In longitudinal data, the interpretation of change over time is often ambiguous due to a co-dependence between changes in the construct over time and changes in the measurement tool and its properties. Because the primary goal in longitudinal data analysis is to articulate changes over time on the latent constructs, measurement of those constructs must be constant, or invariant. This presentation will (a) discuss the psychometric properties that should be assessed to achieve measurement invariance based on item response theory, and (b) introduce statistical models that can be used to make inferences for longitudinal data based on meeting an assumption of longitudinal measurement invariance.

Ji Hoon Ryoo received his PhD in Quantitative Methods in Education from the University of Minnesota in 2010. He is currently a postdoctoral fellow in CYFS working with Dr. James Bovaird on the area of statistical approaches and research methods for the educational and social-behavioral sciences. His research interests include longitudinal and multilevel modeling, educational measurement and program evaluation.
Just as factor analysis is commonly used to infer the presence of underlying continuous latent variables, a related modeling technique – mixture modeling – can be used to inform researchers about underlying categorical latent variables. Often referred to as classification and conceptually similar to traditional clustering, latent class analysis (LCA) and latent profile analysis (LPA) use measured characteristics of individuals to identify latent classes, or phenotypes, through mixture modeling. For instance, mixture modeling has been used to identify types of families and children that are most receptive to interventions and to detect subgroups with similar developmental trajectories (i.e., growth mixture models). The use of such person-centered approaches is gaining popularity in a number of research contexts, including early childhood and education research. This presentation will (a) discuss traditional and modern methods of classification, and (b) provide examples of empirical identification and theoretical validation of latent subgroups within a population.

Kevin Kupzyk received his master's degree in Quantitative Psychology from the University of Kansas in 2005. He is now a methodological consultant for the CYFS Statistics and Research Methodology Unit and a doctoral student in Quantitative, Qualitative and Psychometric Methods in Educational Psychology at UNL. His research interests include power analysis and optimal design of experiments, educational measurement, multilevel modeling and latent variable growth models.
Evaluation is a tool utilized in a variety of settings for a variety of purposes. In educational settings, evaluations are typically conducted to determine the impact of a particular program (e.g., after-school programming). The purpose of this talk is to introduce the concept of evaluation, including a discussion of the characteristics that distinguish an evaluation study from a research study. Different approaches and perspectives on evaluation will be presented along with the common issues often encountered in conducting evaluations in educational settings. Special attention will be placed upon the Utilization-Focused Evaluation approach put forth by Patton (2004).

Greg Welch received his PhD in Research Methodology in Education from the University of Pittsburgh in 2007. He is now a Research Assistant Professor for the CYFS Statistics and Research Methodology Unit. His research interests include structural equation modeling, latent curve analysis and educational policy.
Multilevel models provide an effective means for studying individuals who are clustered into common higher-level organizational contexts (e.g., students clustered in schools, patients clustered in hospitals, children clustered in neighborhoods). One limitation of traditional multilevel models is that they require individuals to be “purely clustered” in higher-level contexts. This requirement is problematic when individuals are clustered into multiple contexts at a given level of a data hierarchy (e.g., students attend middle schools and high schools, but not all students from a given middle school are fed into the same high school). Cross-classified random effects models (CCREMs) and multiple membership random effects models (MMREMs) are flexible extensions of traditional multilevel models that do not require “pure clustering” of individuals in higher-level contexts. This presentation will provide an overview of CCREM and MMREM techniques with a focus on identifying and dealing with commonly occurring cross-classified and multiple membership data structures.

Matthew Grady received his PhD in Educational Psychology from the University of Texas at Austin in 2010. He is currently a Visiting Assistant Professor of Quantitative, Qualitative and Psychometric Methods in Educational Psychology at UNL. His research interests include multilevel modeling, growth curve modeling, computerized adaptive testing and applied Bayesian statistics.
As researchers, when we delve into the literature in our topical area, we often find ourselves confronted with a number of quantitative research studies addressing our area of interest. How do we quantify what we know across this body of research? Meta-analysis can be a useful tool for quantitatively synthesizing what is known in a specific research area. However, the processes and procedures for conducting a meta-analysis can often seem overwhelming. This presentation will provide an overview of the types of research questions meta-analysis can address, procedures for literature search and retrieval, key information to gather from research studies, strategies for data management and analysis, and interpretation of results. A variety of meta-analytic techniques will be discussed and an educational research example will be presented.

Elizabeth Moorman Kim received her PhD in Developmental Psychology from the University of Illinois at Urbana-Champaign in 2009. She is currently a postdoctoral fellow in CYFS working with Dr. Susan Sheridan on intervention programs aimed at building family-school partnerships. Her research interests include parenting and children’s motivation and achievement in school.