Advanced Statistics and Research Design (18:820:585:01)
Rutgers University
Spring 2010
Graduate School of Applied and Professional Psychology
CAS Room 200, Wednesday, 5-7:45 pm
Rutgers Sakai at https://sakai.rutgers.edu/portal

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Class TAs (alphabetical order):
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Course objectives
The primary goal of this course is to provide sufficient knowledge to become a good consumer of scientific articles. More specifically, this course pursues two learning goals. First, this course is designed to broaden and cultivate understanding of Generalized Linear Models (GLMs) with a focus on multiple regression analysis, and to introduce fundamental concepts of factor analysis and path analysis. Second, the course is designed to expose students to a current body of knowledge in research designs such as experiments and interventions, naturalistic observations, and longitudinal studies. In particular, students will be exposed to strengths and weaknesses of randomized clinical trials and quasi-experimental designs when examining intervention efficacy/effectiveness outcomes, and to various threats to internal and external validity. Pros and cons of single studies, narrative literature review, and meta-analysis will be discussed. The class will be taught based on the following two textbooks as well as other supplemental reading materials.

Textbooks

Required class presentation and participation
There will be a total of 10 group presentations. A team comprised of three students will be responsible for choosing one published empirical article, and presenting and discussing it in class for 30 minutes. At least two weeks prior to its scheduled presentation, a chosen article needs to be made available to class as it is required for all other students to actively participate in discussion. In addition, a designated team leader is responsible for submitting his/her team’s presentation file at least 48 hours prior to the scheduled presentation (by Monday evening). This class participation will count 20% towards the final grade. Note also that if students miss more than three classes out of the 15-week schedule, no passing grades will be given.

Two evaluation papers
Students are required to write two evaluation papers after reading assigned empirical articles and each evaluation paper will count 35% towards the final grade. For the exact questions and writing format, follow the posted instruction at http://gsappweb.rutgers.edu/cstudents/comps/GenComps/GenComps05_q1.pdf

One exam
Students are expected to demonstrate their knowledge of the concepts listed in the textbook by Shadish et al. (pages 505-513). Students will be provided with two separate lists of definitions and key concepts. The task is to match them correctly. Students must answer 80% questions correctly to be considered to pass this exam. No passing grades will be given if students fail to pass this exam. This is planned on March 3, 2010.

Computer projects
Two short computer projects will be assigned (10% toward the final grade).
Human Subjects Certification Test
Students must pass the Human Subjects Certification Test (HSCT) and submit a copy of the official letter certifying this by no later than April 12, 2010. For more information, check the following Rutgers website at http://orsp.rutgers.edu/Humans/hscp.php. Without this certification letter, no passing grades will be given.

Strongly recommended readings
In addition to textbook chapters, there will be additional articles (see below) that students are expected to read and produce a summary report (limit it to one page) each week, starting from the second week. The purpose of the summary report is to create an easy guide sheet in preparation for your qualifying exam. You may team up with other students to get better understanding of the articles and to produce more helpful summary reports.

(6) Shavelson Workbook (pp. 130-132).


<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Schedule</th>
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<tr>
<td>1</td>
<td>1/20</td>
<td>First class, Introduction to class, association and causation</td>
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| 2    | 1/27 | Multiple regression – Assumptions and applications  
Group Presentation #1 (Melissa Corbo, Jill Spero, Victoria Dietz) |
| 3    | 2/3  | ARC119 Computer Lab (Intro. to SPSS, basic functions and data handling)  
Fiona Graff and Patricia Simon will be available for Q&A |
| 4    | 2/10 | Multiple regression – Assumptions and applications  
Group Presentation #2 (BJ Friedman, Ashley Keiser, Allison Gallegly) |
| 5    | 2/17 | Multiple regression – Categorical predictors and model selection, interpretation  
Group Presentation #3 (Jennifer Jones, Danielle Narkaus, Maurice Ingram) |
| 6    | 2/24 | Multiple regression – Interactions and multicollinearity  
Group Presentation #4 (Tova Lane, Candace Decaires-McCarthy, Archana Jain) |
| 8    | 3/3  | Quiz, Logistic regression  
Lisa Grinfeld and Fiona Graff will lead a 30-min session on lessons learned from writing evaluation papers |
| 8    | 3/10 | ARC119 Computer Lab (Multiple regression exercise)  
Fiona Graff and Patricia Simon will be available for Q&A  
**Computer Project #1 due by 3/12/10** |
| 9    | 3/17 | Spring Break |
| 10   | 3/24 | Multivariate analysis of variance and covariance; **Evaluation Paper #1 due**  
Group Presentation #5 (James Marinchak, Bill Christiana, Bonnie Gordic) |
| 11   | 3/31 | Principal component analysis (PCA) and factor analysis (FA)  
Group Presentation #6 (Ellie Sroczynski, Michelle Miller, Lara Brodzinsky) |
| 12   | 4/7  | PCA and FA continued, **HSCT letter due by 4/12/10**  
Lisa Grinfeld and Fiona Graff will be present to provide feedback on papers  
Group Presentation #7 (Shara Marrero, Atara Hiller, Max Malitzky) |
| 13   | 4/14 | ARC119 Computer Lab (PCA/FA exercise)  
Fiona Graff and Patricia Simon will be available for Q&A |
| 14   | 4/21 | Basic concepts of structural equation modeling (SEM)  
Group Presentation #8 (Kirby Wycoff, Adam Gottlieb, Karen Lenard)  
**Computer Project #2 due** |
| 15   | 4/28 | Research designs and methods to evaluate intervention outcomes  
Group Presentation #9 (Desiree Romaguera, Karen Weiss, Laurie Zandberg)  
Group Presentation #10 (Courtney You, Margaret Areizaga, Rikki Pashen)  
**Evaluation Paper #2 due** |
| 16   | 5/5  | Final Class - Effect size and practical importance  
Special Presentation - Michelle Miller on Narrative Review and Meta-analysis |

* All assigned papers should be submitted by placing them in your own drop box in the Sakai website.  
* Class schedule and policy may be modified.