

# **Longitudinal Data Analysis**

**Donald Hedeker, Robert D. Gibbons** 

#### **Longitudinal Data Analysis:**

Applied Longitudinal Data Analysis Judith D. Singer, John B. Willett, 2003-03-27 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 Downloadable data sets Library of computer programs in SAS SPSS Stata HLM MLwiN and more Additional material for data analysis Quantitative Longitudinal Data Analysis Vernon Gayle, Paul Lambert, 2020-12-10 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 Longitudinal Data Analysis Garrett Fitzmaurice, Marie Davidian, Geert Verbeke, Geert Molenberghs, 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 **Applied Longitudinal Data Analysis for Medical Science** Jos W. R. Twisk.2023-04-27 Essential for non statisticians and researchers working with longitudinal data from medical studies this updated new edition discusses the most important techniques available for analysing data of this type Using non technical

language the book explores simple methods such as the paired t test and summary statistics as well as more sophisticated regression based methods including mixed model analysis The emphasis of the discussion lies in the interpretation of the results of these different methods covering data analysis with continuous dichotomous categorical and other outcome variables Datasets used throughout the book are provided enabling readers to re analyse the examples as they make their way through chapters and improve their understanding of the material Finally an extensive and practical overview of and comparison between different software packages is provided Readers will be able to use this book as a practical manual in their everyday work without needing a strong background in statistics Analysis of Longitudinal Data Peter Diggle, Patrick Heagerty, Kung-Yee Liang, Scott Zeger, 2013-03-14 The first edition of Analysis for Longitudinal Data has become a classic Describing the statistical models and methods for the analysis of longitudinal data it covers both the underlying statistical theory of each method and its application to a range of examples from the agricultural and biomedical sciences The main topics discussed are design issues exploratory methods of analysis linear models for continuous data general linear models for discrete data and models and methods for handling data and missing values Under each heading worked examples are presented in parallel with the methodological development and sufficient detail is given to enable the reader to reproduce the author's results using the data sets as an appendix This second edition published for the first time in paperback provides a thorough and expanded revision of this important text It includes two new chapters the first discusses fully parametric models for discrete repeated measures data and the second explores statistical models for time dependent predictors

Applied Longitudinal Analysis Garrett M. Fitzmaurice, Nan M. Laird, James H. Ware, 2012-10-23 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 the analysis 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 Analysis Jason Newsom, Richard N. Jones, Scott M. Hofer, 2013-06-19 This book provides accessible treatment to state of the art approaches to analyzing longitudinal studies Comprehensive coverage of the most popular analysis tools allows readers to pick and choose the techniques that best fit their research The analyses are illustrated with examples from major longitudinal data sets including practical information about their content and design Illustrations from popular software packages offer tips on how to interpret the results Each chapter features suggested readings for additional study and a list of articles that further illustrate how to implement the analysis and report the results Syntax examples for several software packages for each of the chapter examples are provided at www psypress com longitudinal data analysis Although many of the examples address health or social science questions related to aging readers from other disciplines will find the analyses relevant to their work In addition to demonstrating statistical analysis of longitudinal data the book shows how to interpret and analyze the results within the context of the research design The methods covered in this book are applicable to a range of applied problems including short to long term longitudinal studies using a range of sample sizes The book provides non technical practical introductions to the concepts and issues relevant to longitudinal analysis Topics include use of publicly available data sets weighting and adjusting for complex sampling designs with longitudinal studies missing data and attrition measurement issues related to longitudinal research the use of ANOVA and regression for average change over time mediation analysis growth curve models basic and advanced structural equation models and survival analysis An ideal supplement for graduate level courses on data analysis and or longitudinal modeling taught in psychology gerontology public health human development family studies medicine sociology social work and other behavioral social and health sciences this multidisciplinary book will also appeal to researchers in these fields A Primer in Longitudinal Data Analysis Toon W Taris, 2000-05-25 The author has done a remarkable job of writing a very accessible introduction to a broad literature As such he should be congratulated on achieving his objective to provide the ideal primer for this growing area of social research Kwantitatieve Methoden This accessible introduction to the theory and practice of longitudinal research takes the reader through the strengths and weaknesses of this kind of research making clear how to design a longitudinal study how to collect data most effectively how to make the best use of statistical techniques and how to interpret results Although the book provides a broad overview of the field the focus is always on the practical issues arising out of longitudinal research This book supplies the student with all that they need to get started and acts as a manual for dealing with opportunities and pitfalls It is the ideal primer for this growing area of social research Applied

**Longitudinal Data Analysis for Epidemiology** Jos W. R. Twisk, 2013-05-09 A practical guide to the most important techniques available for longitudinal data analysis essential for non statisticians and researchers Longitudinal Data *Analysis* Donald Hedeker, Robert D. Gibbons, 2006-05-12 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

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