

## Reading a Research Paper

Sitting down to read an academic research paper is a daunting task. Not only do you have to read the article, but you also need to understand it to use it for your own research. Thankfully, there are a variety of strategies you can use to make the process of reading and comprehending a research paper more effective and less frustrating. This handout will go over tips for each stage of the reading process, from before you read to after you're finished.

### The Different Stages of Reading

Reading can be broken down into three stages: before, during, and after. Each stage is crucial to gaining a complete understanding of any text, especially dense research papers.

#### *Before You Read*

Before you sit down with the research paper, take a moment to pause and reflect on a few key questions.

- Why am I reading this paper?
- What do I need to do with this paper?
- What do I already know about this topic, and what do I hope to learn in this paper?

Your answer to the first question will partially answer the second one. You may need to read a paper for class or to complete your own research. As a result, you may use the article to answer assignment questions, respond to a discussion board, or provide support for your own paper's arguments and analyses.

You want to ask yourself these questions because they will guide how you interact with the article, as well as remind you that there's a reason why you are reading it.

#### *While You Read*

You will very likely have to read the article multiple times to fully understand it. As a result, don't worry over your first read through it. You won't get everything right away, and that's okay. In fact, it's expected.

During your initial read through the paper, pay most of your attention to the crucial parts of any research paper: the abstract, the introduction, and the conclusion.

- The **abstract** is where the author(s) will summarize the overall paper. This big picture overview of the paper will establish its scope, its research question(s), results, and conclusions. When reading the abstract, think about the following questions: *What is the article or study about? What are one or two main findings or results? What conclusions were drawn? How does this article connect or relate to my research topic?*

- The **introduction** presents the research question, basic background information, and the thesis. It will often include vocabulary terms that will be significant throughout the article. When reading the introduction, think about the following questions: *What is the research question? What is the thesis? Are there any key terms or words here I should look up?*
- The **conclusion** summarizes key findings and their interpretations, discusses if the research questions were answered, and mentions the limitations of the study, as well as recommendations for future research. When reading the conclusion, think about the following questions: *How did the author(s) interpret the findings and results? What were the limits of the study? What recommendations are being made?*

Read these sections closely to obtain a solid foundation for the rest of the paper. Additionally, take note of any unfamiliar words or phrases—you'll want to look these up when you're done.

Take a step back from the paper before you return to do a second read. This will give your brain time to begin thinking about what you just read. When you feel like you've refreshed yourself, come back for that second pass. Here, you'll dig into the heart of the paper: the literature review, methodology, results, and discussion sections that are much more specific and detail-heavy.

- The **literature review** section talks about what is already known on the subject or field. It presents past research and shows where the current study fits in. When reading the literature review, think about the following questions: *What is already known about this subject? What is this paper trying to add to the subject? How does my own research fit into the current literature that's already been done?*
- The **methods/methodology** section goes over how the information was obtained for the paper. While you read through the methodology, think about the following questions: *What methods did they use (qualitative or quantitative)? Were there limits on the information they gathered? Could I use similar methods for my own research?*
- The **results** section lists the results and findings of the study, explains which results are significant, and draws connections. When reading the results section, think about these questions: *What results did the author(s) find to be significant? What conclusions do you draw from those results? Do these results support the research question?*
- The **discussion** section may or may not be present. Sometimes, it is included in the conclusion. A specific discussion section goes into more detail about what the results mean, explains how they connect to other studies, and may offer practical applications for the results. When reading the discussion section, think about the following questions: *What connections are there between the results? Do the results line up or agree with previous studies? What, if any, applications are there for the results?*

You will also want to start annotating the text this time. There are many different ways to annotate. You can write notes in the margins, highlight words and phrases, use Post-Its or sticky notes, and/or underline or circle different parts of the paper. There is no “right way” to annotate; you want to find the method that works best for you.

It's important to avoid over-annotating. Oftentimes, we randomly annotate, highlighting what looks important or what we think we might want to come back to later. However, this is not an effective way to engage with the paper. Reserve your annotations for significant or noteworthy items. If you highlight, circle, or take notes on everything, then the annotations lose their usefulness. Instead, annotate mindfully based on the questions you asked yourself before you started reading.

For example, if you are reading the article for a class assignment with several questions about the article's data samples, significant results, and limitations, then you'll want to focus your annotations on the parts of the article that go over samples, results, and limits. Likewise, if you are reading an article to integrate it into your literature review, look for where it is relevant to your research and provides important background or historical information.

### **After You Read**

After your first read-through, look up unfamiliar vocabulary words or jargon. Familiarize yourself with those words and be sure to understand how they are commonly used. This will make your subsequent readings much less of a challenge.

When you have read the paper enough times that you feel comfortable with the material, try rewriting key elements in your own words. See if you can rewrite the thesis and conclusions without looking at the paper. If you are close to the actual thesis and conclusions, you have a good grasp on the material. If you miss the mark, that is okay. Consider reviewing the paper and taking a closer, slower look at the thesis and conclusion.

Finally, start thinking about the ways you can use the annotations you have made. How do you want to use the information in the article? Are there quotes you can use or sentences you can paraphrase? Are there any paragraphs you put question marks next to that you want to explore again?

### **Activity: Practice Reading a Paper**

Navigate to Google Scholar or your most frequently used library database. Find an article on a high-interest topic for your chosen field (e.g., *black bear population trends* for environmental studies or *3D printing* for mechanical engineering). Consider choosing articles from peer-reviewed journals, which you can search for by applying a filter. Using the tips and questions from this handout, can you understand the research question(s), thesis, results, and conclusions presented in that article?

Here are some guiding suggestions:

- When you read the **abstract** and **introduction**, ask yourself the following questions: *Do I need to look up any vocabulary words? Can I rewrite the thesis on my own? What question/questions are being asked?*

- When you read the **discussion** and **conclusion**, ask yourself the following questions: *What are the key results? Can I rewrite the main conclusions on my own? How can I use the information to answer questions or include in my own research?*
- As you **annotate**, check in with yourself about *what* you need to take notes on and *why*. Remember, annotating with a clear purpose is much more helpful than randomly highlighting quotes or data.

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