

CCI 611 -- Statistical Design and Analysis for CCI Research
Fall 2014
Monday 4:40 to 7:30 p.m.; COM-420

Instructors:

Professor Ben Bates – bjbates@utk.edu; office: 333 COM; office hours: MT 1:30-4 or by appointment

Professor Julie Andsager – jandsage@utk.edu; office: 333 COM; office hours: MT 1:30-3 or by appointment

Catalog Description:

Methods of statistical analysis of data in Communication and Information. Begins with a review of basic probability and descriptive statistical concepts, then moves to consider statistical inference and hypothesis-testing, focusing on regression and ANOVA. Emphasizes the use and interpretation of statistics in communication and information research.

Real (i.e., Professor Bates's) Course Description:

Methods of statistical analysis of data in Communication and Information. Begins with a review of basic probability and descriptive statistical concepts, then moves to consider statistical inference and hypothesis-testing, focusing on regression & ANOVA (linear models). The course will also cover other statistical techniques appropriate for CCI and students' research.

Emphasizes the appropriate and proper use and interpretation of statistics in communication and information research. This will include understanding how research design and measurement elements influence which statistical techniques are valid for specific uses, and the appropriate interpretation of statistical results.

Course Objectives

- Improve ability to reason quantitatively
- Understanding how research design and measurement choices impact statistical analysis (and in reverse, what design and measure characteristics do you need for a specific statistical application)
- Understanding the role of probability distributions, and the use of plotting as validity check
- Develop understanding of statistical techniques, how to implement them, and how to interpret results. Techniques will include:
 - Descriptive and exploratory statistics and techniques
 - Chi-Square and other non-parametric statistics and techniques
 - Correlation, basic regression, multivariate, and related linear modelling statistics and techniques
 - Analysis of Variance and related techniques (ANCOVA, MANOVA), Discriminant Analysis
 - Factor Analysis and other data reduction techniques
 - Statistical modeling through time series, path analysis, etc. (if time permits)

- Other techniques of interest (if time permits)
- Understanding what to do with “bad” data

Texts, Readings, Etc.

There will be no specific formal “required” text for this course. Required readings will draw on the plethora of online sources available. However, it may be useful to find a basic applied stats text to use as a resource (They’re all pretty much similar in content and presentation, but run them by the instructors for approval). One of the most comprehensive books is Andrew Hayes’s *Statistical Methods for Communication Science* (2005, Lawrence Erlbaum Associates; 2009, Routledge). There are also several basic probability and statistic e-books available for free from the iBooks (Apple) and Kindle (Amazon) stores. There will be links posted on the class Blackboard site, along with recommendations for other stats and data analysis resources.

There are two other sets of materials you will need: a current copy of SPSS (available free from OIT); and a SPSS dataset from your area of interest (you may have one already; if not, ask your colleagues or professors for one you can use).

Grading: 75% - Homework & Quizzes (see assignments under Tentative Schedule)
 25% - Final Project (Data Analysis)

Tentative Schedule

25 August	Introductions
1 September	Boomsday, no class
8 September	It Starts with Data Measures, distributions, data entry, cleansing & handling, basic plotting for validity
15 September	Sampling, Distributions, & Descriptive Statistics
22 September	Basics of Inferential Statistics & Hypothesis Testing
29 September	Basic Parametric Statistics (General Linear Models) Correlation, T-tests, and Basic Regression
6 October	ANOVA (GLM)
13 October	Dealing with problematic measures, Nonparametric Statistics, Non-Normal Distributions & Variable Transformation
20 October	Multivariate Linear Models (Partial Correlation, Multivariate Regression, Hierarchical Regression, Stepwise Regression) (GLM)

Multivariate Linear Models (MANOVA, ANCOVA, Discriminant Analysis)

Data Reduction Techniques (Factor Analysis, Cluster Analysis)

Models: Forecasting & Testing (Structural Equation Modelling, Path Analysis, Time Series)

11 December (Thursday), 4:45 p.m. – **Final project due**

Homework assignments and final project:

Homework assignments are worth about 9% each (points will be assigned). To be acceptable, completed assignments must provide and label all relevant documents for computer-generated answers (i.e., provide the SPSS output and syntax with answers labeled; for hand calculations, show your work). Assignments must be emailed -- submitted to both bjbates@utk.edu and jandsage@utk.edu by their deadline; "late" will begin 5 minutes after the deadline. (Homework requiring hand calculations can either be turned in on paper or, preferably, scanned/photographed into a .jpg file.) Grades on late assignments will be lowered by 10% each day they are late. Deadlines will be set as we move through the semester, but you will have at least 5 days to complete the homework assignments and no more than one per week. More details on assignments will be included as they are posted on the Blackboard site.

Data cleansing and identification – Using an SPSS data set that we provide, cleanse the data (look for mistakes, such as a 6 entered on a variable with a 5-point response set; make sure missing variables are identified as such; etc.). Then identify the measurement level of each variable and provide the appropriate descriptive statistics as you would for a quantitative research article. *Important:* Save the cleansed SPSS data set – several homework assignments will require it.

Basic calculations – Using the small data set (not the SPSS set) provided, identify the mean, median, and mode for 2 variables. Calculate 2 chi-square tests. Explain what the results mean.

Planning for analysis I – You will be given 2 hypotheses or research questions using the variables in the SPSS data set. What statistical tests would you use to test the hypotheses and answer the RQs? Justify your choices. Then write a hypothesis or research question of your own to be answered with the data set, and explain what statistical tests you will use to test/answer it. (Be sure to look at the data distributions.)

Analysis I – Using the SPSS data set, test the hypotheses and answer the RQs using the appropriate statistical tests. Write a Results section (as you would see in a quantitative research article) to report your findings.

Planning for analysis II – Same as Planning for analysis I, but hypotheses and RQs will include 3-4 variables.

Analysis II – Using the SPSS data set, test the hypotheses and answer the RQs using the appropriate statistical tests. Write a Results section (as you would see in a quantitative research article) to report your findings.

Analysis III – Using the SPSS data set, test the hypotheses and answer the RQs using the appropriate statistical tests. Write a Results section (as you would see in a quantitative research article) to report your findings.

Analysis IV – Same as previous assignments, depending on where we are in the material.

Final project – You will be provided with a new data set, with the basics of Methods and a set of hypotheses/RQs. Follow the appropriate procedures to prepare it for analysis. Complete the Methods section, and write a report that includes Results and brief Discussion.