ADVANCED REGRESSION ANALYSIS WORKSHOP

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DESCRIPTION:

This workshop deals with advanced applied linear regression and involves hands on-analysis. The goal is to provide an accessible and practical coverage of regression analysis focusing on problems in the area of management and organizational behavior, while also addressing use of relevant software tools.

The workshop is intended for graduate students and junior faculty in the social sciences. Students should have had (at least) a one-semester introduction to statistics and one semester introduction to linear regression.

COMPUTER USAGE:

The emphasis on data analysis requires students to make frequent use of a computer during the workshop; therefore, 2-3 hours during each meeting will be held in a computer lab. Lecture demonstrations and handouts will be based on using SPSS and SAS (Version 9.2). Although students may use any software for completing the assignments, most will find these to be convenient tools.

REQUIREMENTS AND EVALUATION:

1. Final project (take-home exam) 75%
2. Participation 25%

TOPICS COVERED:

1. REVISION OF BASIC STATISTICAL CONCEPTS

2. INTRODUCTION TO SPSS/SAS

3. MULTIPLE LINEAR REGRESSION:

- Linear regression
- Binary predictor in linear regression compared to t-test
- Predictor with multiple categories in linear regression
- Linear regression with multiple predictors

RECOMMENDED READING:

1. Cohen., J., Cohen, P., West., S.G., & Aiken, L.S. (2003). Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences. **Chapters 2**: Bivariate Correlation and Regression pp. 19-50.

2. Cohen., J., Cohen, P., West., S.G., & Aiken, L.S. (2003). Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences. **Chapters 3**: Multiple Regression/Correlation with Two or More Independent Variables pp. 64-74; 79-88

4. MODERATION:

- Single moderator (two-way interaction);
  - Moderator with binary IV
  - Moderator with continuous IV
  - Simple slopes analysis with single moderator

RECOMMENDED READING:

1. Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions.* Newbury Park, London, Sage.

2. Dawson, J. F., & Richter, A. W. (2006). Probing three-way interactions in moderated multiple regression: Development and application of a slope difference test. *Journal of Applied Psychology, 91,* 917-926.

3. Cohen., J., Cohen, P., West., S.G., & Aiken, L.S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. **Chapters 7**: Interactions Among Continuous Variables pp. 255-300.

5. MEDIATION ANALYSIS:

- Causal steps approach
- Indirect effect approach
- Mediation with one mediator
- Mediation with multiple mediators
- Conditional Indirect effects

RECOMMENDED READING:

1. Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and non-experimental studies: New procedures and recommendations. *Psychological Methods*, 7, 422–445.

2. MacKinnon, D. P., Warsi, G., & Dwyer, J. H. (1995). A simulation study of mediated effect measures. *Multivariate Behavioral Research*, 30, 41–62.

3. MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7, 83–104.

4. 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.

5. Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36, 717-731.

1. Preacher, Rucker & Hayes (2007): Addressing Moderated Mediation Hypotheses: Theory, Methods, and Prescriptions: *Multivariate Behavioral Research*, 40 (3), 879-891.

6. LOGISTIC REGRESSION

- The model
- Inference based on the model
- Likelihood and Deviance

1. Hosmer, D.W., Lemeshow, S. & Sturdivant, R.X. (2013). *Applied Logistic Regression.*

7. POISSON REGRESSION
- o The model
- o Inference based on the model
- o Offset; Scale- in Poisson Regression

8. AGREEMENT INDICES:
- Intra Class Correlations
- RWG and AD

1. James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. Journal of Applied Psychology, 69, 85-98.

2. Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein, & S. W. J. Kozlowski (Eds.), Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions (pp. 349–381). San Francisco: Jossey-Bass.

3. LeBreton, J. M., & Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. Organizational Research Methods, 11, 815-852.

4. Burke, M. J., & Dunlap, W. P. (2002). Estimating interrater agreement with the average deviation index: A user's guide. Organizational Research Methods, 5, 159-172.

5. Cohen, A., Doveh, E., & Eick, U. (2001). Statistical properties of the rWG(J) index of agreement. Psychological Methods, 6, 297-310.

6. Cohen, A., Doveh, E., & Nahum-Shani, I. (2009). Testing agreement for multi-item scales with the indices rWG(J) and ADM(J). Organizational Research Methods, 12, 148-164.

7. Smith-Crow,K., Burke,M.,J., Cohen,A. & Doveh,E. (2014) Statistical Significance Criteria for the r_{WG} and Average Deviation Interrater Agreement Indices *Journal of Applied Psychology,* 99(2), 239-261