

Data analysis report due Tuesday Dec 8
Student Presentations on Thursday Dec 8**Report guidelines (45 pts)**

Your reports should describe the scientific question addressed by your data, the source of your data, and techniques that you used in analysis. In addition, you should create a graph of your results, a statistical table, a paragraph that summarizes your results, in a way consistent with your statistical analysis, and a paragraph that interprets the data in light of the scientific question. On the front of your report, provide an abstract, and at the end, list any references to the science or the statistical analysis (indicate page numbers if you use a statistical text). Specific suggestions for format of each section follow:

Abstract- The abstract should be a self contained paragraph that provides a brief overview of the study. You should write this after you have finished the rest of the paper. One sentence should describe the question addressed. In another sentence, describe the objectives of the study (including hypotheses tested), and mention the study organism(s) and method of data collection. Your next sentence should mention the statistical analysis used, the next sentence (or two) should summarize results. The last sentence should interpret the significance of your findings, referring back to the original question.

Scientific question- In three or four sentences, describe the scientific question addressed by your data. This description should give the reader insight into the motivation behind the data collection, and should be worded without referring to statistical analysis principles or statistical techniques. You may cite a reference in this section.

Source of data and collection method- In two or three sentences, describe the source for the data, and how the data were collected. For example, many data arise from an experiment, but other data are collected based on analyzing natural changes in the environment (e.g. flowering dates of plants over time, changes in the shape of a stream inferred from aerial photos). Still other data are collected by tabulating separate scientific studies. Be sure to cite the specific source for your data here. You may have obtained them from a scientist, a scientific paper, or from your own data collection.

Statistical analysis techniques- In a few sentences, describe the statistical methods used. These methods may include any data transformations conducted, tests for assumptions (normality or others), and the final analysis method. If you used data published elsewhere or data that someone else analyzed, describe exactly how your analysis method differs from the one used by the authors of the paper.

Graph of results- Represent your data in graphical form (scatterplot, bar graph, pie diagram, etc). You may draw your graph by hand, if you wish, but make sure that it is accurately represented (use graph paper). I do not want to see a difficult to read graph produced by JMP. If you must use JMP, you need to also learn how to make the graph look close to publication quality (see Figs 19.1 to 19.25 in Quinn and Keough for example graphs). Make sure that axes are labeled clearly on your graph. Include a two or three sentence figure caption with your graph.

Statistical table- Provide a statistical table that summarizes any statistics calculated to evaluate the results shown on the graph. The most common example of these is an ANOVA or ANCOVA table, but you might also show the results of a logistic regression model or contingency table analysis on your table. The statistical table should not be a table of means and standard errors. These should show up on your graph.

Results summary- Write a brief paragraph, in plain English, that describes the results shown on your graph and your statistical table. This should not require more than two or three sentences. Do not duplicate information on your graph exactly, but use the text to highlight points that might not be immediately apparent from looking at the graph.

Data interpretation- Write a brief paragraph that interprets your findings in the light of the original research question. This paragraph should not summarize results, but rather it should derive conclusions or offer hypotheses to explain the pattern observed. If you conducted a different analysis of published data, compare your results to those described in the published source

Literature cited- Cite the source of your data and/or the source of the description of the statistical tests made. If you use Quinn and Keough or another statistics text, then mention the specific pages that cover your statistical technique here.

Student presentation guidelines (50 pts)

Presentation time: 10 minutes + 3 minutes for questions

Your presentations should describe the scientific question addressed by your data, the process of your data analysis, with any important assumptions or applications of the technique, your results, comparison to other analyses, and a conclusion that addresses the scientific question. You may use Powerpoint or overhead transparencies for your talk. You should distribute relevant visual aids (tables that don't show up well on overheads or graphs) to the class. I will ask the audience to provide constructive suggestions to each speaker and to write down two questions about each presentation.

Organizing your talk

Your talk should include

- ✓ conceptual framework and research question (1 minute)
- ✓ the study system used in your paper (1 minute)
- ✓ description of statistical methods used (3 minutes)
- ✓ results of your statistical analysis (3 minutes)
- ✓ comparison of your findings to other analyses or other experiments (1 minute)
- ✓ conclusion (1 minute).

What you should bring and distribute to all of us:

1. *Abstract of your paper*
2. *Visual aids*: Essential figures or tables that you will show us and hand out to us at the meeting. Overheads or slides with text and figures or tables would be very useful. In some cases it might be best to describe a figure that is on the handout that you have given us. Don't give us too much! You can explain at most 2 figures or tables in 10 minutes. Your abstract and figures should occupy at most two printed pages.

Don't forget:

1. *You don't have much time*. Pick one important aspect of your project and explain that to us. There should be a take home message. If you cover too much ground, we will get lost.
2. *Text overheads are helpful*. If you print up a couple of overheads with brief text, you can use that text to help you remember what you want to say and to help us follow your most important points. Change and motion help keep your audience focused on what you are saying.
3. *Visual aids help*: Do not find yourself talking for a long time about something that we can't see. One needs multiple reference points to keep one's attention focused.
4. *Practice your talk*. Try it in front of another person. They can help you express your points clearly and help you organize your time (see guidelines above). They can also let you know whether your overhead(s) is/are legible.