Multilevel Theory and Research (16:545:617:01 Index 57912)

Time/Location:	Wednesdays, 1:00-3:40pm, 106 Levin Building	
Instructor:	Stan Gully	
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Overview

This is a Ph.D. level seminar in which we will explore and critically analyze research and theory involving multilevel issues in a human resource management context. We will consider processes and outcomes across different levels of conceptualization (micro, meso, macro) and evaluate the tools, techniques, and theories used to investigate such phenomena. Topics covered in the course are organized in the following sequence:

- Foundations (background and history)
- Tools (analytical and statistical)

- Theories and applications (examples of research and frameworks using a multilevel lens)

Foundations include levels of analysis theory, complex adaptive systems theory, and general systems theory. Tools include agreement indices, hierarchical linear modeling/random coefficient modeling, within and between analysis, and random group resampling. Applications include strategic HRM, groups and teams, culture & climate, leadership, and social networks. The core perspective is that phenomena in human resource management contexts involve a dynamic process that unfolds across multiple levels of conceptualization and analysis, with interacting effects upward and downward in the hierarchy of levels. The attached reading list addresses each of topics in more detail.

It is hoped students will gain new insights into their particular areas of interest, and that these insights will lead to integrative, multilevel research. Hopefully students will write papers that are publishable or sufficiently developed to submit to one of our major conferences.

Readings

Textbook:

Klein, K. J., & Kozlowski, S. W. J. (2000). Multilevel theory, research and methods in organizations. San Francisco, CA: Jossey-Bass.

I have developed a structured set of topics and associated readings but the seminar is intended to be a self-guided learning experience. Your participation is a critical component of the seminar experience. Everyone is expected to be prepared to discuss the readings and to present their views. You should read and critically evaluate the readings and be prepared to discuss and share your observations.

I expect all readings to be completed prior to each class. In preparing for class discussion, you may want to ask yourself some of the following questions:

Why was this reading assigned? In what way does a multilevel perspective change our thinking on the selected topic? What is the "proper" level of analysis? At what level do the authors operate? Do the levels of theory, measurement, analysis, and conclusion match? What did you find interesting about this article?

I expect every person in the seminar to do some additional searching to find articles that address important topics using a multilevel perspective. Each student should submit one or more scholarly articles identified over the course of the semester.

The attached reading list is primarily composed of examples of cross-level and/or multilevel research and theory. I have tried to comb the major journals to find as many examples as possible. However, I am sure that I have missed many. Feel free to bring in other articles that could be added to the list. We will not read all these articles. However, if you are interested in a particular content area, there are plenty of additional readings listed that may help in writing your paper, or future research. I will try to retain <u>some flexibility</u> in both the readings and the schedule. I will likely be updating the list as we progress through the semester. Students may also wish to add articles they think might be of interest.

Student Discussion Leaders

Students are expected to have read all assigned readings before meeting each week. All students are expected to participate in the discussion of the assigned readings for the week and each student will be assigned one or more weeks in which they are responsible for identifying an additional key article and leading part of the day's discussion. Discussion leaders will be expected to present the critical perspectives of the readings assigned for the week and engage classmates in thoughtful exploration of the materials, including critical analysis and questioning of the perspectives presented in the assigned readings. Handouts should be prepared by the discussion leader for classmates and supplementary readings should be included by the student leader that either support or negate the perspectives presented in the assigned readings.

Research Project

You will be asked to apply the concepts presented in the course by writing a conceptual paper addressing some area of research using multilevel theory and associated tools. Ideally, the paper ultimately will be suitable for submission to a journal or may serve as a basis for future research. An outline and the first few pages of your paper are due by 10/21.

The goal is to have you view your own research interests from a broader, more complete, and potentially more complex, multilevel frame of reference. You can choose any topic you wish but it will be helpful if you are already knowledgeable about the topic.

Presentation of Paper

You will be asked to present your project to your colleagues in 15 to 20 minutes. This is consistent with the amount of time allowed at professional meetings. You should prepare as if

you were presenting a paper at a conference. Your colleagues and I will provide you with feedback on your ideas and your revisions will be due by the last week of class.

Exercises

At certain points in the semester exercises may be assigned to clarify concepts or strengthen conceptual understanding. All exercises are expected to be completed as assigned and will be graded on a straight scale..

Essay and Multiple Choice Exam

This will be a 24 hour take-home exam; students will be given 3 questions from which to choose two to answer. Answers for each question should be 4-5 typed pages, and will be graded according to criteria for qualifying exams. Students are expected to complete this exam with no help from, or discussion with other students or faculty. You should view this as practice for the real thing.

Grades

- 10% Attendance, participation, article submissions, contributions to class discussions
- 10% Exercises
- 20% Exam
- 20% Discussion leader and providing critiques of draft projects
- 10% Research presentation
- 30% Final project

Final grades are assigned according to the following scale based on the weighted performance of the above dimensions:

 $\begin{array}{l} (90\text{-}100\%) \ = \ A \\ (86\text{-}89.9\%) \ = \ B + \\ (80\text{-}85.9\%) \ = \ B \\ (76\text{-}79.9\%) \ = \ C + \\ (70\text{-}75.9\%) \ = \ C \\ (0\text{-}69.9\%) \ = \ F \end{array}$

Date	Торіс	Details
1/23	Introduction / Overview	
1/30	Theoretical Foundations I	
2/6	Foundations II	
	Initial idea due	
2/13	Introduction to Statistical Issues	
2/20	Agreement & Reliability	
2/27	WABA / HLM / RCM	
3/6	Cross Level Theory / Contextual	
	Models / Frog-Pond / Moderation	
3/13	Multilevel Mediation	
	Pages 1-5 due	
3/20	SPRING BREAK!	
3/27	Climate and Culture	
4/3	Strategic HRM & Employee	
	Performance	
4/10	Project Work Session	
4/17	Training	
4/24	Teams and Leadership	
	Pages 1-10 due with references	
5/1	Selection and Staffing	
5/8	Presentations	
	Final papers due	
5/15	Final Exam	
	Feedback on presentations due	

Readings

Introduction, course overview, no readings

Foundations I

Katz, D., & Kahn, R. L. 1978. **The social psychology of organizations** (Chapters 1-3, pp. 1-68). NY: Wiley.

Mathieu, J. E., & Chen, G. (2011). The etiology of the multilevel paradigm in management research. Journal of Management, 37, 610-641.

Pfeffer, J. 1991. Organization theory and structural perspectives on management. <u>Journal of</u> <u>Management</u>, **17**: 789-803.

Simon, H. A. 1973. **The organization of complex systems.** In H.H. Pattee (Ed.), Hierarchy theory (pp. 1-27). NY: Braziller.

von Bertalanffy, L. 1968. **General system theory: Foundations, development, applications** (pp. 30-53). New York: George Braziller

Optional:

von Bertalanffy, L. 1972. The history and status of general systems theory. In G. J. Klir (Ed.), <u>Trends in general system theory</u> (pp. 21-41). Wiley.

Foundations II

Klein, K. J., Dansereau, F., & Hall, R. J. 1994. Levels issues in theory development, data collection, and analysis. Academy of Management Review, **19**: 195-229.

Commentary: George, J. M., & James, L. R. 1994. Levels issues in theory development. Academy of Management Review, **19**: 636-640.

Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J. Klein & S. W. J. Kozlowski (Eds.), **Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions** (pp. 3-90). San Francisco, CA: Jossey-Bass.

Rousseau, D. M. (1985). Issues of level in organizational research: Multilevel and cross-level perspectives. In L. L. Cummings & B. Staw (Eds.), **Research in organizational behavior** (Vol. 7, pp1-37). Greenwich, CT: JAI Press.

Measurement Issues

Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. <u>Journal of Applied Psychology</u>, 83, 234-246.

Chen, G., Mathieu, J. E., & Bliese, P. D. (2004). A framework for conducting multilevel construct validation. In F. J. Yammarino & F. Dansereau (Eds.), **Research in multilevel issues: Multilevel issues in organizational behavior and processes** (Vol. 3, pp. 273-303). Elsevier: Oxford, U.K.

Optional:

Chen, G., Mathieu, J. E., & Bliese, P. D. (2004b). Validating frogs and ponds in multilevel contexts: Some afterthoughts. In F. J. Yammarino & F. Dansereau (Eds.), **Research in multilevel issues: Multilevel issues in organizational behavior and processes** (Vol. 3, pp. 335-343). Elsevier: Oxford, U.K.

Hitt, M. A., Beamish, P. W., Jackson, S. E., & Mathieu, J. E. (2007). Building theoretical and empirical bridges across levels: Multilevel research in management. <u>Academy of Management Journal, 50,</u> 1385-1399.

Klein, K.J., Tosi, H., & Cannella, A.A., Jr. (1999). Multilevel theory building: Benefits, barriers, and new developments. <u>Academy of Management Review</u>, 24, 243-248.

Klein, K. J., & Kozlowski, S. W. J. (2000). From micro to meso: Critical steps in conceptualizing and conducting multilevel research. <u>Organizational Research Methods</u>, *3*, 211-236.

Morgeson, F. P., & Hofmann, D. A. (1999). The structure and function of collective constructs: Implications for multilevel research and theory development. <u>Academy of Management Review</u>, <u>24</u>, 249-265.

Roberts, K. H., Hulin, C. L., & Rousseau, D. M. (1978). Developing an interdisciplinary science of organizations. San Francisco: Jossey-Bass (Chapters 1-3, pp. 1-80).

Introduction to Statistical Issues

Firebaugh, G. 1978. A rule for inferring individual-level relationships from aggregate data. <u>American Sociological Review</u>, 43: 557-572.

Glick, W. H., & Roberts. K. (1984). Hypothesized interdependence, assumed independence. Academy of Management Review, 9, 722-735.

Hannan, M. T. & Burstein, L. 1974. Estimation from grouped observations. <u>American</u> <u>Sociological Review</u>, 39, 374-392.

James, L. R. (1982). Aggregation bias in estimates of perceptual agreement. Journal of Applied Psychology, 67, 219-229.

Ostroff, C. (1993). Comparing correlations based on individual-level and aggregated data. Journal of Applied Psychology, 78, 569-582.

Roberts, K. H., Hulin, C. L., & Rousseau, D. M. 1978. Aggregation problems in organizational science. <u>Developing an Interdisciplinary Science of Organizations</u> (Ch. 4, pp. 81-109). San Francisco: Jossey-Bass.

Data Analysis in R (to install R) Bliese, P. (Feb, 2009). <u>Multilevel modeling in R</u> (2.3). <u>http://cran.r-project.org/web/packages/multilevel/index.html</u>

Optional:

Campbell, D. T. (1958). Common fate, similarity, and other indices of the status of aggregates of persons as social entities. <u>Behavioral Science</u>, <u>3</u>, 14-25.

Firebaugh, G. (1979). Assessing group effects: A comparison of two methods. <u>Sociological</u> <u>Methods & Research</u>, 7, 384-395.

+Freeman, J. H. 1978. The unit of analysis in organizational research. In M. W. Meyer & Associates (Eds.), <u>Environments and Organizations</u> (pp. 335-351). San Francisco: Jossey-Bass.

Lincoln, J. R., & Zeitz, G. (1980). Organizational properties from aggregate data: Separating individual and structural effects. <u>American Sociological Review</u>, 45, 391-408.

Moorman, J. E. 1979. Aggregation bias: An empirical demonstration. <u>Sociological Methods and</u> <u>Research, 8,</u> 69-94.

Robinson, W. S. (1950). Ecological correlations and the behavior of individuals. <u>American</u> <u>Sociological Review, 15,</u> 351-357.

Thorndike, E. E. (1939). On the fallacy of imputing the correlations found for groups to the individuals or smaller groups composing them. <u>American Journal of Psychology</u>, 52, 122-124.

Agreement and Reliability

General

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

Rebuttal: http://www.levelsofanalysis.com/compareto%20bliese.html

LeBreton, J. M. & Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. <u>Organizational Research Methods</u>, 11(4), 815-852.

van Mierlo, K., Vermunt, J. K., & Rutte, C. G. (2009). Composing group-level constructs from individual-level survey data. <u>Organizational Research Methods</u>, 12, 368-392.

Dispersion

Cole, M. S., Bedeian, A. G., Hirschfeld, R. R., & Vogel, B. (2011). Dispersion-composition models in multilevel research: A data-analytic framework. <u>Organizational Research Methods</u>, 14, 718-734.

Klein, K. J., Conn, A. B., Smith, D. B., & Sorra, J. S. (2001). Is everyone in agreement? An exploration of within-group agreement in employee perceptions of the work environment. Journal of Applied Psychology, 86, 3-16.

Roberson, Q. M., Sturman, M. C., Simons, T. L. (2007). Does the measure of dispersion matter in multilevel research? A comparison of the relative performance of dispersion indexes. <u>Organizational Research Methods</u>, 10, 564-588.

rwg

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.

LeBreton, J. M., James, L. R., & Lindell, M. K. (2005). Recent issues regarding r_{WG} , r_{WG} , $r_{WG(J)}$, and $r_{WG(J)}$. <u>Organizational Research Methods</u>, *8*, 128-138.

Random Group Resampling

Bliese, P. D., & Halverson, R. R. (2002). Using random group resampling in multilevel research: An example of the buffering effects of leadership climate. <u>Leadership Quarterly</u>, 13, 53-68.

Lüdtke, O., & Robitzsch, A. (2009). Assessing within-group agreement: A critical examination of a random-group resampling approach. <u>Organizational Research Methods</u>, 12, 461-487.

Data Analysis in R. Bliese, P. (Feb, 2009). <u>Multilevel modeling in R</u> (2.3).

Optional:

Bartko, J. J. (1976). On various intraclass correlation reliability coefficients. <u>Psychological</u> <u>Bulletin, 83,</u> 762-765.

Beal, D. J., & Dawson, J. F. (2007). On the use of Likert-type scales in multilevel data: Influence on aggregate variables. <u>Organizational Research Methods</u>, 10, 657-672.

Bleise, P. D., & Halverson, R. R. (1998). Group size and measures of group-level properties: An examination of eta-squared and ICC values. Journal of Management, 24, 157-172.

Brown, R. D., & Hauenstein, N. M. A. (2005). Interrater agreement reconsidered: An alternative to the rwg indices. <u>Organizational Research Methods</u>, *8*, 165-184.

Burke, M. J., & Dunlap, W. P. 2002. Estimating interrater agreement with the average deviation index: A user's guide. <u>Organizational Research Methods</u>, *5*, 159-172.

Cohen, A., Doveh, E., & Eick, U. (2001). Statistical properties of the $r_{WG(J)}$ index of agreement. <u>Psychological Methods</u>, 6, 297-310.

Cohen, A., Doveh, E., & Nahum-Shani, I. (2009). Testing agreement for multi-item scales with the indices $r_{WG(J)}$ and $AD_{M(J)}$. <u>Organizational Research Methods</u>, 12, 148-164.

McGraw, K. O., & Wong, S. P. (1996). Forming inferences about some intraclass correlation coefficients. <u>Psychological Methods</u>, 1, 30-46.

Newman, D. A., & Sin, H. P. (2009). How do missing data bias estimates of within-group agreement? Sensitivity of SD_{WG} , CV_{WG} , $r_{WG(J)}$, $r_{WG(J)}$, and ICC to systematic nonresponse. Organizational Research Methods, 12, 113-147.

Optional debate over rwg:

Schmidt, F. L., & Hunter, J. E. (1989). Interrater reliability coefficients cannot be computed when only one stimulus is rated. Journal of Applied Psychology, 74, 368-370.

Kozlowski, S. W. J., & Hattrup, K. (1992). A disagreement about within-group agreement: Disentangling issues of consistency versus consensus. <u>Journal of Applied Psychology</u>, 77, 161-167.

James, L. R., Demaree, R. G., & Wolf, G. (1993). rwg: An assessment of within group interrater agreement. Journal of Applied Psychology, 78, 306-309.

WABA

Dansereau, F., Cho, J., & Yammarino, F. J. (2006). Avoiding the "fallacy of the wrong level": A within and between analysis (WABA) approach. <u>Group and Organization Management, 31,</u> 536-577.

Dansereau, F., & Yammarino, F. (2000). Within and between analysis: The variant paradigm as an underlying approach to theory building and testing. In K. J. Klein & S. W. J. Kozlowski (Eds.), **Multilevel theory, research and methods in organizations** (pp. 425-466). San Francisco, CA: Jossey-Bass.

Debate:

George, J. M. (1990). Personality, affect, and behavior in groups. <u>Journal of Applied</u> <u>Psychology</u>, 75, 107-116.

Yammarino, F. J. & Markham, S. F. (1992). On the application of within and between analysis: Are absence and affect really group-based phenomena? <u>Journal of Applied</u> <u>Psychology</u>, 77, 168-176. (Provides a critique of George, 1990)

George, J. M., & James, L. R. (1993). Personality, affect, and behavior in groups revisited: Comment on aggregation, levels of analysis, and a recent application of within and between analysis. <u>Journal of Applied Psychology</u>, 78, 798-804. Optional:

Markham, S. E., & Halverson, R. R. (2002). Within- and between-entity analyses in multilevel research: A leadership example using single level analyses and boundary conditions (MRA). Leadership Quarterly, 13, 35-52.

Hierarchical Linear Modeling/Random Coefficient Modeling

Hofmann, D.A. (1997). An overview of the logic and rationale of hierarchical linear models. Journal of Management, 23, 723-744.

Hofmann, D. A., Griffin, M., & Gavin, M. (2000). The application of hierarchical linear modeling to organizational research. In K. J. Klein & S. W. J. Kozlowski (Eds.), **Multilevel theory, research and methods in organizations** (pp. 467-511). San Francisco, CA: Jossey-Bass.

Klein, K., Bliese, B., Kozlowski, S., Dansereau, F., Gavin, M., Griffin, M., Hofmann, D., James, L., Yammarino, F., & Bligh, M. (2000). Multilevel analytical techniques: Commonalities, differences, and continuing questions. In K. J. Klein & S. W. J. Kozlowski (Eds.), **Multilevel theory, research and methods in organizations** (pp. 512-556). San Francisco, CA: Jossey-Bass.

Optional:

Albright, J. J. (2007, May 11). Estimating multilevel models using SPSS, Stata, and SAS.

Ballinger, G. A. (2004). Using generalized estimating equations for longitudinal data analysis. <u>Organizational Research Methods</u>, 7, 127-150.

Bliese, P. D. (2002). Multilevel random coefficient modeling in organizational research: Examples using SAS and S-PLUS. In F. Drasgow & N. Schmitt (Eds.), **Measuring and analyzing behavior in organizations** (pp. 401-445). San Francisco, CA: Jossey-Bass.

Bliese, P. D., & Hanges P. J. (2004). Being both too liberal and too conservative: The perils of treating grouped data as though they were independent. <u>Organizational Research Methods</u>, *7*, 400-417.

Bliese, P. D., & Ployhart, R. E. (2002). Growth modeling using random coefficient models: Model building, testing, and illustrations. <u>Organizational Research Methods</u>, *5*, 362-387.

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

Hox, J. J. (2002). <u>Multilevel analysis: Techniques and applications</u>. Mahwah, NJ: Lawrence Erlbaum Associates. An earlier (1995) book by the same author, <u>Applied multilevel analysis</u>, Amsterdam: TT-Publicaties, is available online at www.geocities.com/joophox/publist/amaboek.pdf Ployhart, R. E., & Vandenberg, R. J. (2010). Longitudinal research: The theory, design, and analysis of change. Journal of Management, 36(1), 94-120.

(not on Sakai) Raudenbush, S. W., & Bryk, A. S. (2001). **Hierarchical linear models: Applications and data analysis methods**. Newbury Park: SAGE Publications. An earlier book by these authors is Bryk, A. S. and Raudenbush, S. W. (1992). **Hierarchical linear models**. Newbury Park: Sage Publications.

(not on Sakai) Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., & Congdon, R. T. (2004). **HLM 6: Hierarchical linear and nonlinear modeling.** Lincolnwood, IL: Scientific Software International.

Scherbaum, C. A., & Ferreter, J. M. (2009). Estimating statistical power and required sample sizes for organizational research using multilevel modeling. <u>Organizational Research Methods</u>, <u>12</u>, 347-367.

Schonfeld, I. S., & Rindskop, D. (2007). Hierarchical linear modeling in organizational research: longitudinal data outside the context of growth curve modeling. <u>Organizational Research</u> <u>Methods, 10,</u> 417-429.

Singer, J. D. (1998). Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. Journal of Educational and Behavioral Statistics, 24, 323-355.

Optional SEM Based Approaches:

(not on Sakai) Chan, D. (1998). The conceptualization and analysis of change over time: An integrative approach incorporating longitudinal mean and covariance structures analysis (LMACS) and multiple indicator latent growth modeling (MLGM). <u>Organizational Research Methods</u>, 1, 421-483.

Willett, J. B., & Keiley, M. K. 2000. Modeling change over time. In H. E. A. Tinsley & S. Brown (Eds.), <u>Handbook of multivariate statistics and mathematical modeling</u> (pp. 665-695). New York: Academic Press.

Willett, J. B., & Sayer, A. G. (1994). Using covariance structure analysis to detect correlates and predictors of individual change over time. <u>Psychological Bulletin, 116</u>, 363–381.

Wu, W., West, S., G., & Taylor, A. B. (2009). Evaluating model fit for growth curve models: Integration of fit indices from SEM and MLM frameworks. <u>Psychological Methods</u>, 14(3), 183-201.

Cross-Level Theory, Contextual Models, Networks <u>General:</u> Blalock, H. M. (1984). Contextual-effects models: Theoretical and methodological issues. <u>Annual Review of Sociology, 10</u>, 353-372. James, L., & Williams, L. (2000). The cross-level operator in regression, ANCOVA, and contextual analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), **Multilevel theory, research and methods in organizations** (pp. 382-424). San Francisco, CA: Jossey-Bass.

Mathieu, J. E., Aguinis, H., Culpepper, S. A., & Chen, G. (2012). Understanding and estimating the power to detect cross-level interaction effects in multilevel modeling. Journal of Applied Psychology, 97(5), 951-966. doi: 10.1037/a0028380

Mossholder, K. W., & Bedeian, A. G. (1983). Cross-level inference and organizational research: Perspectives on interpretation and application. <u>Academy of Management Review, 8,</u> 547-558.

Frog-pond:

Firebaugh, G. (1980). Groups as contexts and frog ponds. In Karlene H. Roberts and Leigh Burstein (eds.), <u>Issues in Aggregation: New Directions for Methodology of Social and</u> <u>Behavioral Science</u> (pp. 43-52). San Francisco: Jossey-Bass,

Networks & Structures:

Brass, D. J. (2000). Frog ponds and networks: Trends in multilevel research. In K. J. Klein & S. W. J. Kozlowski (Eds.), **Multilevel theory, research, and methods in organizations** (pp. 557-571). San Francisco: Jossey-Bass.

Moliterno, T. P., & Mahony, D. M. (2011). Network theory of organization: A multilevel approach. Journal of Management, 37(2), 443-467.

Centering:

Hofmann, D. A. & Gavin, M. B. (1998). Centering decisions in hierarchical linear models: Implications for research in organizations. Journal of Management, 24, 623-641.

Optional:

Beal, D. J., & Weiss, H. M. (2003). Methods of ecological momentary assessment in organizational research. <u>Organizational Research Methods</u>, *6*, 440-464.

Bedian, A. G., Kemery, E. R., & Mossholder, K. W. (1989). Testing for cross-level interactions: An empirical investigation. <u>Behavioral Science</u>, 34, 70-78.

Bliese, P. D., Chan, D. & Ployhart, R. E. 2007. Multilevel methods: Future directions in measurement, longitudinal analyses, and nonnormal outcomes. <u>Organizational Research</u> <u>Methods</u>, 10, 551-563.

Brass, D. J. (1981). Structural relationships, job characteristics, and worker satisfaction and performance. Administrative Science Quarterly, 26, 331-348.

Brass, D. J. 1984. Being in the right place: A structural analysis of individual influence in an organization. <u>Administrative Science Quarterly</u>, 29, 518-539.

Chen, G., Bliese, P. D., & Mathieu, J. E. (2005). Conceptual framework and statistical procedures for delineating and testing multilevel theories of homology. <u>Organizational Research</u> <u>Methods</u>, *8*, 375-409.

Davison, M.L., Kwak, N., Seo, Y.S., & Choi, J. (2002). Using hierarchical linear models to examine moderator effects: Person-by-organization interactions. <u>Organizational</u> <u>Research Methods, 5</u>, 231-254.

Enders, C. K. & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. <u>Psychological Methods</u>, 12, 121-138.

Hofmann, D. A., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. <u>Personnel Psychology</u>, 49, 307-338.

Klein, K. J., Dansereau, F., & Hall, R. J. (1995). On the level: Homogeneity, independence, heterogeneity, and interactions in organizational theory. <u>Academy of Management Review, 20</u>, 7-9.

(not on Sakai) Krackhardt, D. & Porter, L. W. 1985. When friends leave: a structural analysis of the relationship between turnover and stayers' attitudes. <u>Administrative Science Quarterly, 30</u>, 242-261.

Kreft, I. G. G., de Leeuw, J., & Aiken, L. S. (1995). The effect of different forms of centering in hierarchical linear models. <u>Multivariate Behavioral Research</u>, 30, 1-21.

LaHuis, D. M., & Ferguson, M. W. (2009). The accuracy of significance tests for slope variance components in multilevel random coefficient models. <u>Organizational Research Methods</u>, 12, 418-435.

(not on Sakai) Martin, K. D., Cullen, J. B., Johnson, J. L., & Parboteeah, K. P. (2007). Deciding to bribe: A cross-level analysis of firm and home country influences on bribery activity. Academy of Management Journal, 50, 1401-1422.

(not on Sakai) Mathieu, J. E., & Kohler, S. S. (1990). A cross-level examination of group absence influences on individual absence. Journal of Applied Psychology, 75, 217-220.

(not on Sakai) Oldham, G. R., Kulik, C. T., Stepina, L. P., & Ambrose, M. L. 1986. Relations between situational factors and the comparative referents used by employees. <u>Academy of Management Journal</u>, 29, 599-608.

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ICC1: (MSB - MSW) / MSB + [(k-1)*MSW] ICC2: (MSB-MSW) / MSB OR ICC2: k(ICC1) / 1 + (k-1) ICC1

Where k = the average group size

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