ED-795: Non-Experimental Research Methods in Education
Winter 2017

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Home page: http://www-personal.umich.edu/~bpmccall/index.html
Education Links page: http://www-personal.umich.edu/~bpmccall/edlinks.html
Education Blog: http://mccalleconeduc.blogspot.com/

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Lecture Day & Time: Wednesday 1:00 p.m.-4:00 p.m.
Lecture Room: 2229 SEB

Lab Day & Time: Th 10 a.m.-12 p.m.
Lab Room: 2302 SEB

In the Lab sessions you will continue learning the Stata software program, review
material covered in class, and obtain answers to questions about class material, group
projects and homework exercises.

canvas:

Much of the communications for this course will be through on canvas. This site
includes:
- An electronic form of the syllabus.
- Chat room for discussions on difficult topics.
- Homework and Other Assignments.
- Additional Reading Material and slides used in lecture.
- Data
- Drop Boxes for transferring special readings etc. to individuals.
- General Announcements.
- Web Content.
Course Description:

ED-795 is an intermediate course in quantitative methods that focuses on non-experimental methods. The course emphasizes the application of statistical concepts to problems in education. There is also specific instruction in the statistical software package Stata. Topics to be discussed include regression methods, factor analysis, reliability and validity and dichotomous choice models.

Prerequisites:

Students must have taken EDUC 793 or its equivalent.

Optional Books:


Other useful books:


Software:

There are several statistical software programs, the three major ones being SAS, SPSS and Stata. For this class we will use Stata. The Stata program is a good software program for advanced statistical methods that I use in my research.

Learning Objectives:

By the end of the course students will gain enough familiarity with:

- knowledge of intermediate statistical methods which will help students critically assess government and academic reports and research articles.
- the Stata software and statistical concepts to be able to perform more sophisticated statistical analysis on data, for example, multiple regression analysis, regression discontinuity, propensity score matching, factor analysis, MANOVA and MANCOVA.
- two datasets different nationally representative datasets used in educational research: ECLS, NELS and ELS to be comfortable conversing about them and use them in future research projects.
- Ability to produce an original research paper.

Responsibilities:

The best learning environment is a result of the efforts of both students and instructors. We can all learn a lot from one another, but we must each recognize our responsibilities to the group and our work this semester.

The responsibilities of the student include:
- reading required articles and completing other assigned work on time.
- coming to section prepared with questions about the readings or lecture.
- coming to section on time and prepared to participate.
- respecting the views and learning needs of other students.
- consulting with the GSI or Professor about any problems in the course.

The responsibilities of the Professor & GSI’s include:
- coming to lecture or section prepared to facilitate discussion and learning.
- being responsive to the needs of students in section and office hours.
- giving students guidance about how to improve their performance.
- respecting the views and learning needs of the students.
- working with students to resolve any problems in the course.

***Please turn cell phones of before entering the class***
Data Sets Used in Class:

In this class many of the exercises in the homework as well as the group project will come from three data sets that are widely used in educational research.

**Early Childhood Longitudinal Study (ECLS)** conducted by the National Center for Education Statistics

**National Education Longitudinal Study of 1988 (NELS)** conducted by the National Center for Education Statistics.

**Education Longitudinal Study of 2002 (ELS)** conducted by the National Center for Education Statistics.

Brief Descriptions of the Data:

The Early Childhood Longitudinal Study (ECLS) program provides national data on children's status at birth and at various points thereafter, children's transition to no-parental care, early education programs, and school, and children's experiences and growth through the fifth grade. ECLS also provides data to test hypotheses about the effects of a wide range of family, school, community, and individual variables on children's development, early learning, and early performance in school. The Kindergarten Class of 1998-1999 addresses four key issues: (1) school readiness, (2) children's transitions to kindergarten, first grade, and beyond, (3) the relationship between children's kindergarten experience and their elementary school performance, and (4) children's growth in math, reading, and general knowledge (i.e., science and social studies), and their progress through elementary school. The third-grade and fifth-grade data collections include information about the diversity of the study children, the schools they attended, and their academic progress in the years following kindergarten.

The National Education Longitudinal Study of 1988 (NELS) data contains information that represents several nationally representative samples, including eighth graders in 1988, tenth graders in 1990, and twelfth graders in 1992 enrolled in public or private schools. By the time of the third follow-up study in 1994, most NELS:88 sample members had completed four years of high school, while some had dropped out of high school or had attended alternative programs to obtain their diplomas. Student-level data, includes universe variables, base-year, first follow-up, and second follow-up student components, school variables at the student level, second follow-up early graduate supplement and student-level transcript variables, first follow-up and second follow-up dropout components, base-year and second follow-up parent components, and third follow-up questionnaire and derived variables. Postsecondary education attendance data, provides information for third follow-up respondents on attendance at postsecondary institutions, including enrollment dates and major fields of study. Postsecondary
institution data, supplies information about institutions applied to or attended by third follow-up respondents regarding sector, tuition/fee deciles, and enrollment.

The Education Longitudinal Study of 2002 (ELS) is designed to monitor the transition of a national sample of young people as they progress from tenth grade through high school and on to postsecondary education and/or the world of work. In the first year of data collection (the 2002 base year) ELS:2002 measured students' tested achievement and obtained information about their attitudes and experiences. These same students were surveyed and tested again, two years later in 2004 to measure their achievement gains in mathematics, as well as changes in their status, such as transfer to another high school, early completion of high school, or leaving high school before graduation. In the third round of data collection in 2006, information was collected about colleges applied to and aid offers received, enrollment in postsecondary education, employment and earnings, and living situation, including family formation. In addition, high school completion status was updated for those who had not completed as of the third round of data collection. Cohort members will be interviewed again in 2012 so that later outcomes, such as their persistence and attainment in higher education, or their transition into the labor market, can be understood in terms of their earlier aspirations, achievement, and high school experiences.

Course Grading:

A student’s grade will consist of their performance in three areas class participation, homework, the group research project.

The relative breakdown of each of these areas in determining a student’s overall grade is as follows.

- **10% Class Participation**
  - Class participation includes attending class and labs, actively participating in all group activities during class and labs, turning in all non-graded exercises in class and participating in class and lab discussions.
  - At the end of the semester each student will write a brief summary of their participation activities during the semester.

- **40% Homework**
  - Homework assignments must be turned in the day that they are due. Late homework assignments will receive an automatic 10% reduction in points.

- **50% Group Project**
  - The group research project is a semester long project that will result in a research paper.
  - Each group will choose a research topic that can be studied using either the NELS, ELS or ECLS data (or, in some cases alternative data that has received prior approval by instructor).
Groups will consist up to three individuals. Each group will be required to make a 30 minute presentation in class discussing their findings and an approximately 25 page research paper (not including tables and figures) which is a write up of the research project.

One third of the group’s grade is determined by the presentation while two thirds of the grade is determined by the paper.

More information about the group project will be given in class.

Course Topics:

• A Brief Review of Statistical Inference & ANOVA
• Simple Linear Regression
• Multiple Regression
• Assumptions of Regression Model
  • Overall Test of Model
  • Modeling Categorical Predictor Variables
  • Testing Part of the Model
  • Overall Test of Model
  • Modeling Non-Linear Effects
• Heteroskedasticity
• Multicollinearity
• Outliers and Influence
• Weighted Regressions
• Endogenous Regressors & Two-Stage Least Squares
• Panel Data
• MANOVA
• MANCOVA
• Linear Probability Models and Logits
• Propensity Score Matching
• Regression Discontinuity Design
• Reliability and Validity
• Factor Analysis
  • Principal Components Analysis
  • Methods of Rotation
  • Confirmatory Factor Analysis
**Mid-Semester Evaluation:**

At the halfway point in this course I will administer a mid-semester teaching evaluation. This is done in order for me to make some adjustments in the course based on student comments.

*If you feel you need an accommodation for any sort of disability, please make an appointment to see me during my office hours.*

**Retention of Documents**

Documents that are submitted by students in this course that are not picked up by students will be retained by the Professor until December 31, 2017, and then discarded.

**Additional Readings**

Nearly every week we will be discussing quantitative studies in education. Readings for the following week will be announced in class and on canvas the week before. All readings are available on canvas in pdf format.


