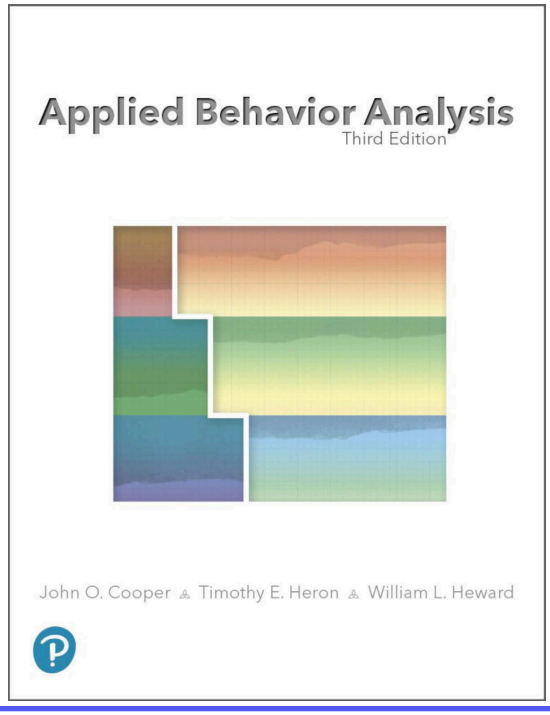


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ABOUT THE AUTHORS



Photo credit: Jill C. Dardig.

Tim Heron (left), John Cooper (center), and Bill Heward (right)

John Cooper, Tim Heron, and Bill Heward were faculty members at The Ohio State University for a combined 90 years. Together they trained special education classroom teachers and leadership personnel guided by the philosophical, scientific, and technological principles of applied behavior analysis. The Ph.D. program in special education and applied behavior analysis that they and their colleagues developed at OSU was the first doctoral program accredited by the Association for Behavior Analysis International. John, Tim, and Bill each received the Alumni Award for Distinguished Teaching, OSU's highest honor for teaching excellence. They are joint recipients of the Ellen P. Reese Award for Communication of Behavioral Concepts from the Cambridge Center for Behavioral Studies.

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PREFACE

As it was 17 years ago, when we began writing the previous edition of this book, our overriding goal for the third edition was to produce an accurate, comprehensive, and contemporary description of applied behavior analysis. The result is a text that demands concentrated and serious study.

Despite its size, scope, and in-depth treatment of concepts, principles, procedures, and issues, *Applied Behavior Analysis, Third Edition*, should be viewed as an introductory text for two reasons. First, the reader need not possess any specialized prerequisite knowledge to understand the content. Second, attaining a full understanding of applied behavior analysis requires considerable study and guided experience beyond this text. There is no topic presented within these pages that has not been treated in greater depth elsewhere. Students of applied behavior analysis should build upon what they learn from this book by reading other sources. How much reading is needed to fully grasp and appreciate applied behavior analysis? Don Baer (2005), one of the co-founders of applied behavior analysis, estimated that

> [T]he cost of knowing well the basic principles and paradigms of the theoretical and experimental aspects of behavior analysis would require about 2,000 pages and some laboratory experience. ABA shares the same basic principles with the theoretical and experimental branches of behavior analysis and adds to them an even larger number of secondary principles, strategies, and tactics for making those basic principles work in the real world as they do in the laboratory. ABA also adds a set of principles about ethical and humane practice, prominent among which is the need to be certain, through constant and extensive measurement and experimentation, that the particular case in hand is going well and will continue to go well—because it will change as it progresses. The cost of knowing all that is, I estimate, about 3,000 pages of reading and several years of supervised practical experience. (pp. 27–28)

The field has grown markedly since its formal inception in 1968, so much so that Baer's 3000-page reading assignment might now exceed 4000 pages, or more. We trust that this book's 800-plus pages will contribute to Baer's reading assignment for many future behavior analysts. Specific suggestions for additional readings in applied behavior analysis and in the conceptual and basic research branches of behavior analysis are cited throughout this text.

Again, while our objective is to provide a complete description of the principles and procedures for changing and analyzing socially important behavior, mastery of this book's content represents the beginning, not the end, of one's study of applied behavior analysis. If our efforts as textbook writers and chapter contributors, combined with those of instructors who assign this book, are successful, the dedicated student will come away with a sound repertoire of fundamental knowledge about applied behavior analysis. In turn, this knowledge will serve as the foundation for more advanced study and supervised practica that ultimately will lead to independent efforts to change and understand behavior that are scientifically sound, socially significant, and ethically appropriate.

TERMINOLOGY

Meaningful description of any scientific activity necessitates a standard set of technical terms. Effectively communicating the design, implementation, outcomes, and/or theoretical bases of an applied behavior analysis requires the accurate use of the discipline's terminology. Throughout this text, we have made every effort to define and use behavior analytic terminology in a conceptually systematic and consistent manner. Mastering the specialized vocabulary of applied behavior analysis is an important initial step in embracing the science and participating effectively as a researcher, practitioner, or consumer. We encourage students to study the field's terminology with diligence. Toward that end, the third edition includes a glossary of more than 500 technical terms and concepts.

REFERENCES, EXTRACTS, FOOTNOTES, AND GRAPHS

An important function of any introductory text to a scientific discipline is to expose students to the empirical and conceptual literature of that field. This edition contains more than 2700 citations to primary-source publications, including historically important experiments (e.g., the first graph presented by B. F. Skinner in his 1938 book *The Behavior of Organisms*), and classic and contemporary examples of applied behavior analysis research—most of which were published in the field's flagship journal, the *Journal of Applied Behavior Analysis*. We also make extensive use of quotations and extracts from key publications representing the conceptual literature. We have done this not only for the historical and/or technical authority these authors provide, but also because their inclusion increases students' exposure to and appreciation for the field's rich primary-source literature.

The third edition includes more than 150 graphs of data from peer-reviewed research, many of which are accompanied by detailed descriptions of the study's methodology. We have a fourfold purpose for providing many procedures, graphs, and references. First, we want to illustrate behavior analysis principles and procedures with actual applications and real data, not hypothetical examples. Second, reading the procedural descriptions will help students appreciate the high degree of technical precision and control of complex environments that researchers and practitioners must achieve to solve problems and show functional relations between variables. Third, the references provide students whose interests are piqued by the descriptions or graphs with directions to the original studies for more in-depth study. Finally, the graphs provide multiple opportunities for students to develop and refine—through practice and discussion with their instructors, mentors, and fellow students—higher-level visual analysis skills.

THIRD EDITION CONTENT ENHANCEMENTS AND FEATURES

Applied behavior analysis has become more mature and sophisticated since the second edition was published. Although the basic principles of behavior remain unchanged, advances in all three interrelated domains of the science of behavior—theoretical, basic research, and applied research—have improved our understanding of those principles and led to increased effectiveness in developing and applying effective and humane behavior change interventions. These developments are reflected in the more than 1,000 new references to the conceptual, basic, and applied literatures of behavior analysis added to this edition.

Chapters by Outstanding Authors

The third edition includes seven chapters authored by prominent scholars in applied behavior analysis. This group of contributors includes the current and two former editors of the *Journal of Applied Behavior Analysis,* two previous editors of *The Analysis of Verbal Behavior,* and associate editors of the *Journal of the Experimental Analysis of Behavior*. Members of this well-known and prolific group of behavior analysts first reported some of the most significant advances in behavior analysis in publications.

Negative Reinforcement

In Chapter 12, Negative Reinforcement, Rick Smith and Brian Iwata present an authoritative account of this commonly misunderstood and misapplied form of reinforcement. In addition to precisely defining this principle, dispelling misconceptions about it, and illustrating applications across a broad spectrum of cases, Smith and Iwata provide specific guidelines for incorporating negative reinforcement into behavior change interventions.

Motivation

Until recently, motivation, a major topic in psychological theories and everyday explanations of behavior, has been an assumed, but inadequately understood, topic in behavior analysis. Due largely to the work of Jack Michael, behavior analysts now have a much better understanding of motivation and its role within applied behavior analysis. In Chapter 16, Motivating Operations, Jack Michael and Caio Miguel explain how certain antecedent events have dual motivating effects: a behavior-altering effect, which makes certain behaviors more (or less) likely; and a value-altering effect, which makes certain events more (or less) effective as reinforcement.

Verbal Behavior

In Chapter 18, Verbal Behavior, Mark Sundberg contrasts B. F. Skinner's functional analysis of verbal behavior with traditional approaches to language, defines and gives examples of basic types of elementary verbal operants (e.g., mands, tacts, intraverbals), and describes implications and applications for these concepts in designing and implementing language intervention programs.

Equivalence-based Instruction

In Chapter 19, Equivalence-based Instruction, Carol Pilgrim builds upon Sidman's groundbreaking research on stimulus equivalence to explain the conditions in which learners acquire new skills and verbal relations without direct instruction on those skills. Pilgrim defines equivalence-based instruction, describes its key outcomes—class formation, delayed emergence, class expansion and class merger, transfer of function, and contextual control—and shows how lessons can be designed to promote those outcomes.

Nonequivalence Relations

In Chapter 20, Engineering Emergent Learning with Nonequivalence Relations, Tom Critchfield and Ruth Anne Rehfeldt explain how people make sense of and function effectively in a world of arbitrary relations in which stimuli "go together," not because they share physical properties, but rather because social-verbal reinforcement contingencies teach people to relate them in a certain way. Relational frame theory (RFT) and acceptance and commitment therapy (ACT), a therapeutic approach grounded in RFT, are described.

Functional Behavior Assessment

In Chapter 27, Functional Behavior Assessment, Stephanie Peterson and Nancy Neef describe one of the more significant developments in applied behavior analysis. Functional behavior assessment has become a well-established method for discovering the function that a problem behavior serves for a person (e.g., to obtain social attention, to avoid an assigned task, to provide sensory stimulation), information that enables practitioners to design interventions that teach adaptive replacement behaviors that serve the same function.

Ethics

In Chapter 31, Ethical and Professional Responsibilities of Applied Behavior Analysts, Tom Freeman, Linda LeBlanc, and Jose Martinez-Diaz clarify what ethical behavior is, explain why ethical behavior is a necessary part of the applied behavior analyst's repertoire, review ethical codes of conduct for behavior analysts, and describe specific procedures for ensuring and assessing ethical practice. New content regarding client services (e.g., informed consent, conflict of interest) and, importantly, ethical implications of new technologies, social media, and professional networking to support ethical behavior is presented.

Text Content Related to the Behavior Analyst Certification Board® BCBA® & BCABA® Behavior Analyst Task List© Fifth Edition

The Behavior Analyst Certification Board® (BACB®) is a nonprofit corporation established in 1998 to meet professional credentialing needs identified by behavior analysts, governments, and consumers of behavior analysis services. To be certified as a Board Certified Behavior Analyst® (BCBA®) or a Board Certified Assistant Behavior Analyst® (BCaBA®), a person must meet academic-degree, educational, and practical-experience eligibility requirements and then pass a psychometrically

sound examination. The BCBA and BCaBA examinations are based on the *BCBA/BCaBA Task List* (5th ed.; BACB, 2017a), which was developed by 16 subject matter experts and subsequently content validated through a survey of more than 6000 BACB certificants (BACB, 2017b). The complete *BCBA/BCaBA Task List* (5th ed.) is printed inside the front and back covers of this text.

We have connected the content of this text to the tasks that the BACB determined are necessary to function as an entry-level behavior analyst. A chart at the beginning of each chapter identifies which Task List items are covered within that chapter. Due to the complex nature of applied behavior analysis, in which the concepts and principles and their application are interrelated and not easily or effectively presented in a linear fashion, some Task List items are covered in more than one chapter. Students studying for BCBA and BCaBA examinations can look up key words from Task List items in the Subject Index to identify the page numbers where relevant information about each item in the *BCBA/BCaBA Task List* (5th ed.) can be found.

This text presents the basic knowledge that a qualified behavior analyst must possess. Although mastering this content will help you obtain a passing score on the BCBA or BCaBA examinations, two important qualifiers must be recognized. First, the BCBA and BCaBA examinations require knowledge beyond that included in this, or any, single textbook. Therefore, to further prepare for the examinations we encourage students to study original sources, engage in supervised practica, and discuss areas of personal interest with trusted and competent mentors. Second, no matter how accurate, extensive, and current this textbook may be, and no matter how thoroughly a student masters its content, he or she will not be fully qualified to function as a behavior analyst. Successful completion of the required coursework in behavior analysis is but one step in the preparation to become a BCBA or a BCaBA. For the most recent information on the BACB requirements, visit the Behavior Analyst Certification Board's website at www.BACB.com.

Behavior Analyst Certification Board. (2017a). *BCBA/BCaBA task list (5th ed.).* Littleton, CO: Author.

Behavior Analyst Certification Board. (2017b, January). *BACB newsletter.* https://www.bacb.com/wp-content/uploads/170113-newsletter.pdf

TEXT ORGANIZATION AND STRUCTURE

The book's 31 chapters are organized into 13 parts. The two chapters in Part 1 describe some tenets that are fundamental to all scientific endeavors, outline a history of behavior analysis as a natural science approach to understanding behavior, define applied behavior analysis, and describe principles and concepts of that science. Parts 2 and 3 examine the elements necessary for an applied behavior analysis. Part 2 presents considerations, criteria, and procedures for selecting, defining, and measuring *applied behavior.* The five chapters in Part 3 examine the logic and operation of specific tactics for the experimental *analysis* of behavior–environment relations, and some issues in planning, replicating, and evaluating analyses of behavior.

The seven chapters in Parts 4 through 6 explore the two most significant principles of behavior—reinforcement and punishment; how antecedent events alter one's motivation to respond; and how behavior comes under the discriminative control of environmental conditions. Part 7 is a detailed examination of B. F. Skinner's analysis of verbal behavior and its implications and applications for language development. The five chapters in Part 8 describe how applied behavior analysts use equivalence-based instruction, nonequivalence relations, imitation, modeling, observational learning, shaping, and chaining to develop new skills and patterns of behavior from simple to complex.

Part 9 details how problem behaviors can be decreased with nonpunishment interventions: extinction, differential reinforcement, and antecedent interventions. Part 10 describes functional behavioral assessment, sophisticated methods for determining the purpose that problem behavior serves for a person, and important information that leads to the design of treatments that replace the problem behavior with adaptive alternative behavior serving the same function.

Part 11 describes four special applications of behavior change technology: token economy, contingency contracting, group contingencies, and self-management. Part 12 outlines strategies and tactics for increasing the likelihood that efforts to change behavior yield generalized outcomes: behavior changes that maintain across time, occur in appropriate settings and situations beyond the training setting, and spread to other useful behaviors. The book's final part describes ethical and professional responsibilities of behavior analysts, ethical implications of new technologies, social media, and professional networking.

SUPPLEMENTS AND RESOURCES FOR STUDENTS AND INSTRUCTORS

Instructor's Resource Manual and Test Bank (ISBN 0-13-481312X)

An Instructor's Resource Manual includes suggestions for learning activities, additional Experiencing Firsthand exercises, supplementary lectures, case study analyses, discussion topics, group activities, and additional media resources. The *Test Bank* that accompanies this text contains both multiple-choice and essay questions. Some items (lower-level questions) simply ask students to identify or explain concepts and principles they have learned. But many others (higher-level questions) ask students to apply those same concepts and principles to specific classroom situations—that is, to actual student behaviors and teaching strategies.

Powerpoint® Slides (ISBN 0-13-4752643)

The PowerPoint slides include key concept summarizations, diagrams, and other graphic aids to enhance learning. They are designed to help students understand, organize, and remember core concepts and theories.

Acknowledgments

The third edition of *Applied Behavior Analysis* is the product of the collective and cumulative efforts of many people. Although space limitations prevent us from thanking everyone by name, we would like to acknowledge those who made substantial contributions to the book's content or production during the 3 years we spent revising the text. First and foremost, we are deeply grateful to the authors of the seven contributed chapters: Rick Smith and Brian Iwata (Negative Reinforcement); Jack Michael and Caio Miguel (Motivating Operations); Mark Sundberg (Verbal Behavior); Carol Pilgrim (Equivalence-based Instruction); Tom Critchfield and Ruth Anne Rehfeldt (Engineering Emergent Learning with Nonequivalence Relations); Stephanie Peterson and Nancy Neef (Functional Behavior Assessment); and Tom Freeman, Linda LeBlanc, and Jose Martinez-Diaz (Ethical and Professional Responsibilities of Applied Behavior Analysts). Because of their efforts, third edition readers will be introduced to important topics in applied behavior analysis by scholars whose research has helped to define and develop those areas.

We thank the Behavior Analyst Certification Board (BACB) for allowing us to integrate the Behavior Analyst Certification Board® BCBA/BCaBA Task List (5th ed.) throughout the revised edition of our text. We are especially grateful to Jim Carr, Chief Executive Officer of the Behavior Analyst Certification Board. Jim graciously continued the arrangement with the BACB we first developed with Jerry Shook for the second edition.

In-depth reviews of the second edition by Jan Montgomery (Florida Institute of Technology), Bethany Raiff (Rowan University), Corey Robertson (Florida Institute of Technology), Tina Sidener (Caldwell University), and Carlos A. Zuluaga (Florida Institute of Technology) offered helpful recommendations for improvement that we incorporated into this edition. The third edition is also enhanced by input and assistance from the following colleagues: Bill Ahearn (New England Center for Children), Sheila Alber-Morgan (The Ohio State University), Nikolay Alipov (Russian National Investigation Medical University), Fernando Armendariz (FABA, Inc.), Judah Axe (Simmons College), Vince Carbone (The Carbone Clinic), Sharon Chien (SEEK), Darlene Crone-Todd (Salem University), Alyce Dickinson (Western Michigan University), Anca Dumitrescu (ATCA, Romania), Ronnie Dietrich (Wing Institute), Tim Hackenberg (Reed College), Louis Hagopian (Kennedy Krieger Institute), Rob Holdsambeck (Cambridge Center for Behavioral Studies), Mickey Keenan (Ulster University, Northern Ireland), Tracy Kettering (Bancroft), Jonathan Kimball (private practice, Maine), Moira Konrad (The Ohio State University), Douglas Kostewicz (University of Pittsburgh), Rick Kubina (Penn State University), Ed Morris (University of Kansas), Dave Palmer (Smith College), Robert Ross (Beacon ABA Services), Hank Schlinger (California State University, Los Angeles), Majda Seuss (Association for Behavior Analysis International), and Janet Twyman (Center for Innovations in Learning).

Turning more than 2500 pages of manuscript into the book you are holding required the support and contributions of a talented team of publishing professionals at Pearson. Copy editor Joanne "Bonnie" Boehme's talent in turning rough prose into clear and understandable text is evident on every page. The bumpy spots that remain are our responsibility. Production Editor Clara Bartunek and Content Producer Janelle Rogers worked closely and patiently with us throughout. Ann Castel Davis, our former editor, was instrumental in convincing us to tackle this edition. We are grateful to Ann and to Director and Publisher Kevin Davis, for their long-standing commitment not only to this title but also to publishing books on behavior analysis and evidence-based practices in special education.

Last, but certainly not least, among those we wish to acknowledge for important and continuing contributions to the "White Book" is Keith "Dutch" Van Norman. Dutch designed the creative and captivating covers of the second and third editions. Thanks, Dutch!

Throughout our careers, each of us has benefited immensely from mentors, colleagues, and students who provided us with the instruction, models, and inspiration needed to attempt to write a book like *Applied Behavior Analysis.* To the extent that our goals in writing this book are achieved, each of them will have played an important role. To the professors who first taught us about applied behavior analysis—Saul Axelrod, Vance Cotter, Todd Eachus, Dick Malott, Jack Michael, Joe Spradlin, and Don Whaley—we will be indebted always. Many faculty colleagues at Ohio State helped us create and sustain an academic environment where work to advance, teach, and apply behavior analysis for the betterment of learners with disabilities is valued. Their individual and collective support is appreciated. We'd be remiss not to single out our longtime department chair, Thomas M. Stephens, for his sustained support and leadership. Although not formerly trained as a behavior analyst, Tom was deeply committed to evidence-based instruction and direct and frequent measurement of student performance. Tom provided much-needed administrative backing, sometimes in the form of covering fire that allowed us to build an applied behavior analysis program in a college dominated by nonbehavioral perspectives. We also wish to thank the many students whom we have been lucky enough to teach and learn with over the years. Your enthusiasm and dedication inspired, encouraged, and motivated us.

Finally, we want to acknowledge the support of our families, past and present: Bunny, Chris, Sharon, Greg, Brian, and Carroll and Vera Cooper; Marge Heron, Kathy, Patrick, and Leia Rogers, Christine, Matt, Audrey and Brady Harsh, and Ray and Bernice Heron; and Jill Dardig, Lee Heward, Lynn Heward and Marcus Bonde, and Joe and Helen Heward. Without their enduring love and support, we would never have attempted the first edition of this book, let alone a second and a third!

BRIEF CONTENTS

PART 1 INTRODUCTION AND BASIC CONCEPTS 1

Chapter 1 Definition and Characteristics of Applied Behavior Analysis 2
Chapter 2 Basic Concepts and Principles 25

PART 2 SELECTING, DEFINING, AND MEASURING BEHAVIOR 47

Chapter 3 Selecting and Defining Target Behaviors 48
Chapter 4 Measuring Behavior 73
Chapter 5 Improving and Assessing the Quality of Behavioral Measurement 101

PART 3 EVALUATING AND ANALYZING BEHAVIOR CHANGE 123

Chapter 6 Constructing and Interpreting Graphic Displays of Behavioral Data 124
Chapter 7 Analyzing Behavior Change: Basic Assumptions and Strategies 155
Chapter 8 Reversal and Multielement Designs 171
Chapter 9 Multiple Baseline and Changing Criterion Designs 193
Chapter 10 Planning and Evaluating Applied Behavior Analysis Research 216

PART 4 REINFORCEMENT 251

Chapter 11 Positive Reinforcement 252
Chapter 12 Negative Reinforcement 287
Chapter 13 Schedules of Reinforcement 301

PART 5 PUNISHMENT 325

Chapter 14 Positive Punishment 326
Chapter 15 Negative Punishment 352

PART 6 ANTECEDENT VARIABLES 371

Chapter 16 Motivating Operations 372
Chapter 17 Stimulus Control 395

PART 7 VERBAL BEHAVIOR 411

Chapter 18 Verbal Behavior 412

PART 8 DEVELOPING NEW BEHAVIOR 451

Chapter 19 Equivalence-based Instruction 452
Chapter 20 Engineering Emergent Learning with Nonequivalence Relations 497
Chapter 21 Imitation, Modeling, and Observational Learning 527
Chapter 22 Shaping 540
Chapter 23 Chaining 557

PART 9 DECREASING BEHAVIOR WITH NONPUNISHMENT PROCEDURES 581

Chapter 24 Extinction 582
Chapter 25 Differential Reinforcement 595
Chapter 26 Antecedent Interventions 613

PART 10 FUNCTIONAL ASSESSMENT 627

Chapter 27 Functional Behavior Assessment 628

PART 11 SPECIAL APPLICATIONS 655

Chapter 28 Token Economy, Group Contingencies, and Contingency Contracting 656

Chapter 29 Self-Management 681

PART 12 PROMOTING GENERALIZED BEHAVIOR CHANGE 713

Chapter 30 Generalization and Maintenance of Behavior Change 714

PART 13 ETHICS 757

Chapter 31 Ethical and Professional Responsibilities of Applied Behavior Analysts 758