Longitudinal Structural Equation Modeling

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Structural Equation Modeling with Mplus - Barbara M. Byrne 2013-06-17
"This text aims to provide readers with a nonmathematical introduction to the basic concepts associated with structural equation modeling, and to illustrate its basic applications using the Mplus program"--Provided by publisher.

Basic and Advanced Bayesian Structural Equation Modeling - Sik-Yum Lee 2012-07-05
This book provides clear instructions to researchers on how to apply Structural Equation Models (SEMs) for analyzing the inter relationships between observed and latent

variables. Basic and Advanced Bayesian Structural Equation Modeling introduces basic and advanced SEMs for analyzing various kinds of complex data, such as ordered and unordered categorical data, multilevel data, mixture data, longitudinal data, highly non-normal data, as well as some of their combinations. In addition, Bayesian semiparametric SEMs to capture the true distribution of explanatory latent variables are introduced, whilst SEM with a nonparametric structural equation to assess unspecified functional relationships among latent variables are also explored. Statistical methodologies are developed using the Bayesian approach giving reliable results for small samples and allowing the use of prior information leading to better statistical results. Estimates of the parameters and model comparison statistics are obtained via powerful Markov Chain Monte Carlo methods in statistical computing. Introduces the Bayesian approach to SEMs, including discussion on the selection of prior distributions, and data augmentation. Demonstrates how to utilize the recent powerful tools in statistical computing including, but not limited to, the Gibbs sampler, the Metropolis-Hasting algorithm, and path sampling for producing various statistical results such as Bayesian estimates and Bayesian model comparison statistics in the analysis of basic and advanced SEMs. Discusses the Bayes factor, Deviance Information Criterion (DIC), and L_ν-measure for Bayesian model comparison. Introduces a number of important generalizations of SEMs, including multilevel and mixture SEMs, latent curve models and longitudinal SEMs, semiparametric SEMs and those with various types of discrete data, and nonparametric structural equations. Illustrates how to use the freely available software WinBUGS to produce the results. Provides numerous real examples for illustrating the theoretical concepts and computational procedures that are presented throughout the

book. Researchers and advanced level students in statistics, biostatistics, public health, business, education, psychology and social science will benefit from this book.

Structural Equation Modeling - David Kaplan 2008-07-23
Using detailed, empirical examples, Structural Equation Modeling, Second Edition, presents a thorough and sophisticated treatment of the foundations of structural equation modeling (SEM). It also demonstrates how SEM can provide a unique lens on the problems social and behavioral scientists face. Intended Audience While the book assumes some knowledge and background in statistics, it guides readers through the foundations and critical assumptions of SEM in an easy-to-understand manner.

Longitudinal Multivariate Psychology - Emilio Ferrer 2018-10-09
This volume presents a collection of chapters focused on the study of multivariate change. As people develop and change, multivariate measurement of that change and analysis of those measures can illuminate the regularities in the trajectories of individual development, as well as time-dependent changes in population averages. As longitudinal data have recently become much more prevalent in psychology and the social sciences, models of change have become increasingly important. This collection focuses on methodological, statistical, and modeling aspects of multivariate change and applications of longitudinal models to the study of psychological processes. The volume is divided into three major sections: Extension of latent change models, Measurement and testing issues in longitudinal modeling, and Novel applications of multivariate longitudinal methodology. It is intended for advanced students and researchers interested in learning about state-of-the-art techniques for longitudinal data analysis, as well as understanding the history and development of such techniques.

New Methods for the Analysis of Change - Linda

M. Collins 2001-01-01
Annotation Psychologists update the Association's 1991 with 12 studies, many from a conference held at Pennsylvania State University in 1998, and some with comments attached. The topics include differential structural equation modeling of intra-individual variability, combining auto-regressive and latent curve models, and planned missing-data designs for analyzing change. Annotation c. Book News, Inc., Portland, OR (booknews.com).

Longitudinal Structural Equation Modeling with Mplus - Christian Geiser 2020-10-08
An in-depth guide to executing longitudinal confirmatory factor analysis (CFA) and structural equation modeling (SEM) in Mplus, this book uses latent state–trait (LST) theory as a unifying conceptual framework, including the relevant coefficients of consistency, occasion specificity, and reliability. Following a standard format, chapters review the theoretical underpinnings, strengths, and limitations of the various models; present data examples; and demonstrate each model's application and interpretation in Mplus, with numerous screen shots and output excerpts. Coverage encompasses both traditional models (autoregressive, change score, and growth curve models) and LST models for analyzing single- and multiple-indicator data. The book discusses measurement equivalence testing, intensive longitudinal data modeling, and missing data handling, and provides strategies for model selection and reporting of results. User-friendly features include special-topic boxes, chapter summaries, and suggestions for further reading. The companion website features data sets, annotated syntax files, and output for all of the examples.

Multilevel Modeling for Social and Personality Psychology - John B Nezlek 2011-03-04
Psychophysiology methods have become very important in the past decade or so with the increase in the understanding of the relationship

between human physiology and behavior. As social behavior research has ventured further into biological waters, more detailed understanding of these methods has become necessary. This volume meets this need in a very accessible way for the advanced level student upwards. Written by a team of well recognized and well-published social psychophysiologists, it leads the reader through some complex but essential areas of understanding for anyone needing to investigate the human biological system and social behavior including the autonomic nervous system, endocrine measures and electromyography. This text will be perfect for all advanced students and researchers in social and personality psychology using social psychophysiological methods as part of their studies or research.

Basics of Structural Equation Modeling - Geoffrey M. Maruyama 1997-09-22
With the availability of software programs, such as LISREL, EQS, and AMOS, modeling (SEM) techniques have become a popular tool for formalized presentation of the hypothesized relationships underlying correlational research and test for the plausibility of hypothesizing for a particular data set. Through the use of careful narrative explanation, Maruyama's text describes the logic underlying SEM approaches, describes how SEM approaches relate to techniques like regression and factor analysis, analyzes the strengths and shortcomings of SEM as compared to alternative methodologies, and explores the various methodologies for analyzing structural equation data. In addition, Maruyama provides carefully constructed exercises both within and

Statistical Power Analysis with Missing Data - Adam Davey 2009-08-20
Statistical power analysis has revolutionized the ways in which we conduct and evaluate research. Similar developments in the statistical analysis of incomplete (missing) data are gaining more widespread applications. This volume

brings statistical power and incomplete data together under a common framework, in a way that is readily accessible to those with only an introductory familiarity with structural equation modeling. It answers many practical questions such as: How missing data affects the statistical power in a study How much power is likely with different amounts and types of missing data How to increase the power of a design in the presence of missing data, and How to identify the most powerful design in the presence of missing data. Points of Reflection encourage readers to stop and test their understanding of the material. Try Me sections test one's ability to apply the material. Troubleshooting Tips help to prevent commonly encountered problems. Exercises reinforce content and Additional Readings provide sources for delving more deeply into selected topics. Numerous examples demonstrate the book's application to a variety of disciplines. Each issue is accompanied by its potential strengths and shortcomings and

examples using a variety of software packages (SAS, SPSS, Stata, LISREL, AMOS, and MPlus). Syntax is provided using a single software program to promote continuity but in each case, parallel syntax using the other packages is presented in appendixes. Routines, data sets, syntax files, and links to student versions of software packages are found at www.psypress.com/davey. The worked examples in Part 2 also provide results from a wider set of estimated models. These tables, and accompanying syntax, can be used to estimate statistical power or required sample size for similar problems under a wide range of conditions. Class-tested at Temple, Virginia Tech, and Miami University of Ohio, this brief text is an ideal supplement for graduate courses in applied statistics, statistics II, intermediate or advanced statistics, experimental design, structural equation modeling, power analysis, and research methods taught in departments of psychology, human development, education,

sociology, nursing, social work, gerontology and other social and health sciences. The book's applied approach will also appeal to researchers in these areas. Sections covering Fundamentals, Applications, and Extensions are designed to take readers from first steps to mastery.

Principles and Practice of Structural Equation Modeling, Fourth Edition - Rex B. Kline 2015-10-08

Emphasizing concepts and rationale over mathematical minutiae, this is the most widely used, complete, and accessible structural equation modeling (SEM) text. Continuing the tradition of using real data examples from a variety of disciplines, the significantly revised fourth edition incorporates recent developments such as Pearl's graphing theory and the structural causal model (SCM), measurement invariance, and more. Readers gain a comprehensive understanding of all phases of SEM, from data collection and screening to the interpretation and reporting of the results. Learning is enhanced by exercises with answers, rules to remember, and topic boxes. The companion website supplies data, syntax, and output for the book's examples--now including files for Amos, EQS, LISREL, Mplus, Stata, and R (lavaan). New to This Edition *Extensively revised to cover important new topics: Pearl's graphing theory and the SCM, causal inference frameworks, conditional process modeling, path models for longitudinal data, item response theory, and more. *Chapters on best practices in all stages of SEM, measurement invariance in confirmatory factor analysis, and significance testing issues and bootstrapping. *Expanded coverage of psychometrics. *Additional computer tools: online files for all detailed examples, previously provided in EQS, LISREL, and Mplus, are now also given in Amos, Stata, and R (lavaan). *Reorganized to cover the specification, identification, and analysis of observed variable models separately from latent variable models. Pedagogical Features

*Exercises with answers, plus end-of-chapter annotated lists of further reading. *Real examples of troublesome data, demonstrating how to handle typical problems in analyses. *Topic boxes on specialized issues, such as causes of nonpositive definite correlations. *Boxed rules to remember. *Website promoting a learn-by-doing approach, including syntax and data files for six widely used SEM computer tools.

An Introduction to Latent Variable Growth Curve Modeling - Terry E. Duncan 2013-05-13 This book provides a comprehensive introduction to latent variable growth curve modeling (LGM) for analyzing repeated measures. It presents the statistical basis for LGM and its various methodological extensions, including a number of practical examples of its use. It is designed to take advantage of the reader's familiarity with analysis of variance and structural equation modeling (SEM) in introducing LGM techniques. Sample data, syntax, input and output, are provided for EQS, Amos, LISREL, and Mplus on the book's CD. Throughout the book, the authors present a variety of LGM techniques that are useful for many different research designs, and numerous figures provide helpful diagrams of the examples. Updated throughout, the second edition features three new chapters—growth modeling with ordered categorical variables, growth mixture modeling, and pooled interrupted time series LGM approaches. Following a new organization, the book now covers the development of the LGM, followed by chapters on multiple-group issues (analyzing growth in multiple populations, accelerated designs, and multi-level longitudinal approaches), and then special topics such as missing data models, LGM power and Monte Carlo estimation, and latent growth interaction models. The model specifications previously included in the appendices are now available on the CD so the reader can more easily adapt the

models to their own research. This practical guide is ideal for a wide range of social and behavioral researchers interested in the measurement of change over time, including social, developmental, organizational, educational, consumer, personality and clinical psychologists, sociologists, and quantitative methodologists, as well as for a text on latent variable growth curve modeling or as a supplement for a course on multivariate statistics. A prerequisite of graduate level statistics is recommended.

A Life Course Perspective on Health Trajectories and Transitions - Claudine Burton-Jeangros 2015-08-11
This open access book examines health trajectories and health transitions at different stages of the life course, including childhood, adulthood and later life. It provides findings that assess the role of biological and social transitions on health status over time. The essays examine a wide range of health issues, including the consequences of military service on body mass index, childhood obesity and cardiovascular health, socio-economic inequalities in preventive health care use, depression and anxiety during the child rearing period, health trajectories and transitions in people with cystic fibrosis and oral health over the life course. The book addresses theoretical, empirical and methodological issues as well as examines different national contexts, which help to identify factors of vulnerability and potential resources that support resilience available for specific groups and/or populations. Health reflects the ability of individuals to adapt to their social environment. This book analyzes health as a dynamic experience. It examines how different aspects of individual health unfold over time as a result of aging but also in relation to changing socioeconomic conditions. It also offers readers potential insights into public policies that affect the health status of a population.
Longitudinal Data Analysis for the Behavioral

Sciences Using R - Jeffrey D. Long 2012
This book is a practical guide for the analysis of longitudinal behavioural data. Longitudinal data consist of repeated measures collected on the same subjects over time.

Structural Equation Modeling With AMOS - Barbara M. Byrne 2001-04
This book illustrates the ease with which AMOS 4.0 can be used to address research questions that lend themselves to structural equation modeling (SEM). This goal is achieved by: 1) presenting a nonmathematical introduction to the basic concepts and appli.

Generalized Latent Variable Modeling - Anders Skrondal 2004-05-11
This book unifies and extends latent variable models, including multilevel or generalized linear mixed models, longitudinal or panel models, item response or factor models, latent class or finite mixture models, and structural equation models. Following a gentle introduction to latent variable modeling, the authors clearly explain and contrast a wide range of estimation and prediction methods from biostatistics, psychometrics, econometrics, and statistics. They present exciting and realistic applications that demonstrate how researchers can use latent variable modeling to solve concrete problems in areas as diverse as medicine, economics, and psychology. The examples considered include many nonstandard response types, such as ordinal, nominal, count, and survival data. Joint modeling of mixed responses, such as survival and longitudinal data, is also illustrated. Numerous displays, figures, and graphs make the text vivid and easy to read. About the authors: Anders Skrondal is Professor and Chair in Social Statistics, Department of Statistics, London School of Economics, UK Sophia Rabe-Hesketh is a Professor of Educational Statistics at the Graduate School of Education and Graduate Group in Biostatistics, University of California, Berkeley, USA.
Generalized Latent Variable Modeling - Anders

Skrondal 2004-05-11
This book unifies and extends latent variable models, including multilevel or generalized linear mixed models, longitudinal or panel models, item response or factor models, latent class or finite mixture models, and structural equation models. Following a gentle introduction to latent variable modeling, the authors clearly explain and contrast a wi

Data Analysis with Mplus - Christian Geiser 2012-11-12
A practical introduction to using Mplus for the analysis of multivariate data, this volume provides step-by-step guidance, complete with real data examples, numerous screen shots, and output excerpts. The author shows how to prepare a data set for import in Mplus using SPSS. He explains how to specify different types of models in Mplus syntax and address typical caveats--for example, assessing measurement invariance in longitudinal SEMs. Coverage includes path and factor analytic models as well as mediational, longitudinal, multilevel, and latent class models. Specific programming tips and solution strategies are presented in boxes in each chapter. The companion website (http://crmda.ku.edu/guilford/geiser) features data sets, annotated syntax files, and output for all of the examples. Of special utility to instructors and students, many of the examples can be run with the free demo version of Mplus.

Structural Equation Modeling - Jichuan Wang 2019-09-17
Presents a useful guide for applications of SEM whilst systematically demonstrating various SEM models using Mplus Focusing on the conceptual and practical aspects of Structural Equation Modeling (SEM), this book demonstrates basic concepts and examples of various SEM models, along with updates on many advanced methods, including confirmatory factor analysis (CFA) with categorical items, bifactor model, Bayesian CFA model, item response theory (IRT) model, graded response

model (GRM), multiple imputation (MI) of missing values, plausible values of latent variables, moderated mediation model, Bayesian SEM, latent growth modeling (LGM) with individually varying times of observations, dynamic structural equation modeling (DSEM), residual dynamic structural equation modeling (RDSEM), testing measurement invariance of instrument with categorical variables, longitudinal latent class analysis (LLCA), latent transition analysis (LTA), growth mixture modeling (GMM) with covariates and distal outcome, manual implementation of the BCH method and the three-step method for mixture modeling, Monte Carlo simulation power analysis for various SEM models, and estimate sample size for latent class analysis (LCA) model. The statistical modeling program Mplus Version 8.2 is featured with all models updated. It provides researchers with a flexible tool that allows them to analyze data with an easy-to-use interface and graphical displays of data and analysis results. Intended as both a teaching resource and a reference guide, and written in non-mathematical terms, Structural Equation Modeling: Applications Using Mplus, 2nd edition provides step-by-step instructions of model specification, estimation, evaluation, and modification. Chapters cover: Confirmatory Factor Analysis (CFA); Structural Equation Models (SEM); SEM for Longitudinal Data; Multi-Group Models; Mixture Models; and Power Analysis and Sample Size Estimate for SEM. Presents a useful reference guide for applications of SEM while systematically demonstrating various advanced SEM models Discusses and demonstrates various SEM models using both cross-sectional and longitudinal data with both continuous and categorical outcomes Provides step-by-step instructions of model specification and estimation, as well as detailed interpretation of Mplus results using real data sets Introduces different methods for sample size estimate and

statistical power analysis for SEM Structural Equation Modeling is an excellent book for researchers and graduate students of SEM who want to understand the theory and learn how to build their own SEM models using Mplus.

Latent Curve Models - Kenneth A. Bollen 2006-01-03
An effective technique for data analysis in the social sciences The recent explosion in longitudinal data in the social scienceshighlights the need for this timely publication. Latent CurveModels: A Structural Equation Perspective provides an effectivetechnique to analyze latent curve models (LCMs). This type of datafeatures random intercepts and slopes that permit each case in asample to have a different trajectory over time. Furthermore,researchers can include variables to predict the parametersgoverning these trajectories. The authors synthesize a vast amount of research and findingsand, at the same time, provide original results. The book analyzesLCMs from the perspective of structural equation models (SEMs) withlatent variables. While the authors discuss simple regression-basedprocedures that are useful in the early stages of LCMs, most of thepresentation uses SEMs as a driving tool. This cutting-edge workincludes some of the authors' recent work on the autoregressivelatent trajectory model, suggests new models for method factors inmultiple indicators, discusses repeated latent variable models, andestablishes the identification of a variety of LCMs. This text has been thoroughly class-tested and makes extensiveuse of pedagogical tools to aid readers in mastering and applyingLCMs quickly and easily to their own data sets. Key featuresinclude: Chapter introductions and summaries that provide a quickoverview of highlights Empirical examples provided throughout that allow readers totest their newly found knowledge and discover practicalapplications Conclusions at the end of each chapter that stress theessential points that

readers need to understand for advancement to more sophisticated topics Extensive footnoting that points the way to the primary literature for more information on particular topics With its emphasis on modeling and the use of numerous examples, this is an excellent book for graduate courses in latent trajectory models as well as a supplemental text for courses in structural modeling. This book is an excellent aid and reference for researchers in quantitative social and behavioral sciences who need to analyze longitudinal data.

Longitudinal Structural Equation Modeling - Todd D. Little 2013-03-25
Featuring actual datasets as illustrative examples, this book reveals numerous ways to apply structural equation modeling (SEM) to any repeated-measures study. Initial chapters lay the groundwork for modeling a longitudinal change process, from measurement, design, and specification issues to model evaluation and interpretation. Covering both big-picture ideas and technical "how-to-do-it" details, the author deftly walks through when and how to use longitudinal confirmatory factor analysis, longitudinal panel models (including the multiple-group case), multilevel models, growth curve models, and complex factor models, as well as models for mediation and moderation. User-friendly features include equation boxes that clearly explain the elements in every equation, end-of-chapter glossaries, and annotated suggestions for further reading. The companion website (http://crmda.ku.edu/guilford/little) provides datasets for all of the examples--which include studies of bullying, adolescent students' emotions, and healthy aging--with syntax and output from LISREL, Mplus, and R (lavaan).

Recent Developments on Structural Equation Models - Kees van Montfort 2004-03-31
After Karl Jöreskog's first presentation in 1970, Structural Equation Modelling or SEM has become a main statistical tool in many fields of

science. It is the standard approach of factor analytic and causal modelling in such diverse fields as sociology, education, psychology, economics, management and medical sciences. In addition to an extension of its application area, Structural Equation Modelling also features a continual renewal and extension of its theoretical background. The sixteen contributions to this book, written by experts from many countries, present important new developments and interesting applications in Structural Equation Modelling. The book addresses methodologists and statisticians professionally dealing with Structural Equation Modelling to enhance their knowledge of the type of models covered and the technical problems involved in their formulation. In addition, the book offers applied researchers new ideas about the use of Structural Equation Modeling in solving their problems. Finally, methodologists, mathematicians and applied researchers alike are addressed, who simply want to update their knowledge of recent approaches in data analysis and mathematical modelling.

Modeling Contextual Effects in Longitudinal Studies - Todd D. Little 2007-03-21
This volume reviews the challenges and alternative approaches to modeling how individuals change across time and provides methodologies and data analytic strategies for behavioral and social science researchers. This accessible guide provides concrete, clear examples of how contextual factors can be included in most research studies. Each chapter c

Longitudinal Analysis - Lesa Hoffman 2015-01-30
Longitudinal Analysis provides an accessible, application-oriented treatment of introductory and advanced linear models for within-person fluctuation and change. Organized by research design and data type, the text uses in-depth examples to provide a complete description of

the model-building process. The core longitudinal models and their extensions are presented within a multilevel modeling framework, paying careful attention to the modeling concerns that are unique to longitudinal data. Written in a conversational style, the text provides verbal and visual interpretation of model equations to aid in their translation to empirical research results. Overviews and summaries, boldfaced key terms, and review questions will help readers synthesize the key concepts in each chapter. Written for non-mathematically-oriented readers, this text features: A description of the data manipulation steps required prior to model estimation so readers can more easily apply the steps to their own data An emphasis on how the terminology, interpretation, and estimation of familiar general linear models relates to those of more complex models for longitudinal data Integrated model comparisons, effect sizes, and statistical inference in each example to

strengthen readers' understanding of the overall model-building process Sample results sections for each example to provide useful templates for published reports Examples using both real and simulated data in the text, along with syntax and output for SPSS, SAS, STATA, and Mplus at www.PilesOfVariance.com to help readers apply the models to their own data The book opens with the building blocks of longitudinal analysis—general ideas, the general linear model for between-person analysis, and between- and within-person models for the variance and the options within repeated measures analysis of variance. Section 2 introduces unconditional longitudinal models including alternative covariance structure models to describe within-person fluctuation over time and random effects models for within-person change. Conditional longitudinal models are presented in section 3, including both time-invariant and time-varying predictors. Section 4 reviews advanced applications, including alternative metrics of

time in accelerated longitudinal designs, three-level models for multiple dimensions of within-person time, the analysis of individuals in groups over time, and repeated measures designs not involving time. The book concludes with additional considerations and future directions, including an overview of sample size planning and other model extensions for non-normal outcomes and intensive longitudinal data. Class-tested at the University of Nebraska-Lincoln and in intensive summer workshops, this is an ideal text for graduate-level courses on longitudinal analysis or general multilevel modeling taught in psychology, human development and family studies, education, business, and other behavioral, social, and health sciences. The book's accessible approach will also help those trying to learn on their own. Only familiarity with general linear models (regression, analysis of variance) is needed for this text.

A Beginner's Guide to Structural Equation Modeling - Randall E. Schumacker 2004-06-24

The second edition features: a CD with all of the book's Amos, EQS, and LISREL programs and data sets; new chapters on importing data issues related to data editing and on how to report research; an updated introduction to matrix notation and programs that illustrate how to compute these calculations; many more computer program examples and chapter exercises; and increased coverage of factors that affect correlation, the 4-step approach to SEM and hypothesis testing, significance, power, and sample size issues. The new edition's expanded use of applications make this book ideal for advanced students and researchers in psychology, education, business, health care, political science, sociology, and biology. A basic understanding of correlation is assumed and an understanding of the matrices used in SEM models is encouraged.

Intensive Longitudinal Methods - Niall Bolger 2013-01-22

This book offers a complete, practical guide to

doing an intensive longitudinal study with individuals, dyads, or groups. It provides the tools for studying social, psychological, and physiological processes in everyday contexts, using methods such as diary and experience sampling. A range of engaging, worked-through research examples with datasets are featured. Coverage includes how to: select the best intensive longitudinal design for a particular research question, apply multilevel models to within-subject designs, model within-subject change processes for continuous and categorical outcomes, assess the reliability of within-subject changes, assure sufficient statistical power, and more. Several end-of-chapter write-ups illustrate effective ways to present study findings for publication. Datasets and output in SPSS, SAS, Mplus, HLM, MLwiN, and R for the examples are available on the companion website (www.intensivelongitudinal.com).
Latent Growth Curve Modeling - Kristopher J. Preacher 2008-06-27

Latent growth curve modeling (LGM)—a special case of confirmatory factor analysis designed to model change over time—is an indispensable and increasingly ubiquitous approach for modeling longitudinal data. This volume introduces LGM techniques to researchers, provides easy-to-follow, didactic examples of several common growth modeling approaches, and highlights recent advancements regarding the treatment of missing data, parameter estimation, and model fit. The book covers the basic linear LGM, and builds from there to describe more complex functional forms (e.g., polynomial latent curves), multivariate latent growth curves used to model simultaneous change in multiple variables, the inclusion of time-varying covariates, predictors of aspects of change, cohort-sequential designs, and multiple-group models. The authors also highlight approaches to dealing with missing data, different estimation methods, and incorporate discussion of model evaluation and comparison

within the context of LGM. The models demonstrate how they may be applied to longitudinal data derived from the NICHD Study of Early Child Care and Youth Development (SECCYD).. Key Features · Provides easy-to-follow, didactic examples of several common growth modeling approaches · Highlights recent advancements regarding the treatment of missing data, parameter estimation, and model fit · Explains the commonalities and differences between latent growth model and multilevel modeling of repeated measures data · Covers the basic linear latent growth model, and builds from there to describe more complex functional forms such as polynomial latent curves, multivariate latent growth curves, time-varying covariates, predictors of aspects of change, cohort-sequential designs, and multiple-group models Learn more about "The Little Green Book" - QASS Series! Click Here Longitudinal Structural Equation Modeling with Mplus - Christian Geiser 2020-10-08 An in-depth guide to executing longitudinal confirmatory factor analysis (CFA) and structural equation modeling (SEM) in Mplus, this book uses latent state–trait (LST) theory as a unifying conceptual framework, including the relevant coefficients of consistency, occasion specificity, and reliability. Following a standard format, chapters review the theoretical underpinnings, strengths, and limitations of the various models; present data examples; and demonstrate each model's application and interpretation in Mplus, with numerous screen shots and output excerpts. Coverage encompasses both traditional models (autoregressive, change score, and growth curve models) and LST models for analyzing single- and multiple-indicator data. The book discusses measurement equivalence testing, intensive longitudinal data modeling, and missing data handling, and provides strategies for model selection and reporting of results. User-friendly features include special-topic boxes, chapter

summaries, and suggestions for further reading. The companion website features data sets, annotated syntax files, and output for all of the examples.

Longitudinal Data Analysis Using Structural Equation Models - John J. McArdle 2014
When determining the most appropriate method for analyzing longitudinal data, you must first consider what research question you want to answer. McArdle and Nesselroade identify five basic purposes of longitudinal structural equation modeling. For each purpose, they present the most useful strategies and models. Two important but underused approaches are emphasized: multiple factorial invariance over time and latent change scores. This volume covers a wealth of models in a straightforward, understandable manner. Rather than overwhelm the reader with an extensive amount of algebra, the authors use path diagrams and emphasize methods that are appropriate for many uses. Book jacket.

Longitudinal Data Analysis - Garrett Fitzmaurice 2008-08-11
Although many books currently available describe statistical models and methods for analyzing longitudinal data, they do not highlight connections between various research threads in the statistical literature. Responding to this void, Longitudinal Data Analysis provides a clear, comprehensive, and unified overview of state-of-the-art theory and applications. It also focuses on the assorted challenges that arise in analyzing longitudinal data. After discussing historical aspects, leading researchers explore four broad themes: parametric modeling, nonparametric and semiparametric methods, joint models, and incomplete data. Each of these sections begins with an introductory chapter that provides useful background material and a broad outline to set the stage for subsequent chapters. Rather than focus on a narrowly defined topic, chapters integrate important research discussions from the statistical

literature. They seamlessly blend theory with applications and include examples and case studies from various disciplines. Destined to become a landmark publication in the field, this carefully edited collection emphasizes statistical models and methods likely to endure in the future. Whether involved in the development of statistical methodology or the analysis of longitudinal data, readers will gain new perspectives on the field.

Handbook of Structural Equation Modeling - Rick H. Hoyle 2012-05-21
The first comprehensive structural equation modeling (SEM) handbook, this accessible volume offers broad and deep coverage of both the mechanics of SEM and specific SEM strategies and applications. The editor, contributors, and editorial advisory board are leading methodologists who have organized the book to move from simpler material to more statistically complex modeling approaches. Sections cover the foundations of SEM; statistical underpinnings, from assumptions to model modifications; steps in implementation, from data preparation through writing the SEM report; and basic and advanced applications, including new and emerging topics in SEM, such as intensive longitudinal assessments, dyadic data, brain imaging, and genotyping. Each chapter provides conceptually oriented descriptions, fully explicated analyses, and engaging examples that reveal modeling possibilities for use with readers' data. Many of the chapters also include access to data and syntax files at the companion website, allowing readers to try their hands at reproducing the authors' results.

Modeling Longitudinal and Multilevel Data - Todd D. Little 2000
This book focuses on the practical issues and approaches to handling longitudinal and multilevel data. All data sets and the corresponding command files are available via the Web. The working examples are available in

the four major SEM packages--LISREL, EQS, MX, and AMOS--and two Multi-level packages--HLM and MLn. All equations and figural conventions are standardized across each contribution. The material is accessible to practicing researchers and students. Users can compare and contrast various analytic approaches to longitudinal and multiple-group data including SEM, Multi-level, LTA, and standard GLM techniques. Ideal for graduate students and practicing researchers in social and behavioral sciences.

Growth Modeling - Kevin J. Grimm 2016-10-17 Growth models are among the core methods for analyzing how and when people change. Discussing both structural equation and multilevel modeling approaches, this book leads readers step by step through applying each model to longitudinal data to answer particular research questions. It demonstrates cutting-edge ways to describe linear and nonlinear change patterns, examine within-person and between-person differences in change, study change in latent variables, identify leading and lagging indicators of change, evaluate co-occurring patterns of change across multiple variables, and more. User-friendly features include real data examples, code (for Mplus or NLMIXED in SAS, and OpenMx or nlme in R), discussion of the output, and interpretation of each model's results. User-Friendly Features *Real, worked-through longitudinal data examples serving as illustrations in each chapter. *Script boxes that provide code for fitting the models to example data and facilitate application to the reader's own data. *"Important Considerations" sections offering caveats, warnings, and recommendations for the use of specific models. *Companion website supplying datasets and syntax for the book's examples, along with additional code in SAS/R for linear mixed-effects modeling.

Methods and Applications of Longitudinal Data Analysis - Xian Liu 2015-09-11

Methods and Applications of Longitudinal Data Analysis describes methods for the analysis of longitudinal data in the medical, biological and behavioral sciences. It introduces basic concepts and functions including a variety of regression models, and their practical applications across many areas of research. Statistical procedures featured within the text include: descriptive methods for delineating trends over time linear mixed regression models with both fixed and random effects covariance pattern models on correlated errors generalized estimating equations nonlinear regression models for categorical repeated measurements techniques for analyzing longitudinal data with non-ignorable missing observations Emphasis is given to applications of these methods, using substantial empirical illustrations, designed to help users of statistics better analyze and understand longitudinal data. Methods and Applications of Longitudinal Data Analysis equips both graduate students and professionals to confidently apply longitudinal data analysis to their particular discipline. It also provides a valuable reference source for applied statisticians, demographers and other quantitative methodologists. From novice to professional: this book starts with the introduction of basic models and ends with the description of some of the most advanced models in longitudinal data analysis Enables students to select the correct statistical methods to apply to their longitudinal data and avoid the pitfalls associated with incorrect selection Identifies the limitations of classical repeated measures models and describes newly developed techniques, along with real-world examples.

Models for Intensive Longitudinal Data - Theodore A. Walls 2006-01-19
Rapid technological advances in devices used for data collection have led to the emergence of a new class of longitudinal data: intensive longitudinal data (ILD). Behavioral scientific studies now frequently utilize handheld

computers, beepers, web interfaces, and other technological tools for collecting many more data points over time than previously possible. Other protocols, such as those used in fMRI and monitoring of public safety, also produce ILD, hence the statistical models in this volume are applicable to a range of data. The volume features state-of-the-art statistical modeling strategies developed by leading statisticians and methodologists working on ILD in conjunction with behavioral scientists. Chapters present applications from across the behavioral and health sciences, including coverage of substantive topics such as stress, smoking cessation, alcohol use, traffic patterns, educational performance and intimacy. Models for Intensive Longitudinal Data (MILD) is designed for those who want to learn about advanced statistical models for intensive longitudinal data and for those with an interest in selecting and applying a given model. The chapters highlight issues of general concern in modeling these kinds of data, such as a focus on regulatory systems, issues of curve registration, variable frequency and spacing of measurements, complex multivariate patterns of change, and multiple independent series. The extraordinary breadth of coverage makes this an indispensable reference for principal investigators designing new studies that will introduce ILD, applied statisticians working on related models, and methodologists, graduate students, and applied analysts working in a range of fields. A companion Web site at www.oup.com/us/MILD contains program examples and documentation.

Structural Equation Modeling - Xiaoqian Wang 2012-07-31
A reference guide for applications of SEM using Mplus Structural Equation Modeling: Applications Using Mplus is intended as both a teaching resource and a reference guide. Written in non-mathematical terms, this book focuses on the conceptual and practical aspects

of Structural Equation Modeling (SEM). Basic concepts and examples of various SEM models are demonstrated along with recently developed advanced methods, such as mixture modeling and model-based power analysis and sample size estimate for SEM. The statistical modeling program, Mplus, is also featured and provides researchers with a flexible tool to analyze their data with an easy-to-use interface and graphical displays of data and analysis results. Key features: Presents a useful reference guide for applications of SEM whilst systematically demonstrating various advanced SEM models, such as multi-group and mixture models using Mplus. Discusses and demonstrates various SEM models using both cross-sectional and longitudinal data with both continuous and categorical outcomes. Provides step-by-step instructions of model specification and estimation, as well as detail interpretation of Mplus results. Explores different methods for sample size estimate and statistical power

analysis for SEM. By following the examples provided in this book, readers will be able to build their own SEM models using Mplus. Teachers, graduate students, and researchers in social sciences and health studies will also benefit from this book.

Longitudinal Research with Latent Variables - Kees van Montfort 2010-05-17 Since Charles Spearman published his seminal paper on factor analysis in 1904 and Karl Joresk̈ og replaced the observed variables in an econometric structural equation model by latent factors in 1970, causal modelling by means of latent variables has become the standard in the social and behavioural sciences. Indeed, the central va- ables that social and behavioural theories deal with, can hardly ever be identi?ed as observed variables. Statistical modelling has to take account of measurement - rors and invalidities in the observed variables and so address the underlying latent variables. Moreover, during the past decades it has been

widely agreed on that serious causal modelling should be based on longitudinal data. It is especially in the ?eld of longitudinal research and analysis, including panel research, that progress has been made in recent years. Many comprehensive panel data sets as, for example, on human development and voting behaviour have become available for analysis. The number of publications based on longitudinal data has increased immensely. Papers with causal claims based on cross-sectional data only experience rejection just for that reason.

Bayesian Structural Equation Modeling - Sarah Depaoli 2021-08-16
This book offers researchers a systematic and accessible introduction to using a Bayesian framework in structural equation modeling (SEM). Stand-alone chapters on each SEM model clearly explain the Bayesian form of the model and walk the reader through implementation. Engaging worked-through examples from diverse social science subfields illustrate the various modeling techniques, highlighting statistical or estimation problems that are likely to arise and describing potential solutions. For each model, instructions are provided for writing up findings for publication, including annotated sample data analysis plans and results sections. Other user-friendly features in every chapter include "Major Take-Home Points," notation glossaries, annotated suggestions for further reading, and sample code in both Mplus and R. The companion website (www.guilford.com/depaoli-materials) supplies data sets; annotated code for implementation in both Mplus and R, so that users can work within their preferred platform; and output for all of the book's examples.

Longitudinal Data Analysis - Professor Catrien C J H C J H Bijleveld 1998-10-26
By looking at the processes of change over time - by carrying out longitudinal studies - researchers answer questions about learning, development, educational growth, social change

and medical outcomes. However, longitudinal research has many faces. This book examines all the main approaches as well as newer developments (such as structural equation modelling, multilevel modelling and optimal scaling) to enable the reader to gain a thorough understanding of the approach and make appropriate decisions about which technique can be applied to the research problem. Conceptual explanations are used to keep technical terms to a minimum; examples are provided for each approach; issues of design, measurement and significance are considered; and a standard notation is used throughout.

Longitudinal Structural Equation Modeling - Jason T. Newsom 2015-06-19
This comprehensive resource reviews structural equation modeling (SEM) strategies for longitudinal data to help readers see which modeling options are available for which hypotheses. The author demonstrates how SEM is related to other longitudinal data techniques throughout. By exploring connections between models, readers gain a better understanding of when to choose one analysis over another. The book explores basic models to sophisticated ones including the statistical and conceptual underpinnings that are the building blocks of the analyses. Accessibly written, research examples from the behavioral and social sciences and results interpretations are provided throughout. The emphasis is on concepts and practical guidance for applied research rather than on mathematical proofs. New terms are highlighted and defined in the glossary. Figures are included for every model along with detailed discussions of model specification and implementation issues. Each chapter also includes examples of each model type, comment sections that provide practical guidance, model extensions, and recommended readings. Highlights include: Covers the major SEM approaches to longitudinal analysis in one resource. Explores connections between longitudinal SEM models

to enhance integration. Numerous examples that help readers match research questions to appropriate analyses and interpret results. Reviews practical issues related to model specification and estimation to reinforce connections. Analyzes continuous and discrete (binary and ordinal) variables throughout for breadth not found in other sources. Reviews key SEM concepts for those who need a refresher (Ch. 1). Emphasizes how to apply and interpret each model through realistic data examples. Provides the book's data sets at www.longitudinalsem.com along with the Mplus and R-lavaan syntax used to generate the results. Introduces the LISREL notation system used throughout (Appendix A). The chapters can be read out of order but it is best to read chapters 1 – 4 first because most of the later chapters refer back to them. The book opens with a review of latent variables and analysis of binary and ordinal variables. Chapter 2 applies this information to assessing longitudinal measurement invariance. SEM tests of dependent means and proportions over time points are explored in Chapter 3, and stability and change, difference scores, and lagged regression are covered in Chapter 4. The remaining chapters are each devoted to one major type of longitudinal SEM -- repeated measures analysis models, full cross-lagged panel models and simplex models, modeling stability with state-trait models, linear and nonlinear growth curve models, latent difference score models, latent transition analysis, time series analysis, survival analysis, and attrition. Missing data is discussed in the context of many of the preceding models in Chapter 13. Ideal for graduate courses on longitudinal (data) analysis, advanced SEM, longitudinal SEM, and/or advanced data (quantitative) analysis taught in the behavioral, social, and health sciences, this text also appeals to researchers in these fields. Intended for those without an extensive math background, prerequisites include familiarity

with basic SEM. Matrix algebra is avoided in all but a few places.

Longitudinal Structural Equation Modeling - Jason T. Newsom 2015-05-31
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