PSYC 6810
Advanced Techniques in the Science of Human Nature

Instructor: Mike Clark Ph.D.
Office hours: variable but usually afternoon and anytime by appointment
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Text: Traditional multivariate texts have grown increasingly unsatisfactory to me. I first used Tabachnick & Fidell, and while still recommended as a resource, I'm not convinced it's very useful in the learning stages. As such, I used Harlow's text (in the bookstore) as a conceptual guide the last two years. However, it still reflects a standard treatment which I honestly don't think is really viable these days and while the book is cheap you could easily glean all of its info in the first returns of Google searches on the chapter topics. While it has been the nature of the course in the past, I propose even a larger breadth to depth ratio for this course. Having had 5700 and 5710 you have fundamentals. This course can extend those while also providing exposure to advanced techniques. In this vein I propose more of a workshop approach with notes and additional resources provided but mostly getting our hands dirty with application and interpretation.

My perspective: As many of you know, my approach to data analysis is typically different from what you are exposed to by others and in what you read. It comes from a focus on methods and reading the works of experts in that realm, not experts in an applied research domain. There has long been an unfortunate disconnect (though entirely unnecessary in my opinion) between what methodologists say/ do/suggest and what is actually practiced by applied researchers in psychology. I teach methods of analysis, and will rely on statisticians and other methodologists for information regarding them.

Classroom atmosphere: Well, we don't meet in a classroom so hopefully that will help dispel some of the usual formality. Almost all of you have taken a course with me and know what to expect, as I do from you. Let's say we have some fun shall we?

Content: up to you with some suggestions and structure provided by me. Here is a proposal:

Two weeks for review of univariate methods, issues with null hypothesis testing, understanding basic models and their assumptions and the like.
Regression with a single model done appropriately with tests of assumptions, adequate examination of variable importance, and robust regression when those assumptions fail.
Exploratory regression included re-examination of traditional approaches and applications of new ones
Overview of other standard regression techniques
Basics of PCA
Tying it together: PC Regression
Overview of Canonical correlation, tie to regression, MANOVA
Classification: DFA and Logistic regression, preview to modern approaches.
Path Analysis
Multilevel Modeling
Factor Analysis Basics and beyond
Overview of CFA/SEM

Course Grade:

Critiques/Analysis/Quizzes and the like (Examples below) 75%
Classroom participation: 15%
Meet with me: 10%

Analysis:

Show demonstration of knowledge and interpretation of statistical output implementing software for the analysis of data. These will be in-class or homework assignments and will be typically assigned after finishing discussion about a particular method or simply to give yourself a chance to demonstrate proficiency with a technique you want to feel comfortable with for whatever reason.

Article critiques:

To help further our ability to interpret the results of these techniques, you are to find research that utilizes a particular method discussed in class in its analysis. The topic can be on anything, so try and find something that is interesting to you. You are to provide the basic motivation underlying the research, the hypotheses involved, give a summary of the results and general conclusions, as well as give your own thoughts about the research.

Quizzes:

A couple over the course of the semester to see if we're comfortable with what's been presented.

Participation:

You are expected to attend each class session. If for some reason you cannot, you'll need to contact me. You are also expected to keep up with the message boards (not necessarily post) and help each other out with projects/questions when the occasion arises. Furthermore, you either need to check your unt email regularly or have it forwarded to your regular email in case I need to contact the class at once.

Meet with me:

Chat about your research or anything else you want. Must do before April.