

CHRISTOPHER G. PRENER, PH.D.

# READING LIST

SOC 5050: QUANTITATIVE ANALYSIS  
FALL, 2016  
SAINT LOUIS UNIVERSITY



# Reading Notes

Reading Abbreviations	
Abbreviation	Full Title
Acock	Acock, Alan. 2016. <i>A Gentle Introduction to Stata</i> . 5 <sup>th</sup> edition. College Station, TX: Stata Press.
Freedman et al.	Freedman, David, Robert Pisani, and Roger Purves. 2007. <i>Statistics</i> . 4 <sup>th</sup> edition. New York, NY: W.W. Norton and Company.
Long	Long, J. Scott. 2009. <i>The Workflow of Data Analysis Using Stata</i> . College Station, TX: Stata Press.
Mitchell	Mitchell, Michael N. 2012. <i>A Visual Guide to Stata Graphics</i> . 3 <sup>rd</sup> edition. College Station, TX: Stata Press.
Wheelan	Wheelan, Charles. 2014. <i>Naked Statistics: Stripping the Dread from the Data</i> . New York, NY: W.W. Norton and Company.

Reading Locations	
Abbreviation	Location
ER	Electronic Reserves
GH	GitHub
Link	Website URL
PL	Pius Library

*Notes:* Github readings will be available in the Course-Readings repository; you will need to be a member of the course organization to access them. The password for the Electric Reserves site will be emailed to students at the beginning of the semester.



# *Reading List*

*Week 1 - August 22<sup>nd</sup>*

## *Course Introduction*

### **Topics**

- Syllabus Overview
- Inferential Statistics - What are quantitative data and what do they look like?
- Data Analysis - Intro to Course Tools: Stata, GitHub, and Atom
- Quantitative Research - What is a Workflow?

### **Readings**

- Acock - Chapters 1 and 4 [GH]
- Freedman et al. - Chapters 1 and 2 [GH]
- Long - Chapters 1 and 8 [GH]
- Wheelan - Chapter 1 [GH]

### **Lab Activity**

- Lab 1 - Introduction to Stata, GitHub, and Atom

*Week 2 - August 29<sup>th</sup>*

*Describing Distributions*

**Topics**

- Inferential Statistics - Mean, Median, Mode, Variance, & Standard Deviation
- Data Analysis - Describing Distributions
- Data Visualization - Histograms and Bar Charts
- Quantitative Research - Getting Organized

**Readings**

- Acock - Chapter 5
- Freedman et al. - Chapters 3 and 4
- Long - Chapter 2
- Wheelan - Chapters 2 and 3

**Lab Activity**

- Lab 2 - Descriptive Statistics and Graphs

**Assignment Due**

- Student Information Sheet and Syllabus Agreement

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*Week 3 - September 5<sup>th</sup>*

*Tegrity Lecture: Working with Data (Part 1)*

**Topics**

- Data Analysis - Initial Data Cleaning Tasks
- Quantitative Research - Structuring Do-Files

**Readings**

- Acock - Chapter 3 (skip Section 3.6)
- Long - Chapter 3

**Lab Activity**

- Lab 3 - Initial Data Cleaning Tasks

**Assignment Due**

- Problem Set 1 - Descriptive Statistics (Week 2)

*Week 4 - September 12<sup>th</sup>**Probability and Bayes' Theorem***Topics**

- Inferential Statistics - Probability and Bayes' Theorem

**Readings**

- Freedman et al. - Chapters 13 and 14
- Silver, Nate. "Less and Less Wrong." Pp. 232-261 in *The Signal and the Noise: Why So Many Predictions Fail but Some Don't*. New York, NY: Penguin Books. [ER]
- Wheelan - Chapters 5, 5.5, and 6

**Lab Activity**

- Lab 4 - Probability and Bayes' Theorem

**Assignment Due**

- Final Project - Memo
- Problem Set 2 - Initial Data Cleaning (Week 3)

*Week 5 - September 19<sup>th</sup>**The Distribution of Random Variables***Topics**

- Inferential Statistics - Binomial, Negative Binomial, Poisson, and Gaussian Distributions; Testing for Normality
- Data Analysis - Calculated Probabilities for Random Variables; Normality Tests in Stata
- Data Visualization - Normality Plots

**Readings**

- Freedman et al. - Chapters 5 and 15

**Lab Activity**

- Lab 5 - Working with Random Variables

**Assignment Due**

- Problem Set 3 - Probability and Bayes' Theorem (Week 4)

*Week 6 - September 26<sup>th</sup>*

*Foundations for Inference*

**Topics**

- Inferential Statistics - Standard Error, Confidence Intervals, Hypothesis Testing, and the Central Limit Theorem

**Readings**

- Freedman et al. - Chapters 6, 16, 17, and 18
- Wheelan - Chapters 8 and 9

**Lab Activity**

- Lab 6 - Foundations for Inference

**Assignment Due**

- Problem Set 4 - Working with Random Variables (Week 5)
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*Week 7 - October 3<sup>rd</sup>*

*Difference of Means (Part 1)*

**Topics**

- Inferential Statistics - One and Two Sample T-Tests
- Quantitative Research - Automating Your Work: Macros

**Readings**

- Freedman et al. - Chapter 26
- Long - Chapter 4, pp. 83-92

**Lab Activity**

- Lab 7 - T-Tests by Hand and Macros

**Assignment Due**

- Quiz 1 - Covers Weeks 1 to 6
- Problem Set 5 - Foundations for Inference (Week 6)



*Week 8 - October 10<sup>th</sup>**Difference of Means (Part 2)***Topics**

- Inferential Statistics - Non-parametric Tests: Wilcoxon Rank Sum Test
- Data Analysis - One and Two Sample T-Tests in Stata; Effect Sizes and Power Analyses for T-Tests
- Data Visualization - Graphing T-Test Results
- Quantitative Research - Automating Your Work: Loops

**Readings**

- Acock - Chapter 7
- Long - Chapter 4, pp. 92-106

**Lab Activity**

- Lab 8 - T-Tests in Stata, Power Analyses, and Loops

**Assignment Due**

- Final Project - Literature Review, Hypotheses, and Data Analysis Plan
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*Week 9 - October 18<sup>th</sup>**Tegrity Lecture: Working with Data (Part 2)***Topics**

- Quantitative Research - Exploring, Cleaning, and Documenting Datasets

**Readings**

- Long - Chapters 5 and 6
- Wheelan - Chapter 7

**Lab Activity**

- Lab 9 - Deep Cleaning Data

**Assignment Due**

- Problem Set 6 - T-Tests and Automation (Weeks 7 and 8)

*Week 10 - October 24<sup>th</sup>*

*Correlations (Part 1)*

**Topics**

- Statistics Applications - Public Polling
- Inferential Statistics - Pearson's  $r$
- Data Visualization - Interpreting Scatterplots
- Quantitative Research - Digging in to the Final Project: Planning, Organizing, and Documenting

**Readings**

- Freedman et al. - Chapters 8 and 9; Chapters 19, 20, and 21
- Long - Chapter 7, pp. 287-298
- Wheelan - Chapters 4 and 10

**Lab Activity**

- Lab 10 - Pearson's  $r$  by Hand and Scatterplot Interpretations

**Assignment Due**

- Problem Set 7 - Deep Cleaning Data (Week 9)

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*Week 11 - October 31<sup>st</sup>*

*Correlations (Part 2)*

**Topics**

- Inferential Statistics - Non-parametric Correlations: Spearman's  $\rho$  and Kendall's  $\tau$
- Data Analysis - Pearson's  $r$  in Stata; Power Analyses for Correlations
- Data Visualization - Creating Scatterplots
- Quantitative Research - More Automation, Baseline Statistics, and Replication

**Readings**

- Acock - Chapter 8 (skip Section 8.5)
- Long - Chapter 7, pp. 298-303 and pp. 312-318

**Lab Activity**

- Lab 11 - Correlations in Stata, Power Analyses, and Scatterplots

*Week 12 - November 7<sup>th</sup>*

## ANOVA

### Topics

- Inferential Statistics - ANOVA Tests
- Data Analysis - ANOVA Tests in Stata
- Quantitative Research - Presenting Results: Creating Tables

### Readings

- Acock - Chapter 9
- Long - Chapter 7, pp. 319-323

### Lab Activity

- Quiz 2 - Weeks 7 to 11
- Lab 12 - ANOVA

### Assignment Due

- Problem Set 8 - Correlation (Weeks 10 and 11)

*Week 13 - November 14<sup>th</sup>*

*Bivariate Regression*

**Topics**

- Inferential Statistics - Regression Theory and Bivariate Regression
- Data Analysis - Bivariate Regression in Stata
- Quantitative Research - Presenting Results: Graphs

**Readings**

- Acock - Chapter 8, pp. 207-212
- Freedman et al. - Chapters 10 and 11
- Long - Chapter 7, pp. 323-326
- Wheelan - Chapter 11

**Lab Activity**

- Lab 13 - Bivariate Regression

**Assignment Due**

- Problem Set 9 - ANOVA (Week 12)

*Week 14 - November 21<sup>st</sup>*

*Multivariate Regression (Part 1)*

**Topics**

- Inferential Statistics - Multivariate Regression Theory
- Data Analysis - Multivariate Regression in Stata
- Data Visualization - The marginsplot Command
- Quantitative Research - Creating Papers and Presentations

**Readings**

- Acock - Chapter 10, pp. 273-281
- Freedman et al. - Chapter 12
- Long - Chapter 7, pp. 326-328

**Lab Activity**

- Lab 14 - Multivariate Regression

**Assignment Due**

- Final Project - Draft of Paper and Slides

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*Week 15 - November 28<sup>th</sup>*

*Multivariate Regression (Part 2)*

**Topics**

- Data Analysis - Multivariate Regression Assumptions and Model Fit
- Data Visualization - Plots for Model Fit
- Quantitative Research - A Project Checklist

**Readings**

- Acock - Chapter 10, pp. 281-296
- Long - Chapter 7, p. 328
- Wheelan - Chapter 12

**Lab Activity**

- Lab 15 - Multivariate Regression Diagnostics

*Week 16 - December 5<sup>th</sup>*

*Analyzing Categorical Data*

**Topics**

- Inferential Statistics - Chi-squared Test; Some Final Points on Statistical Analyses
- Data Analysis - Chi-squared Test in Stata; Power Analyses for Chi-squared Tests

**Readings**

- Acock - Chapter 6
- Freedman et al. - Chapters 28 and 29
- Kass et al. 2016. "Ten Simple Rules for Effective Statistical Practice." *PLoS Computational Biology* 12(6): e1004961. [ER]

**Lab Activity**

- Lab 16 - Analyzing Categorical Data

**Assignments Due**

- Quiz 3 - Weeks 12 to 15
- Problem Set 10 - Multivariate Regression

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*Week 17 - December 12<sup>th</sup>*

*Final Presentations*

**Topics**

- Final Project Presentations - Analyses of the 2012 General Social Survey

**Assignment Due**

- Final Project - All requested data, code, and documentation
- Final Project - .pdf of Slides
- Final Project - .pdf and Printed Copy of Paper