Behavioral Science Research Design

26:830:545

Fall, 2013

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Class Meeting: Tuesday and Thursday, 11:30-12:50
Smith Hall, Room 371

Office Hour: Tuesday, 2:00-4:00, and by appointment

Overview: Psychology addresses age-old questions about human nature. Are people capable of altruism? Is personality simply the sum of experience? Does the mind affect the body? Psychology’s responses to these questions are not always the most comprehensive or the most original. However, the answers that psychology provides are the most reliable. This is because the methods of empirical psychology lead to questions that can be tested and answers that can be replicated. Moreover, the rules and methods of empirical psychology form a universal language that allows researchers from different cultures, nations, and perspectives to engage in each other’s work.

This course is designed to supply a working knowledge of research methods by covering the basic skills and principles needed to conduct effective, original, and responsible social science research. The course approaches research methods from a social psychological perspective. Social psychology research, by necessity, is especially concerned with issues of research ethics, impact and control, design standardization and innovation, and the avoidance of bias. These concerns, and the methods developed to address them, pertain to nearly all the social sciences and should therefore be relevant to most behavioral science students.

Course Objectives: This course has two primary goals:

1. Basic Research Skills: This course covers the basic skills needed to conduct behavioral science research. These skills include hypothesis generation, drafting research plans, creating research procedures, selecting outcome measures, conducting analyses and writing up results in accordance with American Psychological Association (APA) conventions. In addition, the course addresses the ethical issues and corresponding guidelines that responsible research entails.

2. Intro and Intermediate Statistics. The course will review some basic statistical principles, and will cover inferential statistics (t tests, ANOVA, planned contrasts) and measures of association (covariation, correlation, regression, and moderated multiple regression).
**Pre-requisites:** Graduate standing in psychology or a related field. For undergraduates, completion of Principles of Psychology and introductory statistics and methodology (301 and 302), advanced standing in psychology (junior or senior), GPA of 3.0 or better, and by permission of the instructor.

**Learning Outcomes:** The course covers the following principles and techniques:

1. The rationale and the history of the empirical approach to human behavior.
2. Ethical issues and guidelines related to human subjects research.
3. Recognizing and addressing challenges to behavioral science research.
4. How to develop *testable* research questions. How to select and measure independent and dependent variables.
5. How to design factorial experiments: the logic of factorial designs, predicting main effects and interactive effects, and distinguishing between mediators and moderators.
6. Review of basic statistical concepts
7. Analysis of factorial designs: the logic and application of the Analysis of Variance (ANOVA) statistic, including its underlying principles and methods of computation (e.g., main effects, interactive effects, simple effects).
8. Introduction to multiple regression and moderated multiple regression
9. Quasi-experiments and correlational studies.
10. The fundamentals of survey research methods.
11. Writing up research, per American Psychological Association (APA) format.

**Evaluation Criteria:** Course grades will be based on:

- **Grazing task:** 5%
- **Phil. Sci. debate** 5%
- **Quiz 1** 5%
- **Quiz 2** 5%
- **Quiz 3** 5%
- **Stats Take-Home** 15%
- **Mid-term** 25%
- **Final** 35%

Late assignments (Grazing task, Stats take home) lose **5 points** for each day late. Exams can be rescheduled only in extreme circumstances.
### Behavioral Science Research Design: Weekly Topics and Readings

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
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<tbody>
<tr>
<td>Sept. 3</td>
<td>Introduction to the philosophy and logic of experiments.</td>
<td><em>Kerlinger &amp; Lee, Chapter 1.</em></td>
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<td>Philosophy of Science Debate assigned</td>
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<td>Sept. 10</td>
<td>Generating Research Ideas</td>
<td><em>Wicker;</em></td>
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<td><em>Robinson;</em></td>
<td><em>Nisbett</em></td>
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<td>Grazing task assigned</td>
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<td>Sept. 12</td>
<td>Philosophy of Science</td>
<td><em>Popper</em></td>
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<td><em>Kuhn</em></td>
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<td></td>
<td>Philosophy of Science Debate</td>
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<td>Sept. 17</td>
<td>Science and Society</td>
<td><em>Pears</em></td>
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<td><em>Prisoners of Silence Video</em></td>
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<td>Sept. 19</td>
<td>Problems and Hypotheses</td>
<td><em>Kerling &amp; Lee, Chapter 2;</em></td>
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<td><em>St. Exupery</em></td>
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<td>Grazing task due</td>
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<td>Sept. 24</td>
<td>Constructs, Variables, and Definitions</td>
<td><em>Kerlinger &amp; Lee, Chapter 3</em></td>
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<td>Sept. 26</td>
<td>Moderators and mediators</td>
<td><em>Baron &amp; Kenny</em></td>
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<td>Quiz 1</td>
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<td>Oct. 1</td>
<td>Independent variables</td>
<td><em>Aronson, et al., Chapter 7</em></td>
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<td>Oct. 3</td>
<td>Dependent Variables</td>
<td><em>Aronson, et al., Chapter 8</em></td>
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<td>Oct. 8</td>
<td>Experimental designs</td>
<td><em>Aronson, et al.  Chapter 4</em></td>
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Oct. 10  Challenges of behavioral science research  
Aronson, et al., Chapter 2  
Lehrer

Oct. 15  Avoiding bias  
Aronson, et al., Chapter 9;  
Twain, “Eve’s Diary”;  
Harber, et al.

Oct. 17  **Mid-Term**

Oct. 22  Statistics: Review of Basic Concepts and Measures

Oct. 24  Measuring Differences Between Groups: T-Tests  
Field, Chapter 9

Oct. 29  One Way ANOVA: I  
Keppel, pp. 23-64.

Oct. 31  One Way ANOVA: II  
Keppel, pp. 65-83.

Nov. 5  Two Way ANOVA: I  
Keppel, pp. 167-195  
**Quiz 2**

Nov. 7  Two Way ANOVA: II  
Keppel, pp. 196-205

Nov. 12  Planned Contrasts, Post Hoc Tests, and Data Management  
Rosenthal & Rosnow;  
Barhyte & Bacon

Nov. 14  Covariation, Correlation and Regression (1)  
Field, Chapters 6 & 7

Nov. 19  Regression (2)

Nov. 21  Moderated Multiple Regression  
Aguinis

Nov. 26  Survey Methods: Designing research questions I  
Fowler, Chapters 5 & 6  
**Quiz 3**

Nov. 28  THANKSGIVING
| Dec. 3 | Survey Methods: Designing research questions II, *Schuman & Presser*
|        | *Schwartz*
| Dec. 5 | Quasi-experiments, correlational studies, and other non-experimental designs.
|        | *Aronson, et al., Chapter 5*
|        | *Cantril*
|        | **Stats take home test due**
| Dec. 10| Writing up the research report
|        | *APA, Bem*
|        | Eisenhower and Gettysburg address
| Dec. 12| Review, and Catch up
| **Dec. 19** | **FINAL EXAM [DATE SUBJECT TO CHANGE]**
**Reading List:**

*Methods of Research in Social Psychology, 2nd Edition* (Aronson, Ellsworth, Carlsmith, & Gonzales, 1990) is authored by generally-acknowledged masters in social science design. It is comprehensive in scope and very well written. The text is replete with examples of experiments that relate closely to the factorial emphasis of this course.

**Course Reader:**

The course reader is comprised of philosophical, theoretical, and empirical readings that correspond to the themes and objectives of this class. The reader is central to this class.

**Texts**


**Course Reader**


**Recommended Readings**


