

**ANTHROPOLOGICAL DATA ANALYSIS
AUTUMN SEMESTER
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"If a thing exists, it exists in some amount, and if it exists in some amount, it can be measured." E. L. Thorndike (1874-1949)

"If you haven't measured it you don't know what you are talking about....To measure is to know....If you cannot measure it, you cannot improve it." Lord Kelvin (Sir William Thomson 1824-1902)

This course is designed as a one-term introduction to how anthropologists use quantitative analysis to solve their problems of interest. I concentrate on conceptualization and interpretation of quantitative results and hope to promote critical thinking.

Your performance is assessed on your final ability to do four things:

- solve anthropological problems involving quantitative data,
- understand quantitative reasoning,
- write clear and appropriate explanations of quantitative results, and
- choose appropriate techniques to analyze data from simple data sets.

These expectations are appropriate because they increase the chances that you will be able to independently evaluate and understand quantitative results in monographs and journal articles. You will also be able to analyze data from your own research using quantitative techniques. Experience tells me that you will enjoy this course. My style is informal, personal, and yet rigorous. The following explains in more detail what you will be able to do at the conclusion of this course and presents a course outline.

1. Introduction

- Distinguish between descriptive and inferential statistics
- Define population, sample, parameter, static, and variable as used in this course
- Distinguish between quantitative and qualitative variables
- Identify lower and upper limits of a quantitative measurement
- Define independent variable, dependent variable, and extraneous variable.
- Identify four scales of measurement and distinguish between them

9. Hypothesis Testing: One-Sample Designs

- Explain null hypothesis significance testing
- Define alpha, significance level, rejection region, and critical value
- Use a one sample t test to determine the significance of a value
- Explain what rejecting a null hypothesis means

10. Hypothesis Testing: Two-Sample Designs

- Explain null hypothesis significance testing for two samples
- Explain the reasoning for determining degrees of freedom
- Distinguish between independent and paired samples designs
- Calculate and interpret t test values for two sample designs
- Calculate and interpret confidence intervals for two sample designs
- List and explain assumptions required for the t distribution
- Define power and explain the factors that affect power

11. ANOVA: One-Way Classification

- Identify the independent and dependent variables in a one-way ANOVA
- Explain the rationale of ANOVA
- Define F and explain its relationship to t and the normal distribution
- List and explain the assumptions of ANOVA
- Interpret F values, considering power

12. ANOVA: One-Factor Repeated Measures

- Describe a one-factor repeated measures ANOVA
- Interpret the F value from a one-factor repeated measures ANOVA
- Explain advantages and cautions with a repeated measures ANOVA

13. ANOVA: Factorial Design

- Define the terms *factorial design*, *factor*, *cell*, *main effect*, and *interaction*
- Name the sources of variance in a factorial design
- Determine whether F values are significant
- Interpret an interaction
- List assumptions required for a factorial design ANOVA

14. Chi Squared Tests

- Identify the kind of data that require a chi squared test for hypothesis testing
- Identify problems that require tests of independence
- Identify problems that require goodness-of-fit tests
- State null hypotheses and calculate and interpret chi squared values
- Calculate and interpret odds ratios and phi for contingency tables