Book review

Linear-Mixed Models—A Practical Guide Using Statistical Software, *Second Edition*. B. T. West, K. B. Welch, and A. T. Galecki. (2015). Boca Raton, FL: Taylor and Francis/CRC Press. 440 pages, ISBN-10: 1466560991, ISBN-13: 978–1466560994.

Over the last decades, the use of linear-mixed models (LMMs), also termed multilevel models or hierarchical linear models, has become a very important approach to fit longitudinal and hierarchical data. Therefore, they gained a lot of attention from both theorists and practitioners, which led to a multitude of available literature. As examples of recommendable textbooks on the theory of LMMs I would like to mention McCulloch et al. (2011) and Raudenbush and Bryk (2002).

The aim of the present book is to demonstrate the application of the software packages SAS, R, SPSS, Stata, and HLM in the analysis of LMMs. Consequently, the target group clearly is practitioners who have to use computer software for fitting LMMs. After providing a brief overview of the theoretical background in Chapter 2, the authors explain in Chapters 3–8 the use of each software package in various special cases of LMMs, for example two- and three-level models or models for clustered longitudinal data. Although they show the use of each software package in all these different cases, they do put the focus on a different software package in each chapter, that is in Chapters 3 and 4, they emphasize SAS and R, respectively, and so forth. The chapters are structured in such a way that the reader can follow each chapter without any knowledge of the others. This underlines the intention to write more of a handbook than a cohesive textbook. For a more detailed summary of the content, we refer to the review of the first edition by Czado (2009).

New to this second edition are a whole chapter on models for data with crossed random factors and new subsections on power analysis and the fitting of LMMs to complex survey data. Moreover, the authors compare the new *lmer* function in R to the well-known *lme* function in the respective case analyses.

Since this book is mainly about the use of statistical software, the authors also bring the introduced examples up to date. Therefore, I can recommend the book even for owners of the first edition.

My personal impression of this book is very positive. It perfectly fulfills the need of readers who are looking for a quick reference to all kinds of situations in which LMMs might be used as the underlying model. Especially the extensive use of well-arranged tables makes it easy to compare different methods quickly and to decide which one to use. In that regard, I also appreciate that the authors always indicate the source code being used, thereby, enabling the reader to apply that method instantly. Additionally, I very much like the fact that it covers a lot of software packages rather extensively and that in each chapter the focus is on a different kind of software. In that way the reader can develop a good feeling for each of these packages. It also means that the book is suitable for a wide range of practitioners.

In conclusion, 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. However, the reader should be aware that it only contains a brief exposition of the theory of LMMs.

References

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