

Educational Psychology 576

Hierarchical Linear Models

Goal: This course is designed to help students understand the theoretical basis and practical application of hierarchical linear models. After first focusing on the theoretical assumptions of such models and the characteristics of data which are consistent with these assumptions, the course will provide students the opportunity to analyze either their own data or data provided by the instructor.

Class Meetings: Class meetings will consist of didactic presentations by the instructor, discussions of reading assignments, and presentations by the participants of their analysis projects.

Course Evaluation: Course will be graded Credit/No Credit. Students are expected to attend class meetings and contribute to class discussions. Each student or team of students will make an oral or written presentation on their research project during the last two weeks of class.

Texts

Raudenbush, S. W. & Bryk, A. S., (2002). *Hierarchical Linear Models: Applications and Data Analysis Method*(2nd Edition). Newbury Park, CA: Sage. (RB)

Hox, J. (2002). *Multilevel Analysis: Techniques and Applications*. Mahwah, NJ: Erlbaum.(H)

Snijders, T.,& Bosker, R. (1999). *Multilevel Analysis*. Newbury Park, CA: Sage. (SB)

Schedule of Assignments and Topics

| Week | Topic | Readings |
|--------|--|--|
| Jan 7 | Overview of Hierarchical Linear Models | RB Chp 1; H Chp 1-2; SB Chp 1-3 |
| Jan 14 | Logic of Hierarchical Linear Models | RB Chp 1-4; H Chp 1-2; SB Chp 1-5 |
| Jan 21 | Principles of Estimation | RB Chp 3,13,14; H Chp 3-4, 10-11; SB Chp 4-6 |
| Jan 28 | Applications to Multi-level data | RB Chp 4, 5; 8; H Chp 8-9; SB Chp 7-8 |
| Feb 4 | Applications to Change | RB Chp 6; H Chp 5; SB Chp 12 |
| Feb 11 | Application in Study of Multi-level data | Sue Nolen; RB Chp 6; SB Chp 7; |
| Feb 18 | Cross classified Designs | Charles Fleming; RB Chp 12; H Chp 7; SB Chp 11 |
| Feb 25 | Testing Assumptions; Non linear HLM | RB Chp 9, 10,11; H Chp 6; SB Chp 9, 10, 14; |
| Mar 4 | Student Presentations | |
| Mar 11 | Student Presentations | |

Texts

Raudenbush, S. W. & Bryk, A. S., (2002). *Hierarchical Linear Models: Applications and Data Analysis Method*(2nd Edition). Newbury Park, CA: Sage. (RB)

Hox, J. (2002). *Multilevel Analysis: Techniques and Applications*. Mahwah, NJ: Erlbaum.(H)

Snijders, T., & Bosker, R. (1999). *Multilevel Analysis*. Newbury Park, CA: Sage. (SB)

Some Overviews and Foundational Journal Articles and Book Chapters

Arnold, C. L. (1992). An introduction to hierarchical linear models. *Measurement and Evaluation in Counseling and Development*, 25, 58-90.

Bryk, A. S., & Raudenbush, S. W. (1987) Application of hierarchical linear models to assessing change. *Psychological Bulletin*, 101, 147-158.

Burchinal, M., Bailey, D. B., & Snyder, P.. (1994). Using growth curve analysis to evaluate child change in longitudinal investigations. *Journal of Early Intervention*, 18 , 403-423.

Foorman, B. R., Francis, D. J., Novy, D. M., Liverman, D. (1991). How letter-sound instruction mediates progress in first-grade reading and spelling. *Journal of Educational Psychology*, 83, 456-469.

Francis, D. J., Fletcher, J. M., Stuebing, K. K., Davidson, K. C., & Thompson, N. M. (1991). Analysis of change: Modeling individual growth. *Journal of Consulting and Clinical Psychology*, 59, 27-37.

Kreft, I. G. G., deLeeuw, J., & van der Leeden, R. (1994). Review of Five Multilevel Analysis Programs: BMDP-5V, GENMOD, HLM, ML3,VARCL. *The American Statistician*, 48, 324-335.

Raudenbush, S. W. (1988). Educational applications of hierarchical linear models: A review. *Journal of Educational Statistics*, 13, 85-116.

Raudenbush, S., & Bryk, A. S. (1986) A hierarchical model for studying school effects. *Sociology of Education*, 59, 1-17.

Raudenbush, S. W., & Chan, W.S. (1993). Application of a hierarchical linear model to the study of adolescent deviance in an overlapping cohort design. *Journal of Consulting and Clinical Psychology*, 61, 941-951.

Raudenbush, S. W., Rowan, B., & Cheong, Y. F. (1993). Higher order instructional goals in secondary schools: Class, teacher and school influences. *American Educational Research Journal*, 30, 523-553.

Raudenbush, S. W., Rowan, B., & Kang, S. J. (1991). A multilevel model for studying school climate with estimation via the EM algorithm and application to U.S. high school data. *Journal of Educational Statistics*, 16, 295-330.