THE UNIVERSITY OF GEORGIA

DEPARTMENT OF STATISTICS

FRANKLIN COLLEGE OF ARTS AND SCIENCES

The University of Georgia
Department of Statistics

Colloquium Series

Laine Bradshaw
Research, Evaluation,
Measurement and Statistics
University of Georgia

"A Psychometric Model for Scaling Ability and Diagnosing Misconceptions Using Multiple Choice Tests"

Commonly utilized in educational testing, models within the unidimensional item response theory (IRT) framework locate a student's overall ability along a latent continuum by modeling the response probabilities to a set of test items as a function of a single continuous latent variable. Diagnostic classification models (DCMs) are an emerging class of models that, in contrast to IRT models, identify the separate components of what students know (distinct skills or abilities called attributes) by modeling response probabilities as a function of a set of categorical latent variables. The Scaling Individual and Classifying Misconceptions (SICM) model is a new nominal response model that combines the functionalities of the IRT and DCM frameworks by modeling a student's continuous ability by the correct/incorrect nature of his or her responses to multiple-choice items, while simultaneously classifying the student according to dichotomous attributes that are defined as errors or misconceptions. The misconceptions are indicated by the nature of which incorrect alternative is selected, assuming a test is constructed with misconceptions playing into possible response alternatives.

Through this presentation, an introduction of IRT models and DCMs will be provided with an explanation of how these models can be understood from a generalized linear mixed model perspective. Then the SICM model will be presented as a combination of an IRT and DCM model, providing diagnostic, actionable feedback to teachers and students in the form of statistical estimates of student misconceptions in addition to the type of information about students' overall ability that is presently available by common modeling and testing procedures.

Thursday, March 24th, 2011

3:30 PM at 306 Statistics Building

Refreshments immediately following talk in The Cohen Room, room 230, Statistics Building

For more information, please contact:
jhdavis@uga.edu

Parking is available in the South Campus Parking Deck. For a UGA Campus map, please see:
http://aviary.camplan.uga.edu/CampusMap/Default.aspx

Department of Statistics
101 Cedar Street
Athens, GA 30602

Phone: 706-542-5232
Fax: 706-542-3391
www.stat.uga.edu