

Here are some overall comments on typical problems I find in the results section of student papers. In general, my suggestions are aimed at improving style and organization, and eliminating technical problems to help you get this section closer to an accepted publication form. Some of these suggestions will be useful in all areas of your writing and should be applied to the remainder of the text as appropriate.

Style and Organization Problems

1. The results are often written without having benefited from finishing the discussion section. So you must go back to the results and rewrite them after finishing the discussion. Make sure that all of the major results have been included. If it's discussed, it must appear in the result text.
2. The organization of results into distinct categories is essential. For example, you may have a separate section for field data and lab data. Having to bring up one and then the other time and time again often seems out of place and unnecessary. Consequently, the results appear choppy and replete with redundancy. You are better served to integrate field and lab data in this instance. However, to do so seamlessly is going to be the trick. You will want to integrate the data in such a way that they corroborate and add legitimacy to one another without actually coming out and saying so.
3. First attempts at a results section often contain large amounts of data that are redundant with tabled data. Data iterated in a table typically don't need to be re-iterated again in the text. The other half of this problem occurs when the text contains few if any results at all. You must strike a balance here. Both problems typically occur when students have not spelled out in the text important general trends or patterns apparent in the data. As a result they are forced to either repeat tabled data, or limit their narrative to how data were collected and assembled.
4. The 'tone' of the results often seems to become stiff and at times, almost sterile. Approaches of this type make for difficult reading. Don't be afraid to include names in this section. For example in my student's works the word 'fish' may seldom appear, even when the paper is about fish. In most cases "fish" has been largely replaced with 'experimental group, or treatment group', or in some cases the fish are usurped by technical discussion of statistical analyses. As a result, the text seems to be somewhat detached from the fish themselves, focusing instead only on technical elements, often leaving the results to flounder with little or no continuity with the introduction. In fact, someone reading only the results would have few hints as to what animal the paper was written about. I don't recommend going through and scattering in the words fish willy-nilly in the text, but I would take the opportunity here and there to point out that "Red snapper from the high pressure group demonstrated a higher incidence of dillywhopper injury than fish exposed to lower pressure treatments".

5. Don't lose sight of the results themselves and instead focus too much on the statistical analyses. In doing so you make the statistics the central focus of the narrative and not the biology. The graphs and statistics should support the narrative, not be the narrative.
6. Avoid a results section is too wordy. The key to good results is keeping them concise yet complete. Using five words where two will do leaves the ms long on text but short on information. I believe that the text in most first drafts could be cut by 25% or more without loss of information.
7. Make sure your choice of words is appropriate and precise. The words very, quite, there, these, those, merely, much, and so on, are vague and not generally suitable for scientific writing. Also, avoid over-use of specific words in the results to the point that they become redundant.

Mechanics and Technical Problems

1. Students seem to have had a hard time distinguishing between results, methods and discussion points, and large sections of paragraphs in the Results actually belong in these other sections. You should not have any need to describe how data were collected, or why they were collected as they were in the Results – text of this nature belongs in the Methods section. Likewise, it is not appropriate to describe why a set of results is important or explain why they occur as they do – passages of this nature are reserved for the Discussion.
2. Make sure every paragraph has a topic sentence. Inclusion of good topic sentences that summarize general trends or patterns in the data followed by appropriate presentation of specific values, proportions, comparisons, and statistics go a long way to improving the readability of this section. Remember, if you take the first sentence of each paragraph and place them back to back on a page, reading them in order should give you all of the important information necessary to understand the paper. If you find a sentence (or sentences) that doesn't make sense or seems out of place, you don't have a paragraph that conveys any information and you're not done editing yet.
3. Be sure your statistics are not presented correctly. When reporting statistics you must report the test used (e.g., one-way ANOVA, or Student's independent t-test), degrees of freedom, the appropriate statistic (e.g., t, F, H, or R), and the probability associated with that statistic. Also, be clear on the use of all statistics and statistical terms in your paper. For example ANOVA and MRT's – ANOVA results will compare several means and tell you if any one mean is different from at least one other mean value in the group; MRT's, on the other hand, elucidate statistical relationships between all means in a comparison. The ANOVA will return a calculated probability, the MRT will not, it simply compares all mean values against a minimum statistical difference (or range – it depends on the test and how it controls error) that you set. The MRT breakdown is dependent on the alpha level you specify (we used 0.05 typically), i.e., the chance for error you are willing to accept. The alpha level (a set value you pick) is not the same as the probability, P (a calculated value based on

the test statistic). Many students report only the MRT, and treat the alpha level as though it's a probability ($\alpha < 0.05$). Both are no-no's. You must report the ANOVA first followed by the MRT; P will be reported for the ANOVA but you will report "alpha = 0.05" for all MRT's. You get the idea, but be sure to check out the other statistics and clear up similar problems you may have with these.

4. You cannot start a sentence with an acronym. Neither can you use the appendices as you would tables. It is probable that the text will appear without the appendix. Therefore, if you have a need to cite appendices in the text, then you need to table the appropriate data. If you do discuss tabular or graphic data in the text, do not fail to cite the appropriate Table or Figure. Also be sure to number tables and figures consecutively as they appear in the text.

I hope that my instruction here in combination with the lecture material are clear, and that they will help you prepare a functional and well-written draft.