Advances in Statistical Modeling:
Practical Strategies for Addressing Complex Research Questions

SPPAC 2017 Preconference Workshop (3 CEs)

As research questions in pediatric psychology have become more complex, advanced modeling techniques become necessary. This 3 hour workshop will offer an introduction to current statistical modeling techniques relevant to pediatric psychology research. The workshop will include an overview of conceptual models (e.g., mediation, moderation, mediation/moderation combinations) and four didactic modules covering specific statistical modeling techniques: (1) Multi-level modeling/hierarchical level modeling; (2) Mixture models; (3) Techniques commonly used in biostatistics (e.g., Generalized estimating equations, survival analysis); and (4) Latent variable (hybrid) models. For each technique, the following information will be presented: types of research questions that can be addressed; assumptions and challenges; requirements for sample size and missing data; and an example of the technique used in a pediatric psychology research context. Journal editors will also share their perspectives on the use of modeling techniques in current pediatric psychology research and common pitfalls or errors they have observed in submitted manuscripts.

The overarching goal of this workshop is to familiarize participants with the fundamentals of modeling techniques in an effort to guide the development of appropriate research questions, decisions regarding appropriate modeling techniques, and critical review of the use of modeling techniques in research articles. The workshop will be divided into 5 didactic periods (the introduction and 4 teaching modules). Small group breakout sessions will be held after module 2 and module 4, for participants to discuss application of modeling techniques to their current research and develop potential research questions/hypotheses. Additionally, 20 minutes at the end of the workshop will be devoted to a consultation period, during which attendees can ask remaining questions of our experts. While the aim of the workshop is to provide a conceptual overview of modeling concepts (as opposed to a software specific walk-though), a resource bank including sample data, syntax, example publications, and an annotated bibliography of resources will be made available for download by all workshop attendees. The target audience for this workshop would be consumers of research, journal reviewers, researchers who are thinking of implementing modeling techniques, and students/early career professionals who are interested in the potential uses of modeling techniques.

Based on the content of this talk, participants will be able to:

1. Create hypotheses that are testable with statistical modeling approaches.
2. Describe which modeling techniques are most appropriate for specific research questions/ situations.
3. Apply basic limitations of modeling techniques to critical review of research.

Target Learner Level: Introductory
Registration cap: 30

Presenters: Rachel Wasserman, PhD, Bridget Armstrong, PhD, David Barker, PhD, Kristoffer Berlin, PhD, Grayson N. Holmbeck, PhD, Bryan Karazsia, PhD, & Betty Lai, PhD

Dr. Bridget Armstrong's MLM expertise stems from advanced coursework, publication using MLM techniques, and statistical consultation. She is the chair elect of the PRISM SIG. *Dr. David Barker* is the chair of the PRISM SIG and has worked as a clinician, researcher, and statistician on multiple cross-disciplinary teams addressing a variety of mental health and medical outcomes. He has particular expertise in longitudinal modeling, psychometrics, and missing data approaches. *Dr. Kristoffer Berlin* (founding PRISM co-chair) has expertise in using latent variable modeling to inform and refine pediatric health interventions and assessments. *Dr. Betty Lai* is a biostatistician and child psychologist who teaches structural equation modeling. She has applied growth mixture modeling in her research on children's responses to disasters, and is a member of the PRISM SIG. *Dr. Rachel Wasserman* applies

complex conceptual models to her research in psychosocial and neuropsychological outcomes for children with chronic illnesses. She is the SPPAC programming representative for the PRISM SIG. *Dr. Grayson Holmbeck* is editor of the Journal of Pediatric Psychology and *Dr. Bryan Karazsia* is an associate editor of the Journal of Clinical Psychology in Medical Settings. Both teach, conduct research, and publish on best practices in quantitative methodologies.

COI Statement: Bryan T. Karazsia has received payment for statistical consulting within the past year. All other speakers have no conflicts of interest to declare.

Session Date/Time: Thursday, March 30th, 2017; 8:30-11:30 am

The Society of Pediatric Psychology (Division 54 of the American Psychological Association) is approved by the American Psychological Association to sponsor continuing education for psychologists. The Society of Pediatric Psychology maintains responsibility for this program and its contents.