Public Abstract

First Name:Seungmin

Middle Name:

Last Name:Jahng

Adviser's First Name:Phillip

Adviser's Last Name:Wood

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:FS 2008

Department:Psychology

Degree:PhD

Title:MULTILEVEL MODELS FOR INTENSIVE LONGITUDINAL DATA WITH HETEROGENEOUS ERROR STRUCTURE: COVARIANCE TRANSFORMATION AND VARIANCE FUNCTION MODELS

Recent developments in data collection methods in the behavioral and social sciences enables researchers to gather intensive longitudinal data (ILD) and to examine more detailed features of intraindividual variation of a variable(s) over time. Due to its high intensity of assessments within individuals, ILD often has different characteristics from traditional longitudinal data with a few measurement occasions and requires different assumptions of statistical models in use. In the present thesis, issues in the analysis of ILD and problems of current use of statistical models for the analysis of ILD are discussed and investigated. In chapter 2, a brief introduction to multilevel models (MLMs) and issues in modeling covariance structure in MLMs are provided and discussed. In chapter 3, it is shown that bias in estimation of parameters in MLMs which assume the same autocorrelation for all individuals is not ignorable when autocorrelation differs across individuals and its average is high. It is also shown that a transformation method attenuates the bias for ILD. Chapter 4 reviews variance function models for different variances across individuals and introduces a two-step MLM approach for modeling different variance using squared residuals. A simulation study showed that the two-step MLM has good properties for modeling different variances in ILD.