to allow someone to reproduce your work, but more importantly, that allows someone with findings at odds with yours to drill down to the possible reason for the disparity. This is the fodder of future investigation.

Reproducibility

- Are the materials and methods detailed enough to ensure that the work is reproducible? Do you, as the reader, feel confident that you could repeat the study, on the basis of what is written, with a view to reproducing the results?
- Are materials or methods described that do not relate to any of the results presented? The author should say what they did that was necessary to obtain the results presented, and not describe everything they did, some of which may not be relevant to the final product.
- Have you focussed on what you did and not why you did it?
- Are the study site and climate, if relevant, adequately described to ensure reproducibility? Are they over described, that is, has too much detail been provided, more than would be necessary to reproduce the results?

Thoroughness

- Is the use of novel or non-standard methods or approaches fully described? Are standard methods or materials over-described? Could they be replaced with a simple reference to existing literature?
- Is the experimental design clearly articulated and appropriate to the objectives, and are the methods of statistical analysis appropriate?

Style

- Is there a logical order, say chronological, to the description of the materials and methods?
- Has the author focused on saying what was done and what materials were used, not with asides on why it was done and why those materials were chosen?

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CRITERIA FOR ASSESSING THE DISCUSSION

Remember, the Discussion is where you develop argument to bring home the full relevance of your work to science, bringing in where necessary data, argument and insights from the literature to bring your central message home.

Substance

- Is the significance of the results fully explored in relation to the current literature, especially where the results are at odds with current understanding?
- Are all the linkages between discrete elements of the results brought together where they are relevant to substantive conclusions?
- Are all the conclusions and is all of the discussion clearly linked to the results or to the established results of others? Does the discussion extend unacceptably beyond what is supported by the results?
- Speculation outside the realms of that supported by concrete data has its place, but does it dominate the discussion?
- Have all the stated research objectives of the paper been addressed, regardless of the outcome?
- Have the avenues for future work opened up by the study been clearly articulated?

Style

- Are the substantive discussion points brought home with finality? Can we see clearly in each paragraph or set of paragraphs what the author has established, before the paper moves on to the next idea?
- Is there a clear boundary between what the author has contributed to knowledge and understanding and what was previously established in other works?
- Has the author avoided falling into the mould of explaining their results away in terms of conformity with current understanding?
- Is there a clear development of a connected story, or does the discussion read like a series of unconnected points? Is the reader left hanging on an insubstantive point left to the end?

