Conducting & Reading Research in Kinesiology

CONDUCTING & READING RESEARCH

in Kinesiology

Fifth Edition







CONDUCTING & READING RESEARCH IN KINESIOLOGY, FIFTH EDITION

Published by McGraw-Hill, a business unit of The McGraw-Hill Companies, Inc., 1221 Avenue of the Americas, New York, NY, 10020. Copyright © 2013 by The McGraw-Hill Companies, Inc. All rights reserved. Printed in the United States of America. Previous editions © 2006, 2002, and 1998. No part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written consent of The McGraw-Hill Companies, Inc., including, but not limited to, in any network or other electronic storage or transmission, or broadcast for distance learning.

Some ancillaries, including electronic and print components, may not be available to customers outside the United States.

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 0 DOC/DOC 1 0 9 8 7 6 5 4 3 2

ISBN: 978-0-07-802255-5 MHID: 0-07-802255-X

Vice President and Editor-in-Chief: Michael Ryan

Publisher: David Patterson

Sr. Sponsoring Editor: William J. Minick
Developmental Editor: Darlene M. Schueller
Marketing Coordinator: Colleen Havens
Project Manager: Jolynn Kilburg

Buyer: Nicole Baumgartner

Design Coordinator: Margarite Reynolds

Cover Design: Studio Montage, St. Louis, Missouri Cover Image Credit: Design Pics / Tim Antoniuk

Media Project Manager: Sridevi Palani Compositor: Aptara®, Inc.

Typeface: 10/12 Times LT Std Printer: RR Donnelley

Library of Congress Cataloging-in-Publication Data

Baumgartner, Ted A.

Conducting & reading research in kinesiology / Ted A. Baumgartner, Larry

D. Hensley.-5th ed.

p.; cm.

Rev. ed. of: Conducting & reading research in health and human performance / Ted A. Baumgartner, Larry

D. Hensley. 4th ed. c2006.

Includes bibliographical references and index.

ISBN 978-0-07-802255-5 (alk. paper)—ISBN 0-07-802255-X (alk. paper)

I. Hensley, Larry D. (Larry Duncan), 1948- II. Baumgartner, Ted A.

Conducting and reading research in health and human performance. III. Title.

[DNLM: 1. Research. W 20.5]

610'.72-dc23

2012005930

The Internet addresses listed in the text were accurate at the time of publication. The inclusion of a website does not indicate an endorsement by the authors or McGraw-Hill, and McGraw-Hill does not guarantee the accuracy of the information presented at these sites.

About the Authors

Ted A. Baumgartner earned his undergraduate degree in physical education from Oklahoma State University, his master's degree in physical education from Southern Illinois University—Carbondale, and his doctorate from the University of Iowa. He was on the faculty at Indiana University from 1967 to 1977, teaching measurement courses and statistics courses. Since 1977 he has been a professor at the University of Georgia teaching measurement courses, statistics courses, and introduction to research courses. Dr. Baumgartner is a co-author of the book *Measurement for Evaluation in Physical Education and Exercise Science*, 8th edition. He started the journal *Measurement in Physical Education and Exercise Science* and was the first editor of the journal. Dr. Baumgartner is a member of the National Academy of Kinesiology.

Larry D. Hensley earned his undergraduate degree in physical education from Southern Methodist University, his master's degree from Indiana University, and his doctorate from the University of Georgia. Dr. Hensley is an Emeritus Professor in the School of Health, Physical Education, and Leisure Services (HPELS) at the University of Northern Iowa. He was a Distinguished Visiting Professor at the U.S. Military Academy at West Point from 1999 to 2000 and served as an Advisory Professor at the Hong Kong Institute of Education in 2004. Dr. Hensley has authored numerous articles, chapters, and monographs in the areas of applied measurement and exercise science and has taught research methods, measurement, and statistics courses for more than 30 years.

Dedication

This edition of the book is dedicated to Dr. Clint Strong. He taught Introduction to Research Techniques in the School of Health, Physical Education, Recreation, and Dance at Indiana University for many years. His lecture notes and course packet were the basis for the first edition of this book (Baumgartner and Strong 1994). Dr. Strong edited the chapters of the book he wrote when the book was revised for the second edition (Baumgartner and Strong 1998). Larry Hensley, one of Dr. Strong's former master's students, was added as a co-author for the third edition of the book (Baumgartner, Strong, and Hensley 2002). There is still a sizable amount of material in the present edition of the book that originated with Dr. Clint Strong.

Preface

This book was developed based on the methods its authors have used to teach the master's-level introduction to research course for many years. One author has taught an upper-level undergraduate course numerous times. It is assumed that students come to this course with varied backgrounds in areas related to kinesiology. This book is specifically designed for students studying exercise science, physical education, sport management, and related areas. The two major objectives of our courses are to teach students how to conduct their own research and how to read with understanding the research that others have done. The book is comprehensive yet practical and understandable. Many examples of the application of various research methods and techniques commonly used in kinesiology are presented in an attempt to increase students' grasp of the research process.

Many students begin the introduction to research course with little research background, little interest in research, and considerable fear about their ability to succeed in the course. These students may not write a master's thesis. However, it is still important that they develop an appreciation for research and an understanding of how different types of research are conducted so they will become good consumers and readers of the research of others. The book is written with this type of student in mind.

Other students begin the introduction to research course knowing they will write a master's thesis or complete a master's project. These students need to be aware of the many possible research approaches and the procedures that are basic to many types of research. This book will also serve the needs of this type of student.

Doctoral students and beginning researchers who want an overview of the research process should find this book helpful. However, the procedures and techniques specific to a certain type of research in a specialized area are generally not covered in this book.

In Chapter 2 we suggest that a research project begins with the identification of a research topic and progresses through a series of steps until the research is conducted and a report describing the research project is written. The book's chapters are organized in this manner. The first seven chapters are essential to cover. Portions of Chapters 8 through 12 may be covered quickly if only certain types of research are of interest to the student. Likewise, some of the content in Chapters 13 through 17 could be omitted depending on the particular interests and needs of the students.

The three chapters on experimental research, descriptive research, and qualitative research cover the common research approaches in kinesiology. The two statistics chapters are inclusive but are presented with an orientation toward practical use and without emphasis on calculational ability. The computer programs accompanying the statistics chapters are presented with considerable explanation and use of examples. Even the emphasis on doing and understanding research is somewhat unique in this book.

CHANGES TO THE FIFTH EDITION

The fifth edition of *Conducting & Reading Research in Kinesiology* builds upon the strengths of previous editions, with updated material and pedagogical changes designed to increase accuracy in content and clarity in presentation.

Changed Title

The title of the book has been changed from Conducting & Reading Research in Health and Human Performance to Conducting & Reading Research in Kinesiology. This change was made in recognition of the growing acceptance of the term kinesiology to reflect the discipline that serves as the foundation for a number of professional and academic fields of study, such as physical education, exercise and sport science, human performance, and sport management, in particular. The change in title enables the authors to more specifically focus the fifth edition toward research practices and studies that are commonplace in kinesiology and to provide examples that are more meaningful for kinesiology students.

Revised Organization

In order to better reflect the sequence of steps in the research process, the chapter "Reading and Evaluating Research Reports" (now Chapter 4) has been moved nearer the beginning of the book and now follows immediately the chapter "Reviewing the Literature." This reflects the authors' belief that students should begin reading the scientific literature in their chosen area early in the research process and be able to make an informed judgment about the quality of the research being reported. A revised Chapter 3, "Reviewing the Literature," emphasizes the process involved in searching the scientific literature and offers a detailed sequence of steps for conducting a database search. In keeping with the changed title and the focus on research in kinesiology, Chapter 12 now includes sections specifically on historical research and action research.

Updated and Expanded Content

Throughout the fifth edition, the authors have retained pedagogical features, such as *chapter objectives*, *chapter-ending summaries*, *marginal glossary*, and *integrated examples*, that characterized previous editions of the book. The authors have replaced examples of many dated studies with newer, up-to-date studies. All chapters have been revised and modernized, discussions have been updated, and examples now focus exclusively on research in kinesiology.

In Chapter 1, a figure is added that is designed to help the reader conceptualize how research may build the body of knowledge for a field of study. A brief historical perspective on research in the kinesiology field is included.

In order to better reflect published research in the field and provide clarity on the topic, Chapter 2 includes a revised discussion on the purpose of a research study and how to frame the purpose statement in a research report.

Chapter 3, "Reviewing the Literature," has been completely rewritten to emphasize the process involved in searching, reading, and documenting the scientific literature. Particular attention has been given to conducting a database search and using the Internet.

In order to better reflect the actual steps in the research process and to provide students with a framework for reading scholarly articles, "Reading and Evaluating Research Reports" has been relocated as Chapter 4. Many new examples taken from published research studies are included.

Chapter 5, "Developing the Research Plan," builds upon the basic framework for conducting a research study by including detailed information concerning data collection. A completely updated and revised section on measurement techniques, including new examples of various scales commonly used in kinesiology research, is provided.

Chapter 6, "Ethical Concerns in Research," provides a historical perspective on misconduct in scientific research that led to the establishment of ethical principles and regulations related to research practices. Current regulatory guidelines for the protection of research participants as well as detailed information about obtaining informed consent, complete with an informed consent template, are included.

Guest author Jennifer Waldron has completely rewritten Chapter 10, "Qualitative Research." The author emphasizes the interpretive or constructivist paradigm in qualitative research and explains the six traditions of qualitative research. Numerous new examples of qualitative studies found in kinesiology research are presented throughout the chapter. Methods of data collection are emphasized and the author provides many helpful hints based on her own research.

Chapter 12, "Historical Research and Action Research," has been substantially revised. The chapter now includes sections on Historical Research and Action Research, while dropping information on epidemiological research, single participant research, and creative research. The Action Research section is new and reflects the growing trend toward practitioner research in kinesiology.

Data analysis discussions in Chapters 13 and 14 have been updated to match the newest version of SPSS software. A revised Appendix A offers updated instructions for using the newest version of SPSS.

Chapters 16 and 17, "Developing the Research Proposal" and "Writing the Research Report," have been updated with more recent examples from student theses or published articles.

ANCILLARIES

SPSS

Sites where the most recent version of SPSS can be leased for a modest fee are identified in Chapter 13. SPSS empowers students to reach the in-depth answers that come only from using advanced analytical techniques.

McGraw-Hill Create™



Craft your teaching resources to match the way you teach! With McGraw-Hill Create, you can easily rearrange chapters, combine material from other content sources, and quickly upload content you have written like your course syllabus or teaching notes. Find the content you need in Create by searching through thousands of leading McGraw-Hill textbooks. Arrange your book to fit your teaching style. Create even allows you to personalize your book's appearance by selecting the cover and adding your name, school, and course information. Order a Create book and you'll receive a complimentary print review copy in 3–5 business days or a complimentary electronic review copy (eComp) via email in minutes. Go to www.mcgrawhillcreate.com today and register to experience how McGraw-Hill Create empowers you to teach *your* students *your* way.

Electronic Textbook Option

This text is offered through CourseSmart for both instructors and students. CourseSmart is an online resource where students can purchase the complete text online at almost half the cost of a traditional text. Purchasing the eTextbook allows students to take advantage of CourseSmart's web tools for learning, which include full text search, notes and highlighting, and email tools for sharing notes between classmates. To learn more about CourseSmart options, contact your sales representative or visit www.CourseSmart.com.

Instructor's Resources

Instructors's resources to accompany the fifth edition of the book include an Instructor's Manual, a test question bank, and PowerPoint slides. These resources may be downloaded from the Instructor's Resource website at www.mhhe.com/baumgartner5e.

ACKNOWLEDGMENTS

This book is the product of the influence of many people and occurrences. First, the professors who trained and educated the authors must be recognized. Second, the research experiences of the authors have been influential. Third, the experience of teaching the introduction to research course at both the undergraduate and graduate level and the feedback from students in the course are reflected in the book.

Thanks must be expressed to the people in the profession who have reviewed this book and suggested improvements:

FOR THE FIFTH EDITION

Charles D. Sands III Samford University

John T. Foley State University of New York, Cortland

Joseph Kwame Mintah Azusa Pacific University

Katherine M. Polasek State University of New York, Cortland

Megan Babkes Stellino University of Northern Colorado

FOR PREVIOUS EDITIONS

Stan Bassin California State University, Pomona

Thomas Chandler Marshall University Mary L. Dawson

Western Michigan University, Kalamazoo

James M. DiNucci

Stephen F. Austin State University

Mark Huntington

Manchester College

Mark Kelley

Southeastern Louisiana University

Beverly Mitchell

Kennesaw State College

Greg Payne

San Jose State University

Steve Sanders

Tennessee Technological University

Kurt A. Stahura

Arkansas State University

Donna J. Terbizan

North Dakota State University

Kesia Walker

Dillard University

Reuben L. Wright

Prairie View A&M University

Special appreciation goes to Jennifer Waldron, Ph.D., of the University of Northern Iowa, who wrote Chapter 10, "Qualitative Research."

In addition, thanks go to the editors at McGraw-Hill Higher Education, who improved the manuscript considerably.

Finally, the authors must thank their wives and families for allowing them the time to write the book. Adjustments and sacrifices were necessary by all in order for the book to be completed.

T.A.B. L.D.H.

Contents in Brief

Meta-analysis 215

Research 224

Historical Research and Action

Part One The Research Process 2

The Nature and Purpose of Research 4

Understanding the Research Process 29

Preface xix

2

11

3	Reviewing the Literature 50	15 Measurement in Research 320	
4	Reading and Evaluating Research Reports 67	Part Four Writing and Reporting 342	
6		16 Developing the Research Proposal 344	
,	Selection of Research Participants: Sampling Procedures 139	17 Writing the Research Report 363	
Pa	art Two Types of Research 154	Appendix A SPSS for Windows Basics A-1 Appendix B Critical Values of t A-16	
8	Experimental Research 156	Appendix C Critical Values of F A-18	
9	Descriptive Research 177	Appendix D Critical Values of Chi-Square A-26	
10	Qualitative Research 197	Glossary G-1	
11		References R-1	

13

14

Index I-1

Part Three Data Analysis 248

Descriptive Data Analysis 250

Inferential Data Analysis 276

Contents

Preface xix

Part One The Research Process 2

1 The Nature and Purpose of Research 4

The Essence of a Profession: Knowledge 5 Research: The Knowledge Pipeline 6 The Search for Knowledge 8 The Scientific Method 10 Science, Research, and Theory Types of Research 16 Basic and Applied Research 16 Quantitative and Qualitative Research 18 Experimental Research and Nonexperimental Research 20 Experimental Research 21 Causal-Comparative Research 21 Descriptive Research 23 Correlational Research 24 Historical Research 25 The Significance of Research in Kinesiology 25 Summary of Objectives 28

2 Understanding the Research Process 29

Steps in the Research Process 29 Selecting the Question 32

200	-	

Types of Research Questions Descriptive Questions Difference Questions 35 Relationship Questions 35 Defining the Problem 36 Purpose of the Study 38 Delimitations 40 Limitations 41 Assumptions 42 The Concept of Variables 43 Quantitative and Qualitative Variables 43 Discrete Variables 44 Continuous Variables 44 Independent and Dependent Variables 44 Extraneous Variables 46 Control of Variables Random Selection of Research Participants Equating or Matching by Some Criterion 48 Excluding the Variable 48 Summary of Objectives 49

3 Reviewing the Literature 50

The Importance of Reviewing the Literature 51
Sources of Literature 52
Periodicals 54
Searching the Literature 56
Conducting a Database Search 56
Searching the Internet 60
Internet Search Utilities 61
Evaluating Information on the Web 63
Reading and Documenting the Research Literature 64
Summary of Objectives 66

4 Reading and Evaluating Research Reports 67

Preliminary Information 68
Introduction 71
Methods 72
Research Participants 73
Instrumentation 73
Procedures 76
Results 78
Discussion 79

References and Appendix 85
Critiquing a Research Article 85
Criteria 86
Evaluating the Research Report 89
Summary of Objectives 90

5 Developing the Research Plan 91

Selecting the Research Approach 91 Hypotheses 93 Data-Collecting Methods and Techniques 96 Observation Techniques 97 Direct Observation 97 Participant Observation 97 Measurement Techniques 98 Physical Measures 98 Cognitive Measures 99 Affective Measures 99 Likert Scale 100 Semantic Differential Scale 101 Rating Scale 102 Structured-Alternative Scale 103 Questioning Techniques 104 Structured Ouestionnaire 104 Unstructured Questionnaire 105 Structured Interview 105 Unstructured Interview 106 Focus Group Interview 106 Delphi Technique 107 Getting Honest Answers 107 Selecting the Appropriate Method and Instrument 108 Data-Collecting Instruments 108 Selecting the Research Instrument Revising the Instrument 110 Instrument Development 110 Summary of Objectives 112

6 Ethical Concerns in Research 114

The Basis of Ethics in Research 115
Nazi Germany Experimentation during
World War II 115
Tuskegee Syphilis Study 116
Regulation of Research and Protection of Research Participants 117

Informed Consent 122
Privacy and Confidentiality 128
Research Involving Animals 130
Institutional Review Boards 130
Disclosure of Research Findings 135
Summary of Objectives 138

7 Selection of Research Participants: Sampling Procedures 139

Population and Sample 140
Random Processes 142
Sample Selection Methods 142
Probability Sampling 143
Simple Random Sampling 143
Stratified Random Sampling 144
Systematic Sampling 145
Cluster Sampling 146
Nonprobability Sampling 147
Purposive Sampling 148
Convenience Sampling 148
Sample Size 149
Summary of Objectives 153

Part Two Types of Research 154

8 Experimental Research 156

Procedure in Experimental Research 157
Internal and External Validity 160
Controlling Threats to Validity 161
Threats to Internal Validity 161
History 161
Maturation 161
Testing 162
Instrumentation 162
Statistical Regression 162
Selection 163
Experimental Mortality 163
Interaction of Selection and Maturation or History 163
Threats to External Validity 163

Interaction Effect of Testing 163 Interaction Effects of Selection Bias and Experimental Treatment 164 Reactive Effects of Experimental Setting 164 Multiple-Treatment Interference 164 Types of Designs 164 Validity in Summary 168 Methods of Control 169 Common Sources of Error Hawthorne Effect 172 Placebo Effect 172 "John Henry" Effect 173 Rating Effect 173 Experimenter Bias Effect 174 Participant-Researcher Interaction Effect 174 Post Hoc Error 175 Measurement in Experimental Research 175 Summary of Objectives 175

9 Descriptive Research 177

Types of Descriptive Research 178 Survey 178 Developmental 178 Case Study 179 Correlational 179 Normative 180 Observational 181 Action 181 Causal-Comparative 181 Survey Research 182 Preliminary Considerations in Planning a Survey 183 Survey Methods 183 Phone Interview 183 Personal Interview 184 Administered Questionnaire 184 Distributed Questionnaire 185 **Questionnaire** Development 186 Questionnaire Format 188 Ouestionnaire Distribution 189 Questionnaire Return 191 Ouestionnaire Examples 191 Ouestionnaire Summary 195 Summary of Objectives 195