HBEH 761
Advanced Research Methods II
Spring 2014

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<tr>
<th>Instructors</th>
<th>Meeting Time &amp; Place</th>
<th>Course Website</th>
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<tbody>
<tr>
<td>Luz McNaughton Reyes</td>
<td>TR 11-12:15</td>
<td>Accessible through Sakai at: sakai.unc.edu</td>
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<tr>
<td>Mike Bowling</td>
<td>Place: Rosenau 0324 or HSL Room 329 (lab)</td>
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<td>Office Hours by Appointment</td>
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<tr>
<td>Email: <a href="mailto:mcnought@email.unc.edu">mcnought@email.unc.edu</a> (Luz)</td>
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<td><a href="mailto:jbowling@email.unc.edu">jbowling@email.unc.edu</a> (Mike)</td>
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Course Description

Advanced Research Methods I and II, HBHE 760 and HBHE 761, are required for first-year doctoral students in the Department of Health Behavior. The courses are organized by modules and team-taught by department faculty. Emphasis in the first semester, HBHE 760, is on issues related to the research process and study design while emphasis in the second semester, HBHE 761, is on data preparation, sampling, and data analysis. Modules covered in the first semester are: Conceptualizing Research Questions and Hypotheses, Measurement, Experimental and Quasi-Experimental Study Designs and Observational Study Designs. Modules covered in the second semester are: SAS and Statistical Fundamentals, Sampling, Introduction to Multilevel and Longitudinal Data Analysis, and Mediation and Moderation. The class is taught through a combination of didactic instruction, engaged discussion, and in-class exercises in the computer lab.

Course Objectives

At the completion of the course students will be able to:
- Use SAS to perform data management and analysis tasks including dataset and variable manipulation and bivariate statistical testing
- Select and use SAS to apply appropriate bivariate analytic methods for testing a conceptual hypothesis
- Formulate mediation and moderation hypotheses
- Apply appropriate analytic methods for testing mediation and moderation hypotheses
- Identify the types of research questions and study designs that require a multilevel analytic approach
- Generate multilevel hypotheses that reflect different types of causal effects
- Estimate and interpret the basic statistical model that underlies a multilevel approach to data analysis
- Describe different methods used in survey sampling
- Identify the different considerations that go into determining sample size for hypothesis testing
- Critically evaluate research in terms of the appropriateness of the study design, research question, sampling and analytic approach, results, and interpretation

Grading & Assignments

The quality of the course depends on students’ preparation for and participation in discussion and assignments. Students are expected to read the assigned readings before class and come to class prepared to contribute to the discussion. Assignments include graded exercises assigned as homework, a midterm exam, and a final exam. Grades will be based on: graded homework exercises (30%), mid-term exam (30%), final exam (30%), and contribution to class dialogue including leadership of journal club paper discussions (10%).
Honor Code

Students must observe the Honor Code in all course assignments. You are expected to produce your own work, except where group work is specifically allowed. In all written assignments, you must not plagiarize the work of others. The instrument defining the Honor Code defines plagiarism as "deliberate or reckless representation of another's words, thoughts, or ideas as one's own without attribution in connection with submission of academic work, whether graded or otherwise." If you have questions about your responsibility under the honor code, please bring them to one of the instructors or consult with the office of the Dean of Students or the Instrument of Student Judicial Governance. This document, adopted by the Chancellor, the Faculty Council, and the Student Congress, contains all policies and procedures pertaining to the student honor system.

Please include the following pledge on all written assignments: “On my honor, I have neither given nor received unauthorized aid on this assignment.”

Course Evaluations

Student evaluations are critical to course development and improvement. Time is set aside in the last class for completing the official on-line departmental/school evaluation.

Required Readings


- Other readings (see Course Schedule) are available electronically on the Sakai website or as e-books on the UNC libraries website.
Course Schedule

Module 1: SAS and Analytic Fundamentals (Luz Reyes)

1/9  Session 1: Course Introduction and SAS Basics (HSL 329)
    - Class notes (posted on Sakai)
    - In class exercise (posted on Sakai)
    - Little SAS book, 3d edition:
      Chapter 1, Sections 1.1-1.4, 1.6-1.9 (same in 4th edition)
      Chapter 2, Sections 2.1, 2.19-2.20 (same in 4th edition)

1/14 Session 2: Using SAS to Manipulate, Examine and Summarize your Data (HSL 329)
    - Class notes (posted on Sakai)
    - In class exercise (posted on Sakai)
    - Little SAS book, 3d edition:
      Chapter 3, Sections 3.1-3.5 (3.1, 3.2, 3.4, 3.5, 3.6 in 4th edition)
      Chapter 4, Sections 4.1-4.4, 4.9, 4.11 (same in 4th edition)
      Chapter 8, Sections 8.1-8.3 (8.7, 8.9,8.10 in 4th edition)

1/16 Session 3: Examining Item Correlations and Creating Scales (HSL 329)
    - Class notes (posted on Sakai)
    - In class exercise (posted on Sakai)
    - Little SAS book, 3d edition:
      Chapter 3, Section 3.10 (3.11 in 4th edition)
      Chapter 8, Section 8.4 (8.12 in 4th edition)
    - Homework 1 handed out, due 1/30

1/21 Session 4: Estimation: Statistical Inference and Hypothesis Testing (HSL 329)
    - Class notes (posted on Sakai)
    - In class exercise (posted on Sakai)

1/23 Session 5: Bivariate Procedures (HSL 329)
    - In class exercise (posted on Sakai)
    - Class notes (posted on Sakai)

1/28 Session 6: Bivariate Procedures (HSL 329)
    - In Class Exercise (posted on Sakai)

1/30 Session 7: Bivariate Procedures (HSL 329)
    - Homework 1 due / Homework 2 handed out, due 2/11
Module 2: Mediation and Moderation (Luz Reyes)

2/4 Testing Mediation (Rosenau 0324)
- Class notes (posted on Sakai)

2/6 Testing Mediation (Rosenau 0324)
- In class exercise (posted on Sakai)
  - Chapter 4: The Simple Mediation Model

2/11 Testing Mediation (Rosenau 0324)
- In class exercise (posted on Sakai)
  - Chapter 5: Multiple Mediator Models.
  - Chapter 6: Miscellaneous Topics in Mediation Analysis (skip section 6.3 on effect size)

2/13 Testing Moderation (Rosenau 0324)
  - Chapter 7: Fundamentals of Moderation Analysis.

2/18 Testing Moderation (Rosenau 0324)
- In class exercise (posted on Sakai)

2/20 Testing Moderation (Rosenau 0324)
- In class exercise (posted on Sakai)
  - Homework 4 handed out, due 2/27 (**One week turn around)**

2/25 Wrap up and conditional process models (Rosenau 0324)
- In class exercise (posted on Sakai)
  - Homework 3 due

2/27 Journal Club (Rosenau 0324)
- Article Reading Guide (posted on Sakai)
• *Homework 4 Due*

3/4 Midterm Review Session  (Rosenau 0324)

3/6 Midterm  (Rosenau 0324)

**Spring Break! (3/7/14- 3/16/14)**

**Module 3: Introduction to Multilevel & Longitudinal Data Analysis (Luz Reyes)**

3/18 **Multilevel Models** (HSL 329)
- Class notes (posted on Sakai)

3/20 **Multilevel Models**  (HSL 329)
- Class notes (posted on Sakai)

3/25 **Multilevel Models**  (HSL 329)
- Class notes (posted on Sakai)

3/27 **Multilevel Models**  (HSL 329)
- In-class exercise (posted on Sakai)
- *Homework 5 handed out, due 4/15*

4/1 **Multilevel Models**  (HSL 329)
- In-class exercise (posted on Sakai)

4/3 **Journal Club**  (HSL 329)
- Article Reading Guide (posted on Sakai)
Module 4: Sampling (Mike Bowling)

4/8 External validity: representativeness and generalizability
   - Class notes (posted on Sakai)

4/10 Sample Size: Simple Survey Designs

4/15 Sample Size: Complex Survey Designs
   - Class notes (posted on Sakai)
   - Homework 5 Due

4/17 Introduction to Survey Sampling Design and Methodology
   - Class notes (posted on Sakai)
   - Homework 6 handed out, due 4/24 (**One week turn around)

4/22 Analysis of Survey Data
   - Class notes (posted on Sakai)

4/24 In Class Exercise and course evaluation
   - Homework 6 due

4/29 Final Exam 12:00 P.M.