

On Writing a Research Paper

A research paper is a very specific type of paper, with a very definite structure. A well-written research paper will contain certain components, and in a particular order. They are:

- Abstract (sometimes optional)
- Introduction
- Review of the literature
- Study, consisting of (at least) one of the following:
 - Experiment (usually just one or two)
 - Equipment
 - Procedure
 - Analysis
 - Case Study (conducted by researcher) (sometimes just one, perhaps more)
 - Setup
 - Method
 - Case Study (extant, found in literature) (at least one, perhaps several)
- Discussion
- Conclusion and suggestions for further research
- References

If a paper is not set up this way, regardless of how well it is written, it is *not* a research paper.

This does not mean, however, that the paper should be written in this order. In fact, don't even try to write a paper in this order – it usually doesn't work. Instead, begin with a question.

What question? Well, the question to which you hope to provide an answer, of course. Remember, if you aren't ready to provide an answer to a question, *you are not ready to begin* writing a research paper! This may be the hardest part of the paper – having an understanding of what you intend to write *before* you write it. Don't be discouraged, though; this is not something you are likely to be used to. (In fact, it usually only ever comes up when you're writing a research paper.) This aspect of writing a research paper actually requires a degree of discipline not necessarily required by other styles of writing, where you may simply discover what you're writing about as you write it. Do not try to write a research paper this way; it *cannot* work.

So, before you begin, stop and think about it. What *exactly* do you think you're wanting to say in the paper? This may sound simple, but it isn't. The problem is that, unless you're used to thinking this way, you may not know that you don't know. And, even if you think that you do have a question, it's very likely that you're falling into one of three traps...

The first possibility is that you are trying to answer too large a question; so large, in fact, that even you may not see it. This will, at the very least, become apparent when you begin researching your review of the literature. If you find that you have many relevant search terms that are each getting many hits, you can be sure that you've bitten off too large a chunk. Narrow the question – be more specific.

The second possibility is that you are considering too small a question. Most questions, for example, that can be answered with a "Yes" or a "No" are too small. If this is a problem, consider rephrasing the question so that it sounds like "What are the effects of *this* on *that*?" If your question doesn't refer to a relationship, then you might try "What is ...?" or "How does...?" Also, think about whether your question *matters* to anyone. If the question isn't interesting (at least to someone), then the answer cannot be – and it's probably too small a question.

The third possibility is that you don't actually have a specific question at all – just a vague sort of interest, or (perhaps more likely) an assignment that's due. If this is the case, then your task is quite simple: *Read!* Read your textbook, or pick up another book on the topic. Find a magazine article about it. Do a Google search. If others have written about the topic (quite likely), then there must be *something* interesting about it. Your job is to find the interesting thing, and ask yourself a question about it. Then check to see whether the question is too large or too small (see above), and modify it to suit. Once you have the Goldilocks question, you're ready to begin.

Plug your question into the section called "Introduction." The section isn't done, but don't worry about it yet. The next thing to do is to find out what else has been written about it. It may be that someone else has already answered your question. If this is the case, don't despair! For better or worse, the thing about answers is that they almost always lead to more questions. In some cases, the person who answered your question will already have suggested the *next* question to be answered. Good! Use that one. If not, then the next question may be obvious to you after you read what they wrote about the first question. Regardless, you're on your way.

Find the articles that have anything to do with the operant parts of your question. At the very least, you will want to find references that define the operant terms for you, and that discuss the various relationships between the terms. (It is at this point that you

may discover that your question is too large – see above). If you have to choose between several articles that do the job, select the most recently published ones.

You must include as many references as are necessary to substantiate your writing. *You have no latitude in this respect!* If there is any doubt in your mind as to whether to cite a particular statement you have made, ask your “research assistant.” (Your assistant is an imaginary eighth grader who usually gets C’s, and stands beside you, fidgeting. If you ask your assistant whether he already knew what you just wrote and he says “Of course!”, then you don’t need to cite it. If his answer is “Um, I think so,” or “How would I know that?” then you should probably cite it.) This goes for every single fact you write. You don’t get to offer *anything* of your own – no “I think,” no “in my opinion,” and no “obviously.” In fact, you, as the writer, should be invisible. (The point of a research paper is to highlight *the research*, not the researcher.) If, for whatever reason, you are not able to locate a reference for a statement you have made, it’s probably better not to make it. If the statement is critical to your line of reasoning, then (guess what!) you have found *another research question!* It may well be the case that this question must be answered before you can write on your current question; you may want to consider changing your question to the one you just discovered. Chances are good that the research you’ve already done will substantiate some or all of the new question, and the old question then serves as the *next* question to be researched.

Once you have substantiated the question, stop. You may be tempted to find additional references, especially if you only have a few. If this is the case, then your question may be too small (see above). Only include as many references as are necessary to cover all the bases.

Now, if you would like, you may be prepared to go back and fill in the rest of the introduction. The purpose of this section is to convince the reader of your paper that you have written something interesting, if for no other purpose than to get them to keep reading. The gist of the introduction is this: you, the researcher, found some reason that the question you researched was interesting to you, and you are communicating that to the reader. The reader really wants to know why you bothered to do all the work necessary to answer your research question, and then write about it. Tell them. It provides a meaningful context to the question; it makes the question, and thus your paper, matter.

The Study section is a matter of outlining the most efficient available method of demonstrating the answer to your question. The particular method or style used will depend entirely on the nature of the question, and is subject only to the expertise of the researcher. You know (or should know) what you needed to do to answer the question; else, you *really* aren’t ready to write a research paper. The paper gets written only after

the question has been answered – by you, the researcher. Once that is done, this section almost writes itself.

The Discussion section is essentially written for the sake of your hypothetical “research assistant.” It explains, in very simple terms, what you did to answer the research question, and why you did it that way. It explains the results of your study, and connects the results to the question. After the discussion, there should be no doubt (even in your “assistant’s” mind) as to whether the question was adequately answered.

The Conclusion section wraps up the paper. In the Introduction, you essentially set out the project, and let the reader know that there was an interesting answer in the offing. The Lit. Review gave the reader a framework for understanding the question, and for anticipating the shape of the answer. The Study and Discussion sections gave the reader the answer to the research question in a way that was easy to understand. The Conclusion section is there to provide a summary of the circumstances you originally laid out in your introduction, but as now modified/filled in by your research. Having asked and answered the research question, you are, for the moment, the leading authority on your topic. Now, having established that, you are entitled to an opinion. You may offer a personal interpretation of your findings, or perhaps the ramifications of your findings for society, for example, or for the future. Almost certainly the answer to your research question has led, in your mind, to the next question to be researched – perhaps several such. Share these thoughts with your reader. It reminds the reader that you (and they!) are part of a larger scientific community, and that research isn’t entirely sterile, but concerns living people.