PhD Seminar:
Building Theory and Testing Incomplete Theory

Dr. John Lynch
University of Colorado Distinguished Professor
Website: https://www.colorado.edu/business/leeds-directory/faculty/john-g-lynch-jr
Google Scholar: https://scholar.google.com/citations?user=J_OuuIAAAAAJ&hl=en

Dates and Time

- Monday, October 13, 2025:   14:00-17:30
- Wednesday, October 15, 2025:   14:00-17:30
- Friday, October 17, 2025:   14:00-15:30

Location: KOL-H-309

Summary

Scholars in all fields of business and social sciences prize "theory." Some theory is deduced from observations in the literature. Some theory is built by an inductive process of explaining why some empirical phenomenon exists in the real world. No matter what the approach, our theories are incomplete. Consequently, when we conduct empirical studies to test implications of a theory, our models are inevitably misspecified. We will discuss how we make scientific progress despite the inevitable incompleteness of our theories and the concomitant misspecification of data analysis models testing theory.

Learning Objectives

The course will cover developing theory in consumer research, marketing, and adjacent social sciences. Students will develop an appreciation for the effects of inevitable incompleteness of theory for the testing of theories and the interpretation of data from theory tests, including theory tests via experimentation. A core problem is unobserved heterogeneity and heterogeneous effects of focal treatment manipulations as a function of unobserved and unappreciated "background factors." Students will learn to relate these issues to the core scientific criterion of replication and replicability. They will develop a more sophisticated understanding of these issues and be able to relate them to issues that come up routinely in the review process for academic journals. We will address common fallacies about validity in tests of theories.

Evaluation

Discussion questions (in written form, submitted prior to each class meeting)
Oral participation
Note: Evaluation of this seminar will be on a pass/fail basis.

Detailed Content

Part 1: Building Theory

1. How can we make scientific statements about unobservable / latent phenomena?

2. What are "hypothetical constructs" and how can we test theories involving them?

3. What role do inductive methods play in theory building?

4. What is different about developing theory by starting with findings in the literature versus observation of puzzling real-world phenomena?

5. What makes for good "construct-to-construct" theory versus good "phenomenon-to-construct" theory

Part 2: Incompleteness of Theories: implications for Heterogeneous Treatment effect, External Validity, and Replication Research

1. What are: internal validity, construct validity, external validity, and statistical conclusion validity?
2. How are external validity and construct validity related?
3. In his 1957 Presidential Address, the Lee Cronbach lamented the silos separating the work of experimental psychologists and those studying individual differences and he foresaw breakthroughs in modeling person x situation interactions. By 1974, he was pessimistic. Why?
4. How would you characterize conventional wisdom about what external validity is and how one should adapt one's research methods if you place a priority on external validity?
5. What's wrong with those conventional views, and what do those objections suggest about research methodology.
6. What is the distinction between "conceptual" and "exact" or "direct" replication?
7. What is the goal of large-scale replication efforts?
8. What are key findings of large scale replication efforts, and what does this tell us needs to change in how we organize scientific research?

Part 3: Implications of Incomplete Theories for Empirical Theory Tests & Data Analysis.

1. What's different about hard sciences and soft sciences in what is expected of theories? How does that relate to our statistical methods?

2. Is it possible to learn anything from a confounded experiment?

3. If our theory claims X causes M causes Y – i.e, X causes Y through a mediator M, how can we evaluate such claims?

4. What does it mean in a mediation analysis when we find a "direct" effect in addition to an "indirect" effect?

5. How is null hypothesis testing used in theory testing? What are the main critiques of this approach?

6. How does null hypothesis testing figure in claims about "replication."

7. How does the use of null hypothesis testing to determine what studies are publishable lead to apparent failures to replicate?

8. To what extent is our uncertainty about conclusions from research findings a function of issues of statistical conclusion validity versus external validity?

9. How will the way we think about the issues we have discussed in this seminar influence the audience for our work and the ultimate impact of our research — both on academia and on practice?

List of Readings

Session 1. Monday, October 13th

Building Theory.

Required Readings

1. "Cronbach, Lee J. and Paul E. Meehl (1955), "Construct Validity in Psychological Tests," *Psychological Bulletin*, 52 (July), 281-302."

2. Janiszewski, Chris, Aparna A. Labroo, and Derek D. Rucker (2016), "A Tutorial in Consumer Research: Knowledge Creation and Knowledge Appreciation in Deductive-conceptual Consumer Research," *Journal of Consumer Research*, 43 (2): 200-209.

3. Corley, Kevin G. and Dennis A. Gioia (2011), "Building Theory About Theory Building: What Constitutes a Theoretical Contribution?" *Academy of Management Review*, 36 (January), 12-32.

4. Christensen, Clayton M. and Michael E. Raynor (2003), "Why Hard-Nosed Executives Should Care about Management Theory," *Harvard Business Review*, 81 (September), 66-74.

5. Lynch, John G., Stijn van Osselaer, and Patricia Torres (2025), "Unpacking Theories in Consumer Research: Are Our Ideas About What Makes "Good Theory" Holding Us Back? Unpublished working paper.

Recommended Readings

6. Ding, Yu, Wayne S. DeSarbo, Dominique M. Hanssens, Kamel Jedidi, John G. Lynch, Jr., and Donald R. Lehmann (2020), "The Past, Present, and Future of Measurement and Methods in Marketing Analysis. *Marketing Letters*, 31, 175-186. https://doi.org/10.1007/s11002-020-09527-7

7. Shadish, William R., Thomas D. Cook, and Donald T. Campbell (2002) "Chapter 1: Experiments and Generalized Causal Inference" in *Experimental and Quasi-Experimental Designs for Causal Infererence*, pp.1-32 456-, Boston: Houghton Mifflin. Available at: https://iaes.cgiar.org/sites/default/files/pdf/147.pdf

8. Shadish, William R., Thomas D. Cook, and Donald T. Campbell (2002) "Chapter 14: A Critical Assessment of Our Assumptions," in *Experimental and Quasi-Experimental Designs for Causal Infererence*, pp. 456-504, Boston: Houghton Mifflin. Available at: https://iaes.cgiar.org/sites/default/files/pdf/147.pdf

9. MacCorquotdale, Kenneth and Paul E. Meehl (1949), "On a Distinction Between Hypothetical Constructs and Intervening Variables," Psychological Review, 55, 95-107. https://meehl.umn.edu/sites/meehl.umn.edu/files/files/013hypotheticalcconstructs.pdf

10. Lynch Jr, John G., Joseph W. Alba, Aradhna Krishna, Vicki G. Morwitz, and Zeynep Gürhan-Canli. "Knowledge creation in consumer research: Multiple routes, multiple criteria." *Journal of Consumer Psychology* 22, no. 4 (2012): 473-485. https://doi.org/10.1016/j.jcps.2012.06.004

Session 2: Wednesday, October 15th

Incompleteness of Theories: implications for Heterogeneous Treatment effect, External validity, and Replication Research.

Required Readings

1. Cronbach, Lee J. (1975). "Beyond the two Disciplines of Scientific Psychology." *American Psychologist*. 29. 116-127.

2. Lynch, John G., Jr. (1982), "On the External Validity of Experiments in Consumer Research," *Journal of Consumer Research,* 9 (December), 225-239.b DOI: 10.1086/208919

3. Lynch, John G., Jr. (1999), "Theory and External Validity," *Journal of the Academy of Marketing Science*, 27 (Summer), 367-376. https://doi.org/10.1177/0092070399273007

4. Hutchinson, J. Wesley, Wagner A. Kamakura, and John G. Lynch, Jr., (2000) "Unobserved Heterogeneity as an Alternative Explanation for 'Reversal' Effects in Behavioral Research." *Journal of Consumer Research*, 27 (December), 323-344. https://doi.org/10.1086/317588

5. Lynch, John G., Jr., Eric T. Bradlow, Joel C. Huber, and Donald R. Lehmann (2015), "Reflections on the Replication Corner: In Praise of Conceptual Replications," *International Journal of Research in Marketing,* 32 (4), 333-342.[b] https://doi.org/10.1016/j.ijresmar.2015.09.006

6. Krefeld-Schwalb, Antonia, Eli Rosen Sugerman, and Eric J. Johnson (2024), "Exposing omitted moderators: Explaining why effect sizes differ in the social sciences." *Proceedings of the National Academy of Sciences* 121, no. 12 (2024): e2306281121.

7. Davis-Stober, Clintin P., Alexandra Sarafoglou, Balazs Aczel, Suyog H. Chandramouli, Timothy M. Errington, Sarahanne M. Field, Ayelet Fishbach et al. "How can we make sound replication decisions?." *Proceedings of the National Academy of Sciences* 122, no. 5 (2025): e2401236121.

Recommended Readings

8. Ferber, Robert (1977), "Research By Convenience", *Journal of Consumer Research,* 4 (June), 57–58, https://doi.org/10.1086/208679

9. Calder, Bobby. J., Lynn W. Phillips, and Alice M. Tybout (1981). Designing research for application. J*ournal of Consumer Research*, 8(2), 197–207. https://doi.org/10.1086/208856

10. Open Science Collaboration (2015), "Estimating. The Reproducibility of Psychological Science," *Science, 349 (6251), aac4716-1 to 8*. DOI: 10.1126/science.aac4716. Available at: https://osf.io/82fth

Session 3: Friday, October 17th

Implications of Incomplete Theories for Empirical Theory Tests & Data Analysis.

Required Readings

1. Meehl, Paul E. (1967) "Theory-testing in psychology and physics: A methodological paradox." *Philosophy of Science* 34 (2), 103-115. doi:10.1086/288135
2. Brinberg, David L., John G. Lynch, Jr., and Alan G. Sawyer (1992), "Hypothesized and Confounded Explanations in Theory Tests: A Bayesian Analysis." *Journal of Consumer Research*, 19 (September), 139-154.[a,b] DOI: 10.1086/209293 (inevitable confounding)
3. Zhao, Xinshu, John G. Lynch, Jr., and Qimei Chen (2010), "Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis," Journal of Consumer Research, 37 (August), 197-206. https://doi.org/10.1086/651257
4. McShane, Blakely B., Eric T. Bradlow, John G. Lynch, and Robert J. Meyer (2024). "'Statistical Significance' and Statistical Reporting: Moving Beyond Binary," *Journal of Marketing*, 88(3), 1-19. https://doi.org/10.1177/00222429231216910

Recommended Readings

5. Bullock, John G., Donald P. Green, and Shang E. Ha. "Yes, but what's the mechanism? (don't expect an easy answer)." Journal of personality and social psychology 98, no. 4 (2010): 550 558 https://doi.org/10.1037/a0018933 Free preprint version at: https://papers.ssrn.com/sol3/Delivery.cfm?abstractid=1543925
6. Feinberg, Fred. (2024) "p-Values as QWERTY: Curating Evidence in the Computational Era." *Journal of Marketing*, *88*(3), 20-28. https://doi.org/10.1177/00222429231221698 (Original work published 2024)
7. American Marketing Association (2024), "AMA Journals | Editorial Policies and Procedures: Section 13: Policy for Reporting Results," Available at: https://www.ama.org/ama-journals-editorial-policies-procedures/.
8. Savitz, David A et al., Lauren A. Wise, Julia C. Bond, Elizabeth E. Hatch, Collette N. Ncube, Amelia K. Wesselink, Mary D. Willis, Jennifer J. Yland, and Kenneth J. Rothman. "Responding to reviewers and editors about statistical significance testing." *Annals of Internal Medicine* 177, no. 3 (2024): 385-386. https://doi.org/10.7326/M23-2430
9. Nelson, Leif D., Joseph Simmons, and Uri Simonsohn. "Psychology's Renaissance." Annual Review of Psychology 69 (2018): 511-534. https://doi.org/10.1146/annurev-psych-122216-011836
10. Simonsohn, Uri, Joseph P. Simmons, and Leif D. Nelson. "Specification curve analysis." *Nature Human Behaviour,* 4, no. 11 (2020): 1208-1214. https://www.nature.com/articles/s41562-020-0912-z.pdf
11. Richard D. Morey & Clintin P. Davis-Stober (08 Aug 2025): On the poor statistical properties of the P-curve meta-analytic procedure, Journal of the American Statistical Association, DOI: 10.1080/01621459.2025.2544397
12. Andrews, Isiah and Maximilian Kasy (2019), Identification of and correction for publication bias, *American Economic Review* 109, 2766–2794. https://doi.org/10.1257/aer.20180310