

EDP 382K
CORRELATION & REGRESSION
Spring, 2013

Professor: Timothy Z. Keith
254B Sanchez Building
Phone: 512.471.0274
E-mail: tzkeith@austin.utexas.edu
Office hours: Tuesdays, 1:30-3:30 PM; other times by appointment

The easiest way to contact me is via electronic mail.

TA: Jackie Caemmerer
Phone: 845.721.7524
Office: SZB 352, carrel in front
Office hours: Wednesdays, 4:00-5:00; other times by appointment
jcaemmerer@gmail.com

The class will meet 9:30-12:30 Tuesdays, in room 426 Sanchez Building.

Overview:

This class will provide an overview of correlation and other measures of association, and in-depth coverage of multiple regression analysis (MR) and related techniques. We will concentrate on multiple regression because it is a very general analytic system appropriate for studying the relations among variables. The rationale of multiple regression underlies most other multivariate techniques. Once MR is well understood, other multivariate methods are easier to comprehend. ANOVA and ANCOVA are part of the general linear model and can be understood through MR. MR also provides the basis for understanding Structural Equation Modeling (SEM) and other more complex multivariate methods.

My primary interest is that you develop a *conceptual*, rather than numerical, understanding of the method. As Pedhazur (1997) noted, however, the numerical understanding can aid in the conceptual understanding. I also want to insure that you can conduct MR to answer research questions and that you are proficient in interpreting your MR results. Thus, I urge you to work through the examples provided in the text and at the end of each chapter. Nevertheless, since the emphasis in this course will be on practical applications, algebraic and mathematical results will be given without proofs.

Because MR analyses soon become tedious to solve when the number of variables exceed three, we will rely on statistical programs for MR. I will use SPSS for

Windows to do class examples. **I encourage you to rent SPSS** for Windows or Macintosh; the “Grad Pack” can be purchased at the University Computer Store and is a great deal (the Windows version is a better deal if you ever plan to do structural equation modeling, because you can add Amos, an easy to use structural equation modeling program). If you do not have a PC or do not want to license SPSS, there are a number of other options. You can use the computer lab here in Sanchez (Room 536, desktops in back corner [4 copies]) or elsewhere on campus (Campus Labs: ACA 1.124, BUR 120 [10 copies], MEZ 2.104 [5 copies]) or you can purchase some other statistical program (e.g., SAS, Systat). SPSS is no longer available online via remote desktop access.

Textbooks and Other Materials:

Textbooks:

Keith, T. Z. (2006). *Multiple regression and beyond*. Boston: Allyn & Bacon.

George, D., & Mallery, P. (2012). *SPSS for Windows step-by-step: A simple guide and reference, 19.0 update* (12th ed.). Boston: Pearson. (recommended text; earlier versions are OK)

Other readings will be posted on the Blackboard site and organized topically.

Other Materials:

SPSS, Inc. The SPSS “Grad Pack” (recommended). Available at the Campus Computer Store. Also available for online download; check www.onthehub.com. I recommend the Windows version because you can add Amos, a structural equation modeling program.

I will post SPSS output on Blackboard (usually in pdf format). You should print these out and bring them to class.

The data sets you will need to work the examples in the book are available on the Allyn & Bacon website (www.ablongman.com/keith1e) and also on Blackboard. I will post any additional data needed on Blackboard. The data are saved in a variety of formats (SPSS, Excel, plain text).

Other Readings:

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Hillsdale, NJ: Erlbaum.

Keith, T. Z., & Reynolds, M. R. (2012). Using confirmatory factor analysis to aid in understanding the constructs measured by intelligence tests. In D. P. Flanagan &

P. L. Harrison (Eds.), *Contemporary intellectual assessment: Theories, tests, and issues* (3rd ed., pp. 758-799). New York: Guilford.

Keith, T. Z., & Reynolds, C. R. (2003). Measurement and design issues in research on the assessment of children. In C. R. Reynolds & R. W. Kamphaus (Eds.), *Handbook of psychological and educational assessment of children* (2nd ed., pp. 79-111). New York: Guilford.

Kranzler, J. H., Miller, M. D., & Jordon, L. (1999). An examination of racial/ethnic and gender bias on curriculum-based measurement of reading. *School Psychology Quarterly*, 14, 327-342.

Pedhazur, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd ed.). New York: Harcourt Brace.

Objectives:

If you participate and work hard in this course, you should:

1. Develop an understanding of correlation and other measures of association.
2. Develop an understanding of multiple regression as a research method.
3. Be able to analyze data using multiple regression with the SPSS program.
4. Be able to interpret the results of your or others' studies that use MR.
5. Develop an introductory understanding of path analysis, the simplest form of structural equation modeling
6. Develop an understanding of how MR relates to other multivariate methods.
7. Develop an understanding of the types of research questions these methods are useful for answering.

Requirements:

There will be three non-cumulative exams given in the class. Most exam questions will require you to conduct analyses on the computer, and at least two of these will be take-home exams. You are on your honor to do take-home exams completely independently; *anyone found doing otherwise will be subject to the maximum university penalties.*

Take-home exams will be due at beginning of the next class. Late work will be accepted for full earned credit IF AND ONLY IF arrangements are made with me PRIOR TO THE DUE DATE. Otherwise, 10% of the points possible will be deducted for each weekday the exam is late.

Assignments and exercises will also be given on a regular basis. Many of the assignments will not be graded, but are important for your understanding of the material presented in class and in the text. All work on exams and **graded assignments** must be your own, unless otherwise noted. I encourage you to work together on **ungraded assignments**.

Reading assignments are listed in the tentative schedule. I also encourage you to bring in articles you encounter that use MR or the other techniques we will cover so that we can discuss those articles in class.

Course Grades:

Your exams and homework will be averaged according to the percentages (weights) shown below.

Assessment	Weight
Exam 1	30%
Exam 2	30%
Exam 3	30%
Graded Homework	10%

Final grades will be assigned based on the scale below:

Overall course percent	Grade
93.0% - 100%	A
90.0% - 92.9%	A-
87.0% - 89.9%	B+
83.0% - 86.9%	B
80.0% - 82.9%	B-
77.0% - 79.9%	C+
70.0% - 76.9%	C
Below 70%	F

Unless I have made a computational error, grades will not be changed after the end of the semester.

Extra Credit:

You can earn 1 extra credit point (on your final grade) by bringing a copy of an article in your field of study that used multiple regression in the analysis (due no later than the time you hand in your final exam). Articles should include a correlation matrix and standard deviations of the variables in the analysis.

Incompletes:

Unless you can demonstrate that near-catastrophic events have led to a case of extreme hardship, grades of “incomplete” will not be given.

Attendance:

Attendance will not be part of your grade. Students who attend class, of course, tend to be better prepared for exams and assignments. *Please be on time for class!*

Evaluation of the Course:

At the end of the semester, a formal evaluative questionnaire regarding both the curriculum and my instruction will be administered. The information gathered from this process will be used to improve future courses and instruction. Additionally, I strongly encourage you to provide feedback to me during the semester either in person or anonymously – I am here to teach you and want to do it well!

Disability Services:

The University provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students.

EDP 382K
CORRELATION & REGRESSION
Spring, 2013

Tentative Schedule

Class	Date	Topic to be Covered	Assignments (to be completed prior to class)
1	Jan 15	Introduction Data sets, SPSS Correlation, measures of association	
2	Jan 22	Correlation, measures of association Simple linear regression	Keith, Appendices B, E, chap. 1
3	Jan 29	Introduction to MR	Keith, 2, App A
4	Feb 5	MR, additional detail Residuals	Keith, 3 (K-3)
5	Feb 12	Exam	K-4
6	Feb 19	Catch up MR with more independent variables	
7	Feb 26	Three types of regression Prediction versus explanation	K-5
8	March 5	Dummy variables ANOVA	K-6
	March 12	Spring break	
9	March 19	Categorical & continuous variables Interactions (aka moderation) Test bias, ATIs Exam 2 on this date or on March 26	K-7
10	March 26	Exam 2 on this date or on March 19	
11	April 2	Interactions Curvilinear regression	K-8
12	April 9	Partial & semipartial correlations Summary and review	Appendix D K-9
13	April 16	Introduction to path analysis	K-10, Amos primer
14	April 23	Introduction to path analysis	K-11
15	April 30	Final catch-up, take home Exam 3 (exam due by May 7)	
	May 7	Exam week, no class	