

PSYCHOLOGY 535:

Research Methods in I/O Psychology

GENERAL INFORMATION

Class Time: M 9:05am-12:05pm
Instructor: James M. LeBreton
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Location: 350 Moore Building
Office: 632 Moore Building
Office Hours: by appt. (I'm around)
Office Phone: 814-867-4847

RECOMMENDED TEXTBOOKS

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. New York: Houghton-Mifflin Company.

SEMINAR OBJECTIVES

This seminar is designed to help you develop a broad understanding of applied research by exposing you to the various research methods commonly used in psychology. The objectives for the course include: 1) developing a solid core understanding of the concepts underlying the research endeavor; 2) building an appreciation of the strengths and limitations of various designs and methods of research; 3) developing the skills to apply these methods to research problems; 4) creating an understanding of the connections between theory, method, and the advancement of knowledge; 5) becoming aware of ethical issues in research; and 6) making significant progress toward the completion of a Master's thesis proposal.

SEMINAR PHILOSOPHY

This class is my opportunity to introduce you to the interesting and complex world applied research methods. It is my personal mission to make sure that all of you walk away from this class capable of discussing in great depth the topics we cover. I expect everyone to be proactively involved in this educational and professional developmental opportunity.

I hope to learn as much from you as you do from me. To this end, I will actively support and encourage an environment characterized as open, supportive, and fun. I will actively discourage an environment that is characterized as aggressive or hostile. I expect all of us to work together to create an environment that reinforces constructive criticism and feedback, accompanied with comments designed to guide everyone to a better understanding of the issues at hand. Furthermore, I would encourage all of you to think outside the box-- try to frame and address issues in innovative and creative ways.

I view my role in this class differently than I do in undergraduate classes. The model typically adopted during undergraduate education is that of the instructor as "lecturer" and the students as "note takers." Though this model may be effective for undergraduate instruction, it is deficient for graduate instruction for several reasons. Specifically, a number of critical professional skills are not developed in this environment. These include:

- The ability to organize, analyze, and integrate information
- The ability to effectively communicate this information both orally and in writing
- The ability to identify weaknesses or "holes" in extant research and theory
- The ability to think critically about these weaknesses and develop alternatives to fill in the "holes"
- The ability to develop arguments for and against various theoretical positions
- The ability to effectively communicate these arguments both orally and in writing
- The ability to effectively enhance a group's understanding and knowledge of complex multifaceted issues

A fully capable graduate student is more *proactive* and *assertive* about his or her education. Such students are actively involved in shaping and developing the learning process. I know all of you have great things to contribute to class. Thus, I expect each of you to be involved both mentally and verbally in every class session. This is not intended to be intimidating or to make you feel uncomfortable, but to enhance everyone's learning opportunities.

I view my role as one of clarifying issues rather than pontificating to you about them. For many of the topics we will discuss there are no black and white answers, rather it is a case of how strong an argument you can provide for your particular shade of gray. What I will do is share my thoughts and opinions on the topics we discuss, clarify conceptually or technically "sticky" issues, and help keep our discussions "on track."

OVERVIEW OF SEMINAR FORMAT

This course is scheduled to meet three hours every week. During each week we will divide our class time across the following topics or sections:

- Guided discussion of the general readings and topic.
- Discussion (often student-led) of empirical articles relating to the topic of the day, or of practical application of the day's topic in research and in business;
- Student presentations of special topics or of their progress in their research proposals, or other in-class activities.

We'll also talk about the various chapters in *Dissertations and Theses from Start to Finish*. These will provide you with some valuable guidance as you think about the thesis/dissertation process in general, not just about the methodology of research.

This class involves a great deal of reading, but we will **not** spend the bulk of each class period with me lecturing about the readings. Thus, it is up to you to ensure that you have a thorough understanding of the materials covered in the readings. And, if you have questions, be sure to seek answers from me and the other members of the class.

COURSE REQUIREMENTS

- 1) **Participation**. This class provides the basic foundation for the work that you will be doing for the rest of your time in graduate school, and indeed for the rest of your career. It is essential that you attend class, and that you come prepared. Additionally, each of you brings expertise in different areas and different experiences to the class. When you are absent, the other students cannot benefit from your contribution, and the class as a whole suffers. Thus, regular attendance is required. My discretion decides an excused absence (e.g., medical illness, family emergency, approved University absence). Unexcused absences are not acceptable and will result in the automatic drop of a letter grade.

Attendance alone, however, does not necessarily indicate participation. Thus, students are expected to be active members (both cognitively and verbally) of the seminar. This cannot be accomplished without having read the assigned materials in advance of class sessions. In fact, it may require reading the materials more than once, in order to fully understand and integrate them.

Note that each week's readings will often be accompanied by discussion questions, and these will form the basis for the beginnings of each week's class discussions. In preparing for class each week, you should first read the discussion questions, and then quickly skim all of the readings to get a sense of each one. Then read in detail, keeping the discussion questions in mind, and looking for points of consensus or disagreement between the various readings. Preparing this way helps to ensure that your contributions to class are meaningful and thoughtful.

Finally, a major way we learn about research is through talking about research. Active attendance and participation in brown bag talks, CARMA talks, and departmental colloquia is strongly encouraged.

When in class, try to make sure you are addressing the following 'dimensions' of participation:

- Oral Communication – Are your statements articulate and logically coherent?
- Technical Knowledge – Are you prepared for class? Are your descriptions conceptually clear?
- Activity – Are you actively participating in class discussion? Are you contributing not only in terms of quantity, but also in terms of quality to the discussion?

Other aspects of participation:

- Brief assignments may be assigned throughout the semester (e.g., article critiques).
- Pop quizzes may also be administered.
- I may ask students to prepare for and publicly present a formal debate on a topic to be announced. The debate will follow traditional debate format, with presentation of positions followed by rebuttals, and upper-level students and faculty may be invited to attend and join in the judging.

- 2) **Exams**. There will be two exams during the semester. The exams may consist of short answer questions, identification questions, and essay questions. Exams will cover assigned readings and the content of class discussions and lectures.

3) Research proposal. Finally, you will be asked to complete a research proposal describing a study that is well developed, grounded in previous research literature, and practical. The clear expectation is that you will take this proposal and, working with your advisor, develop it over the summer into a full Master's Thesis proposal. Thus, in choosing a topic for your proposal, you should keep in mind such issues as:

- Are there faculty members here who can provide guidance and expertise on my topic?
- Does the proposed research require a sample size that will be extraordinarily difficult to acquire?
- Does the proposed analysis require data analytic techniques with which I am not yet familiar?
- Is the proposed research a project that I can reasonably expect to complete?

The purpose of the research proposal is to:

- To encourage you to familiarize yourself with the recent literature on a topic related to your own interests
- To encourage you to critically evaluate the literature, looking for gaps, problems, or oversights that need to be addressed
- To facilitate your ability to delineate relevant research questions/hypotheses/propositions from these gaps, problems, and oversights
- To strengthen your academic writing skills and familiarity with the APA style
- To provide you with a paper that may be further developed and used as your Master's thesis project.

The final draft of your research proposal should include:

- Introduction: a literature review, including a formal statement of hypotheses.
- Method: sample, measures, procedures
 - Sample: A description of your sample (or proposed sample) including a justification for sample size (N) and a description of the (anticipated) demographic characteristics.
 - Measures: A description of your measures, including information about reliability and sample items.
 - Procedures:
- Results: proposed analyses (i.e., a summary of how you would go about analyzing the data to test the viability of your hypotheses).
- Discussion: implications if hypotheses are supported or refuted; acknowledgement of critical threats to validity, along with how future research might address those threats.

GRADES

Several things are considered in calculating final grades. Your final course grade is a weighted average of the following:

Participation/Preparation:	10%
Mid-term exam:	20%
Final exam:	20%
Research Proposal:	50%

Grades will be assigned using the following scale (I only expect to use the first 4 or 5 categories!):

12 = A+	6 = C+	0 = F
11 = A	5 = C	
10 = A-	4 = C-	
9 = B+	3 = D+	
8 = B	2 = D	
7 = B-	1 = D-	

NATURAL OR UNNATURAL DISASTERS

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Here are the various ways to obtain information about changes to this course: 1) Canvas course web page, 2) my email address: james.lebreton@psu.edu, or 3) my office telephone number: 814-867-4847, or 4) my cell: 765-430-2255.

ACADEMIC INTEGRITY

Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

Students are responsible for maintaining academic integrity. The Department of Psychological Sciences views all acts of academic dishonesty including cheating and plagiarism as gross violations of appropriate student conduct and supports the use of disciplinary actions in response to all acts of dishonesty. If you violate standards of academic integrity in this class, then you will be assigned a grade of F.

DISABILITY SERVICES

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. Student Disability Resources (SDR) website provides contact information for every Penn State campus (<http://equity.psu.edu/sdr/disability-coordinator>). For further information, please visit Student Disability Resources website (<http://equity.psu.edu/sdr/>).

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: See documentation guidelines (<http://equity.psu.edu/sdr/guidelines>). If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early as possible. You must follow this process for every semester that you request accommodations.

The Student Disability Resources office for the University Park campus is located in 116 Boucke Building. They may be telephoned at 814-863-1807.

COUNSELING AND PSYCHOLOGICAL SERVICES

Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

Counseling and Psychological Services at University Park (CAPS)

<http://studentaffairs.psu.edu/counseling/>

Telephone: 814-863-0395

Penn State Crisis Line (24 hours/7 days/week)

Telephone: 877-229-6400

Crisis Text Line (24 hours/7 days/week)

Text: Text LIONS to 741741

EDUCATIONAL EQUITY

Consistent with University Policy AD29, students who believe they have experienced or observed a hate crime, an act of intolerance, discrimination, or harassment that occurs at Penn State are urged to report these incidents as outlined on the University's Report Bias webpage: <http://equity.psu.edu/reportbias/>

COURSE OUTLINE

Week	Date	Topic	Research Review Due Dates	Other Class Activities
1	1/13/2020	Introduction & Overview	General Ideas	
2	1/20/2020	No Class (MLK Day)		
3	1/27/2020	Developing Ideas & the Ethics of Research		
4	2/03/2020	Design I: Validity	Draft 1 Due	
5	2/10/2020	Design II: Experiments		
6	2/17/2020	Design III: Quasi-Experiments		
7	2/24/2020	Design IV: Correlational Designs		
8	3/02/2020	Design V: Multilevel Designs		Midterm Exam Distributed
9	3/09/2020	Spring Break – No Classes		
10	3/16/2020	Measurement I: Classical Test Theory & Reliability	Draft 2 Due	Midterm Exam Due
11	3/23/2020	Measurement II: Reliability & Survey Construction		Introduction to R (Lynda Videos)
12	3/30/2020	Special Topics I: Data Screening & Cleaning in R		
13	4/06/2020	Special Topics: NHST		
14	4/13/2020	Cancel		
15	4/20/2020	Meta-Analysis		
16	4/27/2020	Special Topics: TBD (James/Class)	Draft 3 Due	
17	5/04/2020	Special Topics: TBD (James/Class)		

Due Dates for drafts of the research proposal

January 13: General Research Ideas

Discuss general research interests. For example, “I’m interested in motivation related to people of different ages”, “personnel selection for dangerous jobs”, “leadership development among high school students”, “the effects of racial identity salience and trait affectivity on reactions to subtle discrimination”, “how is parenting style and marital status related to subsequent suicide ideation in late adolescence”, etc. You should be able to identify at least two general variables that might somehow be related.

February 02: DRAFT 1 (Concept Paper)

By this date, you must have narrowed your focus to a set of 1-5 specific research questions or hypotheses. A 3-5-page discussion (double-spaced) description of your ideas is due. Include at least one page describing a potentially feasible research design and data collection strategy to study your chosen topic(s).

March 16: DRAFT 2 (Initial Proposal)

By this date, you must have chosen the specific set of questions or hypotheses that you intend to study in your proposal. An 8 to 12 page, preliminary proposal (double-spaced), including a preliminary literature review and preliminary method section, is due.

April 27: DRAFT 3 (Final Proposal)

A complete, polished draft of your proposal (12-20 pages) is due. It must include your literature review, hypotheses, and a full method section.

Week 3: Developing Ideas and the Ethics of Research

Generating Compelling Ideas and Hypotheses

Cone, J. D., & Foster, S. L. (2006). Dissertations and theses from start to finish: Psychology and related fields (2nd ed.). Washington, D. C.: American Psychological Association.

- Chapter 4 (Finding Topics and Faculty Collaborators): pp. 45-80

Hollenbeck, J. R. (2008). The role of editing in knowledge development: Consensus shifting and consensus creation. In Y. Baruch, A. M. Konrad, H. Aguinis, & W. H. Starbuck (Eds.), *Opening the black box of editorship*. New York: Palgrave MacMillan.

Ethics in Applied Research

American Psychological Association. (2017). Ethical principles of psychologists and code of conduct. Retrieved from: <https://www.apa.org/ethics/code/ethics-code-2017.pdf>

Aguinis, H., & Henle, C. A. (2002). Ethics in research. In S. G. Rogelberg (Ed.), *Handbook of research methods in industrial and organizational psychology* (pp. 34-56). Malden, MA: Blackwell publishing.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. New York: Houghton Mifflin Company.

- Chapter 9 (Practical Problems 1: Ethics, Participant Recruitment, and Random Assignment)

Other Readings

Ilgen, D. R., & Bell, B. S. (2001). Conducting industrial and organizational psychological research: Institutional review of research in work organizations. *Ethics & Behavior*, 11(4), 395-412.

Sieber, J. E. (1998). Planning ethically responsible research. In L. Bickman & D. J. Rog, (Eds.), *Handbook of applied social research methods* (pp. 127-156). Thousand Oaks, CA: Sage Publications.

Wright, T. A., & Wright, V. P. (1999). Ethical responsibility and the organizational researcher: A committed-to-participant research perspective. *Journal of Organizational Behavior*, 20(7), 1107-1112.

Week 3 Discussion Questions

RESEARCH QUESTIONS & HYPOTHESES

1. What are the characteristics of the research articles that Hollenbeck concluded were the most influential or impactful?
2. According to Cone & Foster:
 - a. What are the primary characteristics of a well-worded research question?
 - b. What are the primary characteristics of a well-stated hypothesis?

ETHICS - GENERAL

3. Define ethics. What are the utilitarian and deontological perspectives on ethics?
4. What questions do you have about the APA Standards & Code of Conduct?

ETHICS - RECRUITMENT & DATA COLLECTION

5. What are some of the ethical issues associated with the use of university subject pools?
6. What are some of the ethical issues associated with the use of volunteers?
7. What are some of the basic rights of human participants that researchers have an obligation to protect?
8. What are some of the most important elements of informed consent?
9. What is the difference between privacy, confidentiality, and anonymity?
10. When is it appropriate to use deception and what steps should be undertaken if deception is used?
11. Do you see ethical differences in the deceptiveness of errors of omission vs. errors of commission?
12. What are the important elements of a debriefing?
13. What are some of the ethical issues faced when collecting data in field settings?
14. What is meant by random assignment and what are the various methods used to randomly assign participants to conditions in a research study?

ETHICS - REPORTING RESULTS

15. What are some of the ethical issues researchers face when reporting the results of their studies?

ILGEN & BELL – LEVI WILL ADDRESS IN CLASS

16. What was the purpose of this article? What were the major findings from their study? What are the implications for organizational research?

WRIGHT & WRIGHT - JAMES WILL ADDRESS IN CLASS

17. What was the basic point of this article? What was Milgram's purported criterion for evaluating the appropriateness of a research study? What does it mean for a project to have a commitment-to-participant dimension? Should all studies adopt a CPR approach?

Week 4: Design I - Validity

Platt, J. R. (1964). Strong inference. *Science*, 146, 347-353.

Shadish, Cook, & Campbell

- Chapter 1 (Experiments and Generalized Causal Inference)
- Chapter 2 (Statistical Conclusion Validity and Internal Validity)*
- Chapter 3 (Construct Validity and External Validity)*

Points to ponder:

- What is meant by “strong inference” and what are the necessary and sufficient conditions for a discipline to be poised to make strong inferences?
- What is the difference between an experiment and a quasi-experiment?
- How do SCC define validity?
- What is statistical conclusion validity and what are the threats to this form of validity evidence? How can the threats be addressed?
- What is external validity and what are the threats to this form of validity evidence? How can the threats be addressed?
- What is construct validity and what are the threats to this form of validity evidence? How can the threats be addressed?
- What is internal validity and what are the threats to this form of validity evidence? How can the threats be addressed?

Week 5

Design II: Experiments

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. New York: Houghton Mifflin Company.

- Chapter 8 (Randomized Experiments: Rationale, Designs, and Conditions Conducive to Doing them)
- Chapter 11 (Generalized Causal Inference: A Grounded Theory)

Highhouse, S., & Gillespie, J. Z. (2009). Do samples really matter that much? In C. E. Lance & R. J. Vandenberg (Eds.), *Statistical and methodological myths and urban legends* (pp. 247-266). New York: Routledge Taylor & Francis Group.

Empirical Article:

Reich, T. C., & Hershcovis, M. S. (2015). Observing workplace incivility. *Journal of Applied Psychology*, 100, 203-215.

Points to ponder:

- Why do we do so few true experiments in Industrial/Organizational psychology?
- How confident can we be in taking a finding from a laboratory experiment and applying it in the field? What factors would affect our confidence in the finding's applicability in the field?
- Is the effect size likely to grow or shrink when moving from lab to field? Why?
- What is the difference between random sampling and random assignment? How are these concepts related to experiments and the various forms of validity discussed in SCC?
- Consider the experiments of Reich & Hershcovis. What are possible threats to the four forms of validity identified by SCC? How might these threats be addressed in a more programmatic manner?

Other Related Papers

Latham, G. P., Erez, M., & Locke, E. A. (1988). Resolving scientific disputes by the joint design of crucial experiments by the antagonists: Application to the Erez-Latham dispute regarding participation in goal setting. *Journal of Applied Psychology*, 73, 753-772.

Mitchell, G. (2012). Revisiting truth or triviality: The external validity of research in the psychological laboratory. *Perspectives on Psychological Science*, 7(2), 109-117.

Stone-Romero, E. F. (2002). The relative validity and usefulness of various empirical research designs. In S. G. Rogelberg (Ed.), *Handbook of research methods in industrial and organizational psychology* (pp. 77-98). Malden, MA: Blackwell.

Week 6

Design III: Quasi-Experiments

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. New York: Houghton Mifflin Company.

- Chapter 4 (Quasi-Experimental Designs That Either Lack a Control Group or Lack Pretest Observations on the Outcome)
- Chapter 5 (Quasi-Experimental Designs That Use Both Control Groups and Pretests)
- **Read for Comps**: Chapter 6 (Quasi-Experiments: Interrupted Time Series Designs)

Grant, A. M., & Wall, T. D. 2009. The neglected science and art of quasi-experimentation: Why-to, when-to, and how-to advice for organizational researchers. *Organizational Research Methods*, 12, 653-686.

Empirical Examples:

Lyons, B. D., Hoffman, B. J., Bommer, W. H., Kennedy, C. L., & Hetrick, A. L. (2016). Off-duty deviance: Organizational policies and evidence for two prevention strategies. *Journal of Applied Psychology*, 101, 463-483.

Points to Ponder:

- Quasi-experimentation is one of the most advocated forms of research by organizational scholars. Why? What are the appeals of quasi-experimentation over other types of research?
- Is “quasi-experiment” just another way of saying “poorly designed research”? What are the differences between a good quasi-experiment and a bad one?
- Discuss the trade-offs of using a true experiment vs. a quasi-experiment?
- Why did Lyons et al. (2016) use a quasi-experiment instead of an experiment
 - What changes would be necessary to transform their study into a true experiment?
 - Were there alternative quasi-experimental designs that might have led to stronger conclusions?
- What are “matching” and “stratifying” and how are they used in quasi-experimental research?

Although you are still formulating your research interests, given what you know about I/O psychology and your current interests, do you see experimental or quasi-experimental designs as more appropriate techniques for answering your research questions? Why?

Other Examples:

Greenberg, J. (1990). Employee theft as a reaction to underpayment inequity: The hidden costs of pay cuts. *Journal of Applied Psychology*, 75, 561-568.

Parker, S. K., Johnson, A., Collins, C., & Nguyen, H. (2013). Making the most of structural support: Moderating influence of employees clarity and negative affect. *Academy of Management Journal*, 56, 867-892.

Week 7: Correlational Research & Causal Inference

James, L. R., Mulaik, S. A., & Brett, J. M. (1982). *Causal analysis: Assumptions, models, and data*. Beverly Hills, CA: Sage.

Chapter 1: An interpretation of causality

Chapter 2: Conditions for confirmatory analysis and causal inference.

Dul, J. (2016). Necessary condition analysis (NCA): Logic and methodology of “necessary but not sufficient” causality. *Organizational Research Methods*, 19 (1), 10-52.

Week 8: Design V: Multilevel

- Chan, D. (2005). Multilevel research. In F. T. L. Leong & J. T. Austin (Eds.), *The psychology research handbook* (2nd ed, pp. 401-418). Thousand Oaks, CA: Sage.
- Shiverdecker, L. K., & LeBreton, J. M. (in press). A primer on multilevel (random coefficient) regression modeling. In S. E. Humphrey & J. M. LeBreton (Eds.), *Handbook of multilevel theory, measurement, and analysis*. Washington, D. C.: American Psychological Association.

Examples

- Baysinger, M., Scherer, K. T., & LeBreton, J. M. (2014). Exploring the disruptive effects of psychopathy and aggression on group processes and group performance. *Journal of Applied Psychology*, 99, 48-65.
- Beal, D. J., Trougakos, J. P., Weiss, H. M., & Dalal, R. S. (2013). Affect spin and the emotion regulation process at work. *Journal of Applied Psychology*, 98, 593-605.

Other Recommended Readings

- Atkins, David C. (2005). Using Multilevel Models to Analyze Couple and Family Treatment Data: Basic and Advanced Issues. *Journal of Family Psychology*, 19, 98-110.
- Bliese, P. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations*. San Francisco: Jossey-Bass.
- Bliese, P.D., & Ployhart, R.E. (2002). Growth modeling using random coefficient models: Model building, testing, and illustration. *Organizational Research Methods*, 5, 362-387.
- Bryk, A. S., & Raudenbush, S. W. (2002). *Hierarchical linear models: Application and data analysis methods* (2nd ed.). Newbury Park: Sage.
- Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology*, 83, 234-246.
- Dunn, E. C., Masyn, K. E., Yudron, M., Jones, S. M., & Subramanian, S. V. (2014). Translating multilevel theory into multilevel research: Challenges and opportunities for understanding the social determinants of psychiatric disorders. *Social Psychiatry and Psychiatric Epidemiology*, 49, 859-872.
- Firebaugh, G. (1978). A rule for inferring individual-level relationships from aggregate data. *American Sociological Review*, 43, 557-572.
- 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.
- Kozlowski, S. W. J., Chao, G. T., Grand, J. A., Braun, M. T., & Kuljanin, G. (2013). Advancing multilevel research design: Capturing the dynamics of emergence. *Organizational Research Methods*, 16, 581-615.
- 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.), *Multi-level theory, research, and methods in organizations* (pp. 3-90). San Francisco: Jossey-Bass.
- LeBreton, J. M., & Senter, J. L. (2008). Answers to twenty questions about interrater reliability and interrater agreement. *Organizational Research Methods*, 11, 815-852.
- Ostroff, C. (1993). Comparing correlations based on individual-level and aggregated data. *Journal of Applied Psychology*, 78, 569-582.
- Zhang, Z., Zyphur, M. J., & Preacher, K. J. (2009). Testing multilevel mediation using hierarchical linear models: Problems and solutions. *Organizational Research Methods*, 12, 695-719.

Week 10: Measurement I: Classical Test Theory

Crocker & Algina (1986)

Hinkin (1998)

LeBreton, Scherer, & James (2014)

Week 11: Measurement II: Surveys

Bing, et al. (2004)

Schwarz (1999)

Harrison & McLaughlin (2006)