

HUDM 5123 - Final Project

The final project for this class is meant to be an opportunity for you to apply methods learned and practiced in this course with real data. Because the methods we have covered apply most readily to randomized experiments, I will ask that you use data that come from a randomized experimental design for the project. ANOVA may be used to estimate a treatment effect (main effect) or a differential treatment effect (interaction) but only if the cases were randomly assigned to treatment groups. If cases were not randomly assigned, then the data may be systematically imbalanced on some important confounding variable, either observed or unobserved, that can cause bias in the ANOVA-based estimate of the effect.

So where should you get your data? My first suggestion is to look at the open journal PLOS ONE. There is a link to the journal in our syllabus and you have already worked with data sets in lab that were taken from PLOS ONE publications. Another option is to work with data from your own research work or research lab for this project, especially if you or your colleagues have run a randomized experiment. If you decide to work with your own data or data from your lab, make sure you have permission to use it.

This project should be about 8 double-spaced pages long, on average, not including plots or references. The distribution of page lengths will likely have a standard deviation of about 1.5 pages, though note that the distribution is skewed to the right. Six pages is an absolute minimum.

The paper should include a brief introduction. After the introduction, you will write a brief literature review in which you describe the literature related to the research questions you are asking in this study. This literature review will be shorter than a review would be for a typical paper because here we will be concerned more with the methods. After the literature review you will write a section on methods. At the beginning of the methods section you will note your primary research question and any secondary research questions. Then, you will describe the methods you will use to test the research questions. The most interesting questions will be more than just a one-way ANOVA. I don't want to say that it is a requirement that you work with data that are more complex than single-factor between-subjects, because it's *possible* to do an ok job with simple data if you really work at adding complexity elsewhere. That said, you should consider finding data that permit you to work with a slightly more complex design. Two-factor experiments are interesting because you will be able to check for interaction. Factors with more than two levels are interesting because they will allow you to follow up with pairwise or complex contrasts. ANCOVA is interesting because you can look at adjusted means and compare and contrast ANCOVA-based estimates to ANOVA. Within-subjects factors are interesting as well. In the methods section, then, you should describe the design as well as the methods you will use and any assumptions required for them to be valid. In any case, it is not enough to simply run an omnibus test and call it a day. You should follow up with contrasts of some sort and confidence intervals.

The next section is the Analysis and Results. Here is where you will check tenability of assumptions and give some sense as to whether we should feel comfortable or not interpreting the results without any caveats. Furthermore, here is where you will report the results of the analyses in tables and/or plots and/or in the text. Results include omnibus test results and any relevant follow-up comparisons along with relevant means and confidence intervals.

But what if my omnibus test is not significant? This happens sometimes. You set up an

interesting analysis with your data that hinges on an omnibus test main effect or interaction being significant but then the test is not significant. In that case, you have a couple of options. First, you could run through the mechanics with the disclaimer that you are doing the analyses only for the purpose of the project. Second, you could add complexity from another source. This might mean revisiting your research questions to add an exploratory element or bringing in a new variable or new data. Either is ok.

Finally, you will conclude with a discussion section in which you summarize what you found and reflect on how the results tie in to and inform your research questions. This is also a good place to mention any limitations (all studies have them). Some general comments about the paper... Do not copy/paste any SPSS output into your paper. Instead, describe output in tables, in text, and with plots. It is ok to copy/paste a plot produced by SPSS so long as you do so tastefully, meaning that it should be labeled and have a note that explains to the reader what they are looking at. Do not put plots in the paper unless they are necessary. Follow APA formatting guidelines.