

SOCIOLOGY 328 – SOCIAL STATISTICS I

SEP - DEC, 2014

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Purpose

This course will introduce students to elementary techniques of quantitative data analysis common in sociological research. It emphasizes selection of appropriate statistical techniques, examination of assumptions associated with them and interpretation of the results provided by them. The course will not emphasize calculation and will not involve memorization of complex formulae. It might even be fun on occasion.

Prerequisite and Anti-requisites

SOCI 100 or its equivalent is a prerequisite for this course. Note that UBC students cannot receive credit for any two of the following introductory statistics courses: STAT 200, STAT 203, BIOL 300, COMM 312, COMM 291, EPSE 482, EPSE 483, FRST 231, GEOG 374, HKIN 371, POLI 380, PSYC 218, PSYC 366 and SOCI 328.

Format

We meet 11:00 am – 12:30 pm on Tuesdays and Thursdays in CHEM C126. Classroom time will entail a mixture of lectures, exercises and tutorials.

Textbook (required)

Garner, Roberta. 2010. *The Joy of Stats. Second Edition*. Toronto: The University of Toronto Press. The website for the textbook (www.garnerjoyofstats.com) has useful supplementary material. Please note that the lectures will contain material that is not contained in the textbook and vice versa.

Evaluation

Evaluation will be based on three assignments (30%), a midterm exam (35%) and a final exam (35%). There will be no opportunities for extra credit. Final grades will be scaled if the average final grade for the course is inordinately high or low.

Policy on Missed Classes

Please note that there are no marks allocated for attendance or participation. Students are, however, expected to attend all classes. Because of the cumulative nature of the course, misunderstanding can compound quickly and students who miss class or do not keep up with the readings will have difficulty catching up. Students who encounter medical, emotional or personal problems that affect their attendance or academic performance should contact the Faculty of Arts Academic Advising Services, located in Buchanan D-111, phone (604) 822-4028. Please refer to the UBC Calendar for a more thorough discussion of academic concession. UBC accommodates students with disabilities who have registered with the Disability Resource Centre. The university also accommodates students whose religious obligations conflict with attendance, submitting assignments, or completing scheduled tests and examinations. A list of religious holidays involving fasting, abstention from work or study or participation in religious activities is available on the UBC website. Students should let the instructor know in advance (in the first week of the course) if they will require accommodation on these grounds. Students who plan to be absent for varsity athletics, family obligations or other commitments should not assume they will be accommodated and should discuss their commitments with the instructor beforehand.

Policy on Assignments

The assignments involve implementing statistical techniques with real data and interpreting the results. Late assignments will be penalized 10% per day (a weekend counts as one day). Assignments handed in on the due date but after 3:00 p.m. are deemed to be one day late. Assignments should be handed to the course instructor or T.A. or at the SOCI main office (not to someone else, not by email, etc.).

Policy on Examinations

The exams will (likely) be comprised primarily of multiple choice questions. Students are expected to write examinations on the scheduled dates. A make-up exam will be scheduled by the instructor only if Arts Advising formally indicates that this is appropriate.

Software and Data

The best way to learn statistics is to do statistics which requires messing around with real data. Students and instructor will use a statistical software package called SOFA (Statistics Open for All) which is free and available for download at www.sofastatistics.com. SOFA is easy to use, includes nearly all of the statistical techniques covered in the course, and produces nice tables and graphs. We will use SOFA and data provided by the instructor for classroom examples, exercises and assignments.

Policy on Laptops, Tablets, Cellphones, etc.

Students are welcome to bring laptops or tablets to class. They should, however, be used only for activities related to the course, e.g., taking notes or analyzing data in SOFA. Please do not use laptops, tablets, cellphones, etc. to check Facebook (or Twitter, or Instagram, or Pinterest, or ...), surf the web, read or write emails, read or write texts, and such forth—that's rude. (It is always appropriate to find and share breaking news pertaining to the Manchester United Football Club with the instructor.)

Topics

Unit 1 – Introduction

- *Topics*: thinking statistically; math review
- *Readings*: Preface pp. 17–28
- *Study questions*: Math Refresher pp. 287–317

Unit 2 – Variables

- *Topics*: levels of measurement; characteristics of variables
- *Readings*: Chapter One pp. 29–45
- *Study questions*: Questions One, Two, Three Part I pp. 254–255

Unit 3 – Sampling

- *Topics*: descriptive and inferential statistics; types of samples
- *Readings*: Chapter One pp. 46–52

Unit 4 – Describing a categorical variable

- *Topics*: frequency distributions; pie charts and bar charts
- *Readings*: Chapter Two pp. 55–57 and pp. 70–73
- *Study questions*: Question One, p. 255

Unit 5 – Describing a continuous variable

- *Topics*: measures of central tendency (mean, median, mode); measures of dispersion (range, inter-quartile range, standard deviation); shapes (histograms, stem-plots, box-plots)
- *Readings*: Chapter Two pp. 58–67 and pp. 73–79
- *Study questions*: Questions Two, Four a) and b), Six, Seven, pp. 255–257

Unit 6 – Statistical inference

- *Topics*: confidence intervals; probability; hypothesis testing
- *Readings*: Chapter Three pp. 128–129 and pp. 135–142

<Midterm exam on Tue Oct 7 (in class) covering Units 1 – 6>

Unit 7 – Relationship between two categorical variables

- *Topics:* cross-tabulations; % difference; Chi-square test of significance; Cramer's V
- *Readings:* Chapter Four pp. 153-155, 191–203
- *Study questions:* Question Eight a) – g), p. 263

<Assignment 1 due in class Oct 23>

Unit 8 – Relationship between two continuous variables

- *Topics:* scatterplots; Pearson's r and Spearman's ρ ; regression line
- *Readings:* Chapter Four pp. 166–186
- *Study questions:* Questions Two a), c) – h), Five, p. 260–262

<Assignment 2 due in class Nov 4>

Unit 9 – Relationship between a categorical variable and a continuous variable

- *Topics:* medians-based analysis; one-way ANOVA
- *Readings:* Chapter Four pp. 203–209
- *Study questions:* Question One, p. 260

<Assignment 3 due in class Nov 18>

Unit 10 – Multivariate causal relationships

- *Topics:* conditions for causality; multivariate causal scenarios
- *Readings:* Chapter Four pp. 159–165 and Chapter Four pp. 186–190

<Final exam in formal exam period (Dec 2 – 17) covering entire course>

Assignment 1

In this assignment you will use SOFA to investigate a bivariate relationship between two categorical variables in data from the GSS Cycle 24 dataset. Do not examine a relationship that was covered in detail in a lecture.

1. Provide a theoretical rationale to guide your analysis. Why would you expect the two variables to be related? How would you expect them to be related? Are they likely to be strongly or weakly related, do you think? Is one likely to cause or influence the other, i.e., does it make good sense to designate one as the independent variable and the other as the dependent variable?
2. As far as you can tell, what, exactly, do the variables measure or assess? What are their levels of measurement? What do their distributions look like in this dataset?
3. Using statistical techniques covered in the lectures and textbook, describe and summarize the relationship between the two variables. How are the variables related to one another (if at all)? If they *are* related, is the relationship strong or weak, and is it statistically significant?
4. Provide some interpretive insights regarding the relationship between the variables. Were your theoretical expectations met?

Present your analyses and insights in sentence and paragraph form (accompanied by attractive graphs and tables) as if you were writing a formal report for public consumption. Type your double-spaced assignment using Times Roman 12-point font. Note that you are permitted to work in teams of two or three people and to hand in one version of the assignment on behalf of both or all of you. (You may also choose to work alone if you so desire.) Please ensure that co-authored assignments are truly co-authored.

Assignment 2

In this assignment you will investigate a bivariate relationship between two continuous variables in the GSS Cycle 24 dataset. Follow the instructions provided for Assignment 1.

Assignment 3

In this assignment you will investigate a bivariate relationship between a categorical variable and a continuous variable in the GSS Cycle 24 dataset. Follow the instructions provided for Assignment 1.