

**Society for Prevention Research
25th Annual Meeting
Washington, DC**

Pre-Conference Workshop I

Date: Tuesday, May 30, 2017

Time: 8:30 am – 6:15 pm

Modern Mediation Analysis

Organizer and Presenter: David P. MacKinnon, PhD, Arizona State University

Presenters: Holly P. O'Rourke, PhD, Matthew J. Valente, MA, Gina L. Mazza, Oscar Gonzalez, MA, Arizona State University

Description:

The goal of the workshop is to describe statistical, methodological, and conceptual aspects of mediation analysis. The one-day workshop consists of four parts. Part 1, covers definitions, history, and applications for the mediation model. The purpose of this section is to provide an overview of the research questions the mediation model can answer. Examples from mediation analysis in prevention and treatment research are described. In Part II, the conceptual model described in Part I is quantified in the estimation of mediation in single and multiple mediator models. Estimation of mediation effects including assumptions, statistical tests, confidence intervals, and effect size are covered. The methods described in this section serve as the foundation for more advanced methods in Part III consisting of mediation in path analysis, longitudinal mediation models, and mediation in the context of moderation. In Part IV, general practical and theoretical issues in the investigation of mediation are discussed including methods to adjust for confounders, causal inference, additional approaches to identifying mediating variables, and future directions.

Target workshop audience:

The target audience is prevention and treatment researchers with some knowledge of statistical analysis including multiple regression.

Materials provided to attendees:

The audience will receive access to workshop slides and handouts and materials will be made available either on a website or in printed form.

Outline of workshop:

Dr. MacKinnon will lead the workshop and Dr. O'Rourke, Matthew Valente, Gina Mazza, and Oscar Gonzalez will lead specific sections.

Tentative Agenda for Society for Prevention Research Mediation Analysis Workshop, 2015

Morning

8:30-9:00	Computer Set up
9:00-10:15am	Introduction, workshop goals, definitions, history, examples (Chapter 1 and 2)
10:15-10:45am	Single Mediator Model (Chapter3)
10:45-11:00am	Break
11:00-Noon	Single Mediator Model Continued (Chapter 3 and 4) Methods to test mediation, effect size, power
Noon-1:00pm	Lunch on your own
1:00-2:00pm	Single Mediator Model Continued and Multiple Mediator Models (Chapters 3-5) SPSS, SAS, and Mplus Examples, Inconsistent Mediation
2:00-2:45pm	Special Topic: Moderation and Mediation (Chapter 10)
2:45-3:00pm	Break
3:00-3:45pm	Special Topic: Path Analysis Mediation Models
3:45-4:30	Special Topic : Longitudinal Mediation Models
4:30-5:00pm	Special Topics: Issues in Study Design, Bayesian Methods, Future Directions for Mediation in Prevention research.
5:00-5:15pm	Summary and Sources of Information
5:15-6:15pm	Available to Answer Questions

Presenters:

David P. MacKinnon, Ph.D., is a Foundation Professor in the Department of Psychology at Arizona State University. He received the Ph.D. in measurement and psychometrics from UCLA in 1986. He was an Assistant Professor of Research at the University of Southern California's Institute for Prevention Research from 1986 to 1990. He has been at Arizona State University since 1990 and is affiliated with the Prevention Intervention Research Center and the Research in Prevention Laboratory. Dr. MacKinnon teaches graduate analysis of variance, mediation analysis, and statistical methods in prevention research. He has given numerous workshops in the United States and Europe. In 2011 he received the Nan Tobler Award from the Society for Prevention Research for his book on statistical mediation analysis. He has served on federal review committees and was a consulting editor for the journal, *Prevention Science*. Dr. MacKinnon has been principal investigator on several National Institute on Health grants and is a Fellow of the Association for Psychological Science and American Psychological Association Measurement and Statistics Division. His primary interest is in the area of statistical methods to assess how prevention and treatment programs achieve their effects. He has given over 40 workshops on mediation analysis over 100 invited lectures on mediation analysis.

Holly P. O'Rourke, Ph.D. is a postdoctoral research fellow with the REACH Institute at Arizona State University. She recently received a Ph.D. in Quantitative Psychology from Arizona State University, and was subsequently awarded a T32 Ruth L. Kirschstein National Research Service Award from the National Institutes of Health. Her research interests are primarily in the methodological areas of mediation analysis and longitudinal data analysis, with application of these methods to areas of psychology, health, and prevention, with specific attention to methods in addiction and alcohol treatment research. Her research in mediation has focused on statistical power for tests of the mediated effect in single and multiple mediator models, as well as mediation effect sizes. As a member of Dave MacKinnon's Research in Prevention Laboratory, she worked as a methodologist for several nationwide health promotion intervention programs. She has assisted in teaching or presented as a guest lecturer for several quantitative methods courses at the graduate and undergraduate level. She is an author on several journal articles and a book chapter that discuss the application and development of mediation methods.

Matthew J. Valente, M.A., is a graduate research assistant in the Research in Prevention Laboratory at Arizona State University. He recently received his M.A. in Quantitative Psychology from Arizona State University and is pursuing his Ph.D. in Quantitative Psychology from Arizona State University. His research interests include causal inference in longitudinal mediation models, statistical mediation, and health and safety interventions. His work in causal inference in longitudinal mediation models has focused on comparing models of change for estimating mediated in the pretest-posttest control group design and his work in statistical mediation analysis has focused on statistical tests of mediated effects in structural equation models and Bayesian approach to Potential Outcomes estimators in the single mediator model. As a member of Dave MacKinnon's Research in Prevention Laboratory, he has worked as a methodologist for health promotion programs and has worked as a teaching assistant for several graduate level methodology courses at Arizona State University. He has published several articles on the application and methodological development of statistical mediation analysis.

Gina Mazza is pursuing a Ph.D. in quantitative psychology at Arizona State University. Her research focuses on missing data, treatment noncompliance, and multilevel modeling. She currently works under the direction of Dr. David MacKinnon on topics related to mediation and causal inference. As part of the REACH Institute (formerly the Prevention Research Center) at Arizona State University, Gina collaborated on several projects aimed at improving the health of children and their parents, including divorcing or separating parents and their children, Mexican American children, children facing the loss of a parent, and children with high levels of anxiety. Gina also served as a teaching assistant for two graduate-level courses, Multilevel Modeling (taught by Dr. Craig Enders) and Structural Equation Modeling (taught by Dr. Roger Millsap), and assisted Dr. Kevin Grimm with two American Psychological Association Advanced Training Institutes in May 2015 (Structural Equation Modeling in Longitudinal Research) and June 2016 (Big Data).

Oscar Gonzalez is a National Science Foundation Graduate Research Fellow in the Department of Psychology at Arizona State University, where he is currently pursuing a Ph.D. in Quantitative Psychology. Previously, he received a B.A. in Psychology with a minor in European Studies from the University of Notre Dame and studied abroad in Spain and South Africa. Under the mentorship of Dr. David P. MacKinnon, Oscar works extensively on developing and evaluating methods in the area of statistical mediation analysis, specifically in incorporating innovative psychometric methods and measurement theory to the mediation model to enhance

its conclusions. His research is funded by the National Science Foundation. To be at the forefront of psychometric and assessment research, he has also interned at Educational Testing Service (ETS) to work on the National Assessment of Educational Progress (NAEP – the Nation's Report Card) research agenda on innovative assessment strategies with virtual object manipulatives. His current research stems from his proposed framework of statistical mediation and as *measurement problem*, which includes exploring how psychometric issues, such as measurement invariance and measurement error, influence the conclusions of the statistical mediation model, and the representation of mediating constructs with item response theory latent variable models.
