Anthropology ANG6186: Quantitative Methods in Archaeology
Fall semester 2017—Tuesday, 12:50 – 3:50
Turlington 1208H

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Office Hours: Wednesday, 3 to 5 pm

Quantitative Methods in Archaeology introduces graduate students to basic statistical concepts and techniques as applied in archaeology. The major goal of the class is to provide an understanding of the role of statistical methods in the development and application of research designs. We will address basic descriptive statistics and simple inferential statistics in sufficient depth to provide a background in the general uses of quantitative approaches. In the latter portion of the course we will review some multivariate applications. Issues of sampling will also be an important component of the class.

It is not anticipated that one will become a quantitative expert after taking this class. The aim is to familiarize students with common statistical techniques, and just as importantly, to acquaint them with the potential of translating quantitative anthropological data into meaningful statements about human behavior.

It is not expected that students have a statistics or quantitative background beyond basic algebra. The course thus will start with the very basics. The course will be taught once a week in a three-hour session. For the first half of the class I will present lectures on various topics in statistics. We then will turn to computer software applications in the second half of the class.

Learning Outcomes:
By the end of the semester the student should have acquired the following areas of knowledge and skill sets:
1) Ability to apply a core suite of descriptive and inferential statistical techniques to data sets. This includes acquiring the capability to apply the techniques by computer program (SPSS and R).
2) Comprehend which statistical techniques are appropriate for different types of data sets (continuous versus non-continuous data) and types of research questions.
3) Capability to integrate statistical tests into written narratives of research, as traditionally done in theses, dissertations, and professional publications.
4) Ability to critically evaluate common uses and mis-uses of statistics in anthropological literature.

Method of Evaluation:
There are two requirements for the course that will lead to the assessment of your final grade. Most class sessions will be followed up by a take-home assignment (90 percent of grade). This will allow you to exercise your software skills in doing statistical analysis. The second requirement is course participation. Most of our weekly meetings will also involve one reading in the application of statistics in archaeology. It is my expectation that you will have read this and be prepared to discuss it in class (10 percent of grade). Do not be surprised if I call your name at random to initiate discussion of the reading.

There are no textbooks for the course. Some standard texts in archaeology and statistics include:

Baxter, Michael (2010). *Statistics in Archaeology*. Wiley. ($127 for hardcover, ouch).

Drennan, Richard (2010). *Statistics for Archaeologists: A Commonsense Approach*. 2nd edition. Springer, New York.

Madrigal, Lorena (2012*). Statistics for Anthropology*. 2nd edition. Cambridge University Press, Cambridge. [actually not just archaeology, but a very straightforward intro to common statistical approaches]

Shennan, Stephen (1997). *Quantifying Archaeology*. 2nd edition. University of Iowa Press, Iowa. (may be later editions out there)

Schedule of Classes and Topics

Week 1 August 22
Introduction to Class: Issues of Research Design; Scales of Data; Introduction to SPSS and R

Week 2 August 29
Measures of Central Tendency and Dispersion
Exploratory Data Analysis; Dealing with Data Transformations

Week 3 Sept. 5
Hypothesis Testing & Statistical Inference
Probability and Confidence Intervals

Week 4 Sept. 12
Two-Samples Differences: Non-parametric and Parametric

Week 5 Sept. 19
ANOVA and its Variations; Post-Hoc Comparison Procedures

Week 6 Sept. 26
Dealing with Categorical Data: Chi-Square and Contingency Tables

Week 7 Oct 3
Sampling in Archaeology

Week 8 Oct 10
Bayesian Statistics and Radiocarbon Dates

Week 9 Oct. 17
Comparing Categorical and Ordinal Data: Non-Parametric Approaches

Week 10 Oct. 24
Correlation and Regression

Week 11 Oct. 31
More Themes in Correlation and Regression: Trend Analysis, Stepwise Regression, and more

Week 12 Nov. 7
Spearman Analysis and Other Forms of Non-parametric Correlation

Week 13 Nov. 14
A Primer on Multivariate Approaches

Week 14 Nov. 21
More on Multivariate Approaches

Week 15 Nov. 28
Dealing with Diversity

Week 16 December 5
Overview of resampling