TWELFTH EDITION

BEHAVIOR MODIFICATION

What It Is and How to Do It

Garry Martin and Joseph Pear

Behavior Modification

Behavior Modification is a comprehensive, practical presentation of the principles of behavior modification and guidelines for their application. It introduces forms of behavior modification ranging from helping children learn necessary life skills, to training pets, to solving personal behavior problems. It teaches practical "how-to" skills, including discerning long-term effects; designing, implementing, and evaluating behavioral programs; interpreting behavioral episodes; observing and recording behaviors; and recognizing instances of reinforcement, extinction, and punishment.

The material is presented in an engaging, readable format that assumes no prior knowledge of behavior modification or psychology. Specific cases and examples clarify issues and make the principles real. Guidelines throughout provide a ready source to use as a reference in applying the principles. Questions for Learning, an average of 25 per chapter, are included to support students in checking their knowledge of the material when preparing for tests and exams. Application Exercises are also included in nearly every chapter to assist students in the development of the practical skills they will need to complete behavior modification projects effectively. The accompanying Instructor and Student Resources provides free digital materials designed to test student knowledge and save time when preparing lessons. The resources include:

- Over 700 multiple-choice and true-or-false questions for students to test their knowledge of the material
- Interactive flashcards for each chapter that support students' study
- Downloadable lecture slides designed to save instructors' time
- Instructor access to practicum exercises and a modified form of Bloom's Taxonomy and how it was applied to the Questions for Learning

Behavior Modification is ideal for courses in Behavior Modification, Applied Behavior Analysis, Behavior Therapy, the Psychology of Learning, and related areas; and for students and practitioners of various helping professions—such as clinical psychology, counselling, education, medicine, nursing, occupational therapy, physiotherapy, psychiatric nursing, psychiatry, social work, speech therapy, and sport psychology—who are concerned directly with enhancing various forms of behavior development.

Garry Martin is internationally known for his nine co-authored or co-edited books, 177 journal articles, and 106 invited conference presentations in six countries on various areas in Behavioral Modification, including intellectual disability, autism spectrum disorder, and sport psychology. He has received numerous honors and awards including the Distinguished Contribution Award from the Canadian Psychological Association and an induction into the Royal Society of Canada.

Joseph Pear was internationally known for his work in both Basic and Applied Behavior Analysis. In addition to co-authoring this book with Garry, he has authored two other books and authored or co-authored 12 book chapters, six encyclopedia entries, seven published conference proceedings, two invited newsletter contributions, 60 invited conference presentations and symposia, and 57 peer-reviewed journal articles in diverse areas of Basic and Applied Behavior Analysis. He has received numerous awards and distinctions, including being elected a fellow in both Division 6 ("Society for Behavioral Neuroscience and Comparative Psychology") and Division 25 ("Behavior Analysis") of the American Psychological Association.

Behavior Modification

What It Is and How to Do It

12th Edition

Garry Martin and Joseph Pear

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Preface

About the 12th Edition of This Book

This 12th edition of *Behavior Modification: What It Is and How to Do It*, like its predecessors, assumes no specific prior knowledge about psychology or behavior modification on the part of the reader. Those who want to know how to apply behavior modification to their everyday life—from solving personal behavior problems to helping children learn life's necessary skills—will find the text useful. Mainly, however, this book is addressed to two audiences: (a) college and university students taking courses in behavior modification, applied behavior analysis, behavior therapy, the psychology of learning, and related areas; and (b) students and practitioners of various helping professions—clinical psychology, counseling, education, medicine, nursing, occupational therapy, physiotherapy, psychiatric nursing, psychiatry, social work, speech therapy, and sport psychology—who are concerned directly with enhancing various forms of behavioral development.

After 56 years teaching members of the audiences above, we are convinced that both groups learn to most effectively apply the techniques of behavior modification when the applications are explained with reference to the underlying behavior principles on which they are based. For this reason, as our title implies, this book deals equally with both the procedures and the principles of behavior modification.

Our goals and the manner in which we attempt to achieve them can be summarized as follows:

1. *To introduce the reader to the behavioral orientation of the book (Chapter 1), and to describe the major areas of application of behavior modification techniques for improving the behaviors of individuals in diverse settings (Chapter 2).* Questions for Learning distributed throughout each chapter promote the reader's mastery of the material and ability to generalize to situations not described in the text. These questions can also be used for examination purposes in formal courses.
2. *To teach how to define, measure, and record behavior to be changed in a behavior modification program (Chapter 3) and how to evaluate the effects of behavioral treatments using single-subject research designs (Chapter 4).*
3. *To teach the elementary principles and procedures of behavior modification (Chapters 5–21).* We start with the basic principles and procedures, illustrate them with numerous examples and applications, and increase the complexity of the material gradually. Each of the chapters begins with a case history drawn from the fields of autism spectrum disorder, child development, coaching, developmental disabilities, early education, and sport psychology, or from the normal everyday activities of children and adults. Numerous examples are also given of how each principle operates in everyday life and how it can operate to the detriment of those ignorant of it.
4. *To teach practical how-to skills, such as how to recognize instances of reinforcement, extinction, and punishment and their likely long-term effects; interpret behavioral episodes in terms of behavioral principles and procedures; and design, implement, and evaluate behavioral programs.* To accomplish these goals, we provide (a) Guidelines and Checklists for Effective Applications, (b) Application Exercises Involving Others and checklists which teach the reader how to analyze, interpret, and develop programs for others' behavior, (c) Self-Modification Exercises, which encourage the reader to analyze, interpret, and develop programs for his or her own behavior, and (d) many examples of applications.
5. *To present the material in such a way that it will serve as an easy-to-use handbook for practitioners concerned with overcoming behavioral deficits and excesses in a wide variety of populations and settings.*
6. *To provide advanced discussion and references to acquaint readers with the empirical and theoretical underpinnings of the field.* This occurs throughout the book, especially in Chapters 1–27.
7. *To provide information and references regarding behavior therapy* (*BT*), *including cognitive behavior therapy* (*CBT*), *acceptance and commitment therapy* (*ACT*), *and dialectical behavior therapy* (*DBT*). In this book, students will not be taught how to do these therapies, as they require advanced training and qualifications.
8. *To describe briefly the most effective behavioral treatments for 10 representative psychological disorders, including specific phobias, posttraumatic stress disorder* (*PTSD*), *obsessive-compulsive disorder* (*OCD*), *and depression (Chapters 26 and 27).*

9 *To describe historical highlights of behavior modification (Chapter 28).*
10 *To describe ethical guidelines for the design, implementation, and evaluation of behavioral treatment programs (Chapter 29).* Although we placed the chapter on ethical issues at the end of the book, we believe that this topic is as important as any other topic we cover. In fact, we stress ethical issues throughout the book. Thus, the last chapter provides a reiteration and elaboration of this vital subject. We hope that after reading the concluding chapter, the reader will fully understand that the only justification for behavior modification is its usefulness in serving humanity in general and its recipients in particular.

Changes in the 12th Edition

We made changes in this edition in accordance with recommendations from reviewers, students, and colleagues.

First, in the 11th edition, at the end of each chapter, we included a section called Notes for Further Learning (NFL) that contained 68 notes across the 29 chapters. For the 12th edition we have deleted the NFL section from each chapter. Twenty of these notes were out of date, described superfluous early history, were redundant with chapter content, or added unneeded complexity, and were, therefore, deleted. The remaining 48 were incorporated thoughtfully within the relevant chapters.

Second, we shortened and simplified some of the content of the 12th edition to facilitate student comprehension.

Third, over 40 of the articles that we had cited in the 11th edition were from edited books that have since been revised and republished in new editions. Those revised references have been updated.

Finally, we added many new references across all chapters to reflect the most recent developments in the field and to ensure that the book is up-to-date in all areas of behavior modification.

Digital Materials for Professors and Students: Test Questions, Practica, PowerPoint Slide Material, and Flashcards

One of our goals is to help students learn to think about behavior modification both critically and creatively. To this end, a comprehensive collection of digital materials has been developed to accompany this text.

First, for professors, we have included a short compendium of operational definitions of higher-order thinking (called "Thinking Levels") based on Bloom's Taxonomy.[1] Next, also for professors, we provide the answer key to the study questions that are found throughout the text (which we refer to as Questions for Learning). For each question, the corresponding thinking level is indicated in order to highlight how students are expected to answer these questions on tests and exams so that they may achieve the highest levels of critical thinking about the material. Additionally, 15 **in-class practica** or **minilab exercises** that have been developed and field-tested are included. Each exercise is to be completed by a group of two or three students during a regularly scheduled class. After students have been tested on relevant chapters, completion of a practicum helps them to apply behavior modification principles. (Student feedback indicates that these exercises constitute an excellent teaching tool.) And finally, drafts of more than 200 **PowerPoint slides** (an average of seven per chapter) have also been provided so that professors can easily use them to prepare PowerPoint presentations for lectures.

For students, drafts of nearly 300 **glossary flashcards** (an average of 10 per chapter) have been provided for knowledge retention and study purposes. Each flashcard contains, on one side, either a key term or a concise question, and on the other side, the definition of the term (approximately five to 15 words) or the answer to the question. In addition, students will have access to a large pool of **option-based questions** (multiple-choice and/or true/false) with which they may test their knowledge of the material on a chapter-by-chapter basis.

Both the PowerPoint slides and the glossary flashcards are keyed (again, on a chapter-by-chapter basis) to the Questions for Learning, with the corresponding "QL" number appearing on each.

To the Student

This book is designed to help you learn to talk about and apply behavior modification effectively. You need no prior knowledge about behavior modification to read and understand this text from beginning to end. After many decades of experience using previous editions of this book in our teaching we are confident that students at all

levels—from beginner to advanced—will find the text informative and useful. Additionally, this book provides key study material for those taking the Board Certified Behavior Analyst® (BCBA®) or the Board Certified Assistant Behavior Analyst® (BCaBA®) exams. (The chapters relevant to these exams are outlined in the table at the end of this Preface.)

To clarify concepts and aid comprehension and learning, as well as aid in the application of behavior modification, this book contains cartoons, photographs, drawings, and diagrams, as well as many case studies and checklists. We additionally provide Guidelines for Effective Applications of all the behavior modification methods discussed in the text. These guidelines provide useful checklists and summaries of the material and assist you in the application of the methods described in the text.

Most chapters also present numerous Questions for Learning and Application Exercises, including Self-Modification Exercises and Exercises Involving Others. The Questions for Learning are intended to help you check your knowledge of the material when preparing for tests and exams. The Application Exercises are intended to help you develop the practical skills you will need to complete behavior modification projects effectively.

For further practice, through the publisher's website companion to this text, a pool of **option-based** (multiple-choice and/or true/false) **questions** can be accessed. Also through the website, students will find a complete set of **glossary flashcards**. Each flashcard contains either a concise question or a key term on one side, and on the other side, either the answer to the question or the definition of the term. A "QL" number also appears on each card, indicating, on a chapter-by-chapter basis, the Question(s) for Learning corresponding with that card's term or question.

To help make your study productive and enjoyable, the book progresses from simpler to more complex material. But a word of caution: *Do not be misled by the seeming simplicity of the earlier chapters*. Students who conclude that they are skilled behavior modifiers after they have learned a few simple behavior modification principles unfortunately end up proving the old maxim that "a little knowledge is a dangerous thing." If we personally had to pick the most important chapter in this book in terms of a review of the knowledge and skills that define a competent behavior modifier, it would be Chapter 23—*Planning, Applying, and Evaluating a Behavioral Program*. We therefore strongly suggest that you reserve judgment about your abilities as a behavior modifier until you have mastered Chapter 23 and all the preliminary material on which it is based.

We also point out that—as emphasized in Chapter 29 (*Ethical Issues*)—organizations regulating behavior modification are highly influential. If you are considering applying behavior modification on any level beyond personal, we strongly recommend that you check with the Behavior Analyst Certification Board (www.bacb.com), the Analysis of Behavior International Accreditation Board (www.accreditation.abainternational.org), or other certification bodies such as state or provincial psychological associations to determine how you may obtain the necessary qualifications.

With those words of caution, we wish you much success and enjoyment as you pursue your studies in this exciting and rapidly expanding field.

Acknowledgments

Writing the 12 editions of this book was made possible through the help of many individuals. We gratefully acknowledge the cooperation and support of Dr. Glen Lowther (former Superintendent) and the staff at the Manitoba Developmental Centre and Dr. Carl Stephens (former CEO) and the staff at the St. Amant Centre. Much of the material in this book was initially generated while the authors were involved with these institutions.[2] Without the support of the staff members of the above institutions, this book would likely not have been written. Grateful acknowledgment is also due to our many students for their constructive feedback on the current and earlier editions. We also thank Jack Michael, Rob Hawkins, Bill Leonhart, and Iver Iversen and his students for their many excellent suggestions for improvements of earlier editions. For this edition, special thanks are due to Todd Martin for his fastidious word processing and copy-editing, as well as for his preparation of the PowerPoint slides, glossary flashcards, and other accompanying digital material.

We are grateful to the anonymous reviewers whose helpful comments greatly improved this edition.

We also express our appreciation to Emily Irvine, Sadé Lee, Marlena Sullivan, Georgette Enriquez, Lucy Kennedy, and the other members of the very capable editorial and production team of the Taylor & Francis Group.

Using This Book to Study for the Behavior Analysis Certification Board® Examinations

For individuals using this book to study for the Board Certified Behavior Analyst® (BCBA®) or the Board Certified Assistant Behavior Analyst® (BCaBA®) exam, the following are the chapters in this book where the content for the current task list may be found:

	*Topics from the 5th Edition Task List**	*Relevant Chapters*
	Section 1: Foundations	
A	Philosophical Underpinnings	1, 17, 26, 27, 28
B	Concepts and Principles	5–18
C	Measurement, Data Display, and Interpretation	3, 23
D	Experimental Design	4
	Section II: Applications	
E	Ethics (behave in accordance with the Professional and Ethical Compliance Code for Behavior Analysts)	29
F	Behavioral Assessment	22
G	Behavior-Change Procedures	2, 19, 20, 21, 25
H	Selecting and Implementing Interventions	23, 24
I	Personal Supervision and Management	22

* Adapted from the 5th Edition of the Behavior Analysis Certification Board® Task List.

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Notes

1 Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). *Taxonomy of educational objectives*. New York: Longmans, Green & Company; Pear, J. J., Crone-Todd, D. E., Wirth, K., & Simister, H. (2001). Assessment of thinking levels in students' answers. *Academic Exchange Quarterly*, 5(4), 94–98.

2 See Walters, K., & Thomson, K. (2013). The history of behavior analysis in Manitoba: A sparsely populated Canadian province with an international influence on behavior analysis. *Behavior Analyst*, 36(1), 57–72.

PART

I

The Behavior Modification Approach

Behavior modification focuses on both the public or overt and private or covert behavior of individuals. Since its inception as a field of scientific study, behavior modification—which includes the subfields known as applied behavior analysis and behavior therapy—has proved to be an effective means of modifying behavior in a wide variety of applied settings. This has been accomplished by the development of powerful scientific methods for studying behavior. Behavior modification stresses an individual case design that does not rely on formal statistical methodology that focuses on group averages.

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1 Introduction

Learning Objectives

After studying this chapter, you will be able to:

- Define *behavior*, *behavior modification*, and *behavioral assessment*.
- Describe how behavior modifiers view traditional psychological concepts such as intelligence and creativity.
- Summarize historical highlights of behavior modification.
- Discuss the relationship between behavior modification, applied behavior analysis, and behavior therapy.
- State some common misconceptions about behavior modification.

MANY OF SOCIETY'S best achievements—from democratic government to helping the less fortunate, and from great works of art to important scientific discoveries—as well as some of its most pressing health and social challenges—from unhealthy lifestyles to environmental pollution and from racism to terrorism—are firmly rooted in behavior. But what is behavior? Before attempting an answer, consider the following scenarios:

1. *Withdrawn behavior*. A class of nursery school youngsters is in the playground. While most of the children are playing, one little boy sits quietly by himself, making no effort to join in the fun.
2. *Ineffective studying*. With two term papers due next week and a midterm exam at the same time, Sam is wondering how he is ever going to make it through his first year at university. Yet he continues to spend several hours each day on social media.
3. *Performance nervousness*. Karen, a 14-year-old gymnast, is waiting for her turn to perform on the balance beam at a championship. Showing signs of extreme nervousness, she says to herself, "What if I don't perform well? What if I fall on my backflip? I can't believe how my heart is pounding."
4. *Campground littering*. Tom and Sally have just arrived at the place where they intend to set up camp and are looking in disgust and amazement at the litter left by previous campers. "Don't they care about the environment?" asks Sally. "If people keep this up," Tom says, "there won't be any nature left for anyone to enjoy."
5. *Migraine headaches*. While preparing dinner for her family, Betty was vaguely aware of a familiar feeling creeping up on her. Then, all at once, she felt nauseous. She looked around fearfully, knowing what to expect. "Tom, Joe," she called to her sons watching TV in the living room, "you'll have to finish fixing dinner yourselves—I'm having another migraine."
6. *Staff management*. Jack and Brenda were having coffee one morning at the restaurant they owned. "We're going to have to do something about the evening staff," said Brenda. "When I came in this morning, the ice cream machine wasn't properly cleaned, and the cups and lids weren't restocked." "That's only the tip of the iceberg," said Jack. "You should see the grill!"
7. *Irrational thinking*. Mary, after getting a poor mark on her first exam in her first year at college, thinks, "I'll *never* be a good student. I *must* do well in *all* my courses. My professor must think I'm an idiot."

Close inspection shows that each of the above vignettes involves some sort of human behavior. They illustrate a few of the many problems with which specialists in behavior modification are trained to deal. Each of these types of behavior problem and many others are discussed in the following pages. Behavior modification, as you will see, is applicable to the entire range of human behavior.

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What Is Behavior?

(In this book, key terms are found in **bold**, followed by their definitions. We encourage you to master them as you encounter them.)

Behavior is anything that a person says or does. Some commonly used synonyms include "activity," "action," "performance," "responding," "response," and "reaction." Technically, behavior is any muscular, glandular, or electrical activity of an organism. Is the color of someone's eyes behavior? Is blinking behavior? Are the clothes someone is wearing behavior? Is dressing behavior? If you said no to the first and third questions and yes to the second and fourth, then we agree. One of the goals of this book is to encourage you to begin thinking and talking very specifically about behavior.

How about getting an "A" in a behavior modification course, or losing 10 pounds; are those behaviors? No. Those are *products of behavior*. The behavior that produces an "A" is studying effectively. The behaviors that lead to weight loss are resisting overeating and exercising more.

Walking, talking out loud, throwing a baseball, yelling at someone—are all **overt behaviors** that could be observed and recorded by an individual other than the one performing the behavior. As will be discussed in later chapters, the term *behavior* can also refer to *covert* activities that cannot be observed by others. However, in the field of behavior modification, covert behaviors do *not* typically refer to behaviors done in private, such as undressing in one's bedroom with the door locked and the blinds closed. Neither do they usually refer to secretive actions, such as cheating on an exam. Rather, in behavior modification they more commonly refer to activities that occur "within one's skin" and that therefore require special instruments or procedures for others to observe. For example, just before stepping onto the ice at an important competition, a figure skater might think, "I hope I don't fall," and he or she is likely to feel nervous. Covert as well as overt behaviors can be influenced by behavior modification techniques.

The opposite of private or covert behavior is public or overt behavior. Although, as stated above, behavior modifiers sometimes deal with covert behavior, they tend to focus on overt behavior, because the latter is generally more important to the individual and to society. Also, it is easier to measure overt behavior more accurately than covert behavior.

Sometimes we think in words. This is called *private self-talk* and is illustrated by the figure skater mentioned previously. And sometimes we think by imagining. If you were asked to close your eyes and imagine a clear, blue sky with a few white fluffy clouds, you would likely be able to do so although there are large differences between individuals in the vividness of their imagery (Cui, Jeter, Yang, Montague, & Eagleman, 2007). Imagining is usually thought of as being visual, but it can also involve other senses. For example, we can imagine a scent, a taste, and a feeling of rubbing one's hand across a rough surface. Imagining and private self-talk, in addition to being called **covert behaviors**, are sometimes referred to as *cognitive behaviors*.

Characteristics of behavior that can be measured are called *dimensions of behavior*. Three dimensions of behavior are duration, rate, and intensity. The *duration* of a behavior is the length of time that it lasts (e.g., Mary studied for one hour). The *rate* of a behavior is the number of instances that occur in a given time period (e.g., Frank planted five tomato plants in his garden in 30 minutes). The *intensity* or *force* of a behavior refers to the physical effort or energy involved in emitting the behavior (e.g., Mary has a strong grip when shaking hands).

QUESTIONS FOR LEARNING

Note to reader: You will encounter sets of questions in each chapter. Because the questions are designed to enhance your learning, we encourage you to: (a) pause in your reading of the chapter; (b) prepare answers to those questions; and (c) learn those answers. Doing so will help you to master the content of this book:

1. What is behavior, generally and technically? Give three synonyms for behavior.
2. Distinguish between behavior and products of behavior. Give an example of a behavior and a product of that behavior that are not in this chapter.
3. Distinguish between overt and covert behaviors. Give two examples of each that are not in this chapter.
4. What are cognitive behaviors? Give two examples.
5. Describe two dimensions of behavior. Give an example of each.

Summary Labels for Behavior

While we have all learned to talk about behavior in various ways, we often do so in general terms. Terms such as "honest," "carefree," "hardworking," "unreliable," "independent," "selfish," "incompetent," "kind," "graceful," "unsociable," and "nervous" are summary labels for human actions, but they do not refer to specific behaviors. If, for example, you were to describe a man as nervous, others might know generally what you mean. But they would not know if you were referring to that person's tendency to chew his fingernails, his constant fidgeting, the tendency for his left eye to twitch when talking to someone, his tendency to jump when startled, or some other behavior.

For behavior modification specialists, many terms that are commonly used by psychologists, such as *intelligence*, *attitudes*, and *creativity*, are summary labels for behavior. Behavior modifiers find it advantageous to talk about these concepts *behaviorally*; or, in other words, in what is called a **behavioral language**. What do we mean when we say that a person is *intelligent*? To many people, intelligence is something that you are born with, a sort of "inherited brain power" or innate capacity for learning. But we never observe or directly measure any such thing. On an intelligence test, for example, we simply measure people's behavior—their answers to questions—as they take the test. The word *intelligent* is best used in its adjective form (e.g., "he is an *intelligent* speaker," "his speech is *intelligent*") or its adverb form (e.g., "she writes *intelligently*") to describe how people behave under certain conditions, such as taking a test, but not as a noun for some "thing." Perhaps a person described as intelligent readily solves problems that others find difficult, performs well on most course examinations, reads many books, talks knowledgeably about many topics, or gets a high score on an intelligence test. Depending on who uses the word, *intelligence* can mean any or all of these—but whatever it means, it refers to ways of behaving. Therefore, in this book we avoid using the word *intelligence* as a noun. (For an excellent discussion of a behavioral approach to intelligence, see Williams, Myerson, & Hale, 2008.)

What about an *attitude*? Suppose that Johnny's teacher, Ms. Smith, reports that he has a bad attitude toward school. What does Ms. Smith mean by this? Perhaps she means that Johnny frequently skips school, refuses to do his classwork when he does attend, or swears at the teacher. Whatever she means when she talks about Johnny's "bad attitude," it is clearly his behavior with which she is really concerned.

Creativity also refers to the kinds of behavior that a person is likely to engage under certain circumstances. The creative individual frequently emits behaviors that are novel or unusual and that, at the same time, have desirable effects. (For excellent discussions of behavioral approaches to creativity, see Marr, 2003 and the special issue of *The Pyschological Record* on creativity edited by Crone-Todd, Johnson, & Johnson, 2021.)

Summary labels commonly used to refer to psychological problems include autism spectrum disorder, attention-deficit/hyperactive disorder, anxiety, depression, low self-esteem, road rage, interpersonal difficulties, and sexual dysfunction. There are positive reasons that summary terms or labels for behavior patterns are so frequently used in psychology and in everyday life—not in a special institutional or therapeutic situation. First, they may be useful for quickly providing general information about how an individual might perform. We would expect that a 10-year-old child who has been labeled as having a severe developmental disability, for example, would not be able to read even at the first-grade level. Second, the labels may imply that a particular treatment program will be helpful. Someone who exhibits road rage, for example, might be encouraged to take an anger-management course. Someone who is easily taken advantage of might benefit from an assertiveness training course. However, the use of summary labels also has disadvantages. One is that they may lead to pseudo-explanations of behavior (pseudo meaning false). For example, a child who inverts words while reading, such as "saw" for "was," might be labeled as having dyslexia. If we ask why the child inverts words, and we are given the answer "Because he has dyslexia," then the summary label for the behavior has been used as a pseudo-explanation for the behavior. Another name for pseudo-explanation is circular reasoning.

A second disadvantage of labeling is that labels can negatively affect the way an individual might be treated, such as by focusing on an individual's problem behaviors rather than strengths. Suppose, for example, that a teenager consistently fails to make his bed but reliably mows the lawn and places the garbage cans on the street on pickup days. If the parents describe their son as "lazy," that label may cause them to focus more on the problem behavior than to praise the positive behaviors. In some societies, racial minorities have been given the negative label "lazy" even though they were the ones doing most of the hard, physical work.

In this book, we strongly stress the importance of defining all types of problem in terms of **behavioral deficits** (too little behavior of a particular type) or **behavioral excesses** (too much behavior of a particular type). We do so for several reasons. First, we want to avoid the problems of using general summary labels discussed earlier. Second, regardless of the labels attached to an individual, it is *behavior* that causes concern—and behavior that must be treated to alleviate the problem. Certain behaviors that parents see and hear, or fail to see and hear, cause them to

seek professional help for their children. Certain behaviors teachers see and hear prompt them to seek professional help for their students. Certain behaviors that can be seen or heard cause governments to set up institutions, clinics, community treatment centers, and special programs. And certain behaviors that you emit might cause you to embark on a self-improvement program. Third, specific procedures are now available that can be used to improve behavior in schools, in workplaces, in home settings—in fact, just about anywhere that there is a need to establish more desirable behaviors. These techniques are referred to collectively as *behavior modification*.

QUESTIONS FOR LEARNING

6 From a behavioral point of view, what do terms like *intelligence* or *creativity* refer to? Give an example of each.
7 What are two positive reasons that summary terms for behavior patterns are used frequently in psychology and in everyday life?
8 What are two disadvantages of using summary labels to refer to individuals or their actions? Give an example of each.
9 What is a behavioral deficit? Give two examples that are not in this chapter.
10 What is a behavioral excess? Give two examples that are not in this chapter.
11 What are the three reasons why the authors describe behavior problems in terms of specific behavioral deficits or excesses?

What Is Behavior Modification?

Behavior modification involves the systematic application of learning principles and techniques to assess and improve the overt and covert behaviors of individuals to enhance their daily functioning. Behavior modification has seven main characteristics. First, the most important characteristic is *its strong emphasis on defining problems in terms of behavior that can be measured in some way and using changes in the behavioral measure of the problem as the best indicator of the extent to which the problem is being helped.*

Second, *its treatment procedures and techniques are ways of altering an individual's current environment*—i.e., the individual's immediate physical surroundings—to help that individual function more fully. The physical variables that make up a person's environment are called *stimuli* (plural of *stimulus*). More specifically, **stimuli** are the people, objects, and events currently present in one's immediate surroundings that impinge on one's sense receptors and that can affect behavior. For example, the teacher, other students, and the furniture in a classroom are all potential stimuli in a student's environment in a classroom setting. An individual's own behavior can also be a part of the environment influencing that individual's subsequent behavior. When hitting a forehand shot in tennis, for example, both the sight of the ball coming near and the behavior of completing your backswing provide stimuli for you to complete the forehand shot and hit the ball over the net. Things that a behavior therapist might say to a person called a client are also a part of that client's environment. But behavior modification is much more than *talk therapy* or *verbal psychotherapy*. Although both behavior modifiers and "talk" therapists talk to their clients, their approaches to therapy differ in several important ways. One difference is that a behavior modifier is frequently actively involved in restructuring a client's daily environment to strengthen appropriate behavior, rather than spending a great deal of time discussing the client's past experiences. While knowledge of a client's past experiences might provide useful information for designing a treatment program, knowledge of the current environmental variables that control or, loosely speaking, "cause" a client's behavior is necessary for designing an effective behavioral treatment. Another difference between behavior modifiers and "talk" therapists is that a behavior modifier frequently gives homework assignments for therapeutic purposes. Such homework assignments are discussed in Part V (Chapters 26 and 27).

A third characteristic of behavior modification is that *its methods and rationales can be described precisely*. This makes it possible for behavior modifiers to read descriptions of procedures used by their colleagues, replicate them, and get essentially the same results. It also makes it easier to teach behavior modification procedures than is the case with many other forms of psychological treatment.

As a result of the third characteristic, a fourth characteristic of behavior modification is that *the techniques of behavior modification are often applied by individuals in their daily lives*. Although, as you will read in this book, appropriately trained professionals and paraprofessionals use behavior modification in helping others, the precise description of behavior modification techniques makes it possible for individuals such as parents, teachers, coaches, and others to apply behavior modification to help individuals in everyday situations.

A fifth characteristic of behavior modification is that, to a large extent, *the techniques stem from basic and applied research in the science of learning* (e.g., see Pear, 2016a, 2016b). Therefore, in Part II we cover the principles of learning in considerable detail and show how they are applicable to various types of behavior problem.

Two final characteristics are that behavior modification emphasizes scientific demonstration that a particular intervention or treatment was responsible for a particular behavior change, and it places high value on accountability for everyone involved in behavior modification programs: client, staff, administrators, consultants, and so on.[1]

Thus far, we have talked about the general approach that behavior modifiers take toward behavior. But how do behavior modifiers determine which behaviors to modify? The answer to this question is that behavior modifiers make use of procedures collectively called "behavioral assessment."

What Is Behavioral Assessment?

The most important characteristic of behavior modification, as mentioned earlier, is its use of measures of behavior to judge whether an individual's behavior had been improved by a behavior modification program. Behaviors to be improved in a behavior modification program are called **target behaviors**. For example, if a university student sets a goal of studying two hours out of class for each hour spent in class, studying is the target behavior.

Behavioral assessment involves the collection and analysis of information and data to (a) identify and describe target behaviors; (b) identify possible causes of the behavior; (c) guide the selection of an appropriate behavioral treatment; and (d) evaluate treatment outcome. One type of behavioral assessment involves isolating through experimentation the causes of problem behavior and removing or reversing them. As interest in behavior modification has expanded over the past five decades the demand for clear guidelines for conducting behavioral assessments has also increased. For more information on behavioral assessment, refer to Chapters 3 and 22, which cover the topic in detail, or the books by Cipani (2017a) and Fisher, Piazza, & Roane (2021).

QUESTIONS FOR LEARNING

12 Define behavior modification.
13 What are stimuli? Describe two examples that are not in this chapter.
14 List seven defining characteristics of behavior modification.
15 What is meant by the term *target behavior*? Give an example of a target behavior of yours that you would like to improve. Is your target behavior one that you want to increase (i.e., a behavioral deficit) or one that you want to decrease (i.e., a behavioral excess)?
16 Define behavioral assessment.

Historical Highlights of Behavior Modification

In addition to the term behavior modification, other terms that have been used to describe the application of learning principles to help individuals improve their behavior include *behavior therapy*, *applied behavior analysis*, and *cognitive behavior therapy*. Although these terms overlap in many ways, there are also some rather subtle distinctions between them. In this section, we will briefly describe some of the early history of these terms and the distinctions that have come to characterize them. We will also briefly describe the emergence of behavioral assessment. (A detailed history of behavioral psychology can be found in Pear, 2007.)

Pavlovian Conditioning and Early "Behavior Therapy"

If you have taken an introductory psychology course, you may recall that in the early 1900s a Russian physiologist, **Ivan P. Pavlov**, demonstrated that pairing a neutral stimulus with food taught a dog to salivate to the neutral stimulus. Pavlov's research initiated the study of a type of learning now known as classical, Pavlovian, or respondent conditioning (described in Chapter 5). In a landmark experiment in 1920, John B. Watson and Rosalie Rayner demonstrated Pavlovian conditioning of a fear response in an 11-month-old infant. Although attempts to replicate the Watson and Rayner experiment were unsuccessful, a subsequent landmark experiment by Mary Cover

Jones (1924) clearly demonstrated the "de-conditioning" of a fear in an infant. Over the next 30 years, experiments demonstrated that our fears and other emotions could be influenced by Pavlovian conditioning. In the 1950s in South Africa, a psychiatrist named **Joseph Wolpe**, drawing heavily on Pavlovian conditioning and the work of Mary Cover Jones, developed a behavioral treatment for specific phobias, which are intense irrational fears, such as a fear of heights or closed spaces. In 1960, British psychologist Hans Eysenck was the first to refer to Wolpe's approach as *behavior therapy*. In the early 1960s, Wolpe moved to the United States and his behavior therapy approach for treating anxiety disorders gained in popularity. Applications of behavior therapy to treat a variety of psychological disorders (described in Chapter 27).

Operant Conditioning and Early "Behavior Modification"

Pavlovian conditioning involves reflexes—automatic responses to prior stimuli. In 1938, **B. F. Skinner** distinguished between Pavlovian conditioning and operant conditioning—a type of learning in which behavior is modified by its consequences ("rewards" and "punishers"). In 1953, in his book *Science and Human Behavior*, Skinner offered his interpretation of how basic learning principles could influence the behavior of people in all kinds of situation. In the 1950s and 1960s, behavioral practitioners, influenced by Skinner, published papers that demonstrated applications of operant conditioning principles to help people in a variety of ways. These applications were called *behavior modification*. Examples of these applications include helping an individual to overcome stuttering, eliminating excessive regurgitation by a child with intellectual disabilities, and teaching a child with autism spectrum disorder to wear his prescription glasses. In 1965, Ullmann and Krasner published an influential collection of these applications in a book titled *Case Studies in Behavior Modification*, the first book with "behavior modification" in its title.

Applied Behavior Analysis

The year 1968 saw the publication of the first issue of the *Journal of Applied Behavior Analysis* (*JABA*), a sister publication of the *Journal of the Experimental Analysis of Behavior* (*JEAB*), which deals with basic behavior analysis. In an important editorial article in the first issue of JABA, Donald Baer, Montrose Wolf, and Todd Risley identified the *dimensions of applied behavior analysis* as including (a) a focus on measurable behavior that is socially significant (e.g., littering, parenting skills); (b) a strong emphasis on operant conditioning to develop treatment strategies; (c) an attempt to clearly demonstrate that the applied treatment was responsible for the improvement in the behavior that was measured; and (d) a demonstration of generalizable and long-lasting improvements in behavior. Over the years, the term *applied behavior analysis* has become increasingly popular (Bailey & Burch, 2006). In fact, some authors maintain that *behavior modification* and *applied behavior analysis* are now "two terms used to identify virtually identical fields" (e.g., Miltenberger, 2016). We, however, present a different point of view in this book.

If you are interested in learning more about applied behavior analysis, visit the website of the Association for Behavior Analysis International, an organization billed as the "home of the science and practice of behavior analysis." (Retrieved from https://www.abainternational.org/ welcome.aspx on February 21, 2022.)

Cognitive Behavior Therapy

Do you ever find yourself thinking, "Why do I always screw things up?" or "Why does the worst always happen to me?" The well-known cognitive therapist called **Albert Ellis** considered such statements to be irrational—after all, you don't *always* screw things up and you do some things well. Ellis believed that such irrational thoughts could cause a variety of troublesome emotions. His approach to therapy was to help people identify their irrational beliefs and to replace them with more rational self-statements (Ellis, 1962). Independently of Ellis, **Aaron Beck** assumed that dysfunctional thinking could cause depression and other problems, and he developed a similar therapeutic procedure. Beck (1970) referred to strategies for recognizing maladaptive thinking and replacing it with adaptive thinking as *cognitive therapy*, and he contrasted cognitive therapy with behavior therapy. In the 1970s and 1980s, the term *cognitive behavior modification* was commonly used to refer to this approach (e.g., Meichenbaum, 1977, 1986). However, during the last three decades, the term *cognitive behavior therapy* has become the more common term. Cognitive behavior therapy is discussed in more detail in Chapters 26 and 27.

Behavioral Assessment and the DSM

To help therapists diagnose clients with different types of presumed mental illness, the American Psychiatric Association developed the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-I*, 1952). Applied behavior analysts and behavior therapists made little use of the first three *DSM*s (Hersen, 1976). However, beginning in 1987, the *DSM*s were improved over their predecessors in several respects. First, they are based primarily on research rather than on theory. Second, individual disorders—e.g., obsessive-compulsive disorder, generalized anxiety disorder, major depression—are based on categories of problem behavior. Third, they use a multidimensional recording system that provides extra information for planning treatment, managing a case, and predicting outcomes. With these improvements, applied behavior analysts and behavior therapists have used *DSM*s to classify their clients. They also do so in part because official diagnoses are usually required by clinics, hospitals, schools, and social service agencies before treatment can be provided, and because health insurance companies reimburse practitioners based on a *DSM* diagnosis.

The most recent edition of the manual, *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition Test Revision DSM-5-TR* (DSM-5-TR) was published in 2022. It is important to keep in mind that a *DSM* diagnosis such as autistic spectrum disorder refers to an individual's behavior. If the diagnosis results in the individual being labeled autistic, this may lead to the disadvantages of labeling previously mentioned in this chapter. Moreover, in spite of the implication that all individuals with the same label (e.g., autistic) are the same, they are not. To avoid problems associated with labeling, we should use "people first language." For example, rather than saying that Jerry is autistic, we should say that Jerry has autism spectrum disorder. (As expressed by Malott, 2008, an even better approach would be to say that Jerry has autistic behaviors.) Also, in addition to obtaining a *DSM-5* diagnosis for an individual, a behavior modifier should always conduct detailed behavioral assessments to obtain the necessary information for designing the most effective, individualized treatment program.

Current Use of "Behavior Modification," "Behavior Modifier," and Related Terms

Behavior analysis is the science on which behavior modification is based. The term **behavior analysis** refers to the study of the scientific laws that govern the behavior of human beings and other animals. As mentioned above, the terms **applied behavior analysis** and *behavior modification* are often used interchangeably. Many individuals who specialize in these areas call themselves *applied behavior analysts*. The terms *behavior therapy* and *cognitive behavior therapy* are also often used interchangeably. An additional consideration is that the terms *behavior modifier*, *behavior manager*, and *performance manager* are often used to refer to an individual who, without formal training in behavior modification, uses behavior procedures to improve someone's behavior. As mentioned previously regarding the fourth characteristic of behavior modification, the "behavior modifier" in such instances might be a teacher, parent, spouse, peer, roommate, supervisor, colleague, or even a person modifying his/her own behavior.

With this brief review of terms in mind, there are three types of individuals that the term *behavior modifier* refers to: *applied behavior analysts*, *cognitive behavior therapists* (sometimes just called *behavior therapists*), and *everyone else*. The first two groups are professional behavior modifiers. They have had extensive training in their fields, have passed rigorous examinations on both the content and ethics of their fields, have earned a post-graduate degree (typically a master's degree or doctorate) from a reputable institution and belong to a professional organization that certifies or licenses them and requires them to remain current with the advances in their respective fields. Although this book is frequently used as a beginning text for individuals training to be a member of the first two groups, reading this book does not by itself qualify you to be a member of the first two groups. The professional activities of these two groups constitute the "what-it-is" rather than the "how-to-do-it" aspect of this book. The "how-to-do-it" aspect of this book is directed toward the third group—i.e., everyone else. It teaches you how to use principles of behavior in your day-to-day life but does not by itself teach you how to be a professional behavior modifier. When we use the term *behavior modifier* in this book, we will generally be referring to an applied behavior analyst or cognitive behavior therapist unless otherwise indicated.

Behavior modification is the systematic application of learning principles and techniques to assess and improve individuals' covert and overt behaviors to enhance their daily functioning. Thus, in our view, the term *behavior modification* is broader than and encompasses the other terms referred to above (for further discussion along these lines, see Pear & Martin, 2012; Pear & Simister, 2016).

QUESTIONS FOR LEARNING

17 Briefly describe Joseph Wolpe's contribution to the early history of behavior therapy.
18 Briefly describe B. F. Skinner's early influence on behavior modification.
19 State the four dimensions of applied behavior analysis.
20 In 1970, what was Aaron Beck referring to with respect to the term "cognitive therapy"? In the 1970s and 1980s, what term was commonly used to refer to "cognitive therapy"?
21 What is the full title of the *DSM-5*? In a sentence, what is it?
22 Give five reasons why many behavior modifiers use the *DSM-5*.
23 What is a potential disadvantage of using the *DSM-5*?
24 What is meant by "people first language"? Illustrate with an example.
25 List and briefly describe three types of behavior modifier.

Some Misconceptions About Behavior Modification

You have likely encountered the term *behavior modification* before reading this book. Unfortunately, because there are myths or misconceptions about this area, some of what you have heard is likely false. Consider the following statements:

Myth 1: Use of rewards by behavior modifiers to change behavior is bribery.
Myth 2: Behavior modification involves the use of drugs and electroconvulsive therapy.
Myth 3: Behavior modification treats symptoms; it doesn't get at the underlying problems.
Myth 4: Behavior modification can deal with simple problems, such as teaching toileting or overcoming fear of heights, but it is not applicable for complex problems such as low self-esteem or depression.
Myth 5: Behavior modifiers are cold and unfeeling and don't have empathy or provide compassionate care for their clients.
Myth 6: Behavior modifiers deal only with observable behavior; they don't deal with thoughts and feelings of clients.
Myth 7: Behavior modifiers deny the importance of genetics or heredity in determining behavior.
Myth 8: Behavior modification is outdated.

In various sections throughout this book, you will encounter evidence to dispel these myths or misconceptions.

The Approach of This Book

The main purpose of this book is to describe behavior modification techniques in an enjoyable, readable, and practical manner. Because it has been written for people in helping professions as well as for students, we intend to help readers learn not merely about behavior modification principles but also about how to use the techniques to change behavior. Behavior that someone would like to improve can be classified as either a behavioral deficit or a behavioral excess and can be overt or covert. Below are examples of each type.

Examples of behavioral deficits

1 A child does not pronounce words clearly and does not interact with other children.
2 A teenager does not complete homework assignments, help around the house, work in the yard, or discuss problems and difficulties with her parents.
3 An adult does not pay attention to traffic regulations while driving, does not thank others for courtesies and favors, or does not meet his/her partner at agreed upon times.
4 A basketball player, encouraged by the coach to visualize the ball going into the net just before a foul shot, is unable to do so.

Examples of behavioral excesses

1. A child frequently gets out of bed and throws tantrums at bedtime, throws food on the floor at mealtime, and hides her mother's tablet.
2. A teenager frequently interrupts conversations between his parents and other adults, uses abusive language, and spends hours on social media or text messaging on his/her cell phone.
3. An adult watches TV continuously, frequently eats junk food between meals, smokes one cigarette after another, and bites his/her fingernails.
4. A golfer often thinks negatively (e.g., "If I miss this one, I'll lose!") and experiences considerable anxiety (e.g., heart pounding, palms sweating) just before important shots.

To identify a behavior as excessive or deficient, we must consider the context in which it occurs. For example, a child drawing on paper is showing appropriate behavior, but most parents would consider the child repeatedly drawing on the living room wall as a behavioral excess. A teenager might interact appropriately with members of the same sex but be extremely embarrassed and have difficulty talking to members of the opposite sex—a behavioral deficit. Some behavioral excesses—for example, self-injurious behavior—are inappropriate no matter what the context. In most cases, however, the point at which a particular behavior is considered deficient or excessive is determined primarily by the practices of one's culture and the ethical views of concerned individuals.

To summarize, the behavior modification approach focuses primarily on behavior and involves current environmental (as opposed to medical, pharmacological, or surgical) manipulations to change behavior. Individuals who are labeled as having a developmental disability, autism spectrum disorder, schizophrenia, depression, or an anxiety disorder, for example, are individuals who show behavioral deficits or excesses. Similarly, individuals who are labeled lazy, unmotivated, selfish, incompetent, or uncoordinated are also individuals who show behavioral deficits or excesses. Behavior modification consists of a set of procedures that can be used to change behavior so that these individuals will be considered less of whatever label has been given them. Traditional psychologists not trained in behavior modification have tended to label and classify individuals. Regardless of the label given, however, the behavior of the individuals is still there and is still influenced by their environments. The mother in Figure 1.1, for example, is still concerned about what to do with her child and how to handle the problem. That is where behavior modification comes in.

Some Ethical Issues

As behavior modification has evolved, ethical or moral concerns have become prominent. These are concerns that one should always bear in mind when applying behavior modification. Various groups and/or organizations, such as the Association for Behavioral and Cognitive Therapies, the American Psychological Association, and the Association for Behavior Analysis International, have addressed the ethical issues involved in the application of behavior modification (also see Bailey & Burch, 2016). In this section, we highlight ethical guidelines that you should keep in mind when reading subsequent chapters. In the final chapter of this book, we present a more detailed discussion of the relationship between cultural practices, ethics, and behavior modification.

Qualifications of the Applied Behavior Analyst or Behavior Therapist

As stated earlier, applied behavior analysts and behavior therapists should receive appropriate academic training. This should include supervised practical training to ensure competence in assessing behaviors, designing and implementing treatment programs, and evaluating the treatment results.

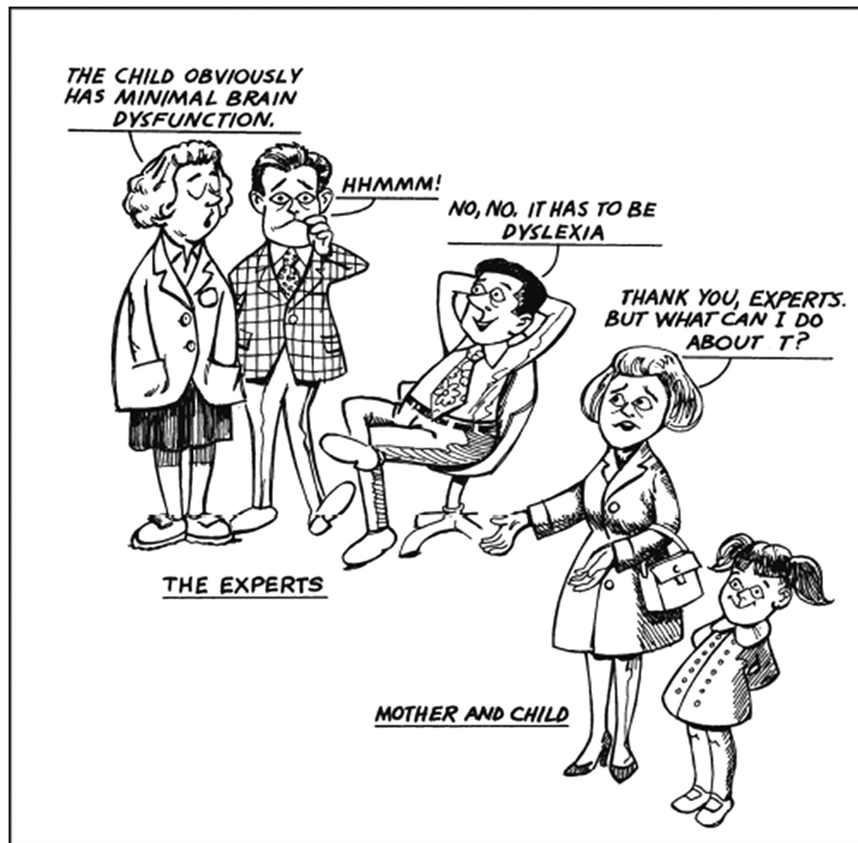
Definition of the Problem and Selection of Goals

Target behaviors selected for modification must be those that are most important for the individual and society. Ideally, the client would be an active participant in the identification of target behaviors. Where this is not possible, competent impartial third parties should be identified to act on behalf of the client.

Selection of Treatment

Applied behavior analysts and behavior therapists should use the most effective, empirically validated intervention methods with the least discomfort and fewest negative side effects.

FIGURE 1.1 The experts "helping" mother with her child?



Record Keeping and Ongoing Evaluation

Applied behavior analysts and behavior therapists should perform a thorough behavioral assessment before applying the intervention. The intervention should include ongoing monitoring of target behaviors, as well as possible side effects, and an appropriate follow-up evaluation after the treatment is concluded. It is the monitoring of data by concerned parties and clients that is the cornerstone for ensuring ethical and effective treatment programs by applied behavior analysts and behavior therapists.

QUESTIONS FOR LEARNING

26 List four myths or misconceptions about behavior modification.
27 List four subtopics that address ethical issues in behavior modification programs.
28 State two guidelines to ensure that target behaviors for behavior modification are the most important for the client and society.
29 What is key to ensuring ethical and effective treatment programs by applied behavior analysts and behavior therapists?

Summary of Chapter 1

Behavior is anything that a person says or does. *Behavior modification* involves the systematic application of learning principles and techniques to assess and improve an individual's covert and overt behaviors to enhance their daily functioning. Behaviors to be improved in a behavior modification program are called *target behaviors*. *Behavioral assessment* involves the collection and analysis of information and data to (a) identify and describe target behaviors; (b) identify possible causes of the behavior; (c) guide the selection of an appropriate treatment; and (d) evaluate treatment outcome.

Behavior Modification Is Based on Principles of Learning

Two important categories of learning are *respondent conditioning*, described by Ivan Pavlov in the early 1900s, and *operant conditioning*, popularized by B. F. Skinner in his book *Science and Human Behavior* (1953). In the first issue of the *Journal of Applied Behavior Analysis* in 1968, Baer, Wolf, and Risley identified the dimensions of *applied behavior analysis*, which is based largely on operant conditioning. Also, in the 1960s and 1970s, Albert Ellis and Aaron Beck independently focused on changing faulty thinking to help individuals overcome depression and other psychological problems. Their approach was originally called *cognitive behavior modification* and is now called *cognitive behavior therapy*. The term *applied behavior analyst* refers to someone who has considerable formal training in applied behavior analysis. The term *behavior therapist* refers to someone who has had considerable formal training in the application of behavior therapy or cognitive behavior therapy for treating psychological disorders. The term *behavior modifier* refers to an applied behavior analyst, a behavior therapist, or someone with no formal training in behavior modification principles but who wishes to use behavior modification techniques to change their own or others' behavior. Thus, the term behavior modification is broader than and encompasses the other two behavioral terms mentioned above (Pear & Martin, 2012). Moreover, it is extremely important to distinguish between professional behavior modifiers and individuals who use behavior modification in their everyday lives. Everyone uses the principles of behavior by virtue of living in a society, but only highly trained professionals are qualified to use behavior modification to treat complex behavior problems.

In this chapter, we described eight misconceptions about behavior modification, and we described examples of behavioral deficits and behavioral excesses treated by behavior modification. We also described several ethical guidelines for applying behavior modification. For applied behavior analysts and behavior therapists, an important ethical guideline is that interventions should include ongoing monitoring of target behaviors before, during, and after the intervention. It is the monitoring of data of concerned parties and clients that is the cornerstone for ensuring ethical and effective treatment programs by applied behavior analysts and behavior therapists.

APPLICATION EXERCISES

Note to reader: In most of the chapters of this book, we provide you with exercises to apply the concepts you learned in the chapters. Generally, we present two types of Application Exercise: (a) exercises involving others, and (b) self-modification exercises, in which you apply the behavior modification concepts you have learned to your own behavior.

A Exercise Involving Others

Consider someone other than yourself. From your point of view, identify:

1 two behavioral deficits for that person to overcome.
2 two behavioral excesses to decrease.

For each example, indicate whether you have described:

a a specific behavior or a general summary label.
b an observable behavior or a covert behavior.
c a behavior or the product of a behavior.

B Self-Modification Exercise

Apply the above exercise to yourself.

Note

1 The authors thank Rob Hawkins for these last two points.

2 Areas of Application

An Overview

Learning Objectives

After studying this chapter, you will be able to describe applications of behavior modification to:

- Parenting and child management.
- Medicine and health care.
- Gerontology.
- Behavioral sport psychology.
- Self-management.
- Intellectual disabilities.
- Business, industry, and government.
- Psychological problems.
- Education.
- Autism spectrum disorders.
- Schizophrenia.
- Diverse populations.

THE VALUE OF behavior modification techniques for improving a wide variety of behaviors has been demonstrated in thousands of research reports. Successful applications have been documented with populations ranging from persons with profound learning disabilities to the highly intelligent, from the very young to the very old, and from controlled institutional programs to varied community settings. Modified behaviors range from simple motor skills to complex problem solving. In areas such as education, social work, nursing, clinical psychology, psychiatry, community psychology, medicine, rehabilitation, business, industry, and sports, applications occur frequently. This chapter describes 12 major areas of application in which behavior modification has a solid foundation.

Parenting and Child Management

Being a parent is a challenging job. In addition to meeting basic needs, parents are totally responsible for their children's initial behavioral development. That responsibility is shared with teachers and others as the child develops through early childhood and adolescence into adulthood. Behavioral techniques help parents teach their children to walk, develop initial language skills, use the toilet, and perform household chores (Dishon, Stormshak, & Kavanagh, 2012). Parents have also been taught behavioral strategies for solving their children's sleep problems (Wirth, 2014) and decreasing problem behaviors, such as nail biting, temper tantrums, aggressive behaviors, disregarding rules, noncompliance with parents' requests, and frequent arguing (Wilder & King-Peery, 2012). Some child and adolescent behavior problems are so complex that, in addition to helping parents work with their children, applied behavior analysts and behavior therapists treat the problems directly (Christner, Stewart, & Freeman, 2007; Gimpel & Holland, 2017; Neef, Perrin, & Madden, 2013). Moreover, a behavioral program referred to as "Triple P" ("Positive Parenting Program") has been demonstrated to be an effective multi-level—i.e., at both the child and parental levels—parenting program to prevent and treat severe behavioral, emotional, and developmental problems in children (Graaf, Speetjens, Smit, Wolff, & Tavecchio, 2008). Triple P has been expanded under the name of Family Transitions Triple P (FTTP) to deal with or prevent the emotional upheavals resulting from family transitions such as divorce (Stallman & Sanders, 2014). Behavioral strategies have also been developed for helping communities prevent youth violence (Mattaini & McGuire, 2006), and for teaching applied-behavior-analysis skills to parents of children with autism spectrum disorder (Fisher et al., 2020).

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Education: From Preschool to University

Since the early 1960s, behavior modification applications in classrooms have progressed on several fronts (Martens, Daily III, Begeny, & Sullivan, 2021). Many applications in elementary school were initially designed to change student behaviors that were disruptive or incompatible with academic learning. Out-of-seat behavior, tantrums, aggressive behavior, and excessive socializing have all been successfully dealt with in classroom settings. Other behavioral applications in schools have involved modifying academic behavior directly, including oral reading, reading comprehension, composition, spelling, handwriting, and mastering mathematics and science concepts. Considerable success has also been achieved in applications with individuals with special problems, such as learning disabilities, hyperactivity, and attention deficits (Neef, Perrin, & Northup, 2020). Excellent "how-to" descriptions of behavior modification techniques for teachers have been published by Alberto & Troutman (2022) and Cipani (2017b), including the use of behavior modification in physical education (Siedentop & Tannehill, 2000; Ward, 2005). See also issues of the *Journal of Applied Behavior Analysis* and the *Journal of Behavioral Education*.

In the 1960s, a behavior modification approach to university teaching was developed by Fred S. Keller and his colleagues in the United States and Brazil (Keller, 1968). Since then, variations of behavioral approaches to university teaching have been described (Austin, 2000; Bernstein & Chase, 2013; Michael, 1991; Pear, 2012). These approaches have three common features: (a) the instructional goals for a course are stated in the form of study questions and application exercises, such as those in this book; (b) students are given opportunities to demonstrate their mastery of the course content through frequent tests or some combination of tests and assignments; and (c) students are given detailed information at the beginning of a course about what is expected of them on the tests and assignments in order to achieve various letter grades. Research has indicated that with these features, the great majority of students are more motivated to remain focused on the task at hand, and a high percentage earn "As" or "Bs" in these courses (Bernstein & Chase, 2013; Hattie, 2009; Moran & Mallott, 2004).

In addition, Keller's approach, known as personalized system of instruction (PSI), includes several other features, such as mastery criteria, where students must perform at a high level on a test or written assignment before proceeding to the next part of the course, and the use of student assistants called proctors to immediately score tests or written assignments. Before the widespread use of computers, PSI courses, as originally conceived by Keller, required a good deal of labor to administer because of the frequent testing and extensive record keeping that PSI requires. With the rise of computer technology, some instructors have automated much of the PSI procedure to make it more efficient. For example, at the University of Manitoba, computer-aided PSI (CAPSI) was developed by Joseph Pear and his colleagues in the 1980s and used at universities in Canada, the United States, Australia, and Brazil. (For reviews of CAPSI, see Pear & Falzarano, in press; Pear & Martin, 2004; Pear, Schnerch, Silva, Svenningsen, & Lambert, 2011; Svenningsen, Bottomley, & Pear, 2018). An innovative feature of CAPSI is that students in the same course who have mastered a given unit of study material can act as proctors or *peer reviewers* for that study unit. Research on CAPSI courses has demonstrated measurable feedback accuracy by peer reviewers and compliance with feedback by students (Martin, Pear, & Martin, 2002a, 2002b). There is also evidence that CAPSI may enhance creativity (Svenningsen & Pear, 2011). In addition, students in a CAPSI course receive more substantive feedback than would be possible in a course taught using traditional methods (Pear & Crone-Todd, 2002). Moreover, students overwhelming report that serving as peer reviewers helps them learn the course material (e.g., Svenningsen et al., 2018).

QUESTIONS FOR LEARNING

1. List four behaviors of children that have been improved by parents' application of behavior modification.
2. List four behaviors of elementary school students that have been modified with behavior modification.
3. Describe three characteristics common to behavioral approaches in university teaching.
4. What is PSI, and who was its founder?
5. What is CAPSI?

Developmental Disabilities

Beginning in the 1960s, some of the most dramatic successes of behavior modification occurred in applications to individuals with atypical childhood development. Intellectual disabilities and autism spectrum disorders (ASD; formerly called "autism") are two types of developmental disability that have received particular attention from

behavior modifiers. But before discussing these areas, we will provide a brief history of the use of several closely related terms.

During the latter half of the 20th century, it was common to use the term *mental retardation* to refer to individuals with intellectual impairments (Conyers, Martin, Martin, & Yu, 2002). During the 1990s, a frequently proposed alternative to the term was the term “developmental disability” (Warren, 2000). However, according to the Developmental Disabilities Bill of Rights Act in the USA (Public Law 95–527, 1984), the term “developmental disability” is broader in meaning than the term “mental retardation.” Partly because of this consideration, the American Association on Intellectual and Developmental Disabilities (AAIDD), formerly the American Association on Mental Retardation, took the position in 2007 that the term *intellectual disability* is the preferred term for the disability previously referred to as mental retardation. In consideration of this history, we view developmental disabilities as a broad area that includes the subareas of intellectual disabilities and ASD.

Intellectual Disabilities

The AAIDD defines “intellectual disability” in part as follows: (a) “Significant limitations in intellectual functioning”; (b) “Significant limitations in adaptive behavior”; and (c) “Onset of both of the above limitations during the developmental period” (Retrieved from https://aaidd.org/intellectual-disability/definition/faqs-on-intellectual-disability#.W0DBdX4naAY on January 10, 2022.)

Many studies have demonstrated the effectiveness of behavioral techniques for teaching behaviors such as toileting, self-help skills (i.e., feeding, dressing, and personal hygiene), communication skills, social skills, vocational skills, leisure-time behaviors, and a variety of community survival behaviors to people with intellectual disabilities. (For examples of behavior modification with persons with intellectual disabilities, see Call, Meyers, McElhanon, & Scheithauer, 2017; Reyes, Vollmer, & Hall, 2017; Tung, Donaldson, & Kahng, 2017. Reviews of the literature can be found in Cuvo & Davis, 2000; Kurtz & Lind, 2013; Peters-Scheffer & Didden, 2020; see also issues of the *Journal of Applied Behavior Analysis*.)

Autism Spectrum Disorder

Children diagnosed with autism spectrum disorders (ASDs) are likely to show some combination of impaired social behavior (e.g., not responding to parents’ playful gestures), impaired communication (e.g., meaningless repetition of words or phrases), and repetitive self-stimulatory behaviors (e.g., fluttering their fingers in front of their eyes). They are also likely to show some behaviors similar to children diagnosed with intellectual disabilities in that they may perform far below average on a variety of self-care behaviors such as dressing, grooming, and feeding. For unknown reasons, the prevalence of ASDs seems to be increasing. According to the U.S. Centers for Disease Control and Prevention (2021), approximately one in 44 children in the United States has ASD. (Retrieved from https://www.cdc.gov/ncbddd/autism/data.html on March 22, 2022. For further information on ASD, visit https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Autism-Spectrum-Disorder-Fact-Sheet.)

In the 1960s and 1970s, Ivar Lovaas developed behavioral treatments for children with ASDs. Using an approach he called early intensive behavioral intervention (EIBI), Lovaas (1966, 1977) focused on strategies to teach social and play behaviors, eliminate self-stimulatory behaviors, and develop language skills. When EIBI was applied to children with ASDs younger than 30 months old and continued until they reached school age, 50% of those children were able to enter a regular classroom at the normal school age (Lovaas, 1987). Moreover, the behavioral treatment produced long-lasting gains (McEachin, Smith, & Lovaas, 1993; also see Smith, Hayward, Gale, Eikeseth, & Klintwall, 2021). Although some reviewers have criticized the experimental design of the Lovaas study (e.g., Gresham & MacMillan, 1997; Tews, 2007), subsequent research has established EIBI as the treatment of choice in terms of both cost and effectiveness for children with ASDs (Ahearn & Tiger, 2013; Kodak, Grow, & Bergmann, 2021; Matson & Smith, 2008; Matson & Sturmey, 2011). There are a number of government-funded EIBI programs for children with ASDs. In Canada, for example, EIBI programs are currently available in all provinces and territories. (For examples of behavior modification with children with ASDs, see Cox, Virues-Ortega, Julio, & Martin, 2017; Dixon, Peach, & Daar, 2017; Gerencser, Higbee, Akers, & Contreras, 2017; Halbur et al., 2021; Johnson, Vladescu, Kodak, & Sidener, 2017; Leaf et al., 2017; Lillie, Harman, Hurd, & Smalley, 2021; Sivaraman, Virues-Ortega, & Roeyers, 2021.)

A common strategy for delivering EIBI to children with ASDs is called discrete-trials teaching (DTT). DTT is made up of a series of individual teaching trials. Researchers have investigated a variety of strategies for teaching staff and parents to implement DTT in EIBI programs (see Thomson, Martin, Arnal, Fazzio, & Yu, 2009). Considering the millions of dollars that are spent on public programs to fund EIBI treatment of children with ASDs, reviewers of outcome literature (e.g., Matson & Smith, 2008; Perry, Pritchard, & Penn, 2006) have identified important requirements that must be met to ensure that resources are being allocated efficiently. Two of these requirements are (a) the development of quality assessment systems to evaluate specific components of EIBI interventions, and (b) the development of research-based, economical, rapid training procedures for teaching parents and instructors to conduct DTT. A step toward meeting the first need is the development and field-testing of the Discrete-Trials Teaching Evaluation Form (Babel, Martin, Fazzio, Arnal, & Thomson, 2008; Jeanson et al., 2010), and a step toward meeting the second need is the field-testing of a self-instructional manual (Fazzio & Martin, 2011) for teaching DTT to instructors of children with ASDs (Fazzio, Martin, Arnal, & Yu, 2009; Thiessen et al., 2009; Thomson et al., 2012; Young, Boris, Thomson, Martin, & Yu, 2012; Zaragoza Scherman et al., 2015).

Schizophrenia

According to the United States National Institute of Mental Health (NIMH):

> Schizophrenia is a serious mental illness that affects how a person thinks, feels, and behaves. People with schizophrenia may seem like they have lost touch with reality, which causes significant distress for the individual, their family members, and friends.
>
> (Retrieved from www.nimh.nih.gov/health/topics/schizophrenia on January 10, 2022)

Although a few case studies were conducted in the 1950s, major attention by applied behavior analysts and behavior therapists was directed toward schizophrenia in the 1960s and early 1970s (Kazdin, 1978). In the late 1970s and early 1980s, however, interest in this area decreased, and only a small number of behavior modification articles in this area were published (Bellack, 1986). There is, nevertheless, clear evidence of the success of behavior modification treatments with schizophrenia. Because inadequate social relationships are a prime contributor to the poor quality of life experienced by people with schizophrenia, social skills have been one of the behaviors targeted for change. Research indicates considerable success in teaching people with schizophrenia to engage in positive social interactions, communication skills, assertiveness skills, and job-finding skills (Bellack & Hersen, 1993; Bellack & Muser, 1990; Bellack, Muser, Gingerich, & Agresta, 1997). Cognitive behavior therapy techniques have also been used effectively to alleviate problems caused by hallucinations or delusions in persons with schizophrenia (Bouchard, Vallieres, Roy, & Maziade, 1996). Studies strongly indicate that behavior therapy can make a significant contribution to the treatment, management, and rehabilitation of persons with schizophrenia (Beck, Rector, Stolar, & Grant, 2008; McKinney & Fiedler, 2004; Wilder, Wong, Hodges, & Ertel, 2020).

Psychological Problems Treated in Clinical Settings

Many studies have demonstrated that there are psychological problems—e.g., anxiety disorders, obsessive-compulsive disorders, stress-related problems, depression, obesity, marital problems, sexual dysfunction, habit disorders—for which specific behavioral procedures administered in a therapist's office or other clinical settings are demonstrably superior to other forms of psychotherapy administered in clinical settings (Barlow, 2021). But what about the use of pharmaceuticals? In a provocative book titled *Taking America Off Drugs*, Stephen Ray Flora (2007) argued that Americans have been deceived into believing that, whatever one's psychological problem, there is a drug to cure it. In contrast, he argues that most psychological problems, including eating disorders, phobias, obsessive-compulsive disorder, attention-deficit hyperactive disorder, depression, schizophrenia, sleep disorders, and sexual disorders, are behavior based, not "neurochemical" or "brain-based." He argued further that, for such problems, behavior therapy is more effective than drug treatment, although he acknowledged that, in a minority of cases for a minority of behavioral difficulties, the treatment of choice might be a combination of behavior therapy and drug treatment.

As mentioned in Chapter 1, behavior therapy is a form of behavior modification of dysfunctional behaviors usually carried out in a clinical setting. Chapters 26 and 27 of this book provide a detailed discussion of behavioral treatments for a variety of psychological problems. Detailed discussion of behavioral treatment of psychological disorders can also be found in Beck (2020) and Dobson and Dobson (2017).

QUESTIONS FOR LEARNING

6 What is currently the preferred term for the disability previously referred to as "mental retardation"?
7 List four behaviors of persons with intellectual disabilities that have been modified using behavior modification.
8 List four behaviors of children with ASDs that have been modified using behavior modification.
9 List four behaviors of people with schizophrenia that have been modified using behavior modification.
10 List four psychological problems that have been effectively treated with behavior therapy.

Self-Management of Personal Problems

Recall some of the problems described in Chapter 1. Sam had difficulty studying and finishing his term papers on time. Karen experienced extreme nervousness just before having to perform her gymnastics routine. Mary frequently experienced irrational thinking about her performance on her college exams. Many people would like to change their behavior. How about you? Would you like to eat more healthily? Get into an exercise program? Become more assertive? Are there skills you can learn to help you to modify your behavior? A great deal of progress has been made in the area referred to as self-management, self-control, self-adjustment, self-regulation, self-direction, or self-modification. Successful self-modification requires a set of skills that can be learned. These skills involve ways of rearranging your environment—the people, objects, events, etc. immediately surrounding you—to control your subsequent behavior. Hundreds of successful self-modification projects directed at behaviors—saving money, exercising, engaging in good study habits, and controlling gambling—have been reported in the behavioral literature (for examples, see Vohs & Baumeister, 2017). Self-modification for personal adjustment is described in more detail in Chapter 25. Discussion of this topic can also be found in Choi and Chung (2012) and Watson and Tharp (2014).

Medical and Health Care

Traditionally, a person who suffered from chronic headaches, a respiratory disorder, or hypertension would never have seen a psychologist for help with any of these problems. In the late 1960s, however, psychologists collaborating with physicians began using behavior modification techniques to treat these and other medical conditions (Doleys, Meredith, & Ciminero, 1982). This launched **behavioral medicine**, a broad interdisciplinary field concerned with the links between health, illness, and behavior (Searight, 1998). Within behavioral medicine, *health psychology* considers how psychological factors can influence or cause illness and how people can be encouraged to practice healthy behavior to prevent health problems (Taylor, 2014). Health psychologists have applied behavioral modification in five major areas:

1 *Direct treatment of medical problems*. Health psychologists are continuing the trend of the late 1960s of developing behavioral techniques to alleviate symptoms such as migraine headaches, backaches, hypertension, seizures, irregular heartbeat, sleep problems, and stomach problems (Luiselli, 2021; Taylor, 2021; Thorn, 2017). One such technique is called *biofeedback*, which consists of monitoring one or more of a person's physiological processes—heart rate, blood pressure, muscle tension, and brain waves—and continuously providing that information to the individual. Such information helps the individual to gain control over the monitored physiological process (Schwartz & Andrasic, 2017; Taylor, 2021).
2 *Establishing treatment compliance*. Do you always keep your dental appointments? Do you always take medication exactly as prescribed by your doctor? Many people do not. Because it is behavior, compliance with medical regimens is a natural target for behavior modification. Recent examples include wearing face masks to prevent the spread of COVID-19 (Halbur et al., 2021; Lillie, Harman, Hurd, & Smalley, 2021), and reducing transmission of it in the workplace (Gravina, Nastasi, Sleiman, Matey, & Simmons, 2020). Thus, an important part of health psychology is promoting treatment compliance (Raiff, Jarvis, & Dallery, 2016; Taylor, 2021).

FIGURE 2.1 Behavioral strategies have been used effectively to help people persist in physical fitness programs

3. *Promotion of healthy living*. Do you exercise at least three times per week? Do you eat healthy foods and minimize your consumption of saturated fat, cholesterol, and salt? Do you limit your consumption of alcohol? Do you say no to addictive drugs? If you can answer yes to these questions, and if you can continue to answer yes as the years go by, then you can considerably lengthen your life span (see Figure 2.1). An important area of behavior modification involves the application of techniques to help people manage their own behaviors—e.g., eating moderate-size well-balanced meals, exercising frequently, and decreasing cigarette smoking—to stay healthy (see Chapter 25; Jarvis & Dallery, 2017; Taylor, 2021).
4. *Management of caregivers*. Health psychologists are concerned not only with the behavior of the client or patient, but also with the behavior of those who have an impact on the medical condition of the client. Thus, health psychologists deal with changing the behavior of their clients' family and friends, physicians, nurses, occupational therapists, speech therapists, and other health specialists (see, e.g., Clarke & Wilson, 2008; Nyp et al., 2011).
5. *Stress management*. Stress is something that you can be sure of encountering in your life. Stressors are conditions or events—e.g., being stuck in traffic, lack of sleep, smog, pending examinations, debts, marital breakdown, and serious illness or death in the family—that present coping difficulties. Stress reactions are physiological and behavioral responses, such as fatigue, hypertension, and ulcers. An important area of health psychology concerns the study of stressors, their effects on behavior, and the development of behavioral strategies for coping with stressors (e.g., Lehrer & Woolfolk, 2021; Taylor, 2021). Some of these strategies are described in later chapters.

In addition to the five areas above, Nisbet and Gick (2008) suggested that health psychology could help to save the planet because healthier living leads to a cleaner environment—i.e., the air, water, food supply, etc. Note that this use of the word "environment" is different from the use of the term "environment" in behavior modification—the people, objects, events, etc. in one's immediate surroundings. The broad interdisciplinary field of behavioral medicine and the subfield of health psychology have the potential to make a profound contribution to the efficiency and effectiveness of modern medicine and health care. For additional reading in this area, see issues of the *Journal of Behavioral Medicine* and the books by Baum, Revenson, and Singer (2011), and Taylor (2021).

Gerontology

Do you want to know what it's like to be old? If so, then "you should smear dirt on your glasses, stuff cotton in your ears, put on heavy shoes that are too big for you, wear gloves, and then try to spend the day in a normal way" (Skinner & Vaughan, 1983, p. 38). As the elderly become an increasing percentage of the population, more and more individuals must deal daily with the loss of skills and abilities to function independently that occur with old age or chronic illness. Again, behavior modification can make a positive contribution here. For example, prior habitual ways of performing daily routines may no longer be possible, and new routines must be developed and learned. Anxiety or fear about the possibility of failing to cope also might have to be dealt with. Disruptive behaviors in nursing or personal care homes may become a serious concern, and new relationships might need to be developed with professional care staff. Behavioral techniques are used increasingly to help the elderly and chronic-care patients to solve these problems (For more information on behavior modification and aging, see the Special Issue on Geriatric Behavior Therapy in *Behavior Therapy*, 2011, 42(1); Baker, LeBlanc, Raetz, & Feliciano, 2011; Turner & Mathews, 2013); also see the special issue on behavior analysis and aging in *Behavior Analysis: Research and Practice*, 2018.)

QUESTIONS FOR LEARNING

11 List four behaviors in the area of self-management of personal problems that have been modified by behavior modification.
12 What is health psychology?
13 List five areas of application within health psychology.
14 List three behaviors of elderly persons that have been improved with behavior modification.

Behavioral Community Psychology

The bulk of the behavioral applications of the 1950s focused on persons with developmental disabilities, psychiatric patients, and others with severe problems and took place in institutional or highly controlled settings. By the 1970s, however, important behavior modification projects were directed toward such broad community objectives as reducing littering in public campgrounds, increasing recycling of returnable soft drink containers, helping community boards to use problem-solving techniques, promoting energy conservation by increasing bus ridership, encouraging welfare recipients to attend self-help meetings, and helping college students live harmoniously in a cooperative housing project. (For reviews of the early research in these areas, see Geller, Winett, & Everett, 1982; Martin & Osborne, 1980.) The scope of behavior modification had clearly expanded from individual problems to community concerns. One of the early studies in this area defined *behavioral community psychology* as "applications to socially significant problems in unstructured community settings where the behavior of individuals is not considered deviant in the traditional sense" (Briscoe, Hoffman, & Bailey, 1975, p. 57). (For additional readings in behavioral community psychology, see issues of the *Journal of Applied Behavior Analysis*, e.g., Fritz et al., 2017; O'Connor, Lerman, Fritz, & Hodde, 2010. For a discussion of how applications of behavioral analysis can lead to "population-wide improvements in human well-being," see Biglan & Glenn, 2013.)

Business, Industry, and Government

Behavior modification has also been applied to improve the performance of individuals in a wide variety of organizational settings, ranging from small businesses to large corporations and from small community centers (note the overlap with behavioral community psychology) to large state hospitals. This general area is referred to as *organizational behavior management* (OBM), which has been defined as the application of behavioral principles and methods to the study and control of individual or group behavior within organizational settings (Frederiksen & Lovett, 1980). Other labels used interchangeably with organizational behavior management include *performance management*, *industrial behavior modification*, *organizational behavior modification*, *organizational behavior technology*, and *organizational behavior analysis*. Organizational behavior management emphasizes (a) specific staff

activities that characterize successful performances or produce successful results, and (b) frequent feedback and rewards for employees who show desirable behaviors.

One of the earliest studies in OBM was carried out at the Emery Air Freight Company. According to an article titled "Conversations with B. F. Skinner" in the 1973 issue of *Organizational Dynamics*, the desired behavior—employees' placement of packages in a special container—was increased from 45% to 95% through the use of praise from supervisors following the desired behavior.

Later studies in OBM have used behavioral techniques to change behavior in ways that improve productivity, decrease tardiness and absenteeism, increase sales, create new businesses, improve worker safety, reduce theft by employees, reduce shoplifting, and improve management-employee relations. (For additional reading in this area, see Abernathy, 2013; Griffin, Phillips, & Gully, 2020; Reid, O'Kane, & Macurik, 2011; and issues of the *Journal of Organizational Behavior Management*.)

Behavioral Sport Psychology

Since the early 1970s, there has been a growing desire on the part of coaches and athletes for more applied sport science research, particularly in the area of sport psychology. Applied behavior analysts have made contributions to this area (Martin & Thomson, 2011). *Behavioral sport psychology* has been defined as the use of behavior analysis principles and techniques to enhance the performance and satisfaction of athletes and others associated with sports (Martin & Tkachuk, 2000). Areas of application include motivating practice and fitness training, teaching new athletic skills, managing troublesome emotions that interfere with athletic performance, helping athletes cope with pressure at major competitions, and helping coaches function more effectively with respect to athletic performance. For information on research and applications in this area, see Luiselli & Reed (2011), Martin (2019), Martin and Ingram (2021), and Virues-Ortega and Martin (2010). For a review of behavior analysis and health, sport, and fitness, see the 2021 special issue of *Behavior Analysis: Research and Practice* on behavior analysis in health, sport, and fitness.

Behavior Modification with Diverse Populations

During the past three decades, applied behavior analysts and behavior therapists have given increased attention to issues of culture, gender, ethnicity, and sexual orientation as variables that can influence the effectiveness of treatment (see, e.g., Beaulieu & Jimenez-Gomez, 2022; Borrego, Ibanez, Spendlove, & Pemberton, 2007; Hatch, Friedman, & Paradis, 1996; Iwamasa, 1999; Iwamasa & Smith, 1996; Paradis, Friedman, Hatch, & Ackerman, 1996; Pederson, Lonner, Draguns, Trimble, & Scharron del Rio, 2015; Purcell, Campos, & Perilla, 1996). It is helpful, for example, for behavior modifiers to know that many clients with Asian cultural backgrounds prefer to be told specifically—as opposed to a more nondirective approach—what to do by the behavior therapist or behavior analyst (Chen, 1995). Many clients with Hispanic cultural backgrounds are more likely to comply with specific goal-directed suggestions if those suggestions are preceded by a period of familiarizing "small talk" (Tanaka-Matsumi & Higginbotham, 1994; also see the special series on behavior therapy with Latino families, *Cognitive and Behavioral Practice*, 2010, 17(2)).

A particularly striking example of the importance of understanding the cultural backgrounds of one's clients comes from the Lakota Sioux reservation near the Badlands in South Dakota. Dr. Tawa Witko, a psychologist on the reservation, described the case of an individual who had been diagnosed by another psychologist as schizophrenic. The reason for the diagnosis was that the man heard voices, especially around ceremony times. Dr. Witko explained that this phenomenon is common among Native Americans, has spiritual meaning, and does not in itself indicate mental illness (Winerman, 2004).

Some cultural factors might weigh against strengthening a particular behavior. For example, increased eye contact as a target behavior for a social skills training program for Native Americans might be inappropriate if, as for the Navajo culture, prolonged eye contact is considered to be aggressive (Tanaka-Matsumi, Higginbotham, & Chang, 2002). Readers interested in behavioral treatment with culturally diverse clients are encouraged to examine the special issues on cultural diversity in *Cognitive and Behavioral Practice* (1996, 3(1)), *The Behavior Therapist* (1999, 22(10), and issues of the *Journal of Muslim Mental Health* and the *International Journal of Culture and Mental Health*.

Although information about clients' cultural backgrounds can be helpful for applied behavior analysts and behavior therapists, we must also be sensitive to the dangers of overgeneralizing about any particular cultural

group. (Cautions similar to those made in Chapter 1 about the dangers of labeling are relevant here.) For example, as Iwamasa (1999) pointed out, the Asian American population is comprised of over 30 different cultural and ethnic groups, and each has its own primary language, values, lifestyles, and patterns of adaptation to the United States.

QUESTIONS FOR LEARNING

15 Define behavioral community psychology.
16 List four behaviors in the area of behavioral community psychology that have been modified by behavior modification.
17 Define organizational behavior management (OBM).
18 List four behaviors in business, industry, or government that have been modified by behavior modification.
19 Define behavioral sport psychology.
20 List four areas of application of behavioral sport psychology.
21 Describe how knowledge of a cultural characteristic might be helpful for behavior modifiers working with individuals from different cultures. Give an example.
22 What caution should behavior modifiers consider when working with individuals from different cultures?

Conclusion

The rise of behavior modification as a successful approach for dealing with a wide range of human problems has been remarkable. Books and journal articles describe behavioral procedures and research ranging from child rearing to coping with old age, from work to leisure activities, and from self-improvement to preserving the natural environment. It has been used with individuals ranging from those with profound disabilities to those who are gifted. Examples of applications in many of these areas are described and illustrated in the following chapters.

Summary of Chapter 2

In this chapter, we described 12 major areas of applications in which behavior modification has a solid foundation. In parent-training programs, parents have been taught behavioral strategies to teach children new skills, decrease problem behaviors, and increase desirable behaviors. In education, behavior modification has been used to teach academic skills, decrease classroom problem behaviors, overcome special problems like attention deficits, and improve university teaching. For persons with intellectual disabilities, behavioral techniques have been successfully used to teach a educational skills, self-care skills, communication skills, vocational skills, and community survival skills. For children with ASDs, early intensive behavioral intervention (EIBI) is now considered the most effective treatment, and there are a number of government-funded EIBI programs. There is clear evidence that persons with schizophrenia can be successfully treated and rehabilitated with cognitive-behavioral techniques. Behavioral procedures are demonstrably superior to other forms of psychotherapy for treating psychological problems in clinical settings, such as anxiety disorders, depression, and marital problems. Many individuals have learned about behavior modification for self-management of personal problems, such as lack of exercising, excessive money spending, and lack of studying.

There are now behavioral applications in five areas of medicine and health care, including direct treatment of medical problems, establishing treatment compliance, promotion of healthy living, management of caregivers, and stress management. Behavior modification is also being applied in gerontology to help the elderly deal with loss of skills associated with aging and cope successfully in nursing or personal care homes. Behavioral community psychology is the application of behavior modification to socially significant problems in unstructured community settings. This application of behavior modification includes behaviors such as decreasing littering, promoting energy conservation, and increasing recycling. Behavior modification has also been applied to business, industry, and government in such areas as improving worker safety, reducing shoplifting, and decreasing tardiness and absenteeism. Behavioral sport psychology is the use of behavior analysis principles and techniques to enhance the performance and satisfaction of athletes and others associated with sports. Behavior modification with diverse populations involves increased attention to culture, gender, ethnicity, and sexual orientation as variables that can influence the effectiveness of treatment. The rise of behavior modification as a successful approach for dealing with a wide range of human behaviors in these 12 areas has been remarkable.

APPLICATION EXERCISES

Self-Modification Exercise

In the subsections "Self-Management of Personal Problems," "Medical and Health Care," "Community Behavior Analysis," and "Behavioral Sport Psychology," we list many behaviors that have been successfully modified. Review each of those sections and prepare a list of 10 of those behaviors that you or a friend would like to improve. For each behavior, indicate whether it is deficient (i.e., a behavioral deficit) or excessive (i.e., a behavioral excess) and whether it is a behavior of yours or a friend's.

3 Defining, Measuring, and Recording Target Behavior

Learning Objectives

After studying this chapter, you will be able to:

- Describe the minimal phases of a behavior modification program.
- Compare and contrast indirect and direct behavioral assessment procedures.
- Describe seven behavioral characteristics that you can record.
- Summarize three strategies for recording behavior.
- Explain procedures for assessing the accuracy of observations.
- Explain why it is important to record accurate data throughout a behavior modification program.
- Explain why it is important for behavior modifiers to show compassionate concern toward their clients and their clients' caregivers.

Do you want to sit here, Mommy?

IMPROVING DARREN'S COOPERATIVE BEHAVIOR[1]

Six-year-old Darren was extremely uncooperative and commanding with his parents. In the hope of learning how to deal more effectively with his excessive commanding behavior, Darren's parents took him to the Gatzert Child Developmental Clinic at the University of Washington. According to his parents, Darren virtually "ran the show" at home, deciding when he would go to bed, what foods he would eat, when his parents could play with him, and so on. To obtain direct observations of Darren's behavior, both cooperative and uncooperative, Dr. Robert Wahler asked Darren's mother to spend some time with Darren in a playroom at the clinic. The playroom was equipped with adjoining observation rooms with one-way windows for data recording. During the first two 20-minute observation sessions, Darren's mother was instructed: "Just play with Darren as you might at home." Darren's commanding behavior was defined as any verbal or nonverbal instructions to his mother, such as saying things like "You go over there, I'll stay here" or pushing her into a chair. Cooperative behavior was defined as any non-commanding statements, actions, or questions, such as "Do you want to sit here?" while pointing to a chair. Darren showed a very low rate of cooperative behavior during the two observation sessions. His commanding behavior, in contrast, occurred at an extremely high rate. Following the observation sessions, Darren's mother was asked to apply a treatment in which she was to be very positive and supportive of any instances of cooperative behavior shown by Darren. At the same time, she was instructed to completely ignore his commanding behavior. During two treatment sessions, Darren's cooperative behavior steadily increased. During the same time, his commanding behavior decreased to near zero.

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Throughout this book, numerous examples, like Darren's case, illustrate the effectiveness of behavior modification procedures. Many of these examples are accompanied by graphs showing the changes—increases or decreases—when the behavioral procedures were applied. The graphs are presented not just to make it easier for you to understand the material; precise records of behavior represent an inseparable part of behavior modification procedures. Indeed, some have gone so far as to say that the major contribution of behavior modification has been the insistence on accurately recording specific behaviors and making decisions based on recorded data rather than merely on subjective impressions. As stated in Chapter 1, behavioral assessment involves the collection and analysis of information and data to: (a) identify and describe target behavior; (b) identify possible causes of the behavior; (c) select appropriate treatment strategies to modify the behavior; and (d) evaluate treatment outcome. After reviewing the "Minimal Phases of a Behavior Modification Program" below, the rest of this chapter focuses on behavioral assessment.

Minimal Phases of a Behavior Modification Program

A successful behavior modification program typically involves five phases during which the target behavior is identified, defined, and recorded: (a) a screening or intake phase; (b) a defining-the-target-behavior phase; (c) a pre-program or baseline-assessment phase; (d) a treatment phase; and (e) a follow-up phase. In this section, we give a brief overview of these phases as they would typically be carried out by an agency or a professional practitioner providing behavior modification services.

Screening or Intake Phase

The initial interactions between a client and a practitioner or an agency, such as between Darren and his parents and Dr. Wahler at the Gatzert Child Development Clinic, constitute the *intake phase*. During this phase, a client or the client's caregiver may be asked to complete an *intake form*, which requests background information: the client's name, address, date of birth, and so forth. It also asks the client or the client's caregiver to state the reason for seeking service from that agency or practitioner.

One function of the screening phase is to determine whether a particular agency or behavior modifier is appropriate to deal with a potential client's behavior (Hawkins, 1979). A second function is to inform the client about the practitioner's or agency's policies and procedures for the services provided. A third function is to screen for a crisis condition, such as child abuse or suicide risk, that might require immediate intervention. A fourth function, in some cases, is to gather sufficient information to diagnose the client according to the standardized categories of mental disorder. Clinics, hospitals, schools, and other agencies might require such diagnoses before treatment can be offered, and health insurance companies often require them before treatment will be paid for. A fifth function of the screening phase is to provide initial information about which behavior(s) should be assessed. To achieve this initial assessment, applied behavior analysts and behavior therapists use the above information plus other information—teachers' reports, various traditional test results, and other assessment devices—to aid in identifying specific target behaviors to address.

Defining-the-Target-Behavior Phase

As stated in Chapter 1, behaviors to be improved in a behavior modification program are called *target behaviors*; these are specific behaviors to decrease (i.e., behavioral excesses) or to increase (i.e., behavioral deficits). In Darren's case, his commanding behavior (a behavioral excess) and his cooperative behavior (a behavioral deficit) were specifically defined. Three of the many examples from later chapters include increasing an adult's daily exercising, decreasing a figure skater's negative self-talk, and increasing a seventh-grader's work rate in math class. Assessment procedures for identifying and describing target behaviors are given later in this chapter.

A Pre-Program or Baseline-Assessment Phase

Like the first two sessions in Darren's case, during the *pre-program assessment* or *baseline* phase, the applied behavior analyst or behavior therapist assesses the target behavior to (a) determine its level prior to the introduction of

the treatment, and (b) analyze the individual's current environment to identify possible controlling variables—or, less technically—"causes" of the behavior to be changed. Controlling variables are discussed in detail later in this book.

The need for a baseline-assessment phase follows from the importance that applied behavior analysts and behavior therapists place on directly measuring the behavior of concern and using changes in the measure as the best indicator that the problem is being addressed. If a child is having difficulty in school, for example, the behavior modifier—most likely an applied behavior analyst—would be especially interested in obtaining a baseline of specific behavioral excesses (e.g., disruptive behavior) or deficits (e.g., a reading deficiency) that constitute the problem. Further details about the sources of information for the baseline phase are given later in this chapter.

When the observational method affects the behaviors being observed, we say that the observation is *obtrusive*. To record observations *unobtrusively* means that the observations do not cause those being observed to deviate from their typical behavior. Observations should not influence the behavior we are observing. You can ensure that your observations are unobtrusive in several ways; (a) observing the behavior from behind a one-way window, (b) inconspicuously observing individuals from a distance, (c) having a confederate or co-observer make observations while working side by side with a client in a normal work setting, (d) recording the behavior with a hidden camera, and (e) evaluating products of the client's behavior. However, anyone contemplating recording the behavior of another person should consult the ethical guidelines of his or her professional organization and the applicable laws pertaining to privacy and confidentiality. (See Chapter 29 of this text.)

Treatment Phase

After making a precise baseline assessment, an applied behavior analyst or behavior therapist will design and apply a program, as in Darren's case, to bring about the desired behavior change. In educational settings, such a program is typically referred to as a *training* or *teaching program*. In community and clinical settings, the program is often called an *intervention* or *therapy program*.

Behavior modification programs typically provide for frequent observation and monitoring of the target behavior during training or treatment to a degree rarely found in other approaches. In addition, applied behavior analysts and behavior therapists strongly emphasize changing the program if the measurements taken indicate that the desired change in behavior is not occurring within a reasonable period of time.

Follow-up Phase

Finally, a *follow-up phase* is conducted to determine whether the improvements achieved during treatment are maintained after the program's termination. When feasible, this will consist of observations in the natural environment—i.e., the home—or when and where the behavior is expected to occur.

QUESTIONS FOR LEARNING

1. Define behavioral assessment.
2. List the five phases of a behavior modification program.
3. What are the five functions of the intake phase of a behavior modification program?
4. What does the term *target behavior* mean? What were the target behaviors in Darren's case?
5. What two things typically occur during the baseline phase of a behavior modification program?
6. What is the difference between obtrusive and unobtrusive observations?
7. In what types of settings are the terms *training or teaching program* and *intervention* or *therapy program* typically used?
8. What is the purpose of the follow-up phase of a behavior modification program?

Indirect, Direct, and Experimental Behavioral Assessments

Defining target behaviors clearly, completely, and in measurable terms is an important prerequisite to the design and implementation of behavior modification programs. Behavioral assessment procedures for collecting information to define and monitor target behaviors fall into three categories: indirect, direct, and experimental.

Indirect Assessment Procedures

In many situations in which a behavior modification program might be applied, the behavior modifier can directly observe the behavior of interest. However, consider a behavior therapist who sees clients in his or her office at regularly scheduled appointment times. It might be impractical for the therapist to observe clients regularly in the situations in which the target behaviors occur. Moreover, what if some of his or her clients want to change some of their thoughts and feelings that others cannot observe? As discussed in Chapters 17 and 26, applied behavior analysts and behavior therapists regard thoughts and feelings as covert behaviors (for exceptions, see Baum, 2012; Rachlin, 2011; for counter arguments to their views, see, e.g., Schlinger, 2011). For such target behaviors, applied behavior analysts and behavior therapists make use of *indirect assessment procedures*—assessments for which the behavior modifier or a trained observer does not directly observe the target behavior when and where the behavior typically occurs. The most common of these indirect procedures are interviews with the client and the client's significant others, questionnaires, role-playing, and client self-monitoring. Indirect assessment procedures have the advantages of being convenient, not requiring an inordinate amount of time, and potentially providing information about covert behaviors.

However, they suffer from the disadvantages that those providing information might not remember relevant observations accurately or have biases that would influence them to provide inaccurate data.

Interviews With the Client and Significant Others

During initial interviews with the client and the client's significant others—spouse, parents, or others directly concerned with the client's welfare—applied behavior analysts, behavior therapists, and traditional therapists typically use similar techniques, such as establishing rapport, being a "good listener," asking open-ended questions, requesting clarification, and acknowledging the validity of the client's feelings and problems.

Establishing rapport and being a good listener are important parts of expressing compassion and showing compassionate care toward the client and the client's significant others, and is recognized as extremely important in all phases of a behavior modification program (e.g., see Taylor, LeBlanc, and Nosik, 2019). Not only is this important for ethical reasons (see Chapter 29), but it can also strongly affect the treatment outcome. As Taylor et al. (2019) stated:

> A behavior analyst's failure to practice essential relationship skills may have deleterious effects on treatment, including clients' failure to support and implement programming, requests for reassignment or replacement of treatment team personnel, or withdrawal from behavior-analytic treatment altogether. (p. 653)

In addition to showing compassionate care toward the client and the client's significant others, the behavior modifier would attempt to obtain information helpful in identifying the target behavior and the variables that currently control it (Spiegler, 2015). Table 3.1 shows the types of questions that behavior analysts typically ask in the initial interview.

Questionnaires

A well-designed questionnaire provides information that might be useful in assessing a client's problem and developing a behavioral program tailored to the client. A large number of such questionnaires are available. Many of

TABLE 3.1 Examples of Questions an Applied Behavior Analyst or a Behavior Therapist Typically Asks During an Intake Interview

1 What seems to be the problem?
2 Can you describe what you typically say or do when you experience the problem?
3 How often does the problem occur?
4 For how long has the problem been occurring?
5 In what situations does the problem typically occur? In other words, what sets it off?
6 What tends to occur immediately after you experience the problem?
7 What are you typically thinking and feeling when the problem occurs?
8 How have you tried to deal with the problem thus far?

these, including questionnaires for couples, families, children, and adults, can be found in a two-volume compendium compiled by Fischer, Corcoran, and Springer (2020a, 2020b). Several types of questionnaires are popular with applied behavior analysts and behavior therapists.

Life history questionnaires provide demographic data, such as marital status, vocational status, and other background data, such as sexual, health, and educational histories. A notable example is *The Multimodal Life History Inventory* (Lazarus & Lazarus, 2005).

Self-report problem checklists have the client indicate from a detailed list those problems that apply to him or her. Such questionnaires are particularly useful in helping the therapist completely specify the problem or problems for which the client is seeking therapy.

An example of a self-report behavioral checklist is one developed by Martin and Thomson (2010) for helping young figure skaters identify problems at practice that might require sport psychology consultation (see Figure 3.1). Asher, Gordon, Selbst, and Cooperberg (2010) developed a variety of checklists for clinical work with children and adolescents experiencing a wide range of diagnoses, including attention-deficit hyperactivity disorder (ADHD) and mood disorders.

FIGURE 3.1 A questionnaire to assess areas in need of help during a seasonal sport psychology program for figure skaters

Name__________________ **Date**________________

Would you say you need help or need to improve:	**Check here if not sure**	**Definitely no**		**To some extent**		**Definitely yes**
Regarding Free Skating Practices, to:						
1. Set specific goals for every practice?	___________	1	2	3	4	5
2. Arrive at every practice totally committed to do your best?	___________	1	2	3	4	5
3. Consistently be stretched and warmed up before steppinq on the ice at practice?	___________	1	2	3	4	5
4. Be more focused when doing your jumps and spins? (Answer “yes” if you often just do the jumps or spins in a haphazard way without trying to do your best.)	___________	1	2	3	4	5
5. Stay positive and not get down on yourself when you’re having a bad practice?	___________	1	2	3	4	5
6. Make better use of full practice time?	___________	1	2	3	4	5
7. Overcome fear of doing difficult jumps?	___________	1	2	3	4	5
8. Improve consistency of jumps you can already land?	___________	1	2	3	4	5
9. Feel more confident about your ability to do difficult jumps?	___________	1	2	3	4	5
10. Not worry about what other skaters are doing?	___________	1	2	3	4	5
11. Figure out how to monitor progress on a new jump that you are learning, so that you don’t get discouraged when progress seems slow?	___________	1	2	3	4	5
12. Do more complete program run-throughs (where you try everything in your program)?	___________	1	2	3	4	5
13. Keep track of your % landed during program run-throughs?	___________	1	2	3	4	5
14. Make better use of video feedback when learning a new jump?	___________	1	2	3	4	5
15. Push harder while stroking, in order to get in better shape?	___________	1	2	3	4	5
16. Keep a written record of your progress in meeting your goal?	___________	1	2	3	4	5

Source: Reprinted with permission from Martin and Thomson (2010)

Survey schedules provide the therapist with information needed to conduct a particular therapeutic technique with the client. The questionnaire shown in Table 6.2 provides information useful in applying positive reinforcement procedures. Other types of survey schedule are designed to provide information preparatory to using other behavioral procedures (for examples, see Asher et al., 2010).

Third-party behavioral checklists or *rating scales* allow a client's significant others and professionals to subjectively assess the frequency and quality of certain client behaviors. An example of such a checklist is the *Discrete-Trials Teaching Evaluation Form* (Fazzio, Arnal, & Martin, 2010) which can be used to reliably evaluate the quality of one-on-one training sessions conducted by a behavior modifier with a child with autism spectrum disorder (Jeanson et al., 2010).

It should be noted that the term *frequency of behavior* can be used to refer to two related but different things. It can refer to the number of instances of a behavior, as in the above example. It can also refer to the number of instances of a behavior in a given time period, or *rate*, as indicated in Chapter 1. In this text, we use *frequency* as synonymous with *rate* unless otherwise indicated. (For further discussion of the distinction between the terms *frequency* and *rate* in behavior modification, see Carr, Nosik, & Luke, 2018; Merbitz, Merbitz, & Pennypacker, 2016.)

Role-Playing

If it is not feasible for the therapist to observe the client in the actual situation in which the problem occurs, an alternative is to recreate that situation or certain crucial aspects of it in the therapist's office. That, essentially, is the rationale behind role-playing—the client and therapist enact interpersonal interactions related to the client's problem (described in Chapter 20). For example, the client might enact being interviewed for a job with the therapist playing the role of the interviewer. Role-playing is frequently used both in assessing a problem and in treating it (discussed further in Chapters 20, 23, and 26; also see Spiegler, 2015).

Client Self-Monitoring

Self-monitoring—the direct observation by the client of his or her own behavior—is the next best thing to the therapist's direct observation. We mention it under indirect assessment procedures because the therapist does not observe the behavior directly. Thus, as with the other indirect assessment procedures, the therapist's confidence in the client's self-monitoring observations will be limited.

Except for covert behavior, behaviors that might be self-monitored are the same as those that a trained observer would observe. These are described later in this chapter. Self-monitoring might also aid the discovery of the causes of the problem behavior, as discussed in Chapter 22. Additional examples of self-monitoring are provided in Chapter 25.

Direct Assessment Procedures

Direct assessment procedures are assessments in which the behavior modifier or a trained observer directly observes and records the target behaviors in the actual settings in which the behavior occurs. In most of the lead cases at the beginning of Chapters 3 to 25, the target behavior was observable by other individuals. The main advantage of direct assessment procedures is that they are more accurate than indirect assessment procedures, which is the reason that applied behavior analysts prefer to use direct assessment procedures whenever possible. Disadvantages of direct assessment procedures are that they are time consuming, require observers to be appropriately trained, and cannot be used to monitor covert behaviors. Direct assessment procedures are discussed in detail later in this chapter.

Experimental Assessment Procedures

Experimental assessment procedures are used to clearly reveal the environmental causes of problem behavior in order to reduce or remove these causes. These procedures are discussed in detail in Chapter 22.

QUESTIONS FOR LEARNING

9 What is prerequisite to the design and implementation of a behavior modification program?
10 What is meant by compassionate care in a behavior modification program? What can be the consequences of a behavior modifier's failure to show compassionate concern for clients and the clients' significant others?
11 Briefly distinguish between direct and indirect assessment procedures.
12 Describe two circumstances that might lead to the use of indirect assessment procedures.
13 Briefly describe the advantages and disadvantages of indirect assessment procedures.
14 List the five main types of indirect assessment procedure.
15 List and describe briefly four types of questionnaire used in behavioral assessments.
16 Briefly describe the main advantage and the three disadvantages of direct assessment procedures.

Characteristics of Behavior for Direct Assessment

Suppose that you have chosen a particular behavior to modify. How do you directly measure, assess, or evaluate that behavior? As mentioned previously, applied behavior analysts prefer direct over indirect assessments. In measuring behavior directly, seven characteristics should be considered: topography, frequency, duration, intensity, stimulus control, latency, and quality.

Topography of Behavior

The **topography** of a response is the specific movements involved in making the response. For example, Stokes, Luiselli, and Reed (2010) analyzed the movements of effective tackling in high school football as 10 distinct components (e.g., head up, wrap arms around ball carrier's thighs, etc.).

Picture prompts are sometimes useful for helping observers to identify variations in the topography of a response. One of the authors developed detailed checklists with picture prompts for evaluating swimming strokes of young competitive swimmers. See Figure 3.2 for the backstroke checklist.

Frequency of Behavior

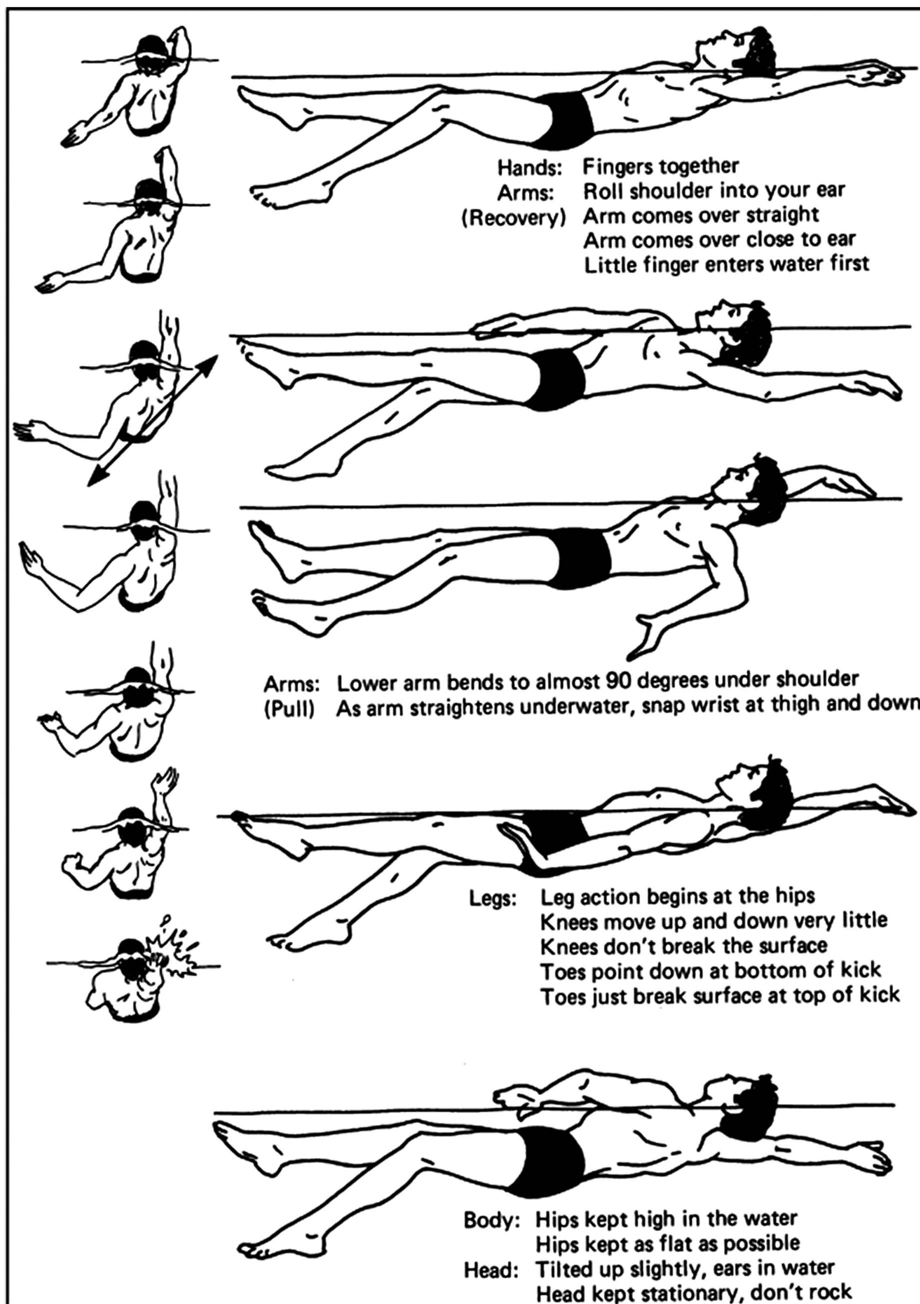
Frequency of behavior refers to the number of instances of a behavior that occur in a given period of time. That was the approach taken by Michelle Hume, a figure skating coach at St. Anne's Figure Skating Club in Manitoba (Hume, Martin, Gonzales, Cracklen, & Genthon, 1985). Coach Hume first defined jumps and spins in such a way that student observers could decide when either of those responses occurred. A *jump* was defined as any occasion when a skater jumped in the air so that both skates left the ice, a minimum of one complete revolution occurred in the air, and the skater landed on one foot, facing in the opposite direction without falling. A *spin* was defined as spinning on one skate for a minimum of three revolutions while maintaining a balanced, stationary position. When the observers knew what behaviors to look for, Coach Hume's next step was to take a baseline of the number of jumps and spins each individual skater performed during several practices. The observers used the data sheet shown in Figure 3.3.

The baseline performance of one of the figure skaters can be seen in Figure 3.4. This type of graph is called a *frequency graph*. Each data point represents the total number of elements (jumps plus spins) completed by a skater during a practice session. Following baseline, Coach Hume introduced a treatment program. A chart prepared for each skater contained a checklist of all jumps and spins that he or she should be practicing. These charts were posted at the side of the rink. Pointing to the charts, Coach Hume said to the skaters:

> Each practice session, do the first three elements on your chart and then record them here. Then practice the next three elements and record them. Continue in this way until you've practiced all the elements. Then go through the whole routine again until the end of practice. At the end of practice, I will check your charts to see how you are doing.

The self-charting treatment program combined with positive feedback from Coach Hume at the end of each practice was effective in improving the number of jumps and spins performed (see Figure 3.4). Interestingly, when

FIGURE 3.2 Checklist for the backstroke



the program was discontinued, performance decreased to near baseline levels. When the program was reinstated, performance again improved.

It is sometimes convenient to design a recording sheet that also serves as a final graph. Consider the case of a child who frequently swore at the teacher and teacher aides in the classroom. The teacher decided to record this behavior using the chart shown in Figure 3.5. Each time the teacher or teacher aides observed an instance of swearing, they were to ignore the child and go to the front desk and place an X in the appropriate place on the chart.

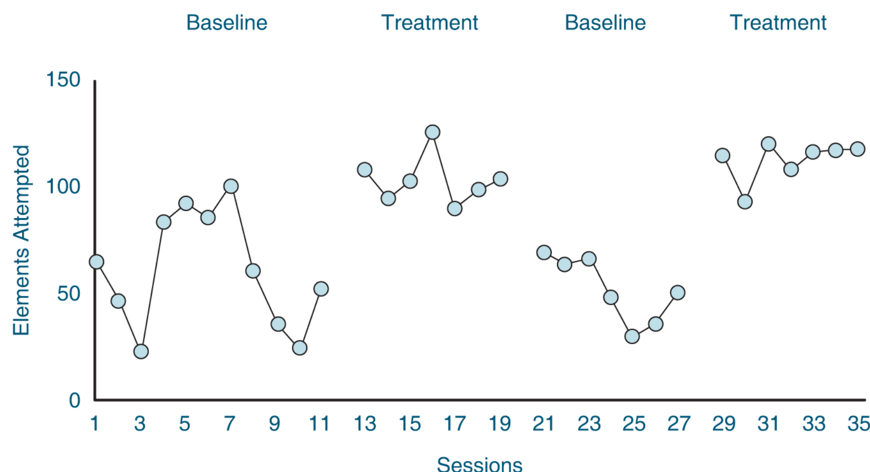
The instances of swearing were recorded up the side of the graph and the days of the program were recorded across the bottom (see Figure 3.5). The graph shows clearly that many instances of swearing occurred during the first 10 days. Beginning on day 11, the teacher or teacher aide decided to praise the child at the end of each 15-minute period in which swearing did not occur. The result can be clearly seen: Swearing showed an immediate drop and eventually decreased to zero. This type of graph is useful for those who do not have the time to transfer their data from their data sheet to a graph.

FIGURE 3.3 A sample data sheet for recording jumps and spins at figure skating practices

Date: January 3 Observer: Bill K.
Student: Kathy

	Instances	Total	Observation Time	Additional Comments
Jumps:	~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ ||	35	25 min	Kathy spent 5 minutes chatting with other skaters
Spins:	~~||||~~ ~~||||~~ ~~||||~~	15	20 min	

FIGURE 3.4 Frequency graph of the number of elements (jumps and spins) per session performed by a figure skater during baseline and treatment (self-recording)



Each instance of a behavior that is recorded in terms of frequency, such as jumping or spinning as defined for the figure skaters, is a separate, individually distinct behavior that is easy to tally in a given period. Behavior modifiers have recorded the frequency of such behaviors as saying a particular word, swearing, throwing objects, completing arithmetic problems, chewing mouthfuls of food, taking puffs on a cigarette, and exhibiting nervous twitches.

Each of these behaviors has the following two characteristics that make successive instances of the behavior relatively easy to record: (1) they are relatively brief, and (2) the amount of time that it takes to perform them is about the same from one occasion to the next.

Duration of Behavior

While frequency is the most common measure of the amount of a given behavior, another common measure is its duration. The **duration of behavior** is the length of time from the beginning to the end of an episode of behavior. In dealing with a behavior such as a tantrum, you may be more concerned with its duration than with its frequency. In fact, frequency can be ambiguous when trying to apply it to something like temper tantrums (Pear, 2004). What should be counted as a separate response? Each cry, scream, or kick on the floor? Or should we count each episode of a tantrum as a separate response? Because it is usually difficult to answer these questions, we can generally avoid them by focusing on the duration of the behavior. Other examples of behavior for which duration may be more appropriate than frequency are listening attentively, sitting in one's seat in a classroom, watching television, talking on the telephone, and taking a break. Duration of behavior is measured using timers, stopwatches, or clocks.