

12.307 Project Report

*** Pointers for the Discussion Section¹***

The Discussion section presents the main overall argument of your report. It follows your Results section, generally picking up where the end of the Introduction left off. The argument that constitutes your Discussion, like all scholarly argument, represents an interplay, conveyed via logical reasoning, between the available evidence (or data, see below) and one or several claims. The evidence is fixed: you cannot change it. You can, however, adjust your claims, which are purely verbal concepts.

Begin your Discussion by reading over your Results section and your Introduction. Remind yourself, first, of the experimental and evidence you have to work with (which you presented in the Results) and, second, of the broader ideas you set out to explore (described in the Introduction). The Results and the Discussion differ from each other in that the former is a close-up examination of the data, largely focused on the figures; and the latter, a stepping back and setting your experiments in a broader context, which is why it is essential to bring in published literature. As you consider your results, ask yourself, So what? and What does it mean? And think of answering these questions as you draft your Discussion.

Most Discussions in scholarly arguments have the following components:

- 1) Central claim (i.e., the conclusion of the paper) ± subsidiary claims
- 2) Evidence
- 3) Logical reasoning
- 4) Counter-claims and their refutation
- 5) A look ahead

1) Central claim (i.e., the conclusion of the paper) ± subsidiary claims

The central claim, or conclusion, is usually written as a single sentence. It may be no more than a re-statement of the results; sometimes it is a broader statement or a slight extrapolation from the results. The central claim is usually announced in the last paragraph of the Introduction and usually also in the first paragraph of the Discussion. It may be a good idea to start by stating your conclusion, so that you understand what you are trying to argue for.

Types of claim: Most papers in science add some bit of knowledge to what is already known. That is, science proceeds largely by a process of accretion: small pieces of a large puzzle that are put in place usually one by one until some overall picture emerges. The central claim, in this case, would be the announcement of the discovery of that new bit of knowledge. However, there are other kinds of claims. Some papers involve the invention of a new method or a novel application of an existing method. Some papers resolve a discrepancy in the literature. Occasionally, papers overturn a widely held view (e.g., Darwin's idea of natural selection to explain the evolution of living organisms, see *On the Origin of Species*).

Claims are valid as long as your evidence supports them. As you work on your paper, consider and reconsider the central claim. It is only a verbal construct; you can change it! The wonderful thing about writing is that it allows us to reconsider our ideas. Ask yourself, Is this actually the case? Is there a better way to formulate my claim? Is there a more exact formulation, or a more carefully weighed and nuanced statement?

¹ Adapted from the work of K. Pepper, used with permission.

Subsidiary claims supporting the central claim

Subsidiary claims are mini-conclusions that support the central claim. You may have stated subsidiary claims at the end of each subsection in the Results. If you re-state those claims in your Discussion, do not repeat the identical sentence. You might also have a subsidiary claim about the relationship between methods and results. It is fine to refer to your figures.

2) Evidence

There are several types of evidence:

- experimental evidence (i.e., your own results);
- observed evidence;
- bibliographic evidence (published results, with references cited);
- statistical evidence;
- “mined” evidence (data extracted from databases).

For your 12.307 paper, you will use experimental. Observed, and possibly bibliographic evidence. (Published papers use a great deal of bibliographic evidence in the Discussion, in order to ground the paper in the existing science.)

3) Logical reasoning

Your logic will become apparent to the reader if you make clear and explicit the relationships between ideas, from one paragraph to the next, and from one sentence to the next. Although some stylists oppose the use of conjunctive adverbs (however, nevertheless, etc.), I find them useful road signs to indicate the direction of your thought to the reader. These signals offer the reader an indication of how ideas stand in relation to one another.

4) Counter-claims and their refutation

Part of the work in writing the Discussion is to anticipate objections to the central claim or other aspects of the study. Addressing counter-claims helps to build the science; simultaneously, it builds your credibility as a scientist. Counter-claims may not directly oppose the central claim; they may come in at an angle, raising questions about the validity of the central claim, that is, about the evidence, the interpretation of the evidence, and the reasoning on which the central claim is based. Anticipating criticism or announcing the flaws or limitations of your own work is an essential part of constructing an argument in general but also can be linked to “a look ahead” (see below).

5) A look ahead

Often limited to the final paragraph of the Discussion (though not necessarily), the look ahead offers readers ideas for how the present study might serve as the basis for new exploration. For your 12.307 paper, be reasonable but also imaginative; this is the part of the paper with which you can inspire others. You might speculate about the broader meaning of your work, uses to which it might be put, implications, ideas for experimentation, etc.

General notes:

Whereas the convention for the last paragraph of the Introduction is fairly well established, there is no general rule for how to start the Discussion. Often, the first paragraph of the Discussion consists of a summary of the main findings of the paper and a statement of the conclusion.

Usually, the Discussion section is not divided into subsections, though it is in some journals. For 12.307, use subsection headings for your Discussion if you anticipate them to be useful to a reader. You may order the paragraphs in any way that makes sense to you.

Because you are writing one continuous section, please pay special attention to paragraph structure, paragraph cohesion, and transitions from one paragraph to the next. Each of your paragraphs should have some structure or

organization. You may be presenting a general rule and then illustrating it with several examples, setting two competing ideas in opposition to each other (for example: on the one hand....on the other hand) or comparing two similar but not identical things. For comparisons, consider either an ABABAB pattern or an AAABBB pattern.

To create paragraph cohesion, determine whether all the sentences naturally form a grouping. Then consider the order and linkage of the sentences within the paragraph. Try to make those connections evident to readers. Finally, consider how to end your paragraph so that there is a comfortable transition to the next. For example, you can use a word or phrase in the last sentence of the paragraph that is identical to a word or phrase in the first sentence of the next paragraph.

At every level of consideration of paragraphs, it is helpful to think of relationships: the relationship of one sentence to the next, one idea to the next, one paragraph to the next.

Questions you can use to check your work

Does the first sentence of each paragraph indicate the content of the paragraph or the direction the paragraph will go? Do all the sentences in a given paragraph belong together— is there a common theme or thread that holds them together? Are sentences in the best order? Are there gaps that might be filled by additional sentences or phrases?

Please check your references carefully. In-text citations in EAPS are, by convention, (author year). Every in-text citation must have a corresponding reference in your list of references, and every item in your list of references must be cited at least once in your text. Most importantly, be careful to accurately represent what the authors are saying.