

Linear Mixed Models: A Practical Guide Using Statistical Software, Second Edition

By Brady T. West, Kathleen B. Welch, Andrzej T Galecki



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Highly recommended by *JASA*, *Technometrics*, and other journals, the first edition of this bestseller showed how to easily perform complex linear mixed model (LMM) analyses via a variety of software programs. **Linear Mixed Models: A Practical Guide Using Statistical Software, Second Edition** continues to lead readers step by step through the process of fitting LMMs. This second edition covers additional topics on the application of LMMs that are valuable for data analysts in all fields. It also updates the case studies using the latest versions of the software procedures and provides up-to-date information on the options and features of the software procedures available for fitting LMMs in SAS, SPSS, Stata, R/S-plus, and HLM.

New to the Second Edition

- A new chapter on models with crossed random effects that uses a case study to illustrate software procedures capable of fitting these models
- Power analysis methods for longitudinal and clustered study designs, including software options for power analyses and suggested approaches to writing simulations
- Use of the lmer() function in the lme4 R package
- New sections on fitting LMMs to complex sample survey data and Bayesian approaches to making inferences based on LMMs
- Updated graphical procedures in the software packages
- Substantially revised index to enable more efficient reading and easier location of material on selected topics or software options
- More practical recommendations on using the software for analysis
- A new R package (WWGbook) that contains all of the data sets used in the examples

Ideal for anyone who uses software for statistical modeling, this book eliminates the need to read multiple software-specific texts by covering the most popular software programs for fitting LMMs in one handy guide. The authors illustrate the models and methods through real-world examples that enable comparisons of model-fitting options and results across the software procedures.

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Editorial Review

Review

"I can recommend the book even for owners of the first edition. ... I can highly recommend this book for all readers who are interested in having a quick reference guide for various procedures regarding LMMs at hand. It covers a lot of different situations in which LMMs are applied and it shows the use of the most commonly used software packages in all of these different settings." *?Biometrical Journal*, 2015

"... a broad and accessible reference of linear models. The authors did an excellent job making substantial revisions in this edition. ... The literature review is relevant and thorough for low-dimensional cases. The chapters are nicely structured, well presented, and motivated. ... The main strength of the book is that it offers many numerical examples that are based on real data sets emerging from a host of research. ... equally attractive to practitioners, graduate students, and researchers." *?Technometrics*, February 2015

Praise for the First Edition:

"... a good overview of the main types or variants of LMMs available. Furthermore, the book also gives a very well-balanced treatment to five mainstream software packages used to fit the LMMs used in each example. The treatment of the examples is done in a rather thorough way, very useful for practitioners. This book is thus highly recommended to all those who are mainly interested in learning how to fit a specific LMM to their data or willing to learn what kinds of data and for what kind of situations LMMs may be fit and adequate. It may also be a very good starting point for those willing to get a more in-depth knowledge of LMMs ... a very useful manual for the application of LMMs, which will contribute beyond any doubt to the development of work in this and related areas."

?Carlos A. Coelho and Abel M. Rodrigues, Journal of Statistical Theory and Practice, 2012

"In this book the authors take on the herculean task of demonstrating how to perform complex LMM analyses with five programs: HLM, R/S–PLUS, SAS, SPSS, and Stata. It is much more than a software manual; through the use of excellent introductory material and details given throughout, it provides a solid introduction to LMM analysis. ... Software-oriented books can quickly become dated, but the [book's] website http://www-personal.umich.edu/~bwest/almmussp.html appears to keep up with new developments ... this book is a tremendous contribution to the field of applied mixed modeling. It is much more than a software manual. It is well organized, has minimal typographical errors, and contains a complete index. It could easily serve as a reference guide. Anyone working with LMMs should seriously consider obtaining this book."

?Technometrics, May 2009, Vol. 51, No. 2

"... the book is very useful for the well-informed practitioner, who wants to fit LMMs and needs to make a choice about the specific statistical software to use." *Biometrical Journal*, Vol. 51, 2009

"... useful to someone who wanted to understand the process of setting up, conducting, and evaluating a mixed model analysis. West et al. [is] appropriate for a researcher with problems where model selection is a major component of the analysis. ... would also be useful to a practicing statistician who is familiar with

mixed models and wishes to use a new statistical package." *Biometrics*, December 2008

"This text is a most welcome addition to the literature on regression models. ... It is one of those rare texts with no glaring omissions or obvious shortcomings. The book consolidates syntax germane to LMMs for most major software packages, obviating the need to consult multiple platform-specific texts. Most importantly, the material is presented in an easy-to-read, sensibly organized fashion ... a must buy for the applied statistician and researcher alike."

?Gregory E. Gilbert, Journal of the American Statistical Association

"I commend this book to anyone who is using software for statistical modelling, either for a detailed account of specific linear models or an exemplar of how to gather the information to compare software." *Journal of the Royal Statistical Society*

"... a good reference for any practicing statisticians and researchers who want a basic introduction to the topic ... also useful for researchers who need to compare their analysis to existing works done using different software packages. Because the basic concept is well summarized and presented through examples and tables ... I would recommend this textbook as a special topic for teaching an advanced undergraduate or introductory graduate course on linear models." *?Journal of Quality Technology*

"... an excellent first course in the theory and methods of linear mixed models ... also provides a thorough and up-to-date guide through the major software applications for linear mixed models, namely, Stata, SAS, R, SPSS, and HLM. Each of five middle chapters highlights a different software package and teaches you the basics of fitting mixed models therein. Tables comparing each package show the results obtained from fitting identical models, If you wish to fit linear mixed models, whether in Stata or elsewhere, we recommend this text."

?Stata Technical Group

About the Author

Statistical Software Consultant at the University of Michigan. She has over 10 years experience using SAS software and has developed and continues to teach several SAS software courses along with providing SAS technical support for the University.

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Michael Davis:

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Iva Simmon:

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