

SPR 2009
Preconference Workshop

1. Title of workshop: How to Add Genetics to your Studies

2. Presenter contact information:

- a. Leslie Leve, Ph.D. (Organizer, discussant, and primary contact), Oregon Social Learning Center, lesliel@oslc.org; 541.485.2711 (phone); 541.485.7087 (fax)
- b. Jenae M. Neiderhiser, Ph.D. (Co-organizer, discussant), Department of Psychology, Pennsylvania State University, jenaemn@psu.edu; 814.865.4818 (phone); 814.863.7002 (fax)
- c. Danielle M. Dick, Ph.D. (Workshop Chair and presenter), Departments of Psychiatry, Psychology, and Human Genetics, Virginia Institute for Psychiatric and Behavioral Genetics at Virginia Commonwealth University, ddick@vcu.edu; 804.828.8756 (phone); 804.828.1471 (fax)
- d. Brien Riley, Ph.D. (Presenter), Departments of Psychiatry, and Human and Molecular Genetics, Virginia Institute for Psychiatric and Behavioral Genetics at Virginia Commonwealth University, bpriley@vcu.edu; 804.828.8083 (phone); 804.828.1471 (fax)
- e. Shawn Latendresse, Ph.D. (Presenter), Department of Psychiatry, Virginia Institute for Psychiatric and Behavioral Genetics at Virginia Commonwealth University, slatendresse@vcu.edu; 804.828.4630 (phone); 804.828.1471 (fax)

3. Purpose of workshop/learning objectives:

The overarching purpose of the proposed workshop is to present information about the theory and mechanics of conducting genetic studies in human populations. Workshop participants will acquire knowledge and resources to enable them to better understand the types of questions that can be addressed in genetic studies, how to collect DNA in their own studies, and the appropriate methods for analyzing genotypic data. A secondary purpose is to build linkages between experts in molecular and behavioral genetics with prevention scientists to serve as resources for one another in future collaborations. Participants will learn:

- a. The different types of genetic studies (twins/quantitative genetics; linkage/association molecular genetic studies) and the types of questions that can be addressed by each method
- b. How to select genes/SNPs
- c. Methods for collecting DNA samples
- d. What happens when DNA samples are sent to a lab for processing
- e. How DNA is genotyped and what data is provided to the researcher
- f. Analytical methods for examining genetic effects
- g. Ethical issues

4. Target workshop audience:

Workshop attendees should have a masters-level or higher background in Psychology, Epidemiology, Sociology, or similar field. In addition, participants should have an interest in incorporating genetics into their future work. No prior experience with genetic studies or

designs is required—this is intended as a basic, “how to” workshop of the mechanics of incorporating genetic studies into current and future research.

5. Materials to be provided to attendees:

Copies of all PowerPoint slides will be distributed to participants. These will contain contact information for experts in behavioral and molecular genetics, as well as names of laboratories for DNA processing. Participants will also receive a sample DNA collection kit.

6. Presenters

Dr. Danielle Dick (Chair and presenter) is an Assistant Professor in the Departments of Psychiatry, Psychology, and Human Genetics at the Virginia Institute for Psychiatric and Behavioral Genetics at Virginia Commonwealth University. She received her Ph.D. in 2001 from Indiana University, where she worked with Richard Rose on the Finnish Twin Studies.

She subsequently completed a postdoctoral fellowship in statistical genetics with Tatiana Foroud in the Department of Medical and Molecular Genetics at Indiana University School of Medicine. Her research involves integrating behavioral and statistical/molecular genetics to study the development of patterns of substance use/dependence and related behavioral disorders across adolescence and into young adulthood. She is the PI of an R01 investigating gene-environment interplay in adolescent substance use using data from the Finnish Twin Studies, a co-investigator on several large collaborative projects aimed at gene-identification, including the Collaborative Study on the Genetics of Alcoholism, and leads the genetic components of several longitudinal, developmental studies that have incorporated genotyping. She teaches on the faculty of the annual genetic methodology workshops hosted in Boulder, CO and Europe, and frequently gives overview seminars about genetics to scientists without backgrounds in this area.

Dr. Brien Riley is Director of the Molecular Genetics Laboratory at the Virginia Institute of Psychiatric and Behavioral Genetics. He is a PI or Co-investigator on several large gene-finding projects in the area of schizophrenia and alcohol dependence. His laboratory is a state of the art genotyping facility with capacity for large-scale genotyping, employing cutting edge techniques. Accordingly, he will lead the workshop segment on the collection of DNA and methods for DNA extraction and genotyping.

Dr. Shawn Latendresse has a PhD in developmental psychology and a Master’s Degree in applied statistics, both from Columbia University, with post-doctoral training in developmental science (Center for Developmental Science at the University of North Carolina, Chapel Hill) and behavioral and statistical genetics (Washington University in St. Louis, VCU). He has experience with a range of statistical packages (SAS, SPSS, Mplus) and expertise in many areas of statistical analysis, including both variable-centered and person-centered approaches to modeling developmental processes (latent growth curve analysis and growth mixture modeling) and the incorporation of genetic data into these models. In addition, his training has focused extensively on the dynamic interplay between genes and the environment as it relates to the development of a variety of risk behaviors. His training in basic statistics, genetics, and psychology make him well-equipped to provide instruction about the extension of standard statistical techniques familiar to the target audience to incorporate genetic information.

Dr. Leslie Leve has a Ph.D. in Developmental Psychology from the University of Oregon. She is a Senior Scientist at the Oregon Social Learning Center and at the Center for Research to Practice, both located in Eugene, OR. Her research interests are in the area of developmental psychopathology, with a focus on understanding the effects of the family environment on child and adolescent development. This has included preventive intervention research with youth in foster care and with adolescents in the juvenile justice system, as well as genetically-informed twin and adoption studies. She has served as an investigator on over a dozen research grants funded by the National Institutes of Health. Currently, she is leading the Early Growth and Development Study-School project and directs a randomized intervention trial designed to prevent the onset of problem behaviors among girls in foster care as they enter middle school. Dr. Leve also serves as a Co-investigator on several related intervention projects with foster care and juvenile justice populations. She serves on the Behavioral Genetics and Epidemiology study section of the NIH Center for Scientific Review, and is a member of the Editorial Board for the Journal of Family Psychology.

Dr. Jenae Neiderhiser received her doctoral degree in Human Development and Family Studies at Pennsylvania State University where she is currently a Professor of Psychology. Since 1988, she has been involved in studies looking at twins, siblings, and adoptees in an effort to understand how children and their families influence each other. The studies that have been used to examine these research questions include the following three sets of studies. The Nonshared Environment in Adolescent Development (NEAD) project and the Young Adult Sibling Study (YASS) is a longitudinal study of 720 twin and sibling pairs in two parent families with both parents and both twins/siblings participating followed from when the twins/siblings were in middle adolescence to young adulthood. The Twin/Offspring Study in Sweden (TOSS) is a study of 909 pairs of twins who are parents of at least one adolescent child and includes twin parents, one child per twin and the spouse/partner of the twin. Finally, the Early Growth and Development Study (EGDS) is a prospective, longitudinal study of 560 sets of adopted children, their adoptive families and birth parents. All of these studies include extensive assessment of the environment within the household, interpersonal relationships, adult and child adjustment, temperament and personality and other related measures. DNA has also been collected for these samples. Her work has been published in journals specializing in developmental psychology and family relations.

7. Outline of workshop

The workshop will be held in four parts, with some portions of the second segment being hands-on. In addition, the first three segments will allow ample time for questions from the attendees and audience discussion, and the fourth segment will serve as a facilitated discussion of the practicalities of adding DNA collection to ongoing epidemiological and prevention studies. Participants will be encouraged to submit questions in advance to be addressed at the workshop.

Part 1: Overview of Theory and Methodological Approaches Employed in Different Types of Genetic Studies (Danielle Dick, Presenter). Topics would include: a description of the different types of genetic studies (twins/quantitative genetics, gene finding studies (linkage/association), genome-wide versus targeted genotyping approaches); adding genetics to epidemiology/prevention projects; types of questions you can address with each of these designs; ethical issues.

Part 2: Adding Genetics to your Studies (Brien Riley, Presenter). Topics would include: how to select genes/SNPs; how to collect DNA; what happens when samples get sent to the lab; how do genotypes get produced and eventually translated into data files appropriate for analysis.

Part 3: The Analysis of Genotypic Data (Shawn Latendresse, Presenter). Topics would include: how familiar analytic strategies (e.g., regression) can be extended to incorporate genetic information; special issues that are involved in the analysis of genotypic data, such as population stratification, racial differences in allele frequencies, and linkage disequilibrium between markers; how to add genotypic information to study more complex issues, such as adding genotypes to latent growth curves to model genetic influences on change across time.

Part 4: Facilitated Discussion (Leslie Leve and Jenae Neiderhiser, Discussants). The workshop will conclude with a facilitated discussion of the practicalities of broadening an existing study to incorporate a genetic focus. Conference organizers Leve and Neiderhiser will serve as experts on the bridge between prevention and genetic methodologies to assist with genetic-to-prevention translational efforts and facilitate a discussion between attendees and presenters about real-life issues and questions that arise when a genetic focus is added to a study (or is attempted for the first time).