

EXPERIMENTAL AND QUASI-EXPERIMENTAL RESEARCH DESIGN

FALL 2017

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Class: Tuesdays 2-5

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Learning objective of this course:

This course is designed to familiarize students with the fundamental principles of experimental design and analysis. Topics covered will include the strengths and weakness of various designs (e.g., pretest-posttest, post-test only, Solomon 4 group, within subject vs. between subject designs), measurement issues, as well as avoiding response bias, social desirability, confounding variables, format (online, phone, face-to-face), sampling, and question wording and order. In addition students will learn how to analyze factorial designs, pilot their study and statistically validate scales to measure theoretical constructs of interest.

Required Texts:

Field, A. & Hole, G. (2003). *How to Design and Report Experiments*. Sage: London.
ISBN 978 0761973836 (paperback version).

Field, A. (2014). *Discovering Statistics Using IBM SPSS Statistics*, 4th edition. Sage: London.
ISBN: 9781446249185 (paperback also available in etextbook)

Shadish, W.R., Cook, T.D., & Campbell, D.T. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Boston: Houghton-Mifflin.
ISBN-13: 978-0395615560
ISBN-10: 0395615569

Turner, J. R. & Thayer, J.F. (2001). *Introduction to Analysis of Variance: Design, Analysis and Interpretation*. Sage, Thousand Oaks
ISBN 0-8039-7075-7 (paperback)

Mutz, D. (2011). *Population-based Survey Experiments*. Princeton University Press.
ISBN 978-0-691-14452-8 (paperback)

Recommended but not required:

Kantowitz B.H., Roediger, H.L. & Elmes, D. G. (2015). *Experimental Psychology*. CENGAGE Learning.
ISBN1-111-35799-4

Babbie, Earl. (2004). The Practice of Social Research (10th Edition). Belmont, CA: Wadsworth.

Reis, H. & Judd, C.M. (2000). *Handbook of Research Methods in Social and Personality Psychology*, Cambridge University Press.

Academic Integrity Policy:

The Annenberg School for Communication is committed to upholding the University's Academic Integrity code as detailed in the SCampus Guide. It is the policy of the School for Communication to report all violations of the code. Any serious violation or pattern of violations of the Academic Integrity Code will result in the student's expulsion from the Communication major or minor, or from the graduate program.

ADA Compliance Statement

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. – 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Course Requirements:

1. Attendance --- As we only meet once a week, and much of the material from lecture does not overlap with that of the text, attendance is crucial. If you are absent more than once you must make an appointment to see me or risk losing credit for the course.

2. Reading assignments — The lectures presume you have done the assigned reading prior to coming to class. The lectures will make much more sense if you have done the background reading ahead of time.

3. Assignments. — There will be a number of assignments each focusing on one aspect of experimental design or analysis. Assignments will be due at the beginning of the following class and will account for a total of **30%** of your grade.

4. Midterm — A 10-12 page (not counting references and appendices) research proposal will constitute **30 %** of your overall grade. This should include a literature review and method section including a detailed description of your proposed experiment. The topic is up to you but must be cleared with me beforehand.

5. Final paper — Students will administer their proposed survey on a small number of individuals from their target population. At least one original scale must be analyzed for validity. The results section should detail the precise analysis you intend for your data and the appendix should contain the SPSS output (even if the number of cases are too low in N to be statistically meaningful). In the traditional discussion section please discuss limitations and future directions you might take with your experiment. All variables and how they were measured should be included in an appendix.

This final research paper should follow the format of an APA research article (intro, methods, results, a discussion section interpreting your findings) and be approximately 15 -20 pages in length (excluding references and appendices) and is worth **30%** of your final grade.

6. In class presentation — Students will prepare and present a 10 minute Powerpoint summary of the results of their pilot test and the validation of their original scale and any changes made as a result. This presentation will account for the final **10%** of your grade in the course.

Assignments:

Please note that all assignments are to be typed (double-spaced) in 12-point Times Roman font, with 1 inch margins. Be sure to proofread your paper carefully to ensure that it is free of grammatical and spelling errors. If a paper contains 10 or more grammar or spelling errors it will receive a grade of F. (If you are not a native English speaker it is recommended that you have a native English speaker look over your paper for grammar. The content of the paper, however, must be yours alone.) There will also be substantial penalties for assignments turned in after the deadline. An “incomplete” will be given only in an emergency.

Cheating and plagiarism:

Any individual found to have copied the work or ideas of others without appropriate citation will receive an F in this course and will be recommended for expulsion from the University.

Outline of Topics

The following is a preliminary outline of topics to be covered in the class. Exact dates for each topic, additional readings, and assignment due dates will be posted on Blackboard. Readings are likely to be modified as we get into the class and I learn more about your skills and interests so always refer to the most recent schedule posted online.

8/22 Week 1: Introduction to the Scientific Method Observation, Correlation and Causal Inference, Ethical Issues

- Experiments vs. Correlational Data
- Causality
- Dependent, independent and organismic variables
- Reliability
- Validity
- Threats to Internal and External Validity
 - History
 - Extraneous Variables
 - Confounds
 - Experimenter Bias
 - Social Desirability
 - Demand Characteristics
 - Control Groups
- Ethical Issues
 - Institutional Review Board
 - Informed Consent
 - Debriefing
 - Deception
 - Confidentiality
 - Protection from Physical and Psychological Harm
 - Special Populations

Readings:

Chapters 1-3 in Shadish, Cook, and Campbell.

Further reading:

Brewer "Research Design and Issues of Validity" Ch. 1 in Reis and Judd

Assignment A:

IRB Certification If you are not already IRB certified please go to <https://www.citiprogram.org/> and complete your training. Bring completion certificate to class.

8/29 Week 2: Hypothesis Testing and Measurement

- Hypotheses and Research Questions
- Operationalization of Constructs into Variables

- Direct and indirect measures
- Levels of measurement
 - Nominal
 - Ordinal
 - Interval
 - Ratio
- Scale construction
- Exploratory Factor Analysis

Readings:

- Chapters 1-3 in Field and Hole, How to Design and Report Experiments
- Chapters 17 Discovering Statistics (Exploratory Factor Analysis)
- John, O. P., & Benet-Martinez, V. (2000). Measurement: Reliability, construct validation, and scale construction. In H. T. Reis & C. M. Judd (Eds.), Handbook of research methods in personality and social psychology. Cambridge University Press. (pp. 339-351).

Further reading

- Holbrook, A. L., Krosnick, J. A., Carson, R. T., & Mitchell, R. C. (2000). Violating conversational conventions disrupts cognitive processing of attitude questions. Journal of Experimental Social Psychology, 36, 465-494.
- Krosnick, J. A. (1991). Response strategies for coping with the cognitive demands of attitude measures in surveys. Applied Cognitive Psychology, 5, 213-236.
- Rubin, Z. (1970). Measurement of romantic love. Journal of Personality and Social Psychology, 16, 265-273.

Assignment B: Operationalization and Hypothesis/Research Questions

1. Identify and define at least 2 constructs of interest to you with at least one being a latent variable and one an independent and one a dependent variable (be sure to identify which are DV and IV).
2. Describe how you would measure/operationalize these constructs (turning them into measurable variables).
3. Construct a scale to measure your latent variables (at least 6 items).
4. Write a research question involving your 2 constructs.
5. Write a hypothesis involving the same 2 constructs.
6. Describe the difference between a RQ and a H. Which is more appropriate for your research?

9/5 Week 3: Analyzing and Interpreting Data: An overview

- Correlation and Causality
 - Independent vs. dependent variables
- Descriptive Statistics
- Inferential Statistics
- Parametric and Nonparametric Tests
- Choosing a Statistical Test

Readings:

- Chapters 1-10 Discovering Statistics as needed
- O'Keefe, D. J. (2003). Message properties, mediating states, and manipulation checks: Claims, evidence, and data analysis in experimental persuasive message effects research. Communication Theory, 13, 251-274.
- Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. Journal of Personality and Social Psychology, 89, 845-851.

The Relationship between Sample Size and Statistical Power

- Ziliak and McCloskey, The Cult of Statistical Significance: How the Standard Error Costs Us Jobs, Justice, and Lives (Ann Arbor, MI: University of Michigan Press, 2008), Chapters 1-2.

Assignment C: Exploratory Factor Analysis.

1. Enter your data into an SPSS datafile.
2. Clean data by running descriptive statistics to
 - a. identify wildcodes and outliers
 - b. check that the range of responses is fairly normally distributed.
 - c. check for items with no or very little variance
 - d. make sure missing data is being handled appropriately (i.e., .)
 - e. check for response biases where appropriate
 - f. describe any changes you would make to your survey as a result of these analyses.
3. Identify a scale from your survey:
 - a. run a correlation matrix of items
 - b. generate an alpha coefficient and interpret it.
4. Exploratory Factor Analysis
 - c. run an orthogonal factor analysis with a varimax rotation
 - d. run an oblique factor analysis with a promax rotation
 - e. based the eigenvalue and scree plot how many factors did you extract?
Is it what you expected? Why or why not? Please explain.
 - f. name the factors and explain why the names are appropriate.
 - g. describe any changes you would make to your scale as a result of these analyses.

9/12 Week 4: Experimental Design

- Randomization
- Pretest/Posttest Design
- Posttest Only Design
- Solomon 4 group Design
- Factorial Designs
 - Between and Within Subjects
- Recruitment
- Attrition

Readings:

- Chapters 8, 9 and 10 in Shadish, Cook, and Campbell.
- Chapters 11-14 in Field and Hole
- Turner, J. R. & Thayer, J.F. (2001). *Introduction to Analysis of Variance: Design, Analysis and Interpretation*. Sage, Thousand Oaks ISBN 0-8039-7075-7 (paperback)

Further reading:

Kirk, R. E. (1995). *Experimental Design*. Pacific Grove, CA: Brooks Cole. (pp. 1-47)
Smith, E. R. (2000). Research Design. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in personality and social psychology* (pp. 17-39). Cambridge University Press.

Assignment D: Experimental Designs

1. Propose an experiment using your topic of interest using each of the following experimental designs:
 - Pretest/Posttest Design
 - Posttest Only Design
 - Solomon 4 group Design
 - Factorial Design
2. Describe which best fits your research and why.

9/19 Week 5: Factorial Experimental Designs

- Main effects and interactions
- Direct and indirect effects
- Between subjects, within subject and mixed designs
- Mediation and Moderation (see Chapter 10 Discovering Statistics)

Assignment E: Analyzing a Factorial Design To Be Determined

9/26 Week 6: One on One Meetings (NO LECTURE)

Readings: Writing Up Your Research, Chapters 9-16 Field and Hole

10/3 Week 7: Quasi-Experiments, Issues of Sampling and the Problem of Self-Report

- Sampling Techniques
- Simple Random
- Stratified Sampling
- Quota sampling
- Purposive Sampling
- Convenience Sampling
- Multi-Stage Cluster Sampling
- Attrition

- Self-Report (Remembering and Forgetting)
- Convergent Validity
- Psychophysiological Measurement
- Attention and Reaction Time
- Mode

Readings:

Chapter 11 in Shadish, Cook, and Campbell.

Blascovich, J. (2000). Using physiological indexes of psychological processes in social psychological research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in personality and social psychology* (pp. 117-137). Cambridge University Press.

Chang, L., & Krosnick, J. A. (2003). Measuring the frequency of regular behaviors: Comparing the 'typical week' to the 'past week.' *Sociological Methodology*, 33, 55-80.

Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist*, 54, 93-105.

Schwarz, N. (2003). Self-reports in consumer research: The challenge of comparing cohorts and cultures. *Journal of Consumer Research*, 29, 588-594.

Wilson, T. D., LaFleur, S. J., & Anderson, D. E. (1996). The validity and consequences of verbal reports about attitudes. In N. Schwarz & S. Sudman (Eds.), *Answering questions: Methodology for determining cognitive and communicative processes in survey research* (pp. 91-114). San Francisco: Jossey-Bass.

Assignment F: Quasi-experiments, Sampling, Problems with Self Report

1. Design a quasi-experiment that attempts to answer your RQ(s) or H(s).
2. List the ways in which your quasi-experiment might be superior to a more controlled experiment.
3. List the ways in which your quasi-experiment might be inferior to a controlled experiment.
4. Discuss which you would choose and why.
5. In a perfect world, who would your ideal sample be for your experiment?
6. What, if any, compromises will you have to make in sampling?
7. Which of the following sampling methods would be best – simple random, stratified random, quota or purposive?

Readings:

- Chapters 4 and 5 in Shadish, Cook, and Campbell.

Further reading:

Fraker, T. and R. Maynard, "The Adequacy of Comparison Group Designs for Evaluations of Employment-Related Programs," *The Journal of Human Resources*, Vol. XXII, No. 2, pp. 194-227. o Natural Experiments o

Zimmerman, David J. 2003. "Peer Effects in Academic Outcomes: Evidence from a Natural

Experiment.” Review of Economics and Statistics 85 (1): 9–23.

Panel Data Designs

Readings:

- Finkel, Causal Analysis with Panel Data, pp. 3-21.

Further reading:

England, Paula, George Farkas, Barbara Stanek Kilbourne, and Thomas Dou. 1988. “Explaining Occupational Sex Segregation and Wages: Findings from a Model with Fixed Effects.” American Sociological Review 53: 544–558.

Readings:

- Chapters 6 and 7 in Shadish, Cook, and Campbell.

Further reading:

Berk, Richard A. and David Rauma (March 1983). “Capitalizing on Nonrandom Assignment to Treatments: A Regression-Discontinuity Evaluation of a Crime Control Program.” Journal of the American Statistical Association, Vol. 78, Issue 381, pp. 21-7

10/10 Week 8: Midterms Due No CLASS

10/17 Week 9: Online Experiments Qualtrics and other options **MIDTERMS RETURNED**

Readings:

Mutz, D. (2011). *Population-based Survey Experiments*. Princeton University Press. ISBN 978-0-691-14452-8 (paperback)

Futher reading:

Visser, P. S, Krosnick, J. A., Lavrakas, P. J. (2000). Survey research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in personality and social psychology* (pp. 223-252). Cambridge University Press.

Assignment G: Online Experiments

1. Program your experiment using Qualtrics.
2. Include a screener and random assignment to condition.
3. Describe the issues/limitations associated with using Qualtrics to conduct your research.
4. Prior to running your pilot describe the specific analysis (Oneway ANOVA, or Factorial Design) that you will conduct to test your RQ(s) or H(s).

10/24 Week 10: Pilot Experiment with class members. NO CLASS

Assignment H:

Everyone in class should act as a participant in everyone else's study. These can be shared electronically but be sure to cc me at smurphy@usc.edu.

Note any potential issues with each study (wording, order, glitches) and inform experimenter by 11/4.

10/31 Week 11: Piloting Experiment with other participants NO CLASS

Assignment I:

1. Run your study with at least 20 participants
2. Input your data into SPSS and label all variables.
3. Ensure your data is "clean" free of wildcodes and outliers (greater than 3 standard deviations from the mean)
4. Run descriptives to assess normality.
5. Perform an exploratory factor analysis on the individual scale items. Based on the output decide which items you will keep and how many factors there are. Send me output.
6. Recode variables into a scale (remember to reverse code if necessary) in original measurement (e.g., mean score using original number of response options).
7. Perform the appropriate analysis to test your hypothesis or RQ.
8. Describe the results.
9. Describe any changes you might make as a result of this pilot.

11/7 Week 12: Results of Piloting: Lessons Learned and Proposed Changes to Experiment

In class discussion of piloting and proposed changes.

11/14 Week 13: Overarching Issues

- Ethics in Research
- Choosing among Research Methods and Designs (Balancing Internal and External Validity)
- Revisiting Significance vs. Importance
- Type 1 and Type 2 Errors
- Sample size and power analysis

Readings:

- Chapter 14 in Shadish, Cook, and Campbell

- **Field, A. and Wilcox, R. (2017).** Robust statistical methods: A primer for clinical psychology and experimental psychopathology researchers, Behaviour Research and Therapy.

<https://doi.org/10.1016/j.brat.2017.05.013>

- Ziliak and McCloskey, The Cult of Statistical Significance: How the Standard Error Costs Us Jobs, Justice, and Lives (Ann Arbor, MI: University of Michigan Press, 2008), Chapters 3-5.
- Shapiro, M. A. (2002). Generalizability in communication research. Human Communication Research, 28, 491-500.

Assignment J: Overarching Issues

1. Are there any potential ethical issues with your proposed research? If so, discuss.
2. Play devil's advocate and assess the internal and external validity of your proposed research (Be cruel.... Reviewers will be).
3. What sample size will you require to avoid a Type 1 error? Include a power analysis showing the size of effect you will be able to detect.
4. What sample size would be statistically significant but not meaningful?

11/21 Week 14: THANKSGIVING NO CLASS

11/28 Week 15: In class presentations

12/5 Week 15: Final Paper due