SOCl 623-001: Latent Variable Models

Fall 2015
Mon/Wed 4:35 AM-5:55 AM
Peterson 310

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E-mail: Please see communication policy below
Office Hours: Tuesday 10:00 – Noon.
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Communication policy

Please use MyCourses for all e-mail communications. E-mails sent to the McGill general e-mail address will not be answered. We will make every attempt to answer e-mail in a timely fashion within 36 hours of receipt. Please see professor during office hours for urgent issues.

Overview

Latent variable models attempt to explain complex relations between manifest/observed variables by simple relations between these variables and an underlying unobservable or “latent” structure. Topics will include both cross-sectional (Latent Class, factor analysis) and longitudinal (Latent Transition/Hidden Markov, Latent Class Growth Analysis, Growth Mixture Models) versions.

Readings

All assigned readings are hyperlinked in this course outline. If you are on campus, or otherwise connected to the campus VPN, clicking on a link will take you directly to the reading. When off campus, you will be redirected to the library website, where you’d have to log in to access the article in question.

The only exception is the Mplus User Guide, which can be downloaded here.

Evaluation

Two take-home assignments 30*2 = 60%
Final research project 30%
Project presentation 10%

Course requirements

There will be two assignments, each worth 30% of your grade. These are intended to test your absorption of the course material, and help you master the tools for the research paper. In addition, there will be a final project worth 30%. Details TBA in class. Tentative topics should
be discussed with me during office hours in October, or via e-mail. Final topics are to be handed in by the end of October. Working together on these course components is fine, but each student—or group—will need to hand in their own assignment. The last two days of the course are reserved for in-class presentations of final projects (10%). At the end of the course, students will be able to properly apply different types of latent variable models and interpret results correctly—as well as creatively use these models to examine sociological/demographic topics.

Given the emphasis on active learning, much of the class time will be devoted to hands-on data analysis. Students are advised to work with the variables they plan to use for their final project, during lab sessions and in each of their take-home assignments.

Problems with computing: If you want to see or e-mail me about a computing problem, bring/attach a complete copy of the commands and output. Especially with Mplus, it is often impossible to diagnose error messages without these.

Policy on late submissions

Late submissions of assignments and the term paper will incur a penalty of 20% of the assignment’s grade. Each additional 24-hour delay (including over the week-end) will incur an extra 20%. Since many assignments require the use of the computer, be warned that the probability of a computer being down is inversely related to the number of days until the assignment is due. Please send any late submissions through MyCourses e-mail as soon as possible.

Class attendance

Class attendance is mandatory. This includes lab sessions. Students are allowed three unexcused absences over the course of the semester. A failing grade for the course will be assigned to any student who exceeds this limit. Requests for excused absences must be made prior to class. If extenuating circumstances preclude prior notification, students must contact me as soon as possible after a missed class to request an excused absence.

Students’ rights and responsibilities

Attendance and participation in class discussions. You are responsible for all announcements made in class and on MyCourses, as well as for all course materials given out in class. You should also check for new announcements or material on MyCourses at least weekly.

Policy Concerning the Rights of Students with Disabilities
If you have a disability please contact the instructor to arrange a time to discuss your situation. It would be helpful if you contact the Office for Students with Disabilities at 398-6009 before you do this.
Remise des travaux en français
Conformément à la Charte des droits de l’étudiant de l’Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l’un des objets est la maîtrise d’une langue).
Les étudiants de ce cours peuvent rédiger tous leurs travaux (incluant les examens) en français, mais doivent pour ce faire obtenir la permission préalable de la professeure. Aucune permission rétroactive ne sera accordée.

Policy for the Accommodation of Religious Holy Days
1. Students will not be penalized if they cannot write examinations or be otherwise evaluated on their religious holy days where such activities conflict with their religious observances.
2. Students who because of religious commitment cannot meet academic obligations, other than final examinations, on certain holy days are responsible for informing their instructor, with two weeks’ notice of each conflict.
3. When the requested accommodation concerns a final examination, students are responsible for advising their faculty office as soon as possible and not later than the deadline for reporting conflicts. Additional documentation confirming their religious affiliation may be requested.

Statement on academic integrity at McGill
“McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/integrity for more information).”
“L’université McGill attache une haute importance à l’honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site www.mcgill.ca/integrity).”

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In the event of extraordinary circumstances beyond the University’s control, the content and/or evaluation scheme in this course is subject to change.

SCHEDULE

Mplus user guide

SEPTEMBER
Course overview, expectations
What is latent variable modeling?
Friday, September 4

Basics
1. Mplus basics, analysis of complex survey data
   Wednesday, September 9
     1. Mplus user guide, Ch.2
2. Path analysis
   Monday, September 14
     • Mplus user guide, Ch.3
   Wednesday, September 16: Lab 1

Continuous latent variables
1. Exploratory factor analysis in Stata (with continuous and categorical indicators)
   Monday, September 21
     DROP/ADD DEADLINE
2. Exploratory factor analysis in Mplus (with continuous and categorical indicators)
   Wednesday, September 23
     • Mplus user guide, Ch.4
3. PCA and polychoric PCA in Stata
   Install polychoric in Stata: net search polychoric
   [Not ssc install polychoric. Not available there.]
   Monday, September 28
   Wednesday, September 30: Lab 2

OCTOBER

4. Confirmatory factor analysis (CFA) + Multiple group analysis
   Monday, October 5
   Stata
   Install confa in Stata: net search confa
   Click on: confa from http://web.missouri.edu/~kolenikovs/stata
   Mplus
   Mplus user guide, Ch.5, upto p.73.

SEM basics
MIMIC & SEM
Exploratory Structural Equation Modeling (ESEM)
Wednesday, October 7
Wednesday, October 14: Lab 3
- Mplus user guide, Ch.5, p73-on

Cluster analysis in Stata
Monday, October 19

Mixture modeling
1. What is mixture modeling?
Wednesday, October 21

2. Cross sectional mixture modeling
Introduction, multiple categorical latent variables
Monday, October 26
Wednesday, October 28: Lab 4

NOVEMBER

Cross sectional mixture modeling continued
Monday, November 2
- Mplus user guide, Ch.7

Wednesday, November 4: Final project brainstorming session
3. Factor-Mixture Models
Monday, November 9

Wednesday, November 11: Lab 5

4. Longitudinal mixture modeling
LCGA vs. GMM
Monday, November 16
Wednesday, November 18

- Mplus user guide, Ch.8, upto p.233

Monday, November 23: Lab 6

Latent Transition/Hidden Markov Models
Wednesday, November 25

- Mplus user guide, Ch.8, from p.233-on

Monday, November 30: Lab 7

DECEMBER

Wednesday, December 2: Presentations 1
Assignment 2 Due

Monday, December 2: Presentations 2
Final Project Due