

# HOW TO READ A SCIENTIFIC ARTICLE

## WHAT IS A SCIENTIFIC ARTICLE?

Scientific articles report on the research findings of scientists. Scientists write articles primarily for the scientific community (other scientists, researchers, and upper-level or graduate-level science students) and publish them in scholarly journals. Please note: scientific journals also include other types of content, such as book reviews, editorials, and commentaries, etc.

There are different types of scientific articles, such as:

- Original research articles, also known as empirical research (discuss the data collected in actual experiments or observation studies)
- Review articles (discuss current state of research on a given topic)
- Theoretical articles (discuss new or established abstract principles related to a specific field of knowledge)

This guide will help you learn how to read original, empirical scientific articles more effectively, with better understanding. Reading scientific articles can be intimidating, as there is often complex information for the reader to decipher, especially for nonspecialists and students. In order to fully understand a scientific article, one technique is to avoid reading the article from beginning to end. Instead, adopt a strategic approach by following the steps outlined below.

## STEPS TO FOLLOW . . .

Scientific articles that present empirical research are composed of different sections and generally follow a specific format and structure – Abstract, Introduction, Methods, Results, and Discussion. Instead of reading these sections in the order they appear, try viewing them in this order: 1) Abstract, 2) Discussion, 3) Introduction, 4) Results, and 5) Methods.

Before you get started, here are some points to keep in mind . . .

- Start by skimming over the article and identifying the different sections and features of the article.
- You may need to read the article or parts of the article a few times before you fully understand the material.
- While you are reading, consult a scientific dictionary for terms you aren't familiar with. Try this online dictionary: <http://www.accessscience.com>
- Make notes as you read. It will help you remember the important aspects of the paper. Or download the fill-in sheet [Critical Analysis for Scientific Articles](#) from the Writing Centre.
- Try explaining what you read to others (friends, classmates, or colleagues). Explaining the article to other people will also help you to understand it better.

## 1. ABSTRACT

The abstract is a brief summary of the article. It contains a description of the problem, an outline of the study or experiment and a summary of the findings.

### **Tips on Reading the Abstract:**

Start by reading the abstract first to get an overview of the article. When reading the abstract, if there are complex terms you don't understand, refer to a scientific dictionary for help. Once you understand the terminology, re-read the abstract. While you are reading the abstract, ask yourself if the results are relevant to your own research.

**Note:** When you plan to use an article for your assignment, please do not rely solely on the abstract. You should read the entire article, as the abstract may omit important information that is covered in the article.

## 2. DISCUSSION (sometimes named **Analysis** or **Conclusion**)

The discussion section functions to provide a clear answer to the question (hypothesis) posed in the introduction. An explanation is given on how the results support the conclusion and how the work relates to other studies in the field. The authors may also indicate any limitations of their study and suggest areas for further research.

### **Tips on Reading the Discussion:**

You can start by reading the first few paragraphs and the last few paragraphs, then continue on to read the entire section. While reading the discussion, think about whether or not you agree with the author's conclusions.

## 3. INTRODUCTION

This section includes the research question, or hypothesis, and a review of prior research on the topic. The introduction serves to generate the readers' interest in the subject and provide them with background information to help them understand the article. A literature review is often included within this section.

### **Tips on Reading the Introduction:**

If the introduction is lengthy, start by reading the beginning and the end of the introduction first, before reading the section in its entirety.

## 4. RESULTS

This section presents the data analysis and describes the outcomes of the measures of the experiment or study. This section usually includes some visual presentation of the information such as graphs, figures, charts, and/or tables that clarify the complex findings reported in the text. Sometimes the results section is included within the discussion section.

### **Tips on Reading the Results:**

Approach this section by examining the graphs, figures, etc., first. Often they present the data in a form that is easier to understand. Attempt to interpret the data before reading the accompanying captions and text. Ask yourself if the data presented supports the conclusion.

## 5. METHODS or METHODOLOGY

This section explains to the reader what experiments were done to answer the question posed in the introduction. Procedures of the experiment are outlined so that the experiment can be duplicated.

### Tips on Reading the Methods:

It is a good idea to read this section last, as the methods section can often be difficult to read, mostly due to technical language. In some cases (unless you are intending to replicate the experiment), simply determining the basic methods used, rather than understanding all the details might be adequate. Some questions to consider: Can the study be repeated? What was the sample size? What factors might have affected the outcome? How did the authors try to ensure their data would be valid?

Lastly, don't forget to read the . . .

**Reference List:** The reference list contains all the sources that are cited in the article and is located at the end of the article. It provides readers the opportunity to view the sources cited in the article and follow up with the citations for more information on the topic.

For more help, contact the **Research Help Desk** at 902-440-5540 or [research@smu.ca](mailto:research@smu.ca)



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