

Scientific papers: Writing the results section

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Purpose of the results section

To **describe your findings** as concisely and clearly as possible. In other words, be careful not to rehash your methods or discuss the meaning of your data in this section.

Organizing the results section

It often makes sense to lead with the findings that most directly address the question or problem you presented in the introduction, followed by results that are still relevant to your overall story, but secondary. One way to envision this type of organization is as an **inverted pyramid** (see handout), in which you start broadly with your most important findings (e.g., your model's predictions) and then taper toward less significant results (e.g., validation data).



On the other hand, you might decide that readers need to know how your model works before they can grasp the predictions. In this case, you flip the pyramid right-side up again, i.e., start narrow with the model's specifics and finish broadly with your major findings.

Whatever structure you choose, make sure each section and paragraph **flows logically from one to the next**. So, for example, although you may have completed your experiments in a certain chronological order, ask yourself if this is the best order for supporting the main message of your paper and getting readers to follow the story.

Common pitfalls to avoid

- **Including anything but your findings.** To quote the catchphrase of the 1950s TV crime drama, *Dragnet*: "Just the facts, Ma'am."
- **Including too many findings.** Remember that the most effective scientific papers usually focus on a single story, message or bottom line. Thus, try to limit your results section as much as possible to those data that directly support the main point of your paper. If you find yourself trying to squeeze in many more, you might consider whether these additional findings should go into another paper.
- **Repeating what is shown in the figures and tables.** Your text should summarize what the figures and tables show, not go through them data point by data point.
- **Losing the connection between the problem posed in the introduction and the solution: your results.** In the best written papers, this link is crystal clear.
- **Emphasizing the method of analysis over the result itself.** For example, says an editorial in *Nature Neuroscience* (2000), writing that "'ANOVA revealed a significant main effect of age and a significant interaction effect' is much less informative than, 'Protein levels decreased significantly with age, and this decline was more pronounced in (certain) animals.'"
- **Failing to guide the reader.** See the discussion below.

Guiding the reader

With the exception, perhaps, of the materials and methods, the results section is the most detailed one in the scientific paper. So, while it's true that this section should primarily present your findings, it's also true that readers need transitions, summaries

and other guideposts to make their way successfully through all your data. Below are three strategies for keeping the reader oriented.

- While you should avoid rehashing your methods in detail, **do describe your overall approach briefly** at the start of the results section, and at the beginning of each subsection, if needed.
- **Offer readers a one-to-two sentence summary of your overall findings for each set of experiments or analyses**, before launching into all the specifics.
- **Describe briefly the logic behind performing experiments or analyses**. For example: "Because A resulted in B, which is in the cascade of C (citation), we decided to see whether A was connected to C; therefore we subjected D to E."*

Statements like these are not fluff; to fully understand your study, readers need a periodic reminder of where they are in the forest as they move through the trees. Otherwise, they can become hopelessly lost in all the details.

References

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