

Organization and Planning of Scientific Research

ZHIDEBEKKYZY AKNUR
PHD, ASSOCIATE PROFESSOR

Lecture 9. Results and discussions

- Discussion
- Examples
- Tips for writing results section
- Tips for writing discussion section

Structure of a research article

Abstract

▶ **IMRAD**

Introduction

▶ Abstract

Literature review / Theoretical background

▶ Introduction

Methodology

▶ **M**aterials and methods

Results / research findings

▶ **R**esults and

Discussion

▶ **D**iscussion / Conclusion

Conclusion

▶ Acknowledgements

Acknowledgements

▶ References

References

Examples →→→



1. Scope
2. Topic
3. Literature review (draft)
4. Research gap
5. Research plan (draft for future Methodology)
6. Research processes
7. Collecting data/information / Getting results
8. Analysis / interpretation / systemizing
9. Preparation for writing

Drafts and data

1. Tables and figures
2. **Results**
3. Methods
4. **Discussion**
5. Introduction / Literature review
6. Conclusion
7. Abstract
8. Other parts: title, keywords, references, acknowledgments, information about authors, contributions, etc.

Article

Results = what your data show

The Results section of a scientific research paper represents the **core findings of a study derived from the methods applied to gather and analyze information**. It presents these findings in a logical sequence **without bias or interpretation from the author**, setting up the reader for later interpretation and evaluation in the Discussion section.

A major purpose of the Results section is to break down the data into sentences that show its significance to the research question(s).

The Results section appears third in the section sequence in most scientific papers. It follows the presentation of the Methods and Materials and is presented before the Discussion section—although the Results and Discussion are presented together in many journals.

This section answers the basic question **“What did you find in your research?”**

What is included in the Results?

The Results section should include **the findings of your study and ONLY the findings of your study**. The findings include:

Data presented in tables, charts, graphs, and other figures (may be placed among research text or on a separate page)

A contextual analysis of this data explaining its meaning in sentence form

Report on data collection, recruitment, and/or participants

Data that corresponds to the central research question(s)

Secondary findings (secondary outcomes, subgroup analyses, etc.)

If the scope of the study is broad or has many variables, or if the methodology used yields a wide range of different results, the author should state **only those results that are most relevant to the research question stated in the Introduction section**.

As a general rule, **any information that does not present the direct findings or outcome of the study should be left out of this section**. Unless the author is requested by the journal or advisor to include Results and Discussions together, explanations and interpretations of these results should be omitted from the Results.

Steps for Composing the Results Section

Because each study is unique, **there is no one-size-fits-all approach** when it comes to designing a strategy for structuring and writing the section of a research paper where findings are presented.

The content and layout of this section will be determined by the specific area of research, the design of the study and its particular methodologies, and the guidelines of the target journal and its editors. However, **the following steps can be used to compose the results of most scientific research studies** and are essential for researchers who are new to preparing a manuscript for publication or who need a reminder of how to construct the Results section.

Step 1: Consult the guidelines or instructions that the target journal or publisher provides authors and read research papers it has published, especially those with similar topics, methods, or results to your study.

The guidelines will generally outline specific requirements for the results or findings section, and the published articles will provide sound examples of successful approaches.

Note length limitations on restrictions on content. For instance, while many journals require the Results and Discussion sections to be separate, others do not—qualitative research papers often include results and interpretations in the same section (“Results and Discussion”).

Reading the aims and scope in the journal’s “guide for authors” section and understanding the interests of its readers will be invaluable in preparing to write the Results section.

Step 2: Consider your research results in relation to the journal's requirements and catalogue your results.

Focus on experimental results and other findings that are especially relevant to your research questions and objectives and include them even if they are unexpected or do not support your ideas and hypotheses.

Catalogue your findings—use subheadings to streamline and clarify your report. This will help you avoid excessive and peripheral details as you write and also help your reader understand and remember your findings. Create appendices that might interest specialists but prove too long or distracting for other readers.

Decide how you will structure of your results. You might match the order of the research questions and hypotheses to your results, or you could arrange them according to the order presented in the Methods section. A chronological order or even a hierarchy of importance or meaningful grouping of main themes or categories might prove effective. Consider your audience, evidence, and most importantly, the objectives of your research when choosing a structure for presenting your findings.

Step 3: Design figures and tables to present and illustrate your data.

Tables and figures should be numbered according to the order in which they are mentioned in the main text of the paper.

Information in figures should be relatively self-explanatory (with the aid of captions), and their design should include all definitions and other information necessary for readers to understand the findings without reading all of the text.

Use tables and figures as a focal point to tell a clear and informative story about your research and avoid repeating information. But remember that while figures clarify and enhance the text, they cannot replace it.

Step 4: Draft your Results section using the findings and figures you have organized.

The goal is to communicate this complex information as clearly and precisely as possible; precise and compact phrases and sentences are most effective.

In the opening paragraph of this section, restate your research questions or aims to focus the reader's attention to what the results are trying to show. It is also a good idea to summarize key findings at the end of this section to create a logical transition to the interpretation and discussion that follows.

Try to write in the past tense and the active voice to relay the findings since the research has already been done and the agent is usually clear. This will ensure that your explanations are also clear and logical.

Make sure that any specialized terminology or abbreviation you have used here has been defined and clarified in the Introduction section.

Step 5: Review your draft; edit and revise until it reports results exactly as you would like to have them reported to your readers.

Double-check the accuracy and consistency of all the data, as well as all of the visual elements included.

Read your draft aloud to catch language errors (grammar, spelling, and mechanics), awkward phrases, and missing transitions.

Ensure that your results are presented in the best order to focus on objectives and prepare readers for interpretations, valuations, and recommendations in the Discussion section. Look back over the paper's Introduction and background while anticipating the Discussion and Conclusion sections to ensure that the presentation of your results is consistent and effective.

Consider seeking additional guidance on your paper. Find additional readers to look over your Results section and see if it can be improved in any way. Peers, professors, or qualified experts can provide valuable insights.

Additional tips: Results \neq Raw data

Summarize what the data show: point out simple relationships, describe big-picture trends, cite figures and tables that present your data

Avoid simply repeating the numbers that are already available in tables and figures

Break into subsections to structure your findings (if needed)

Complement the information that is already in tables and figures

Repeat/highlight only the most important numbers

Do not omit negative results

Avoid interpretation, comments and vague predictions in this section

Discussion = what your data mean

The goal of your Discussion section is to answer the questions you raise in your Introduction by using the results you collected during your research. The content you include in the Discussions segment should reflect the following information:

Remind us why we should be interested in this research project.

Describe the nature of the knowledge gap you were trying to fill using the results of your study.

Don't repeat your Introduction. Instead, focus on why this particular study was needed to fill the gap you noticed and why that gap needed filling in the first place.

Mainly, you want to remind us of how your research will increase our knowledge base and inspire others to conduct further research.

Clearly tell us what that piece of missing knowledge was.

Answer each of the questions you asked in your Introduction and explain how your results support those conclusions.

Make sure to factor in all results relevant to the questions (even if those results were not statistically significant).

Focus on the significance of the most noteworthy results.

If conflicting inferences can be drawn from your results, evaluate the merits of all of them.

Don't rehash what you said earlier in the Results section. Rather, discuss your findings in the context of answering your hypothesis. Instead of making statements like "[The first result] was this...," say, "[The first result] suggests [conclusion]."

Do your conclusions line up with existing literature?

Discuss whether your findings agree with current knowledge and expectations.

Keep in mind good persuasive argument skills, such as explaining the strengths of your arguments and highlighting the weaknesses of contrary opinions.

If you discovered something unexpected, offer reasons. If your conclusions aren't aligned with current literature, explain.

Address any **limitations** of your study and how relevant they are to interpreting your results and validating your findings.

Make sure to acknowledge any weaknesses in your conclusions and suggest room for further research concerning that aspect of your analysis.

Make sure your suggestions aren't ones that should have been conducted during your research! Doing so might raise questions about your initial research design and protocols.

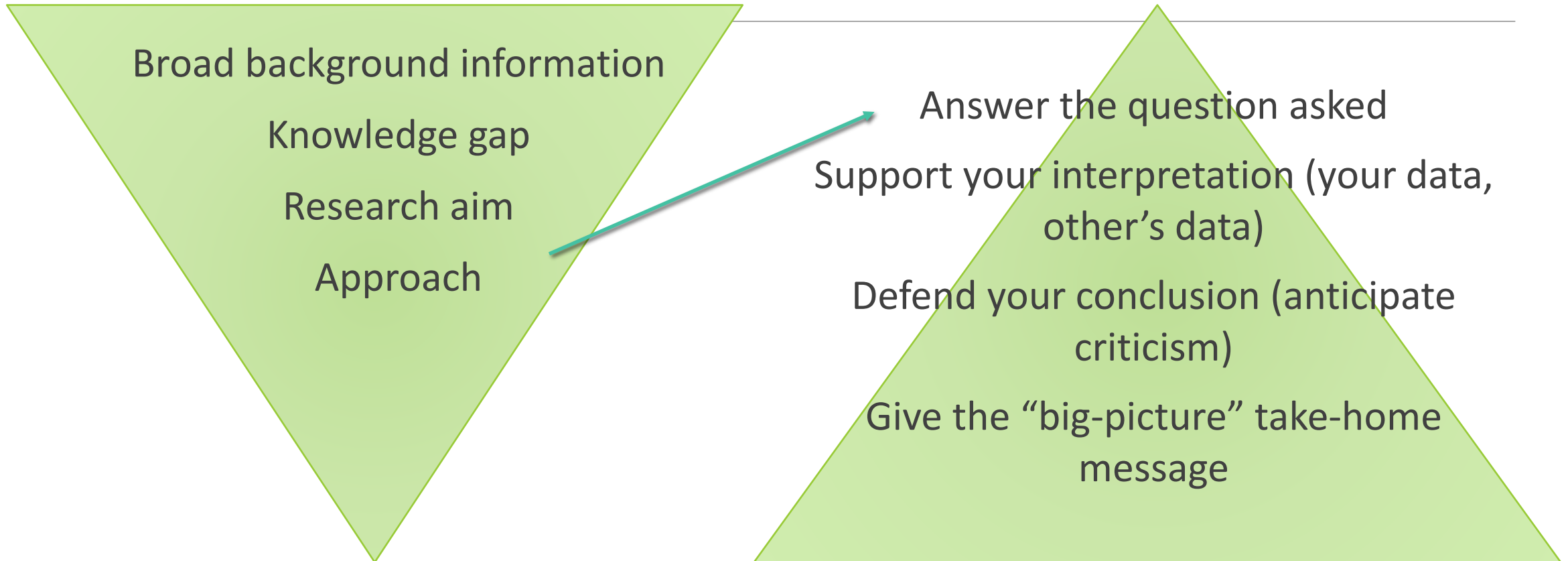
Similarly, maintain a critical but unapologetic tone. You want to instill confidence in your readers that you have thoroughly examined your results and have objectively assessed them in a way that would benefit the scientific community's desire to expand our knowledge base.

Recommend next steps (further research)

Your suggestions should inspire other researchers to conduct follow-up studies to build upon the knowledge you have shared with them.

Keep the list short (no more than two).

Invert the cone from the Introduction section



How should you write the Discussion section?

Keep the same flow across the Results, Methods, and Discussion sections.

We develop a rhythm as we read and parallel structures facilitate our comprehension. When you organize information the same way in each of these related parts of your journal manuscript, we can quickly see how a certain result was interpreted and quickly verify the particular methods used to produce that result.

Notice how using parallel structure will eliminate extra narration in the Discussion part since we can anticipate the flow of your ideas based on what we read in the Results segment. Reducing wordiness is important when you only have a few paragraphs to devote to the Discussion section!

Within each subpart of a Discussion, the information should flow as follows: (A) conclusion first, (B) relevant results and how they relate to that conclusion and (C) relevant literature.

End with a concise summary explaining the big-picture impact of your study on our understanding of the subject matter. At the beginning of your Discussion section, you stated why this particular study was needed to fill the gap you noticed and why that gap needed filling in the first place. Now, it is time to end with “how your research filled that gap.”

Overall, the Discussion section...

Gives you the most freedom

Gives you the most chances to put good writing on display

It the **most challenging** to write

Answer yourself: **What do my results mean and why should anyone care?**

Answer yourself: **So what?** (implications)

Possible options (depends on a journal guidelines)

Results

Results and Findings

Research findings

Results and analysis

Results and Discussion

Discussion

Discussion and conclusion

Discussion / Research Limitations / Conclusion

Discussion / Limitations / Further Research / Conclusion

Vocabulary

<https://www.ref-n-write.com/trial/research-paper-example-writing-results-discussion-section-academic-phrasebank-vocabulary/>

Literature:

1. C.R. Kothari. Research Methodology: Methods and Techniques. Jaipur, India: New Age International, 2004.
2. Geoffrey R. Marczyk, David DeMatteo, David Festinger. Essentials of Research Design and Methodology 1st Edition. Wiley, 2005. 304 pages
3. Jalongo, M. R. and N. Saracho, O. (2016) Writing for Publication - Transitions and Tools that Support Scholars' Success, Springer Texts in Education. doi: 10.1007/978-3-319-31650-5
4. Lantsoght, E. O. L. (2018) The A-Z of the PhD Trajectory, Springer Texts in Education. doi: 10.1007/978-3-319-77425-1.
5. Taylor, L. J. (2019) 'Efron, S.E., & Ravid, R. (2019). Writing the Literature Review: A Practical Guide. New York, NY: The Guilford Press. ISBN: 9781462536894. 298 pp. (softcover).', Family and Consumer Sciences Research Journal. doi: 10.1111/fcsr.12312.
6. Parija S., Kate V. (2018) Thesis Writing for Master's and Ph.D. Program. doi: 10.1007/978-981-13-0890-1.
7. Paul D. Leedy and Jeanne Ellis Ormrod. Practical Research: Planning and Design, Ninth Edition. Published by Merrill by Pearson Education, Inc.

Thank you for your attention!

