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Basic Structure of the Scientific Research Report: IMRaD

In scientific writing, **IMRAD** or **IMRaD** (/ˈɪmræd/) (**Introduction, Methods, Results, and Discussion**)[1] is a common organizational structure (a document format). IMRaD is the most prominent norm for the structure of a scientific journal article of the original research type.[2]
https://en.wikipedia.org/wiki/IMRAD

In A Nutshell:

The goal of the research report is to communicate among scientists:

- - why they did this study
- - that they have done so using an appropriate approach and method
- - what the results of the study were
- - how these results informed their thinking

The **IMRaD** structure: “Introduction, Methods, Results and Discussion”

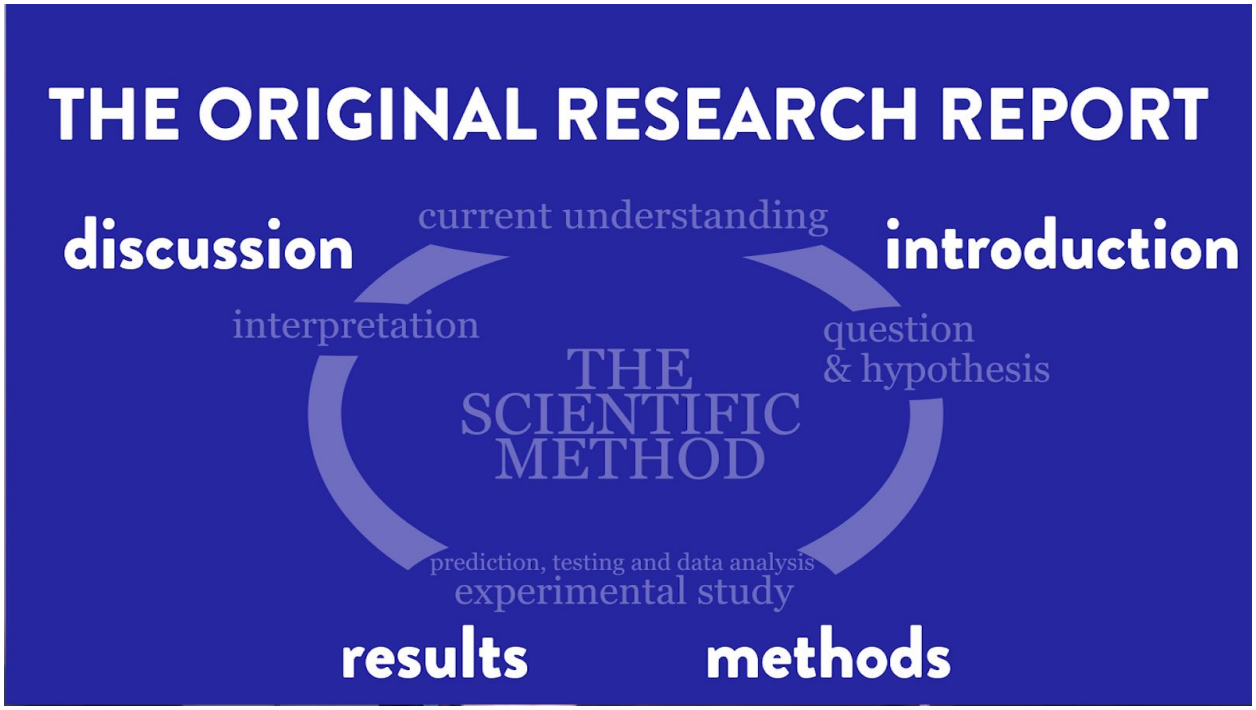
- The **introduction** motivates the study by explaining why the authors chose to design this study, which hypothesis they wanted to test, or which phenomenon they wanted to describe more thoroughly

- The **methods** sections explains exactly how the experiment was done, so readers understand the limitations of the study, and are able to replicate the experiment
- The **results** state and explain the data produced by the experiments
- The **discussion** summarizes the key points, puts the findings in context of the existing body of knowledge, and states the authors' conclusion.

In Addition

- **Title** and **Abstract** present a brief preview on the content
- **Author List** and **Acknowledgements** add information about authors and contributors, including conflicts-of-interest and funding sources.
- **References**: the list of sources for the claims that were cited in the text.

The Report Structure Reflects the Scientific Method



Researchers who follow the scientific method start off with the current state of understanding about the phenomenon they are interested in. In order to do their part in completing the description of the phenomenon, or to better understand it's causes, they formulate research questions and a hypothesis. The next step is to design an experimental study, and to conduct

the experiments. They analyze and interpret the data while keeping in mind the advantages and disadvantages - the limits - of the methods. Based on their interpretation of the data they form conclusions, which they then integrate into their own working model of the phenomenon.

Introduction: The process of finding a research question and formulating a hypothesis is reported in the introduction. At the end of the introduction you should find a brief explanation of the nature of the study, and a preview on the results and the conclusions.

Methods: The technical details of the experiment are explained in the methods section. It allows the reader to better understand the limitations of the study, and it should also put the reader in the position to replicate the study if they find it necessary.

Results: The results section then describes in detail the results of each experiment and usually there is a sentence or so of interpretation of the data. This also includes the results of the statistical analysis. From this description and accompanying figures you should be able to really understand the nature of the resulting data. And have an idea of how these outcomes should be understood.

Discussion: Now that we have our findings, we want to integrate them into the current understanding of the phenomenon. The authors briefly summarize the most important points from the results section, and state whether they think their hypothesis was to be rejected or not. They will look into the existing literature and explain how their finding relate to the state of scientific understanding. For example, they will argue whether the findings are in agreement with the current understanding of the subject matter, or not, and why this might be the case. In the end the authors state their main conclusion from their own results and the significance for the bigger picture.

Additional Segments found in a Research Article

If you have already had a look at a proper research article, you will notice that a couple of typically available segments are not included in the IMRaD acronym.

Title: which in the best cases states the take-home message of the whole study

Abstract: a brief summary, in which each part of the paper will be compressed into only one or two sentences.

Author List: the names of the authors and their affiliation. In life sciences authors usually stick to a sequence according to their contribution to the paper. The first name is usually the researcher - often a graduate student or postdoctoral researcher - who put most of the work in, whereas the last author is usually their adviser. In between are authors with different degrees of contribution.

Acknowledgements: People who helped but did not contribute sufficiently enough to be considered authors, will be thanked in the. Then there will be a conflict-of-interest statement, and the source of funding for the study.

References: And at the end of the paper, we get to the references. The references are a list of sources that the authors cite in the text body. Every claim that was made in the paper needs to be either indicated as the author's speculation or conclusion from the studies, or substantiated by citing the source that first made the claim they are discussing.