

Longitudinal Analysis Modeling Within Person Fluctuation And Change Multivariate Applications Series

Drawing from the authors' own work and from the most recent developments in the field, *Missing Data in Longitudinal Studies: Strategies for Bayesian Modeling and Sensitivity Analysis* describes a comprehensive Bayesian approach for drawing inference from incomplete data in longitudinal studies. To illustrate these methods, the authors employ several data sets throughout that cover a range of study designs, variable types, and missing data issues. The book first reviews modern approaches to formulate and interpret regression models for longitudinal data. It then discusses key ideas in Bayesian inference, including specifying prior distributions, computing posterior distribution, and assessing model fit. The book carefully describes the assumptions needed to make inferences about a full-data distribution from incompletely observed data. For settings with ignorable dropout, it emphasizes the importance of covariance models for inference about the mean while for nonignorable dropout, the book studies a variety of models in detail. It concludes with three case studies that highlight important features of the Bayesian approach for handling nonignorable missingness. With suggestions for further reading at the end of most chapters as well as many applications to the health sciences, this resource offers a unified Bayesian approach to handle missing data in longitudinal studies. *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.

A comprehensive collection of essays from leading experts on family and community engagement The *Wiley Handbook of Family, School, and Community Relationships in Education* brings together in one comprehensive volume a collection of writings from leading scholars on family and community engagement to provide an authoritative overview of the field. The expert contributors identify the contemporary and future issues related to the intersection of students' families, schools, and their communities. The Handbook's chapters are organized to cover the topic from a wide-range of perspectives and vantage points including families, practitioners, policymakers, advocates, as well as researchers. In addition, the Handbook contains writings from several international researchers acknowledging that school, family, and community partnerships is a vital topic for researchers and policymakers worldwide. The contributors explore the essential issues related to the policies and sociopolitical concerns, curriculum and practice, leadership, and the role of families and advocates. This vital resource: Contains a diverse range of topics related to the field Includes information on current research as well as the historical origins Projects the breadth and depth of the field into the future Fills a void in the current literature Offers contributions from leading scholars on family and community engagement Written for faculty and graduate students in education, psychology, and sociology, The *Wiley Handbook of Family, School, and Community Relationships in Education* is a comprehensive and authoritative guide to family and community engagement with schools.

Available online or as a 3-volume print set, this authoritative reference work contains more than 300 entries covering all aspects of the multi-disciplinary field of adult development and aging. Brings together concise, accurate summaries of classic topics as well as the most recent thinking and research in new areas Covers a broad range of issues, from biological and physiological changes in the body to changes in cognition, personality, and social roles to applied areas such as psychotherapy, long-term care, and end-of-life issues Includes contributions from major researchers, theorists, and methodologists from the academic and clinical realms A state-of-the-art reference work that is as essential for experts in the field as for students in the social sciences and humanities coming to the subject for the first time

Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence
Faiths in Green

Handbook of Research Methods for Studying Daily Life
Longitudinal Structural Equation Modeling

With Applications in R
A Latent State-Trait Perspective

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.

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 NL MIXED 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.

The book features many figures and tables illustrating longitudinal data and numerous homework problems. The associated web site contains many longitudinal data sets, examples of computer code, and labs to re-enforce the material. Weiss emphasizes continuous data rather than discrete data, graphical and covariance methods, and generalizations of regression rather than generalizations of analysis of variance.

First published Open Access under a Creative Commons license as *What is Quantitative Longitudinal Data Analysis?*, this title is now also available as part of the Bloomsbury Research Methods series. Across the social sciences, there is widespread agreement that quantitative longitudinal research designs offer analysts powerful scientific data resources. But, to date, many texts on analysing longitudinal social analysis surveys have been written from a statistical, rather than a social science data analysis perspective and they lack adequate coverage of common practical challenges associated with social science data analyses. This book provides a practical and up-to-date introduction to influential approaches to quantitative longitudinal data analysis in the social sciences. The book introduces definitions and terms, explains the relative attractions of such a longitudinal design, and offers an introduction to the main techniques of analysis, explaining their requirements, statistical properties and their substantive contribution.

Basic Concepts, Applications, and Programming, Third Edition

Applied Longitudinal Analysis

Modeling Longitudinal and Multilevel Data

Models for Intensive Longitudinal Data

Statistical Analysis

Missing Data in Longitudinal Studies

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.

Change is constant in everyday life. Infants crawl and then walk, children learn to read and write, teenagers mature in myriad ways, the elderly become frail and forgetful. Beyond these natural processes and events, external forces and interventions instigate and disrupt change: test scores may rise after a coaching course, drug abusers may remain abstinent after residential treatment. By charting changes over time and investigating whether and when events occur, researchers reveal the temporal rhythms of our lives. *Applied Longitudinal Data Analysis* is a much-needed professional book for empirical researchers and graduate students in the behavioral, social, and biomedical sciences. It offers the first accessible in-depth presentation of two of today's most popular statistical methods: multilevel models for individual change and hazard/survival models for event occurrence (in both discrete- and continuous-time). Using clear, concise prose and real data sets from published studies, the authors take you step by step through complete analyses, from simple exploratory displays that reveal underlying patterns through sophisticated specifications of complex statistical models. *Applied Longitudinal Data Analysis* offers readers a private consultation session with internationally recognized experts and represents a unique contribution to the literature on quantitative empirical methods. Visit <http://www.ats.ucla.edu/stat/examples/alda.htm> for: DT Downloadable data sets DT Library of computer programs in SAS, SPSS, Stata, HLM, MLwiN, and more DT Additional material for data analysis

The classic edition of *What If There Were No Significance Tests?* highlights current statistical inference practices. Four areas are featured as essential for making inferences: sound judgment, meaningful research questions, relevant design, and assessing fit in multiple ways. Other options (data visualization, replication or meta-analysis), other features (mediation, moderation, multiple levels or classes), and other approaches (Bayesian analysis, simulation, data mining, qualitative inquiry) are also suggested. The Classic Edition's new Introduction demonstrates the ongoing relevance of the topic and the charge to move away from an exclusive focus on NHST, along with new methods to help make significance testing more accessible to a wider body of researchers to improve our ability to make more accurate statistical inferences. Part 1 presents an overview of significance testing issues. The next part discusses the debate in which significance testing should be rejected or retained. The third part outlines various methods that may supplement significance testing procedures. Part 4 discusses Bayesian approaches and methods and the use of confidence intervals versus significance tests. The book concludes with philosophy of science perspectives. Rather than providing definitive prescriptions, the chapters are largely suggestive of general issues, concerns, and application guidelines. The editors allow readers to choose the best way to conduct hypothesis testing in their respective fields. For anyone doing research in the social sciences, this book is bound to become "must" reading. Ideal for use as a supplement for graduate courses in statistics or quantitative analysis taught in psychology, education, business, nursing, medicine, and the social sciences, the book also benefits independent researchers in the behavioral and social sciences and those who teach statistics.

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.

A Practical Guide

Strategies for Bayesian Modeling and Sensitivity Analysis

Modeling Change and Event Occurrence

Longitudinal Analysis

Modeling Within-Person Fluctuation and Change

Religion, Environmental Change, and Environmental Concern in the United States

In longitudinal studies it is often of interest to investigate how a marker that is repeatedly measured in time is associated with a time to an event of interest, e.g., prostate cancer studies where longitudinal PSA level measurements are collected in conjunction with the time-to-recurrence. *Joint Models for Longitudinal and Time-to-Event Data: With Applications in R* provides a full treatment of random effects joint models for longitudinal and time-to-event outcomes that can be utilized to analyze such data. The content is primarily explanatory, focusing on applications of joint modeling, but sufficient mathematical details are provided to facilitate understanding of the key features of these models. All illustrations put forward can be implemented in the R programming language via the freely available package JM written by the author. All the R code used in the book is available at: <http://jmr.r-forge.r-project.org/>

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.

Praise for the First Edition ". . . [this book] should be on the shelf of everyone interested in . . . longitudinal data analysis." —*Journal of the American Statistical Association* Features newly developed topics and applications of theanalysis of longitudinal data Applied Longitudinal Analysis, Second Edition presents modern methods for analyzing data from longitudinal studies and now features the latest state-of-the-art techniques. The book emphasizes practical, rather than theoretical, aspects of methods for the analysis of diverse types of longitudinal data that can be applied across various fields of study, from the health and medical sciences to the social and behavioral sciences. The authors incorporate their extensive academic and research experience along with various updates that have been made in response to reader feedback. The Second Edition features six newly added chapters that explore topics currently evolving in the field, including: Fixed effects and mixed effects models Marginal models and generalized estimating equations Approximate methods for generalized linear mixed effects models Multiple imputation and inverse probability weighted methods Smoothing methods for longitudinal data Sample size and power Each chapter presents methods in the setting of applications to data sets drawn from the health sciences. New problem sets have been added to many chapters, and a related website features sample programs and computer output using SAS, Stata, and R, as well as data sets and supplemental slides to facilitate a complete understanding of the material. With its strong emphasis on multidisciplinary applications and the interpretation of results, *Applied Longitudinal Analysis, Second Edition* is an excellent book for courses on statistics in the health and medical sciences at the upper-undergraduate and graduate levels. The book also serves as a valuable reference for researchers and professionals in the medical, public health, and pharmaceutical fields as well as those in social and behavioral sciences who would like to learn more about analyzing longitudinal data.

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.

Autoregressive Linear Mixed Effects Models
 Longitudinal Structural Equation Modeling with Mplus
 Multilevel and Longitudinal Modeling with IBM SPSS
 Structural Equation and Multilevel Modeling Approaches
 Methods and Applications of Longitudinal Data Analysis
 Intensive Longitudinal Methods

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

An in-depth, comprehensive and practical guide to egocentric network analysis, focusing on fundamental theoretical, research design, and analytic issues.

Drawing on the authors' extensive research in the analysis of categorical longitudinal data, Latent Markov Models for Longitudinal Data focuses on the formulation of latent Markov models and the practical use of these models. Numerous examples illustrate how latent Markov models are used in economics, education, sociology, and other fields. The R and MATLAB® routines used for the examples are available on the authors' website. The book provides you with the essential background on latent variable models, particularly the latent class model. It discusses how the Markov chain model and the latent class model represent a useful paradigm for latent Markov models. The authors illustrate the assumptions of the basic version of the latent Markov model and introduce maximum likelihood estimation through the Expectation-Maximization algorithm. They also cover constrained versions of the basic latent Markov model, describe the inclusion of the individual covariates, and address the random effects and multilevel extensions of the model. After covering advanced topics, the book concludes with a discussion on Bayesian inference as an alternative to maximum likelihood inference. As longitudinal data become increasingly relevant in many fields, researchers must rely on specific statistical and econometric models tailored to their application. A complete overview of latent Markov models, this book demonstrates how to use the models in three types of analysis: transition analysis with measurement errors, analyses that consider unobserved heterogeneity, and finding clusters of units and studying the transition between the clusters.

Longitudinal data analysis for biomedical and behavioral sciences This innovative book sets forth and describes methods for the analysis of longitudinal data, emphasizing applications to problems in the biomedical and behavioral sciences. Reflecting the growing importance and use of longitudinal data across many areas of research, the text is designed to help users of statistics better analyze and understand this type of data. Much of the material from the book grew out of a course taught by Dr. Hedeker on longitudinal data analysis. The material is, therefore, thoroughly classroom tested and includes a number of features designed to help readers better understand and apply the material. Statistical procedures featured within the text include: * Repeated measures analysis of variance * Multivariate analysis of variance for repeated measures * Random-effects regression models (RRM) * Covariance-pattern models * Generalized-estimating equations (GEE) models * Generalizations of RRM and GEE for categorical outcomes Practical in their approach, the authors emphasize the applications of the methods, using real-world examples for illustration. Some syntax examples are provided, although the authors do not generally focus on software in this book. Several datasets and computer syntax examples are posted on this title's companion Web site. The authors intend to keep the syntax examples current as new versions of the software programs emerge. This text is designed for both undergraduate and graduate courses in longitudinal data analysis. Instructors can take advantage of overheads and additional course materials available online for adopters. Applied statisticians in biomedicine and the social sciences can also use the book as a convenient reference.

What If There Were No Significance Tests?

Modeling Longitudinal Data

A Comprehensive Introduction

Joint Models for Longitudinal and Time-to-Event Data

The Wiley Blackwell Encyclopedia of Adulthood and Aging, 3 Volume Set

Cognitive Diagnostic Assessment for Learning

This second edition has been completely revised and expanded to become the most up-to-date and thorough professional reference text in this fast-moving area of biostatistics. It contains an additional two chapters on fully parametric models for discrete repeated measures data and statistical models for time-dependent predictors.

Item response theory (IRT) has moved beyond the confines of educational measurement into assessment domains such as personality, psychopathology, and patient-reported outcomes. Classic and emerging IRT methods and applications that are revolutionizing psychological measurement, particularly for health assessments used to demonstrate treatment effectiveness, are reviewed in this new volume. World renowned contributors present the latest research and methodologies about these models along with their applications and related challenges. Examples using real data, some from NIH-PROMIS, show how to apply these models in actual research situations. Chapters review fundamental issues of IRT, modern estimation methods, testing assumptions, evaluating fit, item banking, scoring in multidimensional models, and advanced IRT methods. New multidimensional models are provided along with suggestions for deciding among the family of IRT models available. Each chapter provides an introduction, describes state-of-the-art research methods, demonstrates an application, and provides a summary. The book addresses the most critical IRT conceptual and statistical issues confronting researchers and advanced students in psychology, education, and medicine today. Although the chapters highlight health outcomes data the issues addressed are relevant to any content domain. The book addresses: IRT models applied to non-educational data especially patient reported outcomes Differences between cognitive and non-cognitive constructs and the challenges these bring to modeling. The application of multidimensional IRT models designed to capture typical performance data. Cutting-edge methods for deriving a single latent dimension from multidimensional data A new model designed for the measurement of constructs that are defined on one end of a continuum such as substance abuse Scoring individuals under different multidimensional IRT models and item banking for patient-reported health outcomes How to evaluate measurement invariance, diagnose problems with response categories, and assess growth and change. Part 1 reviews fundamental topics such as assumption testing, parameter estimation, and the assessment of model and person fit. New, emerging, and classic IRT models including modeling multidimensional data and the use of new IRT models in typical performance measurement contexts are examined in Part 2. Part 3 reviews the major applications of IRT models such as scoring, item banking for patient-reported health outcomes, evaluating measurement invariance, linking scales to a common metric, and measuring growth and change. The book concludes with a look at future IRT applications in health outcomes measurement. The book summarizes the latest advances and critiques foundational topics such as multidimensionality, assessment of fit, handling non-normality, as well as applied topics such as differential item functioning and multidimensional linking. Intended for researchers, advanced students, and practitioners in psychology, education, and medicine interested in applying IRT methods, this book also serves as a text in advanced graduate courses on IRT or measurement. Familiarity with factor analysis, latent variables, IRT, and basic measurement theory is assumed.

This book is unique in its focus on showing students in the behavioral sciences how to analyze longitudinal data using R software. The book focuses on application, making it practical and accessible to students in psychology, education, and related fields, who have a basic foundation in statistics. It provides explicit instructions in R computer programming throughout the book, showing students exactly how a specific analysis is carried out and how output is interpreted.

Faiths in Green examines how the relationship between religious upbringing, affiliation, disaffiliation, and environmental concern in the United States has changed over time. Public opinion data combined with historical insights show how and why religious groups have constructively responded to environmental change across generations.

Egocentric Network Analysis

Foundations, Methods, and Models

The Wiley Handbook of Family, School, and Community Relationships in Education

Modeling Contextual Effects in Longitudinal Studies

Analysis of Longitudinal Data

A Practical Guide for Researchers in Aging, Health, and Social Sciences

The investigation of change has fascinated researchers for generations, and to do it well, they must have longitudinal data. This text instructs readers in the methodologies at their disposal, including both individual growth modelling and survival analysis.

This practical introduction to second-order and growth mixture models using Mplus introduces simple and complex techniques through incremental steps. The authors extend latent growth curves to second-order growth curve and mixture models and then combine the two. To maximize understanding, each model is presented with basic structural equations, figures with associated syntax that highlight what the statistics mean, Mplus applications, and an interpretation of results. Examples from a variety of disciplines demonstrate the use of the models and exercises allow readers to test their understanding of the techniques. A comprehensive introduction to confirmatory factor analysis, latent growth curve modeling, and growth mixture modeling is provided so the book can be used by readers of various skill levels. The book's datasets are available on the web. Highlights include: -Illustrative examples using Mplus 7.4 include conceptual figures, Mplus program syntax, and an interpretation of results to show readers how to carry out the analyses with actual data. -Exercises with an answer key allow readers to practice the skills they learn. -Applications to a variety of disciplines appeal to those in the behavioral, social, political, educational, occupational, business, and health sciences. -Data files for all the illustrative examples and exercises at www.routledge.com/9781138925151 allow readers to test their understanding of the concepts. -Point to Remember boxes aid in reader comprehension or provide in-depth discussions of key statistical or theoretical concepts. Part 1 introduces basic structural equation modeling (SEM) as well as first- and second-order growth curve modeling. The book opens with the basic concepts from SEM, possible extensions of conventional growth curve models, and the data and measures used throughout the book. The subsequent chapters in part 1 explain the extensions. Chapter 2 introduces conventional modeling of multidimensional panel data, including confirmatory factor analysis (CFA) and growth curve modeling, and its limitations. The logical and theoretical extension of a CFA to a second-order growth curve, known as curve-of-factors model (CFM), are explained in Chapter 3. Chapter 4 illustrates the estimation and interpretation of unconditional and conditional CFMs. Chapter 5 presents the logical and theoretical extension of a parallel process model to a second-order growth curve, known as factor-of-curves model (FCM). Chapter 6 illustrates the estimation and interpretation of unconditional and conditional CFMs. Part 2 reviews growth mixture modeling including unconditional growth mixture modeling (Ch. 7) and conditional growth mixture models (Ch. 8). How to extend second-order growth curves (curve-of-factors and factor-of-curves models) to growth mixture models is highlighted in Chapter 9. Ideal as a supplement for use in graduate courses on (advanced) structural equation, multilevel, longitudinal, or latent variable modeling, latent growth curve and mixture modeling, factor analysis, multivariate statistics, or advanced quantitative techniques (methods) taught in psychology, human development and family studies, business, education, health, and social sciences, this book's practical approach also appeals to researchers. Prerequisites include a basic knowledge of intermediate statistics and structural equation modeling.

The Oxford Handbook of Quantitative Methods in Psychology provides an accessible and comprehensive review of the current state-of-the-science and a one-stop source for learning and reviewing current best-practices in a quantitative methods across the social, behavioral, and educational sciences.

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 Markov Models for Longitudinal Data

Research Methods

Quantitative Longitudinal Data Analysis

Higher-Order Growth Curves and Mixture Modeling with Mplus

Growth Modeling

Structural Equation Modeling With AMOS

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).

Bringing together leading authorities, this unique handbook reviews the breadth of current approaches for studying how people think, feel, and behave in everyday environments, rather than in the laboratory. The volume thoroughly describes experience sampling methods, diary methods, physiological measures, and other self-report and non-self-report tools that allow for repeated, real-time measurement in natural settings. Practical guidance is provided to help the reader design a high-quality study, select and implement appropriate methods, and analyze the resulting data using cutting-edge statistical techniques. Applications across a wide range of psychological subfields and research areas are discussed in detail.

This book provides a new analytical approach for dynamic data repeatedly measured from multiple subjects over time. Random effects account for differences across subjects. Auto-regression in response itself is often used in time series analysis. In longitudinal data analysis, a static mixed effects model is changed into a dynamic one by the introduction of the auto-regression term. Response levels in this model gradually move toward an asymptote or equilibrium which depends on covariates and random effects. The book provides relationships of the autoregressive linear mixed effects models with linear mixed effects models, marginal models, transition models, nonlinear mixed effects models, growth curves, differential equations, and state space representation. State space representation with a modified Kalman filter provides log likelihoods for maximum likelihood estimation, and this representation is suitable for unequally spaced longitudinal data. The extension to multivariate longitudinal data analysis is also provided. Topics in medical fields, such as response-dependent dose modifications, response-dependent dropouts, and randomized controlled trials are discussed. The text is written in plain terms understandable for researchers in other disciplines such as econometrics, sociology, and ecology for the progress of interdisciplinary research.

This bestselling text provides a practical guide to structural equation modeling (SEM) using the Amos Graphical approach. Using clear, everyday language, the text is ideal for those with little to no exposure to either SEM or Amos. The author reviews SEM applications based on actual data taken from her own research. Each chapter "walks" readers through the steps involved (specification, estimation, evaluation, and post hoc modification) in testing a variety of SEM models. Accompanying each application is: an explanation of the issues addressed and a schematic presentation of hypothesized model structure; Amos input and output with interpretations; use of the Amos toolbar icons and pull-down menus; and data upon which the model application was based, together with updated references pertinent to the SEM model tested. Thoroughly updated throughout, the new edition features: All new screen shots featuring Amos Version 23. Descriptions and illustrations of Amos' new Tables View format which enables the specification of a structural model in spreadsheet form. Key concepts and/or techniques that introduce each chapter. Alternative approaches to model analyses when enabled by Amos thereby allowing users to determine the method best suited to their data. Provides analysis of the same model based on continuous and categorical data (Ch. 5) thereby enabling readers to observe two ways of specifying and testing the same model as well as compare results. All applications based on the Amos graphical mode interface accompanied by more "how to" coverage of graphical techniques unique to Amos. More explanation of key procedures and analyses that address questions posed by readers All application data files are available at www.routledge.com/9781138797031. The two introductory chapters in Section 1 review the fundamental concepts of SEM methodology and a general overview of the Amos program. Section 2 provides single-group analyses applications including two first-order confirmatory factor analytic (CFA) models, one second-order CFA model, and one full latent variable model. Section 3 presents multiple-group analyses applications with two rooted in the analysis of covariance structures and one in the analysis of mean and covariance structures. Two models that are increasingly popular with SEM practitioners, construct validity and testing change over time using the latent growth curve, are presented in Section 4. The book concludes with a review of the use of bootstrapping to address non-normal data and a review of missing (or incomplete) data in Section 5. An ideal supplement for graduate level courses in psychology, education, business, and social and health sciences that cover the fundamentals of SEM with a focus on Amos, this practical text continues to be a favorite of both researchers and practitioners. A prerequisite of basic statistics through regression analysis is recommended but no exposure to either SEM or Amos is required.

Longitudinal Data Analysis

An Introduction to Diary and Experience Sampling Research

The Oxford Handbook of Quantitative Methods in Psychology: Vol. 2

Handbook of Item Response Theory Modeling

Longitudinal Data Analysis for the Behavioral Sciences Using R

Applications to Typical Performance Assessment

By charting changes over time and investigating whether and when events occur, researchers reveal the temporal rhythms of our lives.

First Published in 2012. Routledge is an imprint of Taylor & Francis, an informa company.

This book demonstrates how to use multilevel and longitudinal modeling techniques available in the IBM SPSS mixed-effects program (MIXED). Annotated screen shots provide readers with a step-by-step understanding of each technique and navigating the program. Readers learn how to set up, run, and interpret a variety of models. Diagnostic tools, data management issues, and related graphics are introduced throughout. Annotated syntax is also available for those who prefer this approach. Extended examples illustrate the logic of model development to show readers the rationale of the research questions and the steps around which the analyses are structured. The data used in the text and syntax examples are available at www.routledge.com/9780415817110. Highlights of the new edition include: Updated throughout to reflect IBM SPSS Version 21. Further coverage of growth trajectories, coding time-related variables, covariance structures, individual change and longitudinal experimental designs (Ch.5). Extended discussion of other types of research designs for examining change (e.g., regression discontinuity, quasi-experimental) over time (Ch.6). New examples specifying multiple latent constructs and parallel growth processes (Ch. 7). Discussion of alternatives for dealing with missing data and the use of sample weights within multilevel data structures (Ch.1). The book opens with the conceptual and methodological issues associated with multilevel and longitudinal modeling, followed by a discussion of SPSS data management techniques which facilitate working with multilevel, longitudinal, and cross-classified data sets. Chapters 3 and 4 introduce the basics of multilevel modeling: developing a multilevel model, interpreting output, and trouble-shooting common programming and modeling problems. Models for investigating individual and organizational change are presented in chapters 5 and 6, followed by models with multivariate outcomes in chapter 7. Chapter 8 provides an illustration of multilevel models with cross-classified data structures. The book concludes with ways to expand on the various multilevel and longitudinal modeling techniques and issues when conducting multilevel analyses. Ideal as a supplementary text for graduate courses on multilevel and longitudinal modeling, multivariate statistics, and research design taught in education, psychology, business, and sociology, this book 's practical approach also appeals to researchers in these fields. The book provides an excellent supplement to Heck & Thomas 's An Introduction to Multilevel Modeling Techniques, 2nd Edition; however, it can also be used with any multilevel and/or longitudinal modeling book or as a stand-alone text.

This insightful and comprehensive Handbook explores the concept of start-up incubation ecosystems, investigating the various factors that interact to provide a nurturing environment suitable for the successful development of start-ups and illustrating the critical part this plays within entrepreneurial ecosystems. Chapters include literature reviews, theoretical studies, and empirical research featuring both quantitative and qualitative methods, using data from a range of countries analyzed by an international team of authors.

Practical Issues, Applied Approaches, and Specific Examples

Classic Edition

Research Handbook on Start-Up Incubation Ecosystems

Applied Longitudinal Data Analysis

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.