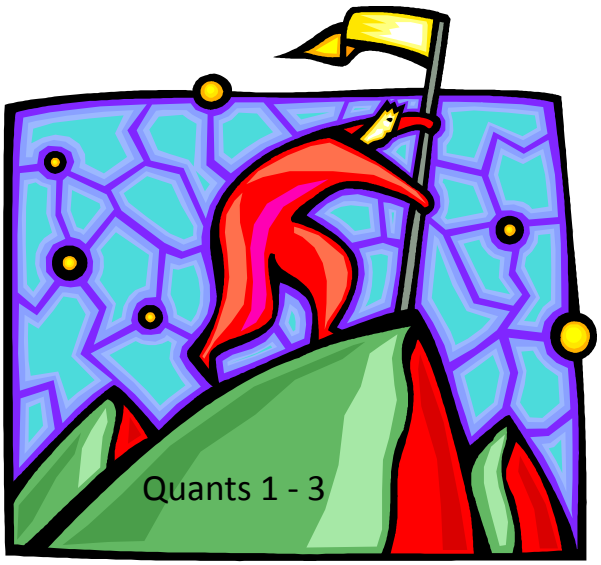
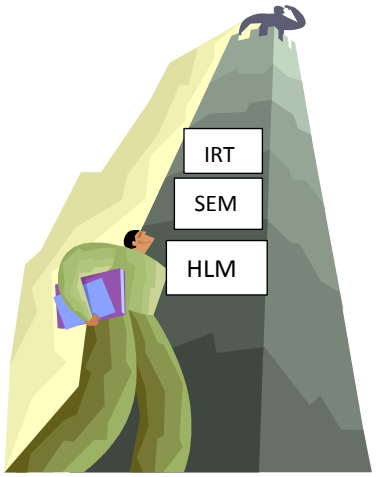
EPRS8550




More Topics

1. Mediation and Moderation
2. Curvilinear Regression
3. Logistic Regression and Discriminant Analysis
4. Comparing Two Regression Models
5. HLM
6. SEM
7. IRT
8. etc.

## 1. Mediation and Moderation

Example Research Question: "Does anxiety significantly mediate the relationship between family history and depression"? (From Dugard, Todman, & Staines, 2010)

Example Research Question: "Is the relationship between anxiety and depression moderated by the number of anxiety-free days?" (From Dugard, Todman, & Staines, 2010)

References/Resources:


Baron, R.M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173-1182. (Classic but outdated)

Dugard, P., Todman, J, & Staines, H. (2010). *Approaching multivariate analysis: A practical introduction*. New York: Routledge. (This is a textbook. See Chapter 6. Partial Correlation, Mediation and Moderation.) Free medical examples: Mediation (http://www.psypress.com/multivariate-analysis/medical-examples/chapter06/med_mediation_analysis.pdf, Note: They do not use the new bootstrapping significance test on this example. Moderation (http://www.psypress.com/multivariate-analysis/medical-examples/chapter06/med_moderation_analysis.pdf)

MacKinnon, D.P., Fairchild, A.J., & Fritz, M. (2007). Mediation analysis. *The annual review of psychology*, *58*, 593-614. (Comprehensive review.)

Mallinckrodt, B, Abraham, W. T., Wei, M., & Russell, D.W. (2006). Advances in testing the significance of mediation effects. *Journal of Counseling Psychology*, *53*, 372-378. (Brief Reports. Helpful for counseling psych. Students.)

Preacher, K.J., & Hayes, A.F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavioral Research Methods, Instruments, and Computers*, *36*, 717-31. (Practical guide in running SPSS using the new significance test).

http://davidakenny.net/cm/mediate.htm (Dr. Kenny's Website.)

http://www.public.asu.edu/~davidpm/ripl/mediate.htm (Dr. MacKinnon's Website.)

Dissertations:

Ganske, Kathryn Hollingsworth, "The relationship between counselor trainee perfectionism and working alliance with supervisor and client" (2008). *Dissertations.* Paper 25. http://digitalarchive.gsu.edu/cps_diss/25

2. Curvilinear Regression

Question: How do you examine nonlinear relationship in multiple regression?

Answer: There are four broad classes of approaches (Cohen, Cohen, West, & Aiken, 2003):

1. Polynomial Regression

2. Monotonic Nonlinear Transformations

3. Non Linear Regression

4. Nonparametric Regression Approaches

References/Resources:

http://core.ecu.edu/psyc/wuenschk/MV/multReg/Curvi.doc (A quick and easy summary handout on curvilinear bivariate regression.)

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analsyis for the behavioral sciences.* New York: Routledge. (See Chapter 6. This is a very comprehensive textbook. Many other chapters may be of your interest.)

Pedhazur, E. J. (1997). Multiple regression in behavioral research: Explanation and prediction (3rd Edition) New York: Holt, Rinehart and Winston. (Our textbook. See Chapter 13.Curvilinear Regression Analysis.)

Dissertations:

Brenneman, Michele Harrison, "Does a continuous measure of handedness predict reading related processes and reading skills across the lifespan?" (2007). *Dissertations.* Paper 7. http://digitalarchive.gsu.edu/cps_diss/7

3. Logistic Regression and Discriminant Analysis

Question: What if my DV is a categorical variable?

Answer: Use logistic regression or discriminant analysis

An Example Research Situation: "A study is carried out to find out how well people with traumatic brain injury (TBI) can be classified shortly after the injury is sustained either as having made a sufficiently good recovery to be back at work at 6 months (WORK = 1) or as not having recovered sufficiently to be back at work at 6 months (WORK = 2). The study is carried out on 54 people with TBI who have Glasgow coma scores below 12. Data are obtained on the following covariates: (1) an EEG-derived score (EEG), (2) the coma score (COMA) and bivariate (yes/no) pupil reactivity (REACT), …" (From Dugard, Todman, & Staines, 2010)

References/Resources:

http://www.kmentor.com/socio-tech-info/2003/12/what-is-the-difference-between.html (What is the difference between logistic regression and discriminant analysis?)

http://people.exeter.ac.uk/SEGLea/multvar2/disclogi.html (Logistic Regression and Discriminant Analysis)

Dugard, P., Todman, J, & Staines, H. (2010). *Approaching multivariate analysis: A practical introduction*. New York: Routledge. (Chapter 9. Discriminant analysis and logistic regression). Free medical examples: Discriminant analysis (http://www.psypress.com/multivariate-analysis/medical-examples/chapter09/med_discriminant_analysis.pdf) , Logistic regression (http://www.psypress.com/multivariate-analysis/medical-examples/chapter09/med_logistic_regression.pdf)

Pedhazur, E. J. (1997). Multiple regression in behavioral research: Explanation and prediction (3rd Edition) New York: Holt, Rinehart and Winston. (Our textbook. See Chapter 17. Categorical Dependent Variable: Logistic Regression.)

Stevens, J. (2009). Applied multivariate statistics for the social sciences. (5th Edition). Mahwah, NJ: Lawrence Erlbaum Associates. (Our optional textbook for Quant 3. See Chapter 7. Discriminant Analysis).

4. Comparing Two Regression Models

Question: How do you compare a regression model across groups?

An Example Research Situation: While developing a multiple regression model to be used to select graduate students based on GRE scores, one of the faculty pointed out that it might not be a good idea to use the same model to select Experimental and Clinical graduate students." (From http://psych.unl.edu/psycrs/statpage/rhtest_eg2a.pdf)

Resources:

http://psych.unl.edu/psycrs/statpage/rhtest_eg2a.pdf (For the example research situation above.)

http://core.ecu.edu/psyc/wuenschk/docs30/CompareCorrCoeff.doc (Document titled "Comparing Correlation Coefficients, Slopes and Intercepts".)

http://www.fon.hum.uva.nl/Service/Statistics/Two_Correlations.html (Testing two correlation coefficients using an applet)

http://www.ats.ucla.edu/stat/stata/faq/compreg2.htm (From UCLA Academic Technology Services. "How can I compare regression coefficients between two groups?)

5. HLM (Hierarchical Linear Modeling)

HLM is used with nested data structures. For example, students (level one) are nested within classrooms (level two), and classrooms are nested within schools (level three).

References:

Stevens, J.P. (2007). *Intermediate statistics: A modern approach*. Third Edition. Lawrence Erlbaum Associates. Taylor & Frances Group, New York. (Our Quant 2 textbook. See Chapter 8. Hierarchical Linear Modeling.)

6. SEM (Structural Equation Modeling)

Structural equation modeling, or SEM, is a very general, chiefly linear, chiefly cross-sectional statistical modeling technique. Factor analysis, path analysis and regression all represent special cases of SEM. (From http://www2.gsu.edu/~mkteer/sem.html)

References:

Pedhazur, E. J. (1997). Multiple regression in behavioral research: Explanation and prediction (3rd Edition) New York: Holt, Rinehart and Winston. (Our textbook. See Chapter 19. Structural Equation Models with Latent Variables.)

7. IRT (Item Response Theory)

Item Response Theory is the study of test and item scores based on assumptions concerning the mathematical relationship between abilities (or other hypothesized traits) and item responses. (From http://echo.edres.org:8080/irt/)

Applications:  Computer Adaptive Testing, Equating, Differential Item Functioning, etc.