Quantitative Cross-Cutting Theme

Nicholas R. Eaton applies various quantitative methodologies to the study of mental disorders. These approaches often include latent variable modeling (e.g., exploratory and confirmatory factor analysis, class/profile analysis, mixture models, structural equation models) in an attempt to uncover fundamental information about mental disorder structure and classification. More recently, his work includes investigation of network models and simulation studies.

Relevant publications (* indicates graduate student author):

Kim, H.*, & Eaton, N. R. (2017). A hierarchical integration of person-centered comorbidity models: structure, stability, and transition over time. *Clinical Psychological Science, 5*(4), 595-612.

Kim, H.*, & Eaton, N. R. (2015). The hierarchical structure of common mental disorders: connecting multiple levels of analysis, bifactor models, and predictive validity. *Journal of Abnormal Psychology, 124*(4)*,* 1064-1078*.*

Eaton, N. R. (2015). Latent variable and network models of comorbidity: toward an empirically derived nosology. *Social Psychiatry and Psychiatric Epidemiology, 50*(6), 845-849.

Eaton, N. R., Krueger, R. F., South, S. C., Simms, L. J., & Clark, L. A. (2011). Contrasting prototypes and dimensions in the classification of personality pathology: Evidence that dimensions, but not prototypes, are robust. *Psychological Medicine, 41*(6), 1151-1163.

Relevant graduate courses taught:

PSY 502: Correlation and Regression
PSY 505: Structural Equation Modeling and Advanced Multivariate Methods
PSY 508: Introduction to Computer Applications in Statistics

Anne Moyer uses systematic review and meta-analytic techniques for research synthesis. The Moyer lab has investigated the efficacy of group versus individual exercise interventions in improving quality of life for breast cancer patients, whether pre-intervention patient distress moderates intervention effectiveness, and the value of including unpublished dissertations in meta-analytic reviews.

Relevant recent publications (* indicates graduate student author, ** indicates an undergraduate student author):

Nicoloro-SantaBarbara, J.*, Busso, C.**, & Moyer, A., & Lobel, M. (2018). Just relax and you'll get pregnant? Meta-analysis examining women's emotional distress and the outcome of assisted reproductive technology. *Social Science and Medicine, 213,* 54-62.

Yusufov, M., Nicoloro-SantaBarbara, J.*, Grey, N. E.*, Moyer, A., & Lobel, M. (2018). Meta-analytic evaluation of stress reduction interventions for undergraduates and graduate students. *International Journal of Stress Management.* Advance online publication.http://dx.doi.org/10.1037/str0000099

Zhou, S.*, Page-Gould, E., Aron, A., Moyer, A., & Hewstone, M. (2018). The extended contact hypothesis: Meta-analysis on 20 years of research. *Personality and Social Psychology Review.* Advance online publication. Retrieved from: http://journals.sagepub.com/doi/abs/10.1177/1088868318762647#articleCitationDownloadContainer

Bowers, J. M.* & Moyer, A. (2017). Effects of school start time on students' sleep duration, daytime sleepiness, and attendance: A meta-analysis. *Sleep Health, 3*, 423-431.

Relevant graduate courses taught:

PSY 507 Meta-Analysis

Christian C. Luhmann uses a variety of quantitative approaches to answer questions in a variety of behavioral domains. Approaches taken include machine learning techniques, Bayesian methods, and Monte Carlo methods. He has applied these tools to answer questions about decision-making behavior in individuals, social influence in large social networks, and patterns of neural activity in clinical samples.

Relevant recent publications (* indicates graduate student advisee, ** indicates an undergraduate student advisee):

Luhmann, C. C. & Yang, B.** (2018, November). Inferring the Mechanisms of Social Contagion: An Approximate Bayesian Approach, presented at the North American Social Networks (NASN) conference, Washington, D.C.

Mayor Torres, J. M., Clarkson, T., Stepanov, E. A., Luhmann, C. C., Lerner, M. D., & Riccardi, G. (in press). Enhanced error decoding from error-related potentials using convolutional neural networks. In Engineering in Medicine and Biology Society (EMBC), Annual International Conference of the IEEE. IEEE.

Arfer, K. B.*, & Luhmann, C. C. (2017). Time-preference tests fail to predict behavior related to self-control. Frontiers in Psychology, 8, 150.

Luhmann, C. C., & Rajaram, S. (2015). Memory transmission in small groups and large networks: An agent-based model. Psychological Science, 26, 1909-1917.

Arfer, K. B.*, & Luhmann, C. C. (2015). The predictive accuracy of intertemporal-choice models, British Journal of Mathematical and Statistical Psychology, 68, 326-341.

Relevant graduate courses taught:

PSY610 - Cognitive Modeling

Relevant research funding:

NSF #1456928 - The Propagation of Memories within Small Groups and across Social Networks (PI, Co-PI: Suparna Rajaram)

NIMH #5R01MH110585-03 - Optimizing Prediction of Social Deficits in Autism Spectrum Disorders (Co-PI, PI: Matthew Lerner)

Greg Zelinsky uses eye movement behavioral paradigms, neurocomputational modeling, and, increasingly, computer vision, to study how attention controls behavior, particularly in the context of visual search tasks. Work in his lab also uses visually-complex objects and realistic scenes as stimuli, which is paralleled by an emphasis on an image-computable modeling approach.

Relevant recent publications (* indicates graduate student author):

Adeli, H.*, Vitu, F., & Zelinsky, G. J. (2017). A model of the superior colliculus predicts fixation locations during scene viewing and visual search. *Journal of Neuroscience, 37(6),* 1453-1467*.*

Wei, Z.*, Adeli, H.*, Zelinsky, G. J., Samaras, D., & Hoai, M. (2016). Learned region sparsity and diversity also predict visual attention. *Advances in Neural Information Processing Systems* (NIPS 2016).

Yu, C-P.*, Maxfield, J. T.*, & Zelinsky, G. J. (2016). Searching for category-consistent features: A computational approach to understanding visual category representation. *Psychological Science*, *27*(6), 870-884.

Maxfield, J. T.*, Stalder, W. D.*, & Zelinsky, G. J. (2014). Effects of target typicality on categorical search. *Journal of Vision*, *14*(12):1, 1-11.

Yu, C-P.*, Samaras, D., & Zelinsky, G. J. (2014). Modeling visual clutter perception using proto-object segmentation. *Journal of Vision*, *14*(7):4, 1-16.

Zelinsky, G. J., Peng, Y.*, Berg, A. C., & Samaras, D. (2013). Modeling guidance and recognition in categorical search: Bridging human and computer object detection. *Journal of Vision*, *13*(3):30, 1-20. doi: 10.1167/13.3.30

Relevant graduate courses taught:

PSY513 - Theories of Attention

Relevant research funding:

NSF #1763981 - Inverse Reinforcement Learning for Human Attention Modeling

Matt Lerner uses an array of contemporary quantitative methods to better understand factors that underlie differences in social competence across typical and atypical populations, as well as across development. These methods include those designed for nested and longitudinal data structures (e.g., multilevel/hierarchical linear modeling; generalized estimating equations), large sample multivariate analyses (e.g., structural equation modeling; invariance testing; latent class/profile analysis), and aggregation of data across datasets (e.g., cross-validation approaches; meta-analyses). Most recently, he has begun to incorporate various predictive modeling approaches (e.g., partial least-squares regression; several machine learning models) into several projects.

Selected relevant papers (* indicates student author; ¥ denotes joint first authorship):

Kang, E.*, Keifer, C.M.*, Levy, E.J.*, Foss-Feig, J.H., McPartland, J.C., & Lerner, M.D. (in press). Atypicality of the N170 event-related potential in autism spectrum disorder: a meta-analysis. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging. DOI:* 10.1016/j.bpsc.2017.11.003.

Goldstein, T.R., & Lerner, M.D. (2018*).* Dramatic pretend play games uniquely improve emotional control in young children. *Developmental Science, 21, e12603*. DOI: 10.1111/desc.12603.

Black, S.R.*, Lerner, M.D., Shirtcliff, E.A., & Klein, D.N. (2018). Patterns of neuroendocrine coupling in 9-year-old children: Effects of sex, body-mass index, and life stress. *Biological Psychology*, *132*, 252-259. DOI: 10.1016/j.biopsycho.2017.11.004.

Mayor Torres, J.M., Clarkson, T., Stepanov, E.A., Luhmann, C.C., Lerner, M.D., Riccardi, G. (2018). Enhanced Error Decoding from Error-Related Potentials Using Convolutional Neural Networks. In *Engineering in Medicine and Biology Society* (EMBC), 2018 40th Annual International Conference of the IEEE (pp. TBD). Honolulu, HI, July 17 - 21.

Lerner, M.D., De Los Reyes, A., Drabick, D.A.G., Gerber, A.H.*, Gadow, K.D. (in press). Informant discrepancy defines discrete, clinically-useful autism spectrum disorder subgroups. *Journal of Child Psychology and Psychiatry*. DOI: 10.1111/jcpp.12730.

Fjermestad, K.W., Lerner, M.D., McLeod, B.D., Wergeland, G.H., Heiervang, E.R., Silverman, W.K.,Öst, L.E., De Los Reyes, A., Havik, O.E., Haugland, B.S.M. (in press).

Therapist-youth agreement on alliance change predicts outcome in CBT for youth anxiety disorders. *Journal of Child Psychology and Psychiatry*.

Lerner, M.D., Potthoff, L.M.*, Hunter, S.J. (2015). Optimizing cross-sectional prediction of social functioning in youth referred for neuropsychological testing. *PLoS One, 10(15),* 1 - 16. DOI: 10.1371/journal.pone.0128303.

White, S.W.¥, Lerner, M.D.¥, McLeod, B.D., Wood, J.J., Ginsburg, G., Kerns, C., Ollendick, T., Kendall, P.C., Piacentini, J., Walkup, J., Compton, S. (2015). Anxiety in children with and without Autism Spectrum Disorders: Examination of factorial equivalence. *Behavior Therapy, 46,* 40 - 53. DOI: http://dx.doi.org/10.1016/j.beth.2014.05.005.

Lerner, M.D., Mikami, A.Y., Levine, K. (2011). Socio-Dramatic Affective-Relational Intervention for Adolescents with Asperger Syndrome: Pilot Study. *Autism, 15(1)*, 21 - 42. doi: 10.1177/1362361309353613. Translated & reprinted in *Autismo*, *10*, 151 – 175.

Relevant grants:

Optimizing Prediction of Social Deficits in Autism Spectrum Disorders (1R01MH110585). National Institute of Mental Health. PI.

Electrophysiological Correlates of Social-Emotional Learning in ASD. Brain & Behavior Research Foundation (NARSAD Young Investigator Award #24890). PI.

Electrophysiological Effects of Social Performance-based Intervention for Autism Spectrum Disorder: A Randomized Controlled Trial. Stony Brook Department of Psychiatry Pilot Grants Program. PI.

Effects of Emotion Identification. Alan Alda Fund for Communication. PI.

Stacey B. Scott uses quantitative and qualitative methods to investigate questions related to stress and adaptation across the lifespan. Her work includes thematic analyses of narrative interview data to cross-sectional examinations of complex interactions using regression trees and random forests to multilevel model analyses to examine within-person variation and change and individual differences in these patterns over moments, days, months, and years.

Relevant recent publications (* indicates graduate student author, **indicates undergraduate student author):

Cho, G.*, Pasquini, G.*, & Scott, S. B. (forthcoming). Measurement burst designs in lifespan developmental methodology. In R. Knight, S. D. Neupert, N. D. Anderson, H.-W. Wahl, and N. A. Pachana (Eds.), *Oxford Encyclopedia of Psychology and Aging.*

Scott, S. B., Sliwinski, M. J., Zawadzki, M., Stawski, R., Kim, J., Marcussen-Clavertz, D., Lanza, S., Conroy, D., Buxton, O., Almeida, D. M., & Smyth, J. M. (2018). A coordinated analysis of affect variance in daily life. *Assessment.* Advance online article https://doi.org/10.1177/1073191118799460

Scott, S. B., Jackson, B. R., Bergeman, C. S., & Pitzer, L. (2013). Combinations of stressors in midlife: Examining role and domain stressors using regression trees and random forests. *Journal of Gerontology: Social Sciences, 68,* 464-475*.* doi:10.1093/geronb/gbs166.

Scott, S. B., Bergeman, C. S., Verney, A.**, Longenbaker, S.**, Markey, M. A.**, & Bisconti, T. L. (2007). Social support in widowhood: A mixed methods study. *Journal of Mixed Methods Research, 1*, 242-266. doi: 10.1177/1558689807302453.

Relevant graduate courses taught:

PSY610.S25 Seminar in Special Topics: Multi-Level Models (MLM)

Affiliated Graduate Students:

The following students are pursuing the Quantitative Certificate within the Department of Psychology.

Student	Area
Apriceno, MaryBeth	SCP
Araiza, Ashley	SCP
Calma, Nicole	CSC
Ensor, Kaitlin	CSC
Greene, Ashley	CLIN
Ibrahim, Sirena	SCP
Kang, Erin	CLIN
Kim, Hyunsik	CLIN
Maswood, Raeya	CSC
Miller, Brittany	SCP
Mun, Diane	SCP
O'Rawe, Jonathan	INE
Rodgriguez-Seijas, Craig	CLIN
Sarwana, Miriam	SCP
Szekely, Akos	CSC
Tuman, Malwina	SCP
Yttredahl, Ashley	INE