

***Psychometric Scale in Modeling Developmental Processes
and Ecological Factors***

Abstract of talk
conference on Modeling Developmental Processes in Ecological Context
in Tempe, Arizona – March 2004

Susan E. Embretson
University of Kansas

Psychometric scales can influence assessments of relationships between ecological factors and developmental processes. Outcome measures for developmental studies on psychological traits are typically based on raw scores (or their linear transformations) from a fixed content test. In this presentation, simulations based on item response theory (IRT) are presented to show the impact of test properties on 1) comparisons between groups that differ in ecological factors, 2) comparison of cross-sectional growth curves, 3) comparison of change between groups and 4) the regression of outcome on age and ecological factors. In summary, the magnitude of impact depends on the appropriateness of test difficulty level. Simulation results are also presented to show that optimal measurement from adaptive testing, rather than IRT scaling alone, is required to adjust these effects. An application to a study on age-related changes in spatial ability is then given to illustrate the impact.