

SYLLABUS FOR PSY 510 – SPRING 2010
*ADVANCED DESIGN AND STATISTICAL PROCEDURES IN THE ASSESSMENT
OF PSYCHOLOGICAL CHANGE*

Instructor: Prof. Dr. Nebi Sümer

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Class Meeting Time: Wednesday from 14:40 to 18:00

Room: Beşeri 102 & PC Lab

Course web address: <http://www.metu.edu.tr/~nsumer/psy510/default.htm>

Textbooks: (Each book will be partially covered)

1. Tabachnick, B.G & Fidell L.S. (2007). *Using Multivariate Statistics*, Third Edition, Northridge: Harper Collins
2. Hoyle, R.H. (1995). *Structural Equation Modeling: Concepts, Issues, and Applications*. London: Sage.
3. Kelloway, E.K. (1998). *Using LISREL for Structural Equation Modeling: A Researcher's Guide*. Thousand Oaks, Ca: Sage
4. Klein, R.B. (2004). *Principles and Practice of Structural Equation Modeling*. Psychology Press.
5. Kaplan, D. (2000). *Structural Equation Modeling: Foundations and Extensions*. Advanced Quantitative Techniques in the Social Sciences Series.

Course Objectives

The purpose of this class is to introduce some of the advanced multivariate statistics including canonical correlation, path analyses, and structural equation modeling using LISREL & AMOS. Specifically, this course aims to enable students (1) develop an understanding of theory/model-based measurement, testing, and analyses, (2) comprehend why structural equation modeling and related statistics are useful in social sciences, (3) acquire skills in analyzing data using LISREL and AMOS programs, (4) recognize and critique the limitations and common mistakes in applying SEM in published papers.

Course format:

PSY500 or an equivalent course on the fundamental techniques of multivariate statistics is prerequisite for this course. The course will consist of two main sections. In the first section, following a general overview, moderated and logistic regression, and canonical correlation will be covered. In the second section, basic concepts and statistical techniques in confirmatory factor analysis and structural equation modeling will be introduced with a specific emphasis on how confirmatory analysis is used in the development of psychological measures. Reading the assigned section and having practice the statistics learned are very imperative to this course. I expect you to be familiar with the contents of each chapter and assigned articles, and to have read the material before the class period for which it was assigned. Regular class attendance is strongly encouraged.

Quizzes: You will take a total of 6 (pop) mini-quizzes in different (randomly determined) weeks. You will be asked 2-3 very short questions from the given week's readings. One quiz with the lowest grade will be excluded and remaining 5 quizzes will add to 10 points. So each quiz will worth 2 points. As you'd easily guess the purpose of these quizzes is to make sure that you read the assigned materials and prepare for the class.

Reports: Writing a Result Section

One of the goals of this course is to have students able to analyze and test assigned data and/or models, and report the results of their analyses in a scientific manner used in refereed journals. Therefore, students will be asked to write a scientific report (result section) by conducting analyses using SPSS and LISREL six times throughout the semesters. Data and the specific models will be provided through course web page. Students should attach the relevant printouts to their report. These reports will be evaluated over 100. If you receive a grade below 70, you may ask for another report within 3 days considering the feedback given on the paper. In the second evaluation, your report will be graded over 80 rather than the maximum grade of 100. Each report is worth 10 points.

Since conducting analyses individually is the only way to master how to use statistical techniques and software, students should not cooperate with others in analyzing the data and writing the report. Students, however, may cooperate with their classmates for practicing the statistical techniques and learning the course material better.

Evaluating and Criticizing Published Work

Student will choose a published article which utilizes SEM and evaluate/critique it in terms of the appropriateness of the analyses employed, weaknesses, and limitations in analyzing and reporting the main findings. Students should also propose alternative analyses or revisions for the models tested or statistics used in the reviewed article. The article critique should be returned by May 31st, 2009, together with the copy of the original article. Maximum length should be 1500 words. Worth 5 points.

Final

A comprehensive essay type in class final will be given at the end of the term. Final will include questions on the fundamental topics covered in the course and writing result sections based on the printouts of the analyses given.

Bonus Credit: You may be asked to participate in experiments and/or complete questionnaire throughout the semester. Those who participate in these studies will be given 1 (one) point added to the final grade.

Grading:

Course credit will be accumulated from the following sources:

1. Quizzes	10
2. Reports on data analyses	70
3. Evaluating and Criticizing Published Work	5
4. Final	20
Total	105 (5 points bonus in advance!)

Tentative course schedule:

February 24	Introduction of the course, syllabus and discussing why we should be successful in this course
March 03	Moderated Regression <ul style="list-style-type: none">➤ Tabachnick, B.G & Fidell L.S. (2007). Ch.5➤ 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.
- Frazier, P. A., Tix, A. P. & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology*, 51, 115-134.
 - <http://davidakenny.net/cm/moderation.htm>
- March 10** **Logistic Regression I (Report 1 on Mod. Reg.)**
- Tabachnick, B.G & Fidell L.S. (2007). Ch.10
 - <http://faculty.chass.ncsu.edu/garson/PA765/logistic.htm>
- March 17** **Logistic Regression II. Application and Interpretation**
- Peng, C.J., Lee, K. L., & Ingersoll, G. M. (2002). An Introduction to Logistic Regression Analysis and Reporting. *Journal of Educational Research*, 96, 3-12.
- March 24** **Canonical Correlation (Report 2 on Log. Reg)**
- Tabachnick, B.G & Fidell L.S. (2007). Ch.12
 - Sherry, A., Henson, R.K. (2005). Conducting and interpreting canonical correlation analysis in personality research: a user-friendly primer. *Journal of Personality Assessment*, 84,37-48.
- March 31** **Overview of Structural Equation Modeling –SEM- (Basics, assumptions, and advantages over conventional analyses) (Report 3 on Can. Corr)**
- Tabachnick, B.G & Fidell L.S, (Ch.14)
 - Hoyle, R. C. (1995). The Structural Equation Modeling Approach: Basic Concepts and Fundamental Issues.
 - Sümer, N. (2000). Yapısal eşitlik modelleri: Temel kavramlar ve örnek uygulamalar. *Türk Psikoloji Yazıları*, 3(6), 49-74.
http://www.ssicentral.com/lisrel/complexdocs/chapter5_web.pdf (user guide)
- <http://www.ssicentral.com/lisrel/resources.html>
<http://www.ssicentral.com/lisrel/examples.html>
- April 7** **Regression and Path Analyses with Observed Variables using: Application LISREL (Report 2)**
- Klein Ch.5, Kaplan Ch.2
- April 14** **Specification, Identification, and Estimation in SEM (Report 4 on Path)**
- Bollen, K. A. 2001. “[Indicator: Methodology.](#)” Pages 7282-7287 in Neil J. Smelser and Paul B. Baltes (editors-in-chief). *International Encyclopedia of the Social and Behavioral Sciences*. Oxford, U.K.:Elsevier Science
 - Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Identification in Structural Equation Modeling. *Data analysis in social psychology*. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology*, pp. 252-258. Boston: McGraw-Hill.
 - MacCallum, R. C. (1995) Model Specification: Procedures, Strategies, and Related Issues. In Hoyle (1995).
- April 21** **Fit assessment and indices, and Reading a LISREL printout**
- Hu, L. T., & Bentler, P.M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling* (pp. 76-99). Thousand Oaks, DA: Sage.
 - Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988) Goodness of fit indexes in confirmatory factor analysis: The

- effect of sample size. *Psychological Bulletin*, 103, 391-410.
- Marsh, H. W., Hau, K. -T., Balla, J. R., & Grayson, D. (1998). Is more ever too much? The number of indicators per factor in confirmatory factor analysis. *Multivariate Behavioral Research*, 33, 181-220.
- April 28** **Measurement models and Confirmatory Factor Analyses: Application (Report 3)**
- Reading LISREL manual, Klein ch. 7
 - Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103, 411-423.
- May 5** **Structural Equation model with latent variables (Report 5 on Con. Factor)**
- Bollen, K.A. 2002. Latent Variables in Psychology and the Social Sciences. *Annual Review of Psychology*. 53: 605-634.
 - Rigdon, E. E. (1995), "A Necessary and Sufficient Identification Rule for Structural Models Estimated in Practice," *Multivariate Behavioral Research*, 30, 359-383.
- May 12** **Using Parcels in SEM Applications (Report 6 on SEM)**
- Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002) To parcel or not to parcel: Exploring the question and weighing the merits. *Structural Equation Modeling*, 9, 151-173.
 - Coffman, D. L., & MacCallum, R. C. (2005). Using parcels to convert path analysis models into latent variable models. *Multivariate Behavioral Research*, 40(2), 235-259
- May 19** **Happy Holiday & Viva Republica**
- May 26** **LISREL Results and Model Modification**
Error Covariance and Writing SEM results
- Hoyle, R. H., & Panter, A. T. (1995). Writing about structural equation modeling. In Hoyle (1995)
 - Roderick, P., McDonald, D., & Moon-Ho Ringo, H. (2002). Principles and Practice in Reporting Structural Equation Analyses. *Psychological Methods* 7, 64–82.
- May 31** **Multi-Sample/Group Analyses**
- (LISREL manual, Klein Ch.11)
 - <http://davidakenny.net/cm/mgroups.htm>
 - Vieno, A., Santinello, M., Pastore, M., & Perkins, D.D. (2007). Social support, sense of community in school, and self-efficacy as resources during early adolescence: an integrative model. *Am J Community Psychol*, 39, 177–190

<p>Special Note: "Plagiarism and cheating are serious offenses and may be punished by failure on an exam, paper, or projects; failure in the course; and/or expulsion from the university."</p>
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