

SOCI 711: Selected Topics in Advanced Quantitative Analysis

Prof. Alex Bierman, Department of Sociology, The University of Calgary
Winter Semester, 2014

Noon – 2:45 pm, Wednesdays, SS 921

Contact Information

Office: SS 902. Phone: 403-220-6226. E-mail: aebierma@ucalgary.ca. *E-mail is the best way to reach me.* Office Hours: Tuesdays and Thursdays, 11:00 am – 12:00 pm, or by appointment. Please note that I am very willing to meet with students outside of normal office hours. If you see that I am in my office, feel free to knock!

Required Texts

Hoffmann, John P. 2004. *Generalized Linear Models: An Applied Approach*. Boston, MA: Pearson Education.

Snijders, Tom A.B. and Roel J. Bosker. 2012. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling, Second Edition*. London: Sage Publishers.

NOTE: There are likely to be several additional readings assigned. Usually, these papers will be available for downloading through the university library. In the event that this is not the case, two to three copies of these readings will be made available in the graduate library on a **two-hour loan basis**.

Texts on Stata

Longest, Kyle C. 2012. *Using Stata for Quantitative Analysis*. Thousand Oaks, CA: Sage.

Acock, Alan C. 2012. *A Gentle Introduction to Stata, Third Edition*. Stata Press.

Neither of these texts are required, but may be useful if you are not familiar with Stata. Note that the Acock text covers a wider variety of functions than the Longest text.

Course Description and Objectives

The first part of this course covers principal component analysis, exploratory factor analysis, and models for polytomous, ordered and count outcomes. The second part of this course covers multilevel modeling and longitudinal data analysis from a multilevel perspective; comparisons to econometric approaches to longitudinal data analysis may also be included. Relevance for sociological research is discussed through examples drawn from the literature and the professor's own research. Stata is primary program used in this class, but Mplus will also be used to demonstrate multilevel data analysis. Both programs are available in the department's computer lab. Stata may also be leased through the "grad plan":

<http://www.stata.com/order/new/edu/gradplans/>

The overall goal of this class is not for you to simply learn a variety of statistical methods, but to gain an appreciation of how to use these methods in your own research. To this end, a central focus as we cover each method will be how the method can be applied in research.

Prerequisites

SOCI 611 or equivalent.

Staying in Contact

Class announcements may occasionally be sent out over e-mail. It is your responsibility to ensure that the university has your correct e-mail address and that your e-mail account is in working order. Outside of office hours or pre-scheduled appointments, the best way to reach me is through e-mail. I cannot guarantee that phone calls will be answered or returned. When e-mailing, please put "SOC 711" in the subject line of your e-mail. I will make every effort to reply to your e-mails within 24 hours, but it may take 24 hours. Typically, e-mail should be used to make appointments or ask for clarifications regarding class scheduling, etc. Previous experience shows that possibility of misunderstanding is quite high when e-mail is used to answer questions about statistics, so it is better to deal with substantive matters in-person.

Grading System

A+ = 95 and over	B+ = 80-84.9999	C+ = 67-71.9999	D+ = 54-58.9999
A = 90-94.9999	B = 76-79.9999	C = 63-66.9999	D = 50-53.9999
A- = 85-89.9999	B- = 72-75.9999	C- = 59-62.9999	F = 49.9999 and lower

Grade Distribution

Labs	40%
Paper	60%

Please note that the grade distribution above refers to *each* quarter-course. Because of the way this course is scheduled, grades from the first quarter-course cannot be averaged with the second quarter-course.

Raising Your Hand

Graduate classes are often conducted in a seminar format, which tends to facilitate a more informal style of class discussion. I highly support this. However, this approach is less conducive to learning in statistics. In my own experience, stopping in the middle of explaining a concept often confuses others who are trying to grasp this concept. Also, I frequently find that questions are answered as I explain the concept. Because of this, I ask that you raise your hand in class and wait to be called on. Please note that I strongly encourage you to ask questions during class, and even question me if you do not believe that a point that I am making is correct. I just ask that you raise your hand and wait to be called on. Please also note that I will often call on students immediately when a hand is raised.

Labs

Please note that, although there is a scheduled "lab" time, there is no TA for this class, and you may work on the labs on the day and time of your own discretion. Because this is a doctoral-level class, a central goal of the labs is in building mastery of the material, not simply

competency or sufficiency. In light of this goal, rather than assigning points per question, the entirety of each lab assignment will be graded in the following manner:

√+ = Comprehensive mastery of material with only a few minor weaknesses; strong confidence that procedures could be applied in research. Equivalent to a score of 92.

√ = Competence in material, but with at least one substantial weakness. Initial application of procedures in research would best be done under supervision of a more experienced researcher. Equivalent to a score of 82.

√- = Weak grasp of material with multiple substantial weaknesses. Little confidence that procedures could be applied in a research setting. Equivalent to a score of 74.

No credit = Does not demonstrate basic understanding. Assignment may be revised and resubmitted for credit, but substantial improvement must be demonstrated, and the maximum points awarded to a revised assignment are 74.

Labs may not be due every week, and may instead be due when we have covered sufficient material for a lab. I will inform you when a lab is due at least a week ahead of time, and labs will be due (typed and stapled) at the beginning of class. Policies for allowing late/deferred labs are the same as the university's office policies for allowing deferred exams. Labs turned in late without an approved deferral will receive 10% off per day, with the first day beginning right after labs are collected in class.

You may work on a lab with one partner, although working on a lab alone is perfectly acceptable, too. If you work on a lab with a partner, you must turn in one assignment with both names. Students receive the same grade when working with a partner, regardless of the amount of work each student put into the lab. Evidence of copying between labs not indicating a partner, or other academic misconduct involving labs, will receive a 0 for the entire assignment.

Papers

Papers will comprise 60% of your grade, and each student must complete a paper for *each* quarter-course. This means that, if you take the full semester, you will be required to complete two papers. Papers will take the form of a mini-article, including an introduction, literature review, methods section, results, and discussion section. A separate hand-out will describe the expectations for the papers in more depth. Overall, though, the first paper must use procedures for analyzing ordinal or count outcomes, and PCA/PAF (if applicable). The second paper must be based on either a multilevel analysis or a longitudinal data analysis from a multilevel perspective. The first paper will be due the 26th of February (which is the seventh week of class, and also the week after reading week), and the second paper will be due April 16th. However, you may request an extension of up to three weeks for either or both papers. Talk to your professor *before the due date* if you believe that an extension for either paper may be necessary. As the purpose of the papers is not to create a full research article during the class, for extensions longer than three weeks, university policies regarding late/deferred work will be in effect.

Basic Course Schedule

We will begin by discussing reliability analysis, PCA, and PAF, including PCA and PAF of dichotomous variables. We will then move to a review of logistic regression involving a dichotomous outcomes, before broadening our study to models of polytomous and ordered dependent variables, and the examining different approaches to count data. This will take us our study of multilevel models of continuous outcomes. We will follow this with an examination of multilevel models of dichotomous outcomes, and then longitudinal data analysis from a multilevel perspective. Time-permitting, we may return to categorical data analysis by discussing more advanced approaches, such as latent class analysis and latent trait analysis.

Course Notes:

1. The main Sociology Department office does not deal with any course-related matters. Please speak directly to your instructor.
2. Academic Misconduct: Please refer to the website listed below for information on University of Calgary policies on Plagiarism/Cheating/Other Academic Misconduct:
<http://www.ucalgary.ca/pubs/calendar/current/k-2-1.html>
3. Protection of Privacy: The Freedom of Information and Protection of Privacy (FOIPP) legislation does not allow students to retrieve any course material from public places. Anything that requires handing back will be returned directly during class or office hours. "If students are unable to pick up their assignments from the instructor, they provide the instructor with a stamped, self-addressed envelope to be used for the return of the assignment."
4. Ethical Research: Students are advised that any research with human subjects--including any interviewing (even with friends and family), opinion polling, or unobtrusive observation--must have the approval of the Departmental Ethics Committee. In completing course requirements, students must not undertake any human subjects research without discussing their plans with the instructor, to determine if ethics approval is required.
5. Deferrals: If possible, please provide advance notice to the instructor if you are unable to write an exam or complete/turn-in assignments on time. All requests for deferral of a course component due to health reasons must be accompanied by written documentation as outlined in the University Calendar and should be obtained while the student has the health issue rather than after recovery. Deferrals will be allowed in the following circumstances: illness, domestic affliction or religious conviction. Travel arrangements and misreading of the syllabus are not valid reasons for requesting a deferral. Deferrals will not be granted if it is determined that just cause is not shown by the student. If you have missed a test for a legitimate reason, the instructor can require you to write a "make up" test as close in time to the original test as possible or can choose to transfer the percentage weight to another course component. If the instructor schedules a "make up" test for you, its date and location will be at the convenience of the Department of Sociology. Deferred Final Exam Form: Please note that requests to defer a Registrar scheduled final exam are dealt with through the Registrar's Office. Further information about deadlines, and where paperwork should be taken, is available on the form, which can be found at:
http://www.ucalgary.ca/registrar/files/registrar/Sp_Su_DFE_App.pdf
Deferred Term Work Form: Deferral of term work past the end of a term also requires a form to be filled out. It's available at <http://www.ucalgary.ca/registrar/files/registrar/defTW.pdf>
Once an extension date has been agreed between instructor and student, the form should be taken to the Faculty of Arts Program Information Centre (SS 110) for approval by an Associate Dean (Students).
6. Student Representation: The 2013-14 Students' Union VP Academic is Emily Macphail; email: suypaca@ucalgary.ca. The Faculty of Arts has four SU representatives who may be contacted at any of the following email addresses: arts1@ucalgary.ca, arts2@ucalgary.ca, arts3@ucalgary.ca, and arts4@ucalgary.ca. You may also wish to contact the Student Ombudsperson for help with a variety of University-related matters: <http://www.ucalgary.ca/provost/students/ombuds/role>
7. Emergency Evacuation: In the case of fire or other emergency evacuation of this classroom, please proceed to the assembly point at Education Block - Food Court. Please check these assembly point locations for your other classes at:
<http://www.ucalgary.ca/emergencyplan/assemblypoints>
8. Safewalk: The University of Calgary provides a "safe walk" service to any location on Campus, including the LRT, parking lots, bus zones, and campus housing. For Campus Security/Safewalk call 220-5333. Campus Security can also be contacted from any of the "Help" phones located around Campus.
9. Academic Accommodation: Students with a disability, who require academic accommodation, must register with the Disability Resource Centre (MC 293, phone 403-220-8237). Please provide academic accommodation letters to the instructor as early in the semester as possible and no later than two weeks after the course begins.