Special Topic: Data Analysis in OB Research  
Spring 2020, B Term

Instructor: Le (Betty) Zhou, Ph.D.
Office: CSOM 3-283
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Class meeting time & location: 1-4pm Tuesday, CSOM 3-166
Office hours: By appointment

Course Overview & Expectations

The goals of this course are (1) to provide an overview of data analyses tools commonly used in OB research, (2) to build the foundation for future self-directed learning of related and more advanced methods, and (3) to help students make progress in developing their own program of research. This course is designed for PhD students interested in empirical research using quantitative methods in Organizational Behavior (OB) field.

Class activities include pre-class readings (required and optional), class lecture, discussion, and homework. Students should complete pre-class preparation work (see details below) prior to the first class meeting. Each week, students should complete required readings before class. Class meetings will include lectures and discussions. Slides or handouts of the lectures will be shared with students before class. All class material, including slides and homework assignments, are intellectual properties of the instructor and should not be shared online or with others without the instructor’s permission. Students are expected to participate in class discussion and proactively ask questions if they have any. Students should individually complete each week’s homework after class, which is designed to help students practice the methods covered in the course. Ultimately, the students should be the driver of their learning process throughout this course.

Demonstrations in class will use SPSS, Mplus, and R. For homework assignments, students can use any software packages which they are familiar with and have the capacity for the analyses needed. Regardless of the statistical packages used, students should submit their homework in a WORD document that includes a manuscript-like report of their analyses and results, using text, figures, and tables. Students can follow the style of reporting in the “Analytic Strategy” and “Results” sections in a management/OB journal they are familiar with (e.g., Journal of Applied Psychology or Academy of Management Journal).

Grade & Assignments

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<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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<tbody>
<tr>
<td>Pre-class test</td>
<td>10</td>
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<tr>
<td><em>Note: Students who perform poorly in this test will be recommended to withdraw from this course.</em></td>
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<tr>
<td>Class participation: Complete required readings before class + Participate in class discussion</td>
<td>20</td>
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<tr>
<td>Homework: Each week’s homework assignment (10 points each) should be completed and emailed to me before 5pm CT Sunday. Late submission will not receive any feedback from me or any points.</td>
<td>70</td>
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Total: 100 points
Schedule

Pre-class Preparation

**Learning goals:** Understand the conceptual meaning of the following concepts and be able to apply them to solve problems in social science research:
- Mean, median, mode
- Variance, standard deviation
- Probability distribution
- Z score
- Population, sample, sampling distribution, estimate, standard error, confidence interval
- Null hypothesis significance test, p value
- Type I & Type II errors, effect size, statistical power
- Independent samples t-test, paired t-test
- ANOVA, planned comparison/constrast, post hoc tests
- Correlation, covariance
- Ordinary least squares (OLS) regression

**Assignment:**
- Khan Academy self-directed learning material shared by the instructor
- Complete pre-class test before 5pm Sunday 3/15. Test will be shared on Monday 3/9. This test is open notes.

Week 1 (3/17): SEM/general latent variable modeling framework

**Learning goals:** Understand foundational structural equation modeling (SEM) concepts; develop the foundation for applying SEM framework to more advanced analysis (e.g., multilevel SEM).
- Latent variable, observed variable, measurement error
- Model fit indices, model comparison
- Multiple-group analysis
- General latent variable modeling framework
- Maximum likelihood estimation
- Missing data
- *Bayes’ theorem, Bayesian approach*

**Required readings:**

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1 We will cover topics noted by an asterisk if we have time.


**Optional readings:**


**Assignment:** Homework 1

**Week 2 (3/24): Moderation & congruence analyses**

**Learning goals:**

o Interaction, moderation

o Simple slope, region of significance

o Graphic presentation of moderation analysis results

o Polynomial regression

o Graphic presentation of polynomial regression results (response surface)

**Required readings:**


Optional readings:

Assignment: Homework 2

**Week 3 (3/31): Mediation analysis**

Learning goals:
  o Mediation
  o Indirect effects
  o Integrating mediation and moderation in single-level models
  o *Categorical outcome variable, count outcome variable

Required readings:

Optional readings:
Assignment: Homework 3

Week 4 (4/7): Multilevel analysis I

Learning goals: This week we will discuss multilevel concepts and basic idea of multilevel modeling.
- Levels-of-analysis issues in conceptualization and operationalization of constructs
- Aggregation tests, ICC(1), ICC(2), \( r_{wg} \)
- Basic multilevel model

Required readings:

Optional readings:
- Bliese, P. D., & Hanges, P. J. (2004). Being both too liberal and too conservative: The perils of treating grouped data as though they were independent. Organizational Research Methods, 7, 400-417.

Assignment: Homework 4

Week 5 (4/14): Multilevel analysis II

Learning goals: Continuing from last week, we will discuss
- Centering
- Integrating moderation and mediation in multilevel models
Required readings:

Optional readings:

Assignment: Homework 5

Week 6 (4/21): Longitudinal data analysis I

**Learning goals:** This week we start from some longitudinal data analyses tools that are already popular among OB researchers:
- Cross-lagged model
- Latent growth model
- Latent change score model

**Required readings:**
- Chan, D. (1998). The conceptualization and analysis of change over time: An integrative approach incorporating longitudinal mean and covariance structures analysis (LMACS)
and multiple indicator latent growth modeling (MLGM). *Organizational Research Methods, 1*, 421-483.


**Optional readings:**

**Assignment:** Homework 6

**Week 7 (4/28): Longitudinal data analysis II**

**Learning goals:** Continuing from last week, we will discuss
- Centering in longitudinal analyses
- Time series analysis
- Intensive longitudinal data analysis
- Survival analysis
- *Latent categorical variable analysis and application in longitudinal analyses*

**Required readings:**

**Optional readings:**


**Assignment:** Homework 7

**Week 8 (5/5): CARMA binge watch (in CSOM 4-300V)**

12:00pm-12:10pm: set up, lunch
12:10pm-1:20pm: Big data concepts – Sang Eun Woo
1:25pm-2:35pm: Big data analytics – Fred Oswald
2:40pm-3:50pm: Causal identification through a cumulative body of research in the study of strategy and organizations – Myles Shaver