

CHAPTER III: How to read a scientific paper

Attempting to read a scientific or scholarly research article for the first time may seem overwhelming and confusing. This guide details how to read a scientific article step-by-step. First, you should not approach a scientific article like a textbook-reading from beginning to end of the chapter or book without pause for **reflection or criticism**. Additionally, it is highly recommended that you highlight and take notes as you move through the article. Taking notes will keep you focused on the task at hand and help you work towards comprehension of the entire article.

1. Skim the article: This should only take you a few minutes. You are not trying to comprehend the entire article at this point, but just get a basic overview. You don't have to read in order; the discussion/conclusions will help you to determine if the article is relevant to your research. You might then continue on to the Introduction. Pay attention to the structure of the article, headings, and figures.

2. Grasp the vocabulary: Begin to go through the article and highlight words and phrases you do not understand. Some words or phrases you may be able to get an understanding from the context in which it is used, but for others you may need the assistance of a medical or scientific dictionary. Subject-specific dictionaries available through our Library databases and online are listed below.

3. Identify the structure of the article and work on your comprehension:

Most journals use an **IMRD** structure: **An abstract** followed by **Introduction, Methods, Results, and Discussion**. These sections typically contain conventional features, which **you will start to recognize**. If you learn to look for these features you will begin to read and comprehend the article more quickly.

- **The abstract** gives a **quick overview** of the article. It will usually contain four pieces of information: **purpose** or **rationale of study** (**why they did it**); **methodology** (**how they did it**); **results** (**what they found**); **conclusion** (**what it means**). **Begin by reading the abstract to make sure this is what you are looking for and that it will be worth your time and effort.**
- **The introduction** gives background information about the **topic** and sets out **specific questions** to be addressed by **the authors**. You can skim through the introduction if you are already familiar with the **paper's topic**.

- **The methods** section gives **technical details** of how the experiments were carried out and serves as a “how-to” **manual** if you wanted to **replicate** the **same** experiments as the authors. This is another section you may want to only skim unless you **wish to identify** the methods used by the researchers or if you intend to **replicate** the research yourself.
- **The results** are the meat of the scientific article and contain all of the **data from** the experiments. You should **spend time looking at all the graphs, pictures, and tables** as these **figures will contain most of the data.**

Lastly, **the discussion** is the authors' **opportunity to give their opinions**. Keep in mind that the discussions are **the authors' interpretations** and not necessarily **facts**. It is still a good place for you to get ideas about what kind of research **questions are still unanswered** in the field and what **types of questions** you might want your own research project to tackle.

4. Read the bibliography/references section: Reading the references or works cited may lead you to other **useful resources**. You might also get a better understanding of the **basic terminology**, **main concepts**, **major researchers**, and **basic terminology** in the area you are researching.

5. Reflect on what you have read and draw your own conclusions:

As you are reading jot down any questions that come to mind. They may be answered later on in the article or you may have stumbled upon something that the authors did not consider. Here are some examples of questions you may ask yourself as you read:

- Have I taken time to understand all the terminology?
- Am I spending too much time on the less important parts of this article?
- Do I have any reason to question the credibility of this research?
- What specific problem does the research address and why is it important?
- How do these results relate to my research interests or to other works which I have read?

6. Read the article a second time in chronological order: Reading the article a second time will **reinforce your overall understanding**. You may even start to make connections to **other articles that you have read on this topic**.