Fall 2016 Course Syllabus
PSY 510/610 Categorical Data Analysis

Instructor
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Meeting Times and Location
Class: Monday, 8:45 AM – 12:30 PM, Cramer Hall 307. Lab sessions will be held the last hour (from 11:30 – 12:30) of some class periods in NH 450.

Text

Recommended, Optional Texts

Overview
This course is intended to introduce students to categorical data analyses. The general goal is to provide a thorough background in the conceptual aspects, statistical underpinnings, and application of this method rather than a tutorial on a specific software package. By the end of the course, students should be able analyze use categorical data analysis methods to analyze real data using current statistical software, write about, critique applications of, and read methodological articles about categorical data analysis. Prerequisites: Students should have at least one graduate statistics course covering chi-square, ANOVA, and regression analysis, such as PSY 521/621 and PSY 522/622

Homeworks
There will be three homework assignments consisting primarily of data analysis and reporting of categorical analyses using R, SPSS, or SAS. I will supply homework questions and data files (usually 10-12 questions) and you will be asked to analyze your own data for at least one question on each assignment. I can assist you in finding a data set if needed. You will be able to choose among the software programs for many questions, but some analyses may not be available or convenient in all software programs. Illustrations are available in the text or will be provided in class for all types of analyses on the homework assignment. Homework due dates are: Mon 10/24, Mon 11/14, Mon 12/5. Late assignments are not accepted without substantial penalty except for cases of illness or family emergencies. Please contact me ahead of time if you are going to miss the deadline for any reason. You are welcome to work with others when running the analyses or consult them on interpretation, but your assignment must be written in your own words.

Grades
Grades are based on an average of the three homework assignments with total percentages assigned the following grades: \( \geq 90 = A \), 85-89.9 = B+, 80-84.9 = B, 75-79.9 = C+, 70-74.9 = C.

Other Resources
There are several useful electronic links on the class website.

Disabilities
I am happy to make any necessary arrangements with students who have a disability and are in need of academic accommodations. If you have not done so already, please contact the Disability Resource Center, 116 Smith Memorial Student Union, http://www.pdx.edu/drc/, Email: drc@pdx.edu, for assistance and any testing arrangements. I would appreciate it if you would check with me as soon as possible to discuss any needed accommodations and to make sure that I have received a faculty notification letter. If any aspects of instruction or course design result in barriers to your inclusion or learning, please let me know.
Fall 2016 Course Readings
PSY 510/610 Categorical Data Analysis

All supplemental readings available online at the class website: http://web.pdx.edu/~newsomj

10/3 Descriptive and Univariate Statistics
Levels of scale/measurement, review of probability, descriptive statistics, distributions for binary and categorical variables, test of single proportion, univariate chi-square, estimation basics


10/10 Two Categorical Variables
Contingency of 2 x 2 using Pearson and likelihood ratio chi-square comparing two proportions, I x J tables, measures of association, tetrachoric correlations, interrater agreement statistics

Azen & Walker, Chapter 4 “Association between Two Categorical Variables”


10/17 Three Categorical Variables, Matched Pairs and Repeated Measures
Mantel-Haenszel, Cochran-Mantel-Haenszel, McNemar’s chi-square and related conventional tests, measures analysis for categorical variables

Azen & Walker Chapter 5 ‘Association Between Three Categorical Variables’


10/24 HW 1 Due

10/24 Ordinal Analyses for Contingency Tables and Loglinear Models

Azen & Walker Chapter 7 “Log-Linear Models”


10/31 Regression Models for Binary and Ordinal Outcomes I: Binary Outcomes, The Basics
Logistic regression (continuous and binary predictors), interactions with logistic regression, mediation, alternative models: probit models and complementary log-log models

Azen & Walker Chapters 8 & 9 “Logistic Regression with Continuous Predictors” and “Logistic Regression with Categorical Predictors”


11/7 Regression Models for Binary and Ordinal Outcomes II: Diagnostics and Longitudinal Applications
Diagnostics with logistic regression, lagged regression, GEE, conditional logistic models, and multilevel regression for discrete variables; propensity scores


11/14 HW 2 Due

11/14 Regression Models for Binary and Ordinal Outcomes III: Generalized Linear Models, Ordinal Outcomes, Multicategory Outcomes
Generalized linear models, ordered/cumulative logit and probit, multinomial logistic, discrete choice, discrete survival analysis

Azen & Walker Chapter 6 “Generalized linear models”


Azen & Walker Chapter 10 “Logistic Regression for Multicategory Outcomes”

11/21 Sample Size, Estimation, and Practical Issues


11/28 Psychometric Issues
Some basics of IRT, introduction to latent class modeling concepts


12/5 HW 3 due (finals week)