Week 1 Lecture Notes

Sherri Verdugo

August 24, 2014

Contents

Course Description

- SOCI 303 Statistics for the Social Sciences

Description: Prerequisites: completion of G. E. Categories III.A.1 and III.C.1. Techniques for the elementary statistical analysis of social data. Description and inferential measures include tests, chi-square, analysis of variance, contingency table analysis and linear regression. Units: (3)

This class is not difficult, but you will be required to retain the information you learn. Take notes, ask questions, inquire. This is the learning process so you will need to recall math concepts. If enough people are interested, I will run a math review boot camp during the second week during office hours. In addition, I will provide extra notes for math concepts that will be key in our class.

Syllabus

Let's take a few minutes to go over the syllabus and expectations for the class.

Surviving Statistics

Statistics is a method based class. Meaning that you will learn methods that will carry you through to the next topic. This semester will build on top of knowledge you already know and will learn. If you are stuck, confused, or you want to talk about statistics, I encourage you to come to my office.

- Statistics is defined as: a set of methods where one wants to infer facts about a population using *noisy* statistical data where uncertainty must be accounted for.
- Motivations:
- Elections (who will win an election... prediction)
- Clinical research (will a certain medication perform better?)
- Does the weight of a car impact the mpg of the car?
- Hypothesis testing... using evidence based methods!

When things go wrong with research

- Can things go wrong:
- Hormone replacement therapy study in 2002 stopped for negative events.
- Newborns and extra corporeal membrane oxygenation treatment (ECMOs)... sample sized based criticism.
- How to avoid things going "wrong"...
- Reproducible research
- Documentation
- Following procedures
- Correct interpretation

Expectations

- Overview of the field of statistics
- Provide an overview of the scientific method
- Statistical reasoning learned from observations
- Techniques for dealing with uncertainties in drawing conclusions
- Making sense of data
- Familiarity with SPSS

Over the course, you will find that some topics may be more difficult than others. Just remember to look back at your notes because a missing step can often lead to the wrong answer.

Class Organization

Chapter	Title	Topic
Ch. 1	How we reason	Scientific Method
Ch. 2	Levels of Measurement	NOIR
Ch. 3	Defining Variables	Operational Definitions
Ch. 4	Central Tendency	Mean, Median, Mode
Ch. 5	Measuring Dispersion	Range, Variance, St. Deviation
Ch. 6	Contingency Tables	Construction, Regrouping
Ch. 7	Statistical Inference	Tests of Significance
Ch. 8	Probability Distributions	z test & t test
Ch. 9	Two Sample t-test	Independent vs. Dependent
Ch. 10	One-Way ANOVA	Analysis of Variance
Ch. 11	Measuring Association	Interpreting Association
Ch. 12	Chi-Square	Tests for Contingency
Misc. 1	Correlation	Does not imply causation
Misc. 2	Regression	Prediction

Overview of course

Each week we will be dividing our time between lecture and hands on experience. Check the course websites for more information.

Item	Points Possible
Attendance	100 Points (based on rosters)
Participation	50 Points
Homework	100 Points
Homework Desc.	5 assignments @ 20 points each
Exams	300 points
Exam Desc.	2 exams @ 150 points each
Writing Assignment	150 points 2 components
W.A. Desc.	Draft 75 Points
W.A. Desc.	Final 75 Points

Total Points available: `Points:  100 + 50 + 100 + 300 + 150 = 700`

Please make sure you check the course website for deadlines and other course information.

Questions

You can reach me at: sverdugo@fullerton.edu

Phone: 657.278.6728