

Psychology 512: Correlation, Regression, and Quasi-Experimental Design
Spring, 2011
Tues/Thurs 12:00-1:15pm

Course Instructor

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General Description

The ultimate goal of scientific inquiry is to investigate the validity of hypotheses derived from theory about the causes and effects of a particular phenomenon. Experimental approaches to investigate causality are reviewed in *Psych 511: Analysis of Variance and Experimental Designs*. In this course, we will review the research methods and data analytic approaches which are used when we lack the complete environmental control afforded to us in the laboratory settings. Such research designs are known as quasi-experimental and non-experimental (or correlational) designs. The analysis of data derived from these designs typically relies upon regression-based statistics.

Specific Course Aims

1. To be able to identify situations when quasi-experimental or correlational designs are utilized.
2. To identify (and rectify to the extent that it is possible) the threats to the internal and external validity of such designs.
3. To select and apply appropriate statistical procedures to analyze data resulting from quasi- and non-experimental designs.
4. To become familiar with exploratory and confirmatory factor analysis, path analysis, and structural equation modeling.

You will achieve these course aims through a combination of readings, lectures, student-led discussion, and hands-on analysis of data.

Required Instructional Materials (*available from Bookstore)

- *Bobko, P. (2001). *Correlation and regression: Applications for industrial organizational psychology and management*. Thousand Oaks, CA: Sage Publications.
- *Kelloway, E. K. (1998). *Using LISREL for structural equation modeling*. Thousand Oaks, CA: Sage Publications.
- *Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs*. Boston, MA: Houghton Mifflin.
- American Behavioral Scientist* Special Issue (1981). Entire Volume 25.
- Campbell & Fiske (1959). Convergent and discriminant validation by the multimethod-multitrait matrix. *Psychological Bulletin*, 56, 81-105.
- Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist*, 49, 997-1003.
- Cronbach & Meehl (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52, 281-302.
- Guzzo, R. A., Jackson, S. E., & Katzell, R. A. (1987). Meta-analysis analysis. *Research in Organizational Behavior*, 9, 407-442.
- Meehl, P. (1990). Why summaries of research on psychological theories are often uninterpretable. *Psychological Reports*, 66, 195-244.

- Probst, T. M. (2003). Exploring employee outcomes of organizational restructuring: A Solomon four-group study. *Group and Organization Management*, 28, 416-439.
- Robert, C., Probst, T. M., Drasgow, F., Martocchio, J., & Lawler, J. (2000). Empowerment and continuous improvement in the U.S., Mexico, Poland, and India: Predicting fit on the basis of the dimensions of power distance and individualism. *Journal of Applied Psychology*, 85, 643-658.
- Schweiger, D. M., & DeNisi, A. S. (1991). Communication with employees following a merger: A longitudinal field experiment. *Academy of Management Journal*, 34, 110-135.

You will also need to download a copy of LISREL. You can either purchase the full version or download the student version from www.ssicentral.com/lisrel/student.html

Optional Resources:

Since there will be several SPSS lab assignments, you may wish to pick up a basic textbook on conducting analyses with SPSS. Here are a few to choose from:

Voelkl, K. & Gerber, S. (1999). *Using SPSS for Windows: Data analysis and graphics*. New York: Springer-Verlag New York, Inc.

George, D., & Mallery, P. (2005). *SPSS for Windows Step by Step*. Allyn & Bacon.

Morgan, G. A., & Griego, O. V. (1998). *Easy use and interpretation of SPSS for Windows*. Mahwah, NJ: Lawrence Erlbaum Associates.

Course Requirements

1. Student Participation (10% of grade)

In general, students get out of a course what they put into it, meaning the more YOU are able to dedicate to attending class consistently and completing course requirements, the more you will gain. Statistics can be a very challenging subject; therefore, it is to your great advantage to thoroughly read the assigned chapters/articles before each lecture. Much of the course material builds upon earlier concepts; therefore, it is imperative not to fall behind. Additionally, you are expected to participate in class discussions and ask questions. Psych 512 is NOT intended to be a lecture-only class (although it does entail a certain amount of that).

2. Homework Assignments (40% of grade)

While the focus of this course is more on conceptual understanding than computation, there will necessarily be some math involved. Thus, there will be a number of homework problems that require computations conducted by hand.

Additionally, it is important to be able to apply your acquired knowledge to actual research questions. Therefore, there will be a number of lab activities and SPSS/LISREL assignments that will allow you to develop the skills needed to run and interpret statistical analyses on actual data.

Note: There is only one written assignment before Exam I. Enjoy this respite, because the latter two-thirds of the class will be chock-full of homework & labs...

3. Exams (50% of grade)

You are responsible for all of the material presented in class and in the assigned readings. If you miss a class, you should contact a trusted classmate for his/her notes. Exam questions will be a mixture of conceptual thought-questions and computational problems. You may bring 1 "cheat-sheet" of 8½ x 11" paper with notes for the exam.

There will be no late or make-up exams during the semester. If you are ill or must miss an exam for some reason, a make-up exam will be scheduled at the end of the semester that will be comprehensive (i.e., will cover material from the entire semester). If you miss an exam, you must take the make-up.

Grading

All assignments and exams are graded out of a possible 100 points. Final grades will be determined using the 90-100 (A) / 80-89 (B) / 70-79 (C) / 60-69 (D) / and below 60 (F) cutoffs. There will be no rounding up and no pluses or minuses.

Class Schedule

ALL READINGS ARE DUE ON THE DATE THEY ARE LISTED.

ALL ASSIGNMENTS (in bold) ARE DUE THE CLASS AFTER THEY ARE LISTED.

Date	Topic	Readings/Assignments
1/11	Syllabus Review	
1/13	Introduction	Meehl (1990); SCC 1
1/18	Judgment Calls	American Behavioral Scientist Issue
1/20	Statistical Conclusion and Internal Validity	SCC 2; C&M(1955); C&F(1959)
1/25	Construct and External Validity	SCC 3
1/27	Quasi-Experimental Designs I	SCC 4; SCC 5; Probst (2003); Schweiger and DeNisi (1991)
2/1	Quasi-Experimental Designs II	
2/3	EXAM I	Probst v. Schweiger Assignment Due
2/8	Brief Review of Hypothesis Testing	B 1; Cohen (1994)
2/10	Correlation Coefficients	B2: 1-7 by hand; 8 in SPSS
2/15	Testing Correlations for Significance I	
2/17	Testing Correlations for Significance II	B3: 1-7 by hand
2/22	Range Restriction	B5: 1-3, 4b by hand; 4a in SPSS
2/24	Bivariate Regression I	
3/1	Bivariate Regression II	B6: 1,2,4 in SPSS; 3 & 5 by hand
3/3	Partial Correlations I	
3/8	Partial Correlations II	B7: 2 & 4 by hand; 1 & 3 in SPSS
3/10	EXAM II	
3/22	Multiple Regression I	
3/24	Multiple Regression II	
3/29	Multiple Regression III	B8: 1 & 3 by hand; 2 in SPSS
3/31	Polynomial Regression	B9: 1 & 2 by hand and in SPSS
4/5	Interactions in Regression	B9: 3 & 4 by hand and in SPSS
4/7	Validity Shrinkage; Suppressor Variables; GLM I	
4/12	Validity Shrinkage; Suppressor Variables; GLM II	B10: 1-4 by hand
4/14	Introduction to SEM (Guest Lecture)	K1; K2: LISREL HW#1
4/19	Assessing Model Fit	K3: LISREL HW#2
4/21	LISRELease	K4: LISREL HW#3
4/26	Path Analysis I	
4/28	Path Analysis II	K6: LISREL HW#5
5/5	EXAM III DUE @ NOON	Turn Exam into VCLS 208 Drop Box.