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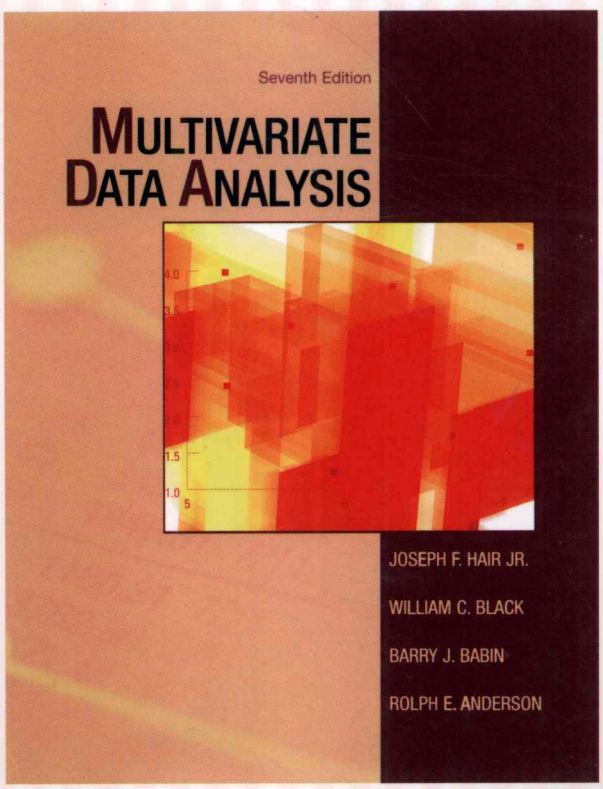
多元数据分析

Multivariate Data Analysis (Seventh Edition)

（英文版 · 第7版）



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本书版权登记号：图字：01-2011-1452

图书在版编目（CIP）数据

多元数据分析（英文版·第 7 版）/（美）海尔（Hair, J. F.）等著. —北京：机械工业出版社，2011.5
（华章统计学原版精品系列）
书名原文：Multivariate Data Analysis, Seventh Edition

ISBN 978-7-111-34198-7

I. 多…　II. 海…　III. 多元分析－英文　IV. O212.4

中国版本图书馆 CIP 数据核字（2011）第 069142 号

机械工业出版社（北京市西城区百万庄大街 22 号　邮政编码　100037）
责任编辑：迟振春
北京京北印刷有限公司印刷
2011 年 6 月第 1 版第 1 次印刷
186mm × 240mm • 51.5 印张
标准书号：ISBN 978-7-111-34198-7
定价：109.00 元

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PREFACE

More than 30 years ago when the first edition of *Multivariate Data Analysis* was published, we could not have imagined the applications of multivariate statistics would be as pervasive as they are today. During this time, we have seen phenomenal changes in the environment faced by both academic and applied researchers. First, developing technology has provided desktop analytical capabilities that no one could have anticipated just a few years ago. In a little more than 3 decades, we have gone from punch cards to speech recognition, revolutionizing the way we can interact with and use computers and information. At the same time, we have seen tremendous advances in statistical software, particularly in its ease of use, ranging from completely integrated computer packages such as SPSS and SAS to specialized programs for such techniques as neural networks and conjoint analysis. Today, researchers can find almost any conceivable technique in an accessible, easy-to-use format and often at a reasonable price.

On the statistical front, we have seen widespread application of new techniques, such as structural equation modeling and partial least squares. These advances, however, have been matched by an ever-increasing need for more analytical capability and better metrics. The information explosion has not only challenged our ability to physically handle and analyze the available information, but also required a reassessment of data analysis approaches. Finally, the complexity of the topics being addressed and the increased role of theory and measurement in research design have combined to require more rigorous and sophisticated techniques to perform the necessary confirmatory analyses.

These events have all contributed to the acceptance of the past six editions of this text and the demand for this 7th edition. In approaching this revision, we have tried to embrace both academic and applied researchers with a presentation strongly grounded in statistical techniques, but focusing on design, estimation, and interpretation. We continually strive to reduce our reliance on statistical notation and terminology and instead to identify the fundamental concepts which affect application of these techniques and then express them in simple terms—the result being an applications-oriented introduction to multivariate analysis for the non-statistician. Our commitment remains to provide a firm understanding of the statistical and managerial principles underlying multivariate analysis so as to develop a "comfort zone" not only for the statistical but also the practical issues involved.

NEW FEATURES

First, the authors are continuously working to simplify and streamline coverage of the techniques, and the 7th edition is no exception. This edition is shorter and simpler in its organization, with chapters focusing on a single topic. Moreover, all chapters have been revised to incorporate advances in technology, and several chapters have undergone more extensive change. For example, the initial discussion of topics focuses on a basic understanding of a technique and how to apply it. More advanced issues and concerns are addressed either later in the chapter or in a separate chapter, such as with structural equations modeling. Two chapters, cluster analysis and conjoint, were extensively revised to more effectively demonstrate straightforward approaches to obtain solutions.

Metrics increasingly are relied upon in both scholarly and business applications. This edition updates and expands coverage of important metrics, such as power and effect size. Based on much positive feedback, the "Rules of Thumb" for the application and interpretation of the various techniques have been expanded in this edition, including important issues like sample size. The rules of thumb are highlighted throughout the chapters to facilitate their use. We are confident these guidelines will facilitate your utilization of the techniques.

Another major change is the expansion and reorganization in coverage of structural equations modeling. Chapter 11 provides an overview of structural equation modeling. Chapter 12 then focuses on confirmatory factor analysis, issues in estimating and testing structural models, and advanced topics in both confirmatory factor analysis and structural equations modeling, such as testing higher-order factor models, group models, moderating and mediating variables and PLS. We also worked to eliminate and minimize the use of technical terms and mathematical and statistical notation that often is confusing. These chapters provide a comprehensive overview and explanation of this technique.

Special thanks are due to Pei-ju Lucy Ting and Hsin-Ju Stephanie Tsai, both from University of Manchester, for the revision of the chapter on canonical correlation analysis (Chapter 5). They updated this chapter with an example using the HBAT database, added recently published material, and reorganized it to facilitate understanding.

An important development is the expansion of a Web site (www.mvstats.com) devoted to multivariate analysis, titled "Great Ideas in Teaching Multivariate Statistics." This Web site acts as a resource center for individuals interested in multivariate analysis, providing links to resources for each technique as well as a forum for identifying new topics or statistical methods. In this way, we can provide more timely feedback to researchers other than if they were to wait for a new edition of the book. The Web site also represents a clearinghouse for materials on teaching multivariate statistics, including exercises, datasets, and project ideas.

Each of these changes, and others not mentioned, will assist readers in gaining a more thorough understanding of both the statistical and applied issues underlying these techniques.

ACKNOWLEDGMENTS

We would like to acknowledge the assistance of the following individuals on prior editions of the text: Bruce Alford, Louisiana Tech University; David Andrus, Kansas State University; Jill Attaway, Illinois State University; Jim Boles, Georgia State University; David Booth, Kent State University; Alvin C. Burns, Louisiana State University; Alan J. Bush, University of Memphis; Robert Bush, Louisiana State University at Alexandria; Rabikar Chatterjee, University of Michigan; Kerri Curtis, Golden Gate University; Chaim Ehrman, University of Illinois at Chicago; Joel Evans, Hofstra University; Thomas L. Gillpatrick, Portland State University; Andreas Herrman, University of St. Gallen; Dipak Jain, Northwestern University; Stavros Kalafatis, Kingston University; John Lastovicka, University of Kansas; Margaret Liebman, La Salle University; Arthur Money, Henley Management College; Peter McGoldrick, University of Manchester; Richard Netemeyer, University of Virginia; Ossi Pesamaa, Jonkoping University; Robert Peterson, University of Texas; Torsten Pieper, Kennesaw State University; Scott Roach, Northeast Louisiana University; Phillip Samouel, Kingston University; Marcus Schmidt, Copenhagen Business School; Muzaffar Shaikh, Florida Institute of Technology; Dan Sherrell, University of Memphis; Walter A. Smith, Tulsa University; Goren Svensson, University of Oslo; Ronald D. Taylor, Mississippi State University; Jerry L. Wall, University of Louisiana-Monroe; and Arch Woodside, Boston College. Hans Eibe Sørensen, University of Southern Denmark; Koo Rijkema, Eindhoven University of Technology; James Sallis, Uppsala Universitet; Iain Weir, University of the West of England.

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