



## 2014 WPA Statistics Workshops

**Thursday, April 24, 1:30-3:30 PM**

### **Introduction to Item Response Theory OR Don't be afraid of IRT!**

**Andrew Ainsworth**

**California State University Northridge**

The focus of this workshop will be on applications of Item Response Theory (IRT) models to measuring psychological phenomenon. The workshop will begin with a brief discussion/review of related topics (e.g., classical test theory, logistic regression, latent variable models) will then focus on introducing basic Item Response Theory (IRT) models, assumptions and procedures. After establishing IRT fundamentals the modeling techniques will be illustrated conceptually using IRT software (e.g., FlexMIRT and EQSIRT) and data sets will be utilized throughout the workshop as examples. Workshop attendees will learn 1) basic IRT concepts, assumptions and procedures, 2) how IRT models can be applied to answer questions concerning psychological data, and 3) why psychologists should be using IRT models more frequently. This workshop is an excellent primer/refresher for Dr. Kathleen Preston's Advanced Topics in IRT workshop (Friday).

Andrew Ainsworth is an Associate Professor in the Department of Psychology at California State University, Northridge where he teaches many advanced statistics courses including Applied Multivariate Analysis and Latent Variable Analysis. He earned his Ph.D. in 2007 in measurement and psychometrics from UCLA. His primary area of interest is applied multivariate statistics with a particular emphasis in structural equation modeling and item response theory. He is the co-director of the General Experimental psychology graduate program at CSU Northridge and he is currently the statistical consultant for a few large grants, including the NIH funded Research Infrastructure for Minority Institutions (RIMI) grant which supports health related research across disciplines at CSU Northridge.

**Friday, April 25, 8:30-10:30 AM**

### **Advanced Topics in IRT: Evaluating the effectiveness of each response option with the nominal response model**

**Kathleen Preston**

**California State University, Fullerton**

An essential aspect of psychological research is the measurement of individuals on a construct of interest. Furthermore, accurate measurement of individuals is imperative when high-stakes decisions are being made. Therefore, much of psychological research involves the development,

revision, and application of measurement instruments. While most of the focus is on the item content, there is little focus on the appropriateness of the response options with a 5-, 7-, or even 9-point Likert-type response format being arbitrarily chosen. Fortunately, the nominal response model (NRM), a much underutilized polytomous item response theory (IRT) model, has the unique ability to estimate within-item category functioning, allowing researchers the opportunity to empirically evaluate the appropriateness of each response option. This more thorough and interesting way to analyze the effectiveness of each response option is especially important during scale development, or when concerned about the psychometric properties of an established measure.

This session will focus on scale development and revision under an IRT framework. We will begin with a conceptual overview of polytomous IRT models focusing on the NRM. We will then cover how to specify the NRM for analysis using modern IRT software, discuss some technical decisions, and interpret and plot the resulting category parameters. Finally, we will examine the within-item category functioning through the application of the Wald test, make empirically based modifications to the response options, and evaluate the psychometric properties of the resulting scale. A solid understanding of measurement theory and introductory knowledge of IRT such as that provided in Andrew Ainsworth's Introduction to IRT workshop (Thursday) would be beneficial.

Kathleen Preston is Assistant Professor in the Department of Psychology at California State University, Fullerton. She completed her Ph.D. in 2011 at the University of California, Los Angeles. Her primary research interests are in quantitative methodology, specifically utilizing psychometric theory to develop and refine psychological measurement tools. She teaches introductory statistics, advanced statistics, multivariate statistics, psychometrics, and structural equation modeling at California State University, Fullerton.

**Saturday, April 26, 8:45-10:45 AM**

**Growth Curve Modeling with Latent Variables**  
**Sanjay Srivastava, University of Oregon**

If you want to study change, you need to study people changing – and that means collecting longitudinal data. But how do you analyze it? One powerful approach is growth curve modeling, which lets you go beyond describing how the average person changes and lets you model how different people change in different ways. Growth curves can be fit in either multilevel modeling software or structural equation modeling software; these two approaches overlap a great deal, but in practice lend themselves to somewhat different extensions. This session will focus on growth curve modeling within an SEM framework. We will begin with a conceptual overview of what a growth curve model is and what kind of data you need to do it (e.g., data from at least 3 and preferably 4+ timepoints). We will then cover how to specify a basic growth curve model in SEM, discuss important modeling decisions, and talk about how to interpret results. We will conclude with a preview of some of the ways to extend the basic model, including models with covariates, growth in multiple variables, etc. A solid understanding of regression is a must; some knowledge of SEM would be helpful.

Sanjay Srivastava is an Associate Professor in the Department of Psychology at the University of Oregon. He completed his Ph.D. in 2002 at the University of California, Berkeley. His primary research interests are in the expression and interpretation of personality and emotions in interpersonal contexts, and the development of personality across the lifespan. He also teaches advanced statistics courses at the University of Oregon.

**Sunday, April 27, 8:30-10:30 AM**

**Multiple Regression: Assumptions, Analyses, and Presentation**

**Christopher L. Aberson**

**Humboldt State University**

This workshop provides an overview of the application of multiple regression analysis from start to finish. I begin with a discussion of basic statistical values for OLS regression and provide a brief overview of their calculation and interpretation. Next, I cover evaluating regression assumptions and techniques for addressing violations. I then provide sample analyses and interpretations along with APA style presentation examples. After covering these topics, I discuss advanced graphing techniques for detecting violations of assumptions, approaches for detecting and dealing with extreme scores, and application of approaches such as Hierarchical Multiple Regression. Attendees will receive a packet demonstrating use of SPSS and R for conducting analyses. A basic background in correlation and linear regression, consistent with the coverage in most introductory statistics textbooks, will be helpful.

Chris Aberson is Professor of Psychology at Humboldt State University. He earned his Ph.D. at the Claremont Graduate University in 1999. His research interests in social psychology include prejudice, racism, and attitudes toward affirmative action. He serves as Associate Editor for Group Processes and Intergroup Relations. His quantitative interests focus on statistical power. His book, *Applied Power Analysis for the Behavioral Sciences* was published in 2010.

**Thanks to the APA Science Directorate for their support of the statistics workshops.**