APPLIED BEHAVIOR ANALYSIS FOR TEACHERS

PAUL A. ALBERTO · ANNE C. TROUTMAN · JUDAH B. AXE

Applied Behavior Analysis for Teachers

Tenth Edition

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Dedication

This book is dedicated to Dr. Bill Heward, teacher, mentor, colleague, and friend.

About the Author

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Paul A. Alberto After receiving his undergraduate degree from Hunter College in New York City he taught elementary aged students with intellectual disabilities in the south Bronx. While teaching he completed a master's degree in Special Education: mental retardation at Fordham University. He moved to Atlanta and completed his PhD in Special Education: Severe Disabilities at Georgia State University. His professional career in higher education has been at GSU in the Department of Educational Psychology and Special Education. He is the Dean and Regents' Professor in Intellectual Disabilities in the College of Education & Human Development.He is the director of GSU's Bureau for Students with Multiple and Severe Disabilities and the coordinator of the teacher education program in Multiple and Severe Disabilities.

Anne C. Troutman After receiving her undergraduate degree in elementary education from the University of Georgia in 1964 Anne taught elementary grades for 5 years. She completed her Master's Degree in special education from Georgia State University and taught students with behavior disorders in self-contained and resource settings and served as a crisis intervention specialist and special education supervisor. After receiving her Ph.D. from Georgia State in 1977 she taught graduate and undergraduate students in general and special education at The University of Memphis until her retirement in 2009.

Preface

We initially prepared *Applied Behavior Analysis for Teachers* because we wanted a technically sound, systematically organized, but readable and even enjoyable text for our own students. We want students to understand concepts of applied behavior analysis and know how to apply those concepts in classrooms and other settings. We believe, and our belief is supported by research, that applied behavior analysis is the most powerful teaching tool available.

We have not provided a cookbook with step-by-step directions for solving every possible problem an educator might encounter. That would be impossible. What makes working with children and young adults so much fun is that each one is different and no one procedure will be effective for all of them. We want our readers to be able to use the principles to create their own recipes for success. Successful application of the principles requires the full and active participation of a creative educator. Because we believe that applied behavior analysis is so powerful, we stress learning to use it appropriately and ethically. The text is organized in a manner that allows instructors to assign students a behavior-change project concurrently with class discussions and readings. The text progresses from identifying a target behavior to collecting and graphing data, selecting an experimental design, conducting a functional analysis, arranging consequences, arranging antecedents, and promoting the generalization of behavior change. We've tried to provide students with the basics of a teaching technology that will serve as a solid foundation for other methods courses.

New to This Edition

It is incredibly heartening to be updating this text for its 10th edition after the book has inspired the use of applied behavior analysis in classrooms for over 40 years. In this edition, we continued working to make the text readable and user-friendly, as well as including many examples we hope students will enjoy reading. Our examples describe students from preschool through young adulthood functioning at various levels of ability. We describe excellent teachers as well as poor ones. Many of our examples describe the kind of teachers we think we are and hope your students will be—good teachers who learn from their inevitable mistakes. While the basic principles of behavior have not changed over the last 40 years, the robustness of the applications of applied behavior analysis for providing meaningful improvements to the lives of students with and without disabilities has soared. Those advancements are captured in the updates made to this edition.

- **New References, Figures, and Tables.** This edition contains over 850 new references, with Chapters 4, 7, 8, 9, and 10 each containing over 100 new references. There are 21 new figures. Many of these (8) are new examples of single-subject design graphs in Chapter 6. Many (6) are examples of data collection sheets and apps for self-monitoring in Chapter 12. There are 8 new tables. Many of these (3) are applications of positive reinforcement in Chapter 8, including praise and group contingencies.

- **Advancements in Technology.** In this edition, we replaced examples of overhead projectors, dictionaries, file cabinets, and digital cameras, with smartboards, internet searches, digital files, smartphones, and apps. There are around 24 such changes with respect to technology. Many of these (12) are examples of devices and apps used for data collection (Chapter 4) and self-monitoring (Chapter 12).

- **Positive and Sensitive Language.** Some of the language and examples in previous editions reflected the culture of prior decades, which used language we now consider negative and biased. Some of the negativity was related to how others viewed behaviorism and applied behavior analysis. Although those negative opinions remain, we believe the culture is more accepting of behavioral approaches to education and other societal endeavors compared to past decades. We changed phrases such as "students with behavior problems" to "students who exhibit challenging behaviors." We removed references to "uninformed people" and "useless procedures." We removed examples of a teacher "tearing her hair out" and a person squirting a dog in the face with hot sauce. We removed reference to a student who was always late to class or never showed up. There are around 30 such updates in this edition that reflect more positivity and sensitivity to diversity, equity, and inclusion. Most of these (19) are in Chapters 2 and 13 as they discuss ethical considerations in applied behavior analysis.

- **Ethical Guidelines.** There were several expansions and updates to ethical considerations when using applied behavior analysis. Two major documents were discussed: the ethical code of the Behavior Analysis Certification Board® (Chapter 2) and the position statement on restraint and seclusion from the Association for Behavior Analysis International (Chapter 9). Ethical considerations were also discussed in terms of single-subject design (Chapter 6) and the need for training in conducting functional analyses (Chapter 7) and administering restraints (Chapter 9).

- **New Terminology.** To reflect updates in the literature on applied behavior analysis, there are around 20 new terms or modified definitions of terms. New terms include motivating operations (Chapters 1 and 7), whole-interval DRO and momentary DRO (Chapter 9), resurgence in FCT (Chapter 9), behavioral momentum theory (Chapter 9), video prompting (Chapter 10), and self-graphing (Chapter 12). Changes to terminology include changing "behavior modification" to "applied behavior analysis" (Chapters 2 and 13), "controlled presentation" to "trial-by-trial recording" (Chapter 4), "changing conditions design" to "multiple treatments design" (Chapter 6), "behavior" to "challenging behavior" (when appropriate; Chapter 7), "reinforcer sampling" to "preference assessment" (Chapter 8), "multiple stimulus presentation" to "multiple stimulus without replacement (MSWO) preference assessment" (Chapter 8), "decreasing assistance" to "most-to-least prompting" (Chapter 10), "increasing assistance" to "least-to-most prompting" (Chapter 10), and "self-recording" to "self-monitoring" (Chapter 12). Finally, there were clarifications and modifications to the definitions and descriptions of positive reinforcement (Chapter 1), negative reinforcement (Chapter 1), social validity (Chapters 2 and 6), extinction (Chapter 9), discriminative stimulus (Chapter 10), and generalization (Chapter 11).
- **Vignettes.** Throughout the text, vignettes involving Professor Grundy, his students, and colleagues have been updated to reflect changes in the field.

In addition, Chapters 8 and 9 contain seven instances of making stronger connections between explanations of concepts and vignettes. This helps exemplify the concepts in the vignettes and clarify the purposes of the vignettes.

Key Content Updates by Chapter

- **Chapter 3:** Put the components of behavioral objectives in more behavioral language and provided updated definitions of "on-task behavior."
- **Chapter 4:** Updated comparisons between measurement systems and methods of measuring interobserver agreement.
- **Chapters 5 and 6:** Emphasized "*x*-axis" and "*y*-axis" over "abscissa" and "ordinate" and updated the terminology and guidelines for determining experimental control with the alternating treatments design.
- **Chapter 7:** Expanded the description of the scatter plot, added guidelines for ABC data collection, updated the comparisons of functional behavior assessments and functional analyses of challenging behavior, expanded the descriptions of conditions in a function analysis, introduced a "multiple functions" category of function-based interventions, added the "check in/check out" and "daily report card" procedures of Positive Behavior Support (PBS), and updated examples of Schoolwide PBS.
- **Chapter 8:** Discussed the method of simply applying contingencies rather than first stating the contingencies, added preference assessment methods (pictorial, video, activity, free operant), updated guidelines on using token reinforcement, expanded on the Good Behavior Game, and introduced teaching at the "instruction level" versus the "frustration level."
- **Chapter 9:** Decreased examples of using punishment, added diagrams depicting differential reinforcement procedures, added information on legislation regarding physical restraint, added a table on how to implement extinction given different functions of challenging behavior, and cautioned against implementing extinction alone.
- **Chapter 11:** Updated the conceptualization of "train and hope," highlighted the importance of conditioning attention as a reinforcer, introduced the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP), and expanded on the examples and applications of lag schedules of reinforcement.
- **Chapter 12:** Added a flow chart of steps for implementing self-monitoring and emphasized the need to teach students how to self-manage.

These changes provide up-to-date, cutting-edge definitions and examples in applied behavior analysis to maximize the effectiveness of teachers in classrooms.

Pedagogical Features:

To facilitate learning, this edition includes **Discussion Questions** at the end of each chapter, **explanatory asides** that clarify key points or make inter-textual connections, and **vignettes** to provide opportunities to see concepts in action.

Discussion Questions

1. Write a short letter home to the parents or guardians of the students with whom you will be working this year. Describe your procedures (based on the principles of applied behavior analysis described in Chapter 1) without using any terminology likely to upset the parents.

2. One of your colleagues has cornered you in your classroom after school. She has heard that you are using "behavior modification" with your students and thinks that you are inhumane, coercive, and unethical. What will you say to her?

Guidelines for the use of aversive and exclusionary procedures will be provided in Chapter 9.

A belief that behavior is lawful does not imply that human beings are not free to choose what they will do.

Watch 'Em Like A . . .

Mr. Hawk was a teacher in a short-term rehabilitation class for 10- to 13-year-old students with serious behavior problems. His job was to get his students' academic skills as well as their behavior up to snuff and very quickly reintegrate them into general education classrooms. He provided behavioral consultation to the classroom teachers and continued help with academics as necessary. Some of his students remained with him full time for several months; others began attending some general education classes within a week. Mr. Hawk used a token reinforcement system (see the discussion beginning on page 219 about token reinforcers) and prided himself on finding unusual, but effective, activity reinforcers simply by listening to students, asking what they wanted to do, or watching what they chose to do when they had free time.

Some of his students, for example, used their points to spend 10 minutes sitting on Mr. Hawk's motorcycle, safely parked in the faculty parking lot with the ignition key in Mr. Hawk's pocket. Some students helped the building engineer empty trash; others played with games or toys in the classroom. One boy, who showed some characteristics of autism, preferred to straighten and reorganize various manipulatives and teaching materials; Mr. Hawk was going to be sorry to lose Richard.

One day Mr. Hawk got a new student. In an effort to give him some immediate academic success and to provide an opportunity for reinforcement, Mr. Hawk gave Aidan a math assignment on the computer. The format was colorful, highly interactive, and entertaining. Mr. Hawk chose a level that he knew would be fairly easy for the boy. After a few minutes, Aidan blurted out, "Wow, this is baaad!" whereupon the young man at the next computer leaned over toward him and said softly, "Careful, man, you let him find out you like something, next thing you know, you'll be earnin' it doin' something you don't like."

Burrhus Teaches the Professor

Professor Grundy was sitting on the sofa reading the newspaper. Burrhus padded into the room, lumbered over to Grundy, and stuck his huge head under the professor's arm between the professor and the paper. "Look, Minerva," said the professor, scratching Burrhus on the head, "he likes me. Good boy. Good boy. Aren't you a good boy?" He continued to scratch; Burrhus remained close to the professor, occasionally inserting his head and being petted and praised. Later that day the professor returned from the grocery store. Burrhus lumbered over, stuck his head between the professor and the grocery bag and precipitated the bag to the floor. "He didn't mean to," stated the professor. "He was just glad to see me. Weren't you boy?" he crooned, stepping over the broken eggs that Mrs. Grundy was cleaning up. "Want to go chase your ball?" After dinner Grundy retired to his study to complete work on an important manuscript. Burrhus accompanied him and settled in a place close to the professor's feet. All went well until Burrhus got up, inserted his head between the professor and the computer screen, drooled into the keyboard, and smeared the screen. Grundy leaped up and shouted, "Minerva, call this dog! He's driving me crazy! He's going to have to learn to leave me alone when I'm working."

"Oliver," said Mrs. Grundy tartly, "you have been reinforcing him with your attention for nudging you all day. Now you're complaining. Do you expect him to know you're working? I talked to Miss Oattis this morning. She's teaching a dog obedience class starting next week. I think the two of you need to go."

Pearson eText, Learning Management System (LMS)-Compatible Assessment Bank, and Other Instructor Resources

Pearson eText

The Pearson eText is a simple-to-use, mobile-optimized, personalized reading experience. It allows you to easily highlight, take notes, and review key vocabulary all in one place—even when offline. Seamlessly integrated videos and other rich media will engage you and give you access to the help you need, when you need it. To gain access or to sign in to your Pearson eText, visit: https://www.pearson.com/pearson-etext. Features include:

- **Video Examples** Each chapter includes *Video Examples* that illustrate principles or concepts aligned pedagogically with the chapter. These clips enable you to know what experts do when they are practicing partnerships, and include captions that ask you to consider how you would respond to situations depicted in the video. They are not just for you to view and enjoy; they are for you to reflect on and take into account as part of your education.

- **Interactive Glossary** All key terms in the eText are bolded and provide instant access to full glossary definitions, allowing you to quickly build your professional vocabulary as you are reading.

LMS-Compatible Assessment Bank

With this new edition, all assessment types—quizzes, application exercises, and chapter tests— are included in LMS-compatible banks for the following learning management systems: Blackboard (9780137322121), Canvas (9780137322169), D2L (9780137322176), and Moodle (9780137322152). These packaged files allow maximum flexibility to instructors when it comes to importing, assigning, and grading. Assessment types include:

- **Learning Outcome Quizzes** Each chapter learning outcome is the focus of a Learning Outcome Quiz that is available for instructors to assign through their Learning Management System. Learning outcomes identify chapter content that is most important for learners and serve as the organizational framework for each chapter. The higher-order, multiple choice questions in each quiz will measure your understanding of chapter content, guide the expectations for your learning, and inform the accountability and the applications of your new knowledge. When used in the LMS environment, these multiple choice questions are automatically graded and include feedback for the correct answer and for each distractor to help guide students' learning.

- **Application Exercises** Each chapter provides opportunities to apply what you have learned through Application Exercises. These exercises are usually short-answer format and can be based on Pearson eText Video Examples, written cases, or scenarios modeled by pedagogical text features. When used in the LMS environment, a model response written by experts is provided after you submit the exercise. This feedback helps guide your learning and can assist your instructor in grading.

- **Chapter Tests** Suggested test items are provided for each chapter and include questions in various formats: true/false, multiple choice, and short answer/essay. When used in the LMS environment, true/false and multiple choice questions are automatically graded, and model responses are provided for short answer and essay questions.

Instructor's Manual (9780135606230)

The Instructor's Manual is provided as a Word document and includes resources to assist professors in planning their course. If you do not use a Learning Management System, or if you prefer to administer assessments on paper, you can copy and paste items from the instructor's manual to create your own quizzes, assignments, or tests.

PowerPoint® Slides (9780135606100)

PowerPoint® slides are provided for each chapter and highlight key concepts and summarize the content of the text to make it more meaningful for students.

Note: All instructor resources—LMS-compatible assessment bank, instructor's manual, and PowerPoint slides are available for download at www.pearsonhighered.com. Use one of the following methods:

- From the main page, use the search function to look up the lead author (i.e., Alberto, Troutman, & Axe) or the title (i.e., Applied Behavior Analysis for Teachers). Select the desired search result, then access the "Resources" tab to view and download all available resources.

- From the main page, use the search function to look up the ISBN (provided above) of the specific instructor resource you would like to download. When the product page loads, access the "Downloadable Resources" tab.

Acknowledgments

We would like to thank all the people who helped us in the process of producing **Applied Behavior Analysis for Teachers, Tenth Edition**, including all the professionals at Pearson with whom we have worked. Thanks to Rebecca Fox-Gieg, Curtis Vickers, Janelle Rogers, Karthik Orukaimani, and Kevin Davis. Thank you to Sarah Frampton for preparing the online learning materials. Thank you to Ellie, Maren, and Nora Axe for your love and support. We appreciate the suggestions of those who have reviewed the text.

We continue to appreciate the users of the text. We often hear from people who first read the book as undergraduates and who now assign it to students in their own university classes. We are honored to be partners in the development of those who teach.

Brief Contents

Contents

Chapter 1

Roots of Applied Behavior Analysis

⌄ Learning Outcomes

1.1 Describe the limitations and potential usefulness of biophysical and biochemical explanations.

1.2 State what can be learned from developmental explanations.

1.3 Explain the limitations of cognitive explanations of behavior.

1.4 Describe the usefulness of behavioral explanations and define positive reinforcement, negative reinforcement, punishment, extinction, and antecedent control.

1.5 Describe the origins of a behavioral explanation for behavior.

Why do people behave as they do? Why do some people behave in socially approved ways and others in a manner condemned or despised by society? Is it possible to predict what people are likely to do? What can be done to change behavior that is harmful to an individual or destructive to society?

In an effort to answer questions like these, human beings have offered explanations ranging from possession by demons to abnormal quantities of chemicals in the brain. Suggested answers have been debated, written about, attacked, and defended for centuries and continue to be offered today. There are good reasons for continuing to investigate human behavior. Information about the development of certain behaviors in human beings may help parents and teachers find the best way of childrearing or teaching. If we know how people are likely to behave under certain conditions, we can decide whether to provide or avoid such conditions. Those of us who are teachers are particularly concerned with changing behavior; that is, in fact, our job. We want to teach our students to do some things and to stop doing others.

To understand, predict, and change human behavior, we must first understand how human behavior works. We must answer as completely as possible the "why" questions asked above. Therefore, Alexander Pope's dictum that "the proper study of mankind is man" (perhaps rephrased to "the proper study of humanity is people") needs no other revision; it is as true in the 21st century as it was in the 18th.

In this chapter we consider the requirements for meaningful and useful explanations of human behavior. We then describe several interpretations of human behavior that have influenced large numbers of practitioners, including teachers. The discussion traces the historical development of a way to understand and predict human behavior called **applied behavior analysis**.

The Usefulness of Explanations

Learning Outcome 1.1   **Describe the limitations and potential usefulness of biophysical and biochemical explanations.**

> A useful theory has inclusiveness, verifiability, predictive utility, and parsimony.

If a way of explaining behavior is to be useful for the practitioner, it must meet four requirements. First, it should be *inclusive*. It must account for a substantial quantity of behavior. An explanation has limited usefulness if it fails to account for the bulk of human behavior and thus makes prediction and systematic change of behavior impossible. Second, an explanation must be *verifiable*; that is, we should be able to test in some way that it does account for behavior. Third, the explanation should have *predictive utility*. It should provide reliable answers about what people are likely to do under certain circumstances, thereby giving the practitioner the opportunity to change behavior by changing conditions. Fourth, it should be *parsimonious*. A parsimonious explanation is the simplest one that will account for observed phenomena. Parsimony does not guarantee correctness (Mahoney, 1974) because the simplest explanation may not always be the correct one, but it prevents our being so imaginative as to lose touch with the reality of observed data. When the bathroom light fails to operate at 3 a.m., one should check the bulb before calling the electric company to report a blackout. There may be a blackout, but the parsimonious explanation is a burned-out bulb. In examining some of the theories developed to explain human behavior, we shall evaluate each explanation for its inclusiveness, verifiability, predictive utility, and parsimony.

Biophysical Explanations

> Some theorists contend that human behavior is controlled by physical influences.

Since physicians of ancient Greece first proposed that human behavior was the result of interactions among four bodily fluids or "humors"—blood, phlegm, yellow bile (choler), and black bile (melancholy)—theorists have searched for explanations

Professor Grundy Traces the Cause

Having observed an undergraduate student's behavior for some time, Professor Grundy noticed that the student was always looking down in his notebook and doodling. Grundy couldn't tell if DeWayne was paying attention or not and grew quite concerned. Because the professor was certain his dynamic, meaningful lectures were not related to this behavior, he decided to investigate the matter. He paid a visit to the high school attended by the student and located his 10th-grade English teacher, Ms. Marner. "Yes, DeWayne was always doodling in high school," said Ms. Marner. "He must have picked that up in middle school."

Professor Grundy then went to visit the middle school. "You know," said the guidance counselor, "a lot of our kids do that. Their elementary school just doesn't curb that behavior in time." At the elementary school, Professor Grundy talked to the principal. "DeWayne was doing that since day one. I'm pretty sure his mom is an artist—he probably started it by watching her."

Professor Grundy, sure that he would at last find the answer, went to talk to DeWayne's mother. "I'll tell you," said DeWayne's mother, "he takes after his father's side of the family. They're all a bunch of doodlers."

for human behavior within the physical structure of the body. Such theories have included those based on genetic or hereditary factors, those that emphasize biochemical influences, and those that suggest aberrant behavior is caused by some damage to the brain. The following anecdote indicates a belief in hereditary influences on behavior.

GENETIC AND HEREDITARY EFFECTS   DeWayne's mother explained his doodling behavior by referring to hereditary influences. Could she have been right? The effects of heredity on human behavior, both typical and atypical, have been investigated extensively. There is little question that intellectual disabilities, resulting in significant deficits in a wide range of behaviors, is sometimes associated with chromosomal abnormalities or with the inheritance of recessive genes. Evidence indicates that other behavioral characteristics have some genetic or hereditary basis as well. It is generally accepted that persons with autism have abnormalities in brain development and neurochemistry and that there may be genetic factors related to this disorder (Malik et al., 2019; Woodbury-Smith & Scherer, 2018). Many emotional and behavior disorders, such as anxiety disorder, depression, schizophrenia, oppositional defiant disorder, and conduct disorder, appear to have some genetic origin (Burke & Romano-Verthelyi, 2018; Salvatore & Dick, 2018). Attention deficit disorder and attention deficit hyperactivity disorder also appear to be genetically related (Faraone & Larsson, 2019), as do some learning disabilities (Mazzocco et al., 2016; Petrill, 2014).

When DeWayne's mother explained her son's behavior to Professor Grundy, her claim that DeWayne takes after his father's family may have involved a degree of truth. It is possible that certain genetic characteristics may increase the probability of certain behavioral characteristics.

Biological Explanations
Pearson eText
Video Example 1.1
In this video, a speech and language pathologist explains how a nativist theory of language emphasizes the role of biology in behavior expression. Notice how the educator draws connections between the brain's functioning and a computer, with particular inputs and outputs. What are some limitations of this approach?

Biochemical Explanations

Some researchers have suggested that certain behaviors may result from excesses or deficiencies of various substances found in the body. These chemical substances are labeled differently from those hypothesized by the ancient Greeks but are often held responsible for similar disturbances of behavior.

Biochemical abnormalities have been found in some children with serious disturbances of behavior. Investigation of such factors, however, has established only that biochemical abnormalities exist, not that they cause the disorder. Other behavior disturbances characterized as hyperactivity, learning disability, or intellectual disability

Some children
with disabilities
show biochemical
abnormalities.

> ## Professor Grundy Learns to Think in Circles
>
> Professor Grundy, as one of his instructional duties, visited student teachers. On his first trip to evaluate Ms. Harper in a primary resource room, he observed that one student, Ralph, wandered continuously about the room. Curious about such behavior, because the other students remained seated, Professor Grundy inquired, "Why is Ralph wandering around the room? Why doesn't he sit down like the others?" Ms. Harper was aghast at such ignorance on the part of a professor.
>
> "Why, Ralph is hyperactive, Professor Grundy. That's why he never stays in his seat."
>
> "Ah," replied the professor. "That's very interesting. How do you know he's hyperactive?"
>
> With barely concealed disdain, Ms. Harper hissed, "Professor, I know he's hyperactive because he won't stay in his seat."
>
> After observing the class for a few more minutes, he noticed Ms. Harper and the supervising teacher whispering and casting glances in his direction. Professor Grundy once again attracted Ms. Harper's attention. "What," he inquired politely, "causes Ralph's hyperactivity?"
>
> The disdain was no longer concealed. "Professor," answered Ms. Harper, "hyperactivity is caused by brain damage."
>
> "Indeed," responded the professor, "and you know he has brain damage because …"
>
> "Of course I know he has brain damage, Professor. He's hyperactive, isn't he?"

have been linked to biophysical factors such as hypoglycemia, malnutrition, and allergic reactions. It is often suggested that biochemical or other physiological factors may, along with other influences, result in damage to the brain or central nervous system.

Hyperactivity is not necessarily caused by brain dysfunction.

BRAIN DAMAGE The circular reasoning illustrated by Ms. Harper is, unfortunately, not uncommon. Many professionals explain a great deal of students' inappropriate behavior similarly. The notion that certain kinds of behavior result from brain damage has its roots in the work of Goldstein (1939), who studied soldiers having head injuries during World War I. He identified certain behavioral characteristics, including distractibility, perceptual confusion, and hyperactivity. Observing similar characteristics in some children with cognitive disabilities, some professionals concluded that the children must also be brain injured and that the brain injury was the cause of the behavior. This led to the identification of a hyperkinetic behavior syndrome (Strauss & Lehtinen, 1947), assumed to be the result of minimal brain dysfunction in persons who had no history of brain injury. This syndrome included such characteristics as hyperactivity, distractibility, impulsivity, short attention span, emotional lability (changeability), perceptual problems, and clumsiness. Large numbers of children with these characteristics are currently being diagnosed with attention deficit disorder (ADD) or attention deficit hyperactivity disorder (ADHD) (American Psychiatric Association, 2013), but there is little empirical support for using the possibility of brain injury to account for problem behavior in all children who show such behavioral characteristics.

Many children are presently being defined as "at risk" for the development of academic and social problems because of the effects of both influences before birth (such as parental malnutrition or substance abuse) and environmental factors. In recent years fetal alcohol syndrome, smoking by expectant mothers, illegal drug use by expectant mothers, and pediatric AIDS have apparently resulted in increased learning and behavioral problems in children (Chasnoff, Wells, Telford, Schmidt, & Messer, 2010; Scott-Goodwin et al., 2016; Phillips et al., 2016; Whittington et al., 2018). Although there are clear indications that these factors result in biochemical, central nervous system, and other physiological

abnormalities, no specific behavioral deficit or excess has been directly attributed to any specific factor.

The Usefulness of Biophysical and Biochemical Explanations

The search for explanations of human behavior based on physiological factors has important implications. As a result of such research, the technology for preventing or lessening some serious problems has been developed. Perhaps the best-known example of such technology is the routine testing of all infants for phenylketonuria (PKU), a hereditary disorder of metabolism. Placing infants with PKU on special diets can prevent the intellectual disabilities formerly associated with this disorder (Berry, 1969). It is possible that future research may explain a good deal more human behavior on a biological or hereditary basis. Currently, however, only a small part of the vast quantity of human behavior can be explained in this way.

Some biophysical explanations are testable, meeting the second of our four requirements for usefulness. For example, scientists can definitely establish the existence of Down syndrome by observing chromosomes. Some metabolic or biochemical disorders can also be scientifically verified. Verification of such presumed causes of behavior as minimal brain dysfunction, however, is not dependable (Werry, 1986).

Even with evidence of the existence of some physiological disorder, it does not follow that any specific behavior is automatically a result of the disorder. For the teacher, explanations based on presumed physiological disorders have little predictive utility. To say that Rachel cannot walk, talk, or feed herself because she is developmentally delayed as a result of a chromosomal disorder tells us nothing about the conditions under which Rachel might learn to perform these behaviors. Ms. Harper's explanation of Ralph's failure to sit down on the basis of hyperactivity caused by brain damage does not provide any useful information about what might help Ralph learn to stay in his seat. To say that Harold cannot read because he is a child at risk is to put Harold at the greater risk of not learning because we have low expectations for him. Even apparently constitutional differences in temperament are so vulnerable to environmental influences (Chess & Thomas, 1984) that they provide only limited information about how a child is apt to behave under given conditions.

The final criterion, parsimony, is also frequently ignored when physical causes are postulated for student behaviors. Searching for such causes often distracts teachers from simpler, more immediate factors that may be controlling behaviors in the classroom. Perhaps the greatest danger of such explanations is that some teachers may use them as excuses not to teach: Rachel cannot feed herself because she is developmentally delayed, not because I have not taught her. Ralph will not sit down because he is brain damaged, not because I have poor classroom management skills. Irving cannot read because he has dyslexia, not because I have not figured out a way to teach him. Biophysical explanations may also cause teachers to have low expectations for some students. When this happens, teachers might not even try to teach things students are capable of learning. The accompanying chart summarizes the usefulness of biophysical theory.

The Usefulness of Biophysical Theory			
	Good	**Fair**	**Poor**
Inclusiveness			✓
Verifiability		✓	
Predictive Utility			✓
Parsimony			✓

> ### A Freudian by the Garbage Can
>
> Upon returning to the university after observing student teachers, Professor Grundy prepared to return to work on his textbook manuscript, now at least 7 months behind schedule. To his horror, his carefully organized sources, notes, drafts, and revisions were no longer "arranged" on the floor of his office. Worse, his carefully organized sticky notes had been removed from the walls, door, windows, and computer. Professor Grundy ran frantically down the hall, loudly berating the custodial worker who had taken advantage of his absence to remove what he considered "that trash" from the room so that he could vacuum and dust.
>
> As Grundy pawed through the outside garbage can, a colleague offered sympathy. "That's what happens when an anal-expulsive personality conflicts with an anal-retentive." Grundy's regrettably loud and obscene response to this observation drew the additional comment, "Definite signs of regression to the oral-aggressive stage there, Grundy."

Developmental Explanations

Learning Outcome 1.2 **State what can be learned from developmental explanations.**

Observation of human beings confirms that many predictable patterns of development occur. Physical growth proceeds in a fairly consistent manner. Most children start walking, talking, and performing some social behaviors such as smiling in fairly predictable sequences and at generally predictable chronological ages (Gesell & Ilg, 1943). Some theorists have attempted to explain many aspects of human behavior—cognitive, social, emotional, and moral—based on fixed, innate developmental sequences. Their proposed explanations are meant to account for normal as well as "deviant" (other than the accepted or usual) human behavior. The following sections review two of the numerous developmental theories and examine their usefulness in terms of inclusiveness, verifiability, predictive utility, and parsimony.

Psychoanalytic Theory

Although many different explanations of human behavior have been described as psychoanalytic, all have their roots in theories of Sigmund Freud, who asserted that normal and aberrant human behavior may be understood and explained on the basis of progression through certain crucial stages, perhaps the most commonly accepted and most widely disseminated of his theories. The hypothetical stages include oral (dependent and aggressive), anal (expulsive and retentive), and phallic (when gender awareness occurs). These stages are believed to occur before the age of 6 and, if mastered, result in emergence into the latency stage, which represents a sort of rest stop until puberty, when the last stage, the genital stage, emerges.

This theory suggests that people who progress through the stages successfully become relatively normal adults. In Freud's view, problems arise when a person fixates (or becomes stuck) at a certain stage or when anxiety causes a regression to a previous stage. People who fixate at or regress to the oral-dependent stage may merely be extremely dependent, or they may seek to solve problems by oral means such as overeating, smoking, or alcohol or drug abuse. A person fixated at the oral-aggressive stage may be sarcastic or verbally abusive. Fixation at the anal-expulsive stage results in messiness and disorganization; at the anal-retentive stage, in compulsive orderliness.

A Stage Theory of Cognitive Development

Jean Piaget was a biologist and psychologist who proposed a stage theory of human development. Piaget's descriptions of the cognitive and moral development of children have had extensive impact among educators. Like Freud, Piaget theorized that certain forces, biologically determined, contribute to development (Piaget & Inhelder, 1969). The forces suggested by Piaget, however, are those enabling the organism to adapt to the environment—specifically, assimilation, the tendency to adapt the environment to enhance personal functioning, and accommodation, the tendency to change behavior to adapt to the environment. The process of maintaining a balance between these two forces is called equilibration. Equilibration facilitates growth; other factors that also do so are organic maturation, experience, and social interaction. Piaget's stages include sensory-motor (birth to 1 1/2 years), preoperational (1 1/2 to 7 years), concrete operations (7 to 11 years), and formal operations (12 years to adulthood).

The Usefulness of Developmental Explanations

Both developmental theories we have discussed are inclusive; they apparently explain a great deal of human behavior, cognitive and affective, normal and atypical. Verifiability, however, is another matter. Although Piagetian theorists have repeatedly demonstrated the existence of academic and pre-academic behaviors that appear to be age related in many children, attempts to verify psychoanalytic explanations have not been successful (Achenbach & Lewis, 1971). Considerable resistance to verifying theoretical constructs exists among those who accept the psychoanalytic explanation of human behavior (Schultz, 1969). Although it can be verified that many people act in certain ways at certain ages, this does not prove that the cause of such behavior is an underlying developmental stage or that failure to reach or pass such a stage causes inappropriate or maladaptive behavior. There is little evidence to verify that the order of such stages is invariant or that reaching or passing through earlier stages is necessary for functioning at higher levels.

The accompanying chart summarizes the usefulness of developmental theory.

The Usefulness of Developmental Theory			
	Good	**Fair**	**Poor**
Inclusiveness	✓		
Verifiability			✓
Predictive Utility		✓	
Parsimony			✓

Some developmental theories can predict what some human beings will do at certain ages. By their nature these theories offer general information about average persons. However, "a prediction about what the average individual will do is of no value in dealing with a particular individual" (Skinner, 1953, p. 19). Developmental theories provide limited information about what conditions predict an individual's behavior in specific circumstances. The practitioner who wishes to change behavior by changing conditions can expect little help from developmental theories. Developmental explanations of behavior are equally inadequate when judged by the criterion of parsimony. To say that a child has temper tantrums because he is fixated at the oral stage of development is seldom the simplest explanation available. Because of their lack of parsimony, developmental explanations may lead the
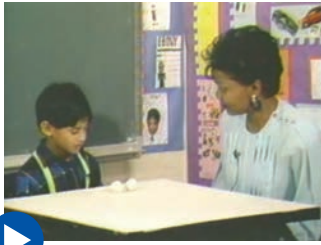
Piaget's Stages in Action
Pearson eText
Video Example 1.2
In this video, an educator presents tasks to children of varying ages to assess for some of Piaget's core developmental achievements. The performance of the students varies according to age, aligning with Piaget's stages based on ages. Consider the Usefulness Checklist as you watch and consider how this might apply to a student with a developmental delay. What are some limitations of this approach?

Professor Grundy Gains Insight

Having been thoroughly demoralized by his interaction with his student teacher, Professor Grundy decided to pay another surprise visit that afternoon. He was determined to avoid subjecting himself to further ridicule. He did not mention Ralph's hyperactivity but instead concentrated on observing Ms. Harper's teaching. Her lesson plan indicated that she was teaching math, but Professor Grundy was confused by the fact that her group was playing with small wooden blocks of various sizes. Ms. Harper sat at the table with the group but did not interact with the students.

At the conclusion of the lesson, Professor Grundy approached Ms. Harper and asked her why she was not teaching basic addition and subtraction facts as she had planned.

"Professor," stated Ms. Harper, "I conducted my lesson exactly as I had planned. The students were using the blocks to gain insight into the relationship among numbers. Perhaps you are not familiar with the constructivist approach, but everyone knows that true insight is vital to the learning process and that it is impossible to teach children; we can only facilitate their own inner construction of knowledge."

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teacher to excuses as unproductive as those prompted by biophysical explanations. Teachers, particularly teachers of students with disabilities, cannot wait for a student to become developmentally ready for each learning task. An explanation that encourages teachers to take students from their current levels to subsequent levels is clearly more useful than a developmental explanation—at least from a practical point of view. We might expect Professor Grundy's developmental colleagues, for example, to explain Grundy's difficulty with the concept of hyperactivity on the basis of his failure to reach the level of formal operational thinking required to deal with hypothetical constructs. Might there be a more parsimonious, more useful explanation of his behavior? Professor Grundy continues to collect theories of behavior in the following episode.

Cognitive Explanations

Learning Outcome 1.3   **Explain the limitations of cognitive explanations of behavior.**

The educational theory espoused (in a somewhat exaggerated form, to be sure) by Ms. Harper is based on an explanation of human behavior and learning that combines elements of developmental theory, especially Piagetian, with a theory first described in Germany in the early part of the 20th century. The first major proponent of this explanation was Max Wertheimer (Hill, 1963), who was interested in people's perception of reality.

Wertheimer suggested it was the relationship among things perceived that was important rather than the things themselves. People, he suggested, tend to perceive things in an organized fashion, so that what is seen or heard is different from merely the parts that compose it. He labeled an organized perception of this type a *gestalt*, using a German word for which there is no exact English equivalent but that may be translated as "form," "pattern," or "configuration." English-speaking advocates of this view have retained the word *gestalt*, and we call this explanation Gestalt psychology. Those who have applied this explanation to education believe that learning depends on imposing one's own meaningful patterns and insights on information and that rote learning, even if it leads to correct solutions to problems, is less useful.

Gestalt psychology has had considerable influence on education. The best-known educator to espouse this approach to understanding behavior is Jerome

Educators who espouse gestalt theory encourage "discovery learning."

Bruner (1960). What has come to be called the cognitive theory of education places an emphasis on rearranging thought patterns and gaining insight as a basis for learning new academic and social behaviors. The resulting teaching practices are called discovery learning. Learning is explained on the basis of insight, pattern rearrangement, and intuitive leaps. Teachers do not impart knowledge; they merely arrange the environment to facilitate discovery. Motivation is presumed to occur as a result of innate needs that are met when organization is imposed on objects or events in the arrangement. Motivation is thus intrinsic and need not be provided by the teacher. In its latest manifestation, cognitive theory applied to education has been termed *constructivism*. This approach holds that teachers cannot provide knowledge to students; students must construct their own knowledge in their own minds (Fosnot & Perry, 2005; Taber, 2019). "Rather than behaviours or skills as the goal of instruction, concept development and deep understanding are the foci" (Fosnot, 1996, p. 10).

The Usefulness of Cognitive Explanations

Cognitive theory explains a great deal of human behavior. Theorists can account for both intellectual and social behavior. Virtually all behavior can be explained as the result of imposing structure on unstructured environmental events or of perceiving the relative importance of such events. Thus, cognitive theory meets the criterion of inclusiveness.

The theory lacks verifiability, however. Because all of the processes are supposed to take place internally, there is no way to confirm their existence. Only the outcome is verifiable—the process is assumed.

The predictive utility of cognitive theory is also limited. In academic areas, the teacher who uses a discovery or constructivist approach has very little control over what students will discover or construct. Most advocates of this approach would insist that they do not want to predict outcomes of learning. Unfortunately, this unwillingness to control the outcome of the teaching–learning process has led to rather poor results. Educational practices based on a cognitive approach have been less successful than those emphasizing direct instruction (Engelmann & Carnine, 1982).

Addressing our final criterion, we must conclude that cognitive theory is not parsimonious. In neither intellectual nor social areas are the explanations necessary in understanding or predicting behavior.

The Usefulness of Cognitive Theory	Good	Fair	Poor
Inclusiveness	✓		
Verifiability			✓
Predictive Utility			✓
Parsimony			✓

Although all of the theories described so far provide information about human behavior, none of them meets all four of our criteria. The explanations we have provided are very general, and our conclusions about their usefulness should not be taken as an indication that they have no value. We simply believe they provide insufficient practical guidance for classroom teachers. After the following vignette, we shall describe a behavioral explanation of human behavior that we believe most nearly reaches the criteria of inclusiveness, verifiability, predictive utility, and parsimony.

Professor Grundy Takes Action

Professor Grundy had an absolutely rotten day. A number of the students in his 8 a.m. class had come in late, disrupting his lecture. He had been ridiculed by a student teacher; his precious manuscript had been retrieved from the dumpster in a sadly wrinkled and malodorous condition; his colleague had made repeated references to "anal-expulsive" and "oral-aggressive" tendencies during the day in spite of Grundy's protests.

After arriving at home and pouring himself a large drink for medicinal purposes, Grundy decided something must be done. He made several detailed plans and retired for the evening, confident he was on the right track. The next morning he arose, enthusiastically determined, in spite of a slight headache, to put his plans into action.

His first step was to arrive at his 8 a.m. class 5 minutes early—somewhat of a novelty because he usually arrived several minutes late. He spent the extra 5 minutes chatting affably with students and clarifying points from the previous day's lecture when asked to do so. At 8:00 sharp, he presented each of the five students present with an "on-time slip" worth 2 points on the next exam.

After the morning lecture, Professor Grundy proceeded to his office, where he affixed to the door a large sign reading "PLEASE DO NOT CLEAN THIS OFFICE TODAY." He then opened the window, wondering just what the biology department had deposited in the dumpster to cause so strong a smell. He spent an hour reorganizing his notes.

Next, Grundy once again visited Ms. Harper, this time suggesting that she would receive an unsatisfactory grade for student teaching unless she learned to control Ralph's behavior and to teach basic math facts. Her habitual expression of disdain changed to one of rapt attention. Professor Grundy had observed that Ralph, because he was too "hyperactive" to remain in his seat, spent the time while other students worked wandering from toy to toy in the free-time area of the classroom. He suggested that Ms. Harper allow Ralph to play with the toys only after remaining in his seat for a specified length of time: very short periods at first, gradually increasing in length. Grundy further suggested the student teacher make flash cards of basic addition and subtraction facts, allowing the students to play with the colored blocks after they had learned several combinations.

Returning happily to his office, the professor encountered his psychoanalytically oriented colleague, who once again jocularly repeated his insights into Grundy's character. Ignoring the comments, the professor began an animated conversation with the departmental office associate, praising the rapidity with which she was helping him reorganize his manuscript. She assured him it had first priority, because she couldn't wait to be rid of the stinking pages.

Within a short time, Professor Grundy felt that he had things under control. Most of the students enrolled in his 8 a.m. class were present and on time every morning, even though Grundy had begun to give "on-time slips" only occasionally. Ms. Harper had stopped sneering and started teaching. Ralph's wandering had decreased dramatically, and the math group had learned to add and subtract. Grundy continued to ignore his colleague's comments, which gradually ceased when no response was forthcoming, and his notes and drafts were rapidly being transformed into a freshly processed manuscript. The only negative outcome was a sharp note from campus security stating that the condition of his office constituted a fire hazard and that it must be cleaned immediately.

▶

Constructivist Classroom
Pearson eText
Video Example 1.3
In this video, educators describe their constructivist classrooms and approach to learning. How do the educators draw a distinction between their approach and a "pour and store" approach to learning?

Behavioral Explanations

Learning Outcome 1.4 **Describe the usefulness of behavioral explanations and define positive reinforcement, negative reinforcement, punishment, extinction, and antecedent control.**

In the preceding vignette, Professor Grundy emerged as the behaviorist that he is. To solve some of his problems, he used techniques derived from yet another explanation of human behavior. The behavioral explanation suggests that rather than looking

inside a person for the cause of a behavior, we look to the environment, usually the immediate environment, to explain behavior. This explanation states that human behavior, both adaptive and maladaptive, is learned. Learning occurs as a result of the consequences of behavior. To put it very simply, behavior that is followed by pleasant consequences tends to be repeated and thus learned. Behavior that is followed by unpleasant consequences tends not to be repeated and thus not learned. By assuming that his students, including DeWayne, came to class late, that the custodian cleaned, that the student teacher ridiculed, that Ralph wandered, and that his psychoanalytic colleague teased because they had learned to do so, Professor Grundy was able to teach them to do other things instead. In doing so, he applied several learning principles underlying the behaviorists' view of human behavior. The following sections introduce these principles, each of which will be discussed in detail in later chapters. A word of caution: in applied behavior analysis, these terms are used very differently than they are used in everyday language. Pay close attention to the technical definitions.

Positive Reinforcement

Positive reinforcement describes a functional relation between two environmental events: a **behavior** (any observable action) and a **consequence** (a result of that action). Positive reinforcement is demonstrated when a behavior is followed by a consequence that increases the behavior's future rate of occurrence.

Many human behaviors are learned as a result of positive reinforcement. Parents who praise their children for putting away toys may teach the children to be neat. This also works in unintended ways: parents who give their children candy to make them stop screaming in the grocery store may teach the children to scream. The cleaning behavior of Professor Grundy's custodian undoubtedly was learned and maintained through positive reinforcement, as was the wit of Grundy's psychoanalytic colleague. Grundy used positive reinforcement (on-time tickets, conversation, and time with toys) to increase his students' rate of coming to class on time and the amount of time Ralph stayed in his seat.

Negative Reinforcement

Negative reinforcement describes a relationship among events in which the rate of a behavior's occurrence increases when some (usually aversive or unpleasant) environmental condition is removed or reduced in intensity. (This may be different from the definition you previously learned.) Human beings learn many behaviors when acting in a certain way results in the termination of unpleasantness. Professor Grundy, for example, learned that opening windows results in the reduction of unpleasant odors in closed rooms. Similarly, the office associate reorganized his manuscript rapidly because when she finished, she could throw away the smelly papers.

Punishment

The word **punishment** also describes a relationship: a behavior is followed by a consequence that decreases the behavior's future rate of occurrence. An event is described as a **punisher** only if the rate of occurrence of the preceding behavior decreases. Behaviorists use the word *punishment* as a technical term to describe a specific relationship; confusion may arise because the same word is used in a nontechnical sense to describe unpleasant things done to people in an effort to change their behavior. To the behaviorist, punishment occurs only when the preceding behavior decreases. In the technical sense of the term, something is not necessarily punishment merely because

someone perceives the consequent event as unpleasant. A behaviorist can never say, "I punished him, but it didn't change his behavior," as do many parents and teachers. It is punishment, in the technical sense, only if the functional relation can be established. People could say that Professor Grundy's verbal threat to Ms. Harper, for example, was apparently a punisher: her ridiculing comments to him stopped. Of course, we wish he had used a more positive approach.

Extinction

When a previously reinforced behavior is no longer reinforced, its rate of occurrence decreases. This relationship is described as **extinction**. Recall from our vignette that when Grundy no longer reacted to his colleague's ridicule, the behavior stopped. For a behaviorist, all learning principles are defined on the basis of what actually happens, not what we think is happening. Grundy may have thought he was punishing his colleague by yelling or otherwise expressing his annoyance. In reality, the rate of the behavior increased when Grundy reacted in this way; the real relationship was that of positive reinforcement. The behavior stopped when the positive reinforcer was withdrawn.

Antecedent Control

Requirements that a functional assessment or analysis be performed for students with disabilities before changes in placement can be made (see Chapter 7 for a detailed discussion) have greatly increased interest in antecedent control. Teachers and researchers have come to rely much more frequently on examination of antecedent events and conditions, those occurring before the behavior, to determine what might be setting the stage for appropriate or challenging behaviors. There is also increased emphasis on manipulating antecedent conditions or events to manage and prevent challenging behavior.

Stimulus control is the focus of Chapter 9.

An antecedent that occurs immediately before a behavior is called a discriminative stimulus and is said to "occasion" (to set the occasion for) a behavior. There is a functional relation, called **stimulus control**, between behavior and an **antecedent stimulus** rather than behavior and its consequences. Consequences must have been present during the development of the relation, but the antecedent condition or event now serves as a signal or cue for the behavior. In our vignette, the custodian's adherence to posted notices had apparently been reinforced in the past, so Professor Grundy's sign was effective even in the absence of a reinforcer or a punisher.

Another type of antecedent that affects behavior is **setting events**, which is similar to **motivating operations** (Chan, 2016; Iovanonne et al., 2017; Michael & Miguel, 2020; Nosik & Carr, 2015). These conditions or events may occur simultaneously with a discriminative stimulus or hours or even days before. They may occur in the same setting or in a completely different one. They influence behavior by temporarily changing the value or effectiveness of reinforcers. The simplest kinds of motivating operations are deprivation and satiation. A student who has just come in from the playground, sweating buckets from playing a hard game of kickball, is likely to be more responsive to a tall glass of water as a potential reinforcer than one who has just consumed a large glass of water in the air-conditioned cafeteria. Kazdin (2000) described three types of setting events: social, physiological, and environmental. Bailey, Wolery, and Sugai (1988) subdivided environmental setting events into instructional dimensions, physical dimensions, social dimensions, and environmental changes. These varieties of conditions and events may include variables as diverse as a noisy or uncomfortably warm classroom (environmental), the presence of a disliked staff member or peer (social), or a headache (physiological).

Bailey et al. (1988) included considerations about instructional materials that may not be age appropriate or gender appropriate. It may be that no reinforcer will (or indeed should) induce a teenager to touch, much less read, a colorfully illustrated book about a small doll. We believe that issues of students' ethnic or cultural heritage can also serve as setting events. Students are much more motivated to interact with materials that portray people like themselves (Fong et al., 2017; Sciuchetti, 2017). Attention to cultural diversity may enable teachers to provide reinforcers that are more meaningful and powerful and to avoid strategies that are ineffective or offensive. Strategies such as personalized contextual instruction (Voltz, 2003) that embed instruction into contexts of interest to students in a given setting may enhance the value of reinforcers. The Music Hath Charms anecdote describes a classroom using this approach.

Other Learning Principles

In addition to these major learning principles, Professor Grundy illustrated the use of several other influences on human behavior described by behaviorists. These influences include **modeling** and **shaping**. Modeling is the demonstration of behavior. The professor had been modeling inappropriate behavior—coming to class late—and his students had apparently been imitating that behavior. People learn many behaviors, both appropriate and inappropriate, by imitating a model. Infants learn to talk by imitating their caregivers; adults can learn to operate complex machinery by watching a demonstration.

Shaping uses the reinforcement of successive approximations to a desired behavior to teach new behavior. Grundy suggested that Ms. Harper use shaping to teach Ralph to stay in his seat. She was initially to reinforce sitting behavior when it occurred

Music Hath Charms

Ms. Garcia, a general education teacher, Mr. Walden, a special education teacher, and Ms. Nguyen, a paraprofessional, share the responsibility for an inclusive primary class of 25 students that they privately agree "gives new meaning to the term diversity." Their students range in age from 7 to 9. They teach 14 boys and 11 girls: 12 African-American students, 8 Hispanic students, and 4 Asian students. They have 7 children with learning disabilities, 4 children with behavior disorders, and 2 children who are intellectually gifted. And they have Yuri, a boy from Russia who has autism. What the children have in common is eligibility for free or reduced-price lunch and the fact that all of their teachers believe every one of them is capable of great things.

Things had been going well; the teachers used the standard curriculum and a combination of group and individual teaching. They used a simple point system with the class as a whole (the students could earn tangibles and activities for completing work and behaving appropriately) and implemented more complex positive behavior support plans with some children with more challenging behaviors. The students were making good academic progress but, as Mr. Walden

stated at a meeting one afternoon, "Nobody seems real excited about school except us." The three teachers decided to implement an integrated unit approach that Ms. Garcia had learned about in a class she was taking at the local university and researched on the Internet and at the university library. The next morning Ms. Garcia explained the plan to the students, asking them to think about what they would like to study. The students seemed to think the teachers must be kidding and made several suggestions ranging from sports to dinosaurs, but most of the interest appeared to center around music. "Rap!" shouted several students. "Salsa!" suggested others. "All right," agreed Ms. Garcia, as Ms. Nguyen and Mr. Walden moved around praising students who were attending, "Let's make a list of what we already know about music and then a list of things we would like to know. Ms. Nguyen, would you help Yuri put the sticky notes with our ideas on the board?"

After almost an hour they had a good list to start out with and the teachers were startled to see that it was almost lunchtime. They were even more startled to realize that no one had given the students points all morning and that verbal praise and pats on the back had been enough.

for short periods of time and gradually increase the sitting time required for Ralph to earn the reinforcer. Many behaviors are taught by shaping. Parents may praise a young child effusively the first time she dresses herself, even if her blouse is on inside out and her shorts are on backward. Later she may earn a compliment only if her outfit is perfectly coordinated.

The Task of the Behaviorist

If you can see it, hear it, feel it, or smell it, it's observable. If you can count it or measure it, it's quantifiable.

Behaviorists explain the development of both typical and atypical human behavior in terms of the principles just described. An important aspect of this approach is its emphasis on behavior. To qualify as a behavior, something must be *observable* and *quantifiable* (Baer, Wolf, & Risley, 1968). We must be able to see (or sometimes hear, feel, or even smell) the behavior. To make such direct observation meaningful, some way of measuring the behavior in quantitative terms (How much? How long? How often?) must be established. Behaviorists cannot reliably state that any of the relations described as learning principles exist unless these criteria are met.

Skinner (1953) suggested that behaviorists are less concerned with explaining behavior than with describing it. The emphasis, he states, is on which environmental factors increase, decrease, or maintain the rate of occurrence of specific behaviors. It is important to note that behaviorists do not deny the existence of physiological problems that may contribute to some behavioral problems. Nor do most behaviorists deny the effects of heredity (Mahoney, 1974) or even developmental stages (Ferster, Culbertson, & Boren, 1975). Their primary emphasis, however, is on present environmental conditions, both antecedent and consequent, maintaining behavior and on establishing and verifying functional relations between such conditions and behavior.

The Usefulness of Behavioral Explanations

One of the most common criticisms of the behavioral approach is that it leaves much of human behavior unexplained. Emphasis on observable behavior has led many to assume that behavioral principles can account for only simple motor responses. However, Skinner (1953, 1957, 1971) applied basic learning principles to explain a wide variety of complex human behavior, including language, education, economics, politics, and religious beliefs.

The fact that behavioral principles have not accounted for all aspects of human behavior should not lead to the assumption that they cannot. In the years since Skinner first identified the principles of behavior that developed into the discipline of applied behavior analysis, many aspects have been accounted for. Many phenomena have yet to be explained. "In the meantime—which may last forever—the best strategy is to isolate variables that influence important behavior and manipulate those variables to make life better" (Poling & Byrne, 1996, p. 79). Because behaviorists refuse to theorize about what they have not observed, explanation must await verification. Behaviorists are ready temporarily to sacrifice some degree of inclusiveness for verifiability.

Verifiability is the essence of the behavioral explanation. Other theorists posit a theory and attempt to verify it through experimental investigation. Behaviorists, on the other hand, investigate before formulating what may be described as generalizations rather than theories. That adult attention serves as a positive reinforcer for most children (Baer & Wolf, 1968; Harris, Johnston, Kelley, & Wolf, 1964) is an example of such a generalization. This statement was made only after repeated observations established a functional relation between children's behavior and adult attention. (Note that adult attention does not always

function as a positive reinforcer.) The following chart summarizes the usefulness of behavioral theory.

The Usefulness of Behavioral Theory			
	Good	**Fair**	**Poor**
Inclusiveness		✓	
Verifiability	✓		
Predictive Utility	✓		
Parsimony	✓		

The focus of the behavioral approach is changing behavior. Predictive utility is an essential part of any behavioral explanation. Functional relations are established and generalizations are made precisely so that they can be used to change maladaptive or inappropriate behavior and increase appropriate behavior. Behaviorists are reinforced by changing behavior, not by discussing it. Unless it is possible to use generalizations to predict what people will do under certain conditions, behaviorists see little point in making the statements. An enormous body of evidence exists, representing the application of learning principles to human behavior. Such data make possible the prediction of behavior under a wide variety of conditions.

Behavioral explanations are parsimonious, satisfying our fourth criterion for usefulness. Describing behavior solely in terms of observable, verifiable, functional relations avoids the use of "explanatory fictions." Such fictions are defined only in terms of their effects, resulting in the circular reasoning we discussed earlier. Rather than invoking "hyperactivity"—an example of an explanatory fiction—to explain Ralph's out-of-seat behavior, Professor Grundy chose a behavioral approach to look at what happened before and after Ralph left his seat. In this way, behaviorism avoids explanations distant from observed behavior and its relationship to the environment. It is unacceptable to explain out-of-seat behavior by labeling the cause as hyperactivity or to explain messiness as fixation at or regression to the anal-expulsive stage of behavior. Neither explanation adds useful information about the problem, nor strategies to improve the behavior.

The assumption that behaviors are being maintained by current environmental conditions and that the behavior may be changed by changing the environment is not merely parsimonious, it is supremely optimistic. The teacher who concentrates on discovering and changing the environmental conditions maintaining students' inappropriate or maladaptive behavior does not give up on them because they have cultural differences, intellectual disabilities, brain damage, emotional disturbance, hyperactivity, or are at risk, or developmentally unready to learn; she teaches them. If students' behavior is described in terms of behavioral excesses (too much moving around) or deficits (too little reading) rather than in terms of explanatory fictions, the teacher can go about the business of teaching—decreasing behavioral excesses and overcoming behavioral deficits.

Historical Development of Behaviorism

Learning Outcome 1.5   **Describe the origins of a behavioral explanation for behavior.**

Behaviorism as a science has roots in philosophical and psychological traditions originating several centuries ago. The learning principles described earlier certainly existed before being formally defined. People's behavior has been influenced since

"Explanatory fictions" explain nothing. Behaviorists explain behavior on the basis of observation, not imagination.

Who is B.F. Skinner?
Pearson eText
Video Example 1.4
In this video, B.F. Skinner's contributions to the study of psychology are briefly explained. What distinctions do you notice between behavior analysis and the other theories in this chapter?

https://www.youtube.com/watch?v=tqabCNrenZo

the beginning of civilization. In the following section, we will examine several historical descriptions of how people have used the relation between behavior and its consequences. Then we will trace the development of behaviorism as a formal way of explaining, predicting, and changing human behavior.

Historical Precedents

The arrangement of environmental conditions in order to influence behavior is by no means a recent invention. It is said that the ancient Romans put eels in the bottom of wine cups to decrease excessive drinking. Crossman (1975, p. 348) provided a historical example of the use of positive reinforcement:

> There is a fascinating history behind the pretzel. About 610 an imaginative Alpine monk formed the ends of dough, left over from the baking of bread, into baked strips folded into a looped twist so as to represent the folded arms of children in prayer. The tasty treat was offered to the children as they learned their prayers and thereby came to be called "pretiola"—Latin for "little reward." (From the back of a Country Club Foods pretzel bag, Salt Lake City.)

Benjamin Franklin demonstrated that adults' behavior could also be changed, using a rather different positive reinforcer (Skinner, 1969). When a ship's chaplain complained that few sailors attended prayers, Franklin suggested that the chaplain take charge of serving the sailors' daily ration of rum and deal it out only after the prayers. Attendance improved remarkably.

Parents and teachers have likewise applied the principles of learning in their efforts to teach children. "Clean up your plate and then you can have dessert," says the parent hoping for positive reinforcement. "When you finish your arithmetic, you may play a game," promises the teacher. Parents and teachers, whether they are aware of it or not, also use punishment: the child who runs into the street is scolded; the student who finishes his assignment quickly is given more work to do. All of us have heard "Just ignore him and he'll stop. He's only doing it for attention." If he does stop, we have an example of extinction. Of course, many parents and teachers extinguish appropriate behavior as well, paying no attention to children who are behaving nicely. Negative reinforcement is demonstrated in many homes every day: "You don't play outside until that room is clean." Teachers also use negative reinforcement when they require students, for example, to finish assignments before going to lunch or to recess. Kindergarten teachers who ask their charges to use their "inside voices" are trying to establish stimulus control. Whenever teachers show their students how to do something, they are modeling.

| Behavioral principles operate whether anyone is consciously using them.

It becomes apparent that a person does not need to know the names of the relationships involved to use them. Indeed, applying behavioral learning principles sounds a lot like common sense. If it is so simple, why must students take courses and read books? Why have such quantities of material been written and so much research conducted?

The answer is that it is inefficient to fail to arrange environmental conditions so that functional relations are established, or to allow such relations to be randomly established, or to assume that such relations have been established based only on common sense. This inefficiency has resulted in high levels of maladaptive behavior in schools and sometimes frighteningly low levels of academic and pre-academic learning. It is our aim in writing this book to help teachers become applied behavior analysts. The derivation and definition of the term *applied behavior analysis* will be discussed in the remaining sections of this chapter.

Psychological Antecedents

RESPONDENT CONDITIONING   Most people are aware of the work of Ivan Pavlov, who observed that when a tone was sounded as dogs were fed, the dogs

began to salivate when they heard the tone even when food was not present. (Anyone who feeds dogs can observe a similar phenomenon when the dogs arrive drooling when they hear the food pans being taken from the dishwasher.) Pavlov's precise observation and measurement have served as a model for experimental research to this day. His classic experiment involved pairing food powder (which elicits salivation, an automatic reflex) with a tone that would normally have no effect on dogs' salivation. The presentation of the tone preceded the presentation of the food powder; after repeated pairings, salivation occurred when only the tone was presented (Hill, 1970). The food powder was labeled the *unconditioned stimulus* (US); the tone, the *conditioned stimulus* (CS). Salivation is an unconditioned response to food powder and a conditioned response to the tone. The relationship may be represented as shown in the accompanying diagram. The process of pairing stimuli so that an unconditioned stimulus elicits a response is known as *Pavlovian, classical*, or *respondent conditioning*.

Stage 1:
                                     Food (UCS)
          Tone - → Salivation

Stage 2:
          Tone ─────────────────────────→ Salivation
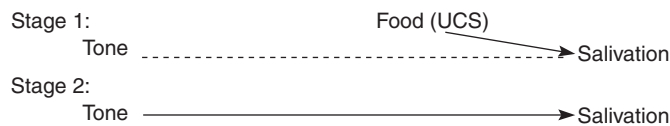
ASSOCIATIONISM   Another influential experimenter whose research paralleled that of Pavlov was Edward Thorndike. Thorndike studied cats rather than dogs, and his primary interest was discovering associations between situations and responses (Thorndike, 1931). He formulated two laws that profoundly influenced the subsequent development of behavioral science. The Law of Effect (Thorndike, 1905) states that "any act which in a given situation produces satisfaction becomes associated with that situation, so that when the situation recurs the act is more likely than before to recur also" (p. 203). Second is the Law of Exercise, which states that a response made in a particular situation becomes associated with the situation. The relationship of the Law of Effect with the principle of positive reinforcement is obvious. The Law of Exercise is similarly related to the stimulus control principle discussed earlier.

BEHAVIORISM   The term *behaviorism* was first used by John Watson (1914, 1919, 1925). Watson advocated the complete abolition of any datum in psychology that did not result from direct observation. He considered such concepts as mind, instinct, thought, and emotion both useless and superfluous. He denied the existence of instinct in human beings and reduced thought to subvocal speech, emotion to bodily responses. A Watsonian behaviorist of our acquaintance once responded to a question by saying, "I've changed my mind (you should excuse the expression)." The true Watsonian does not acknowledge the existence of any such entity as "mind."

> If we were all Watsonians, we couldn't say, "She hurt my feelings," "My mind wandered," or "Use your imagination."

Watson and Raynor (1920) conditioned a startle response in a baby, Albert, by pairing a white rat (CS) with a loud noise (US). Watson contended that all "emotional" responses such as fear were conditioned in similar ways. In an interestingly related procedure, Jones (1924) desensitized a 3-year-old child who showed a fear response to white rabbits and other white furry objects by pairing the child's favorite foods with the rabbit. This procedure was unfortunately not carried out with Albert, who moved away before his conditioned fear could be eliminated. Albert might have been scared of white rats all his life, which may have created a number of problems, including preventing his employment as a behavioral psychologist.

OPERANT CONDITIONING   The learning principles described at the beginning of this section are those suggested by proponents of an *operant conditioning* model for

explaining, predicting, and changing human behavior. The best-known operant conditioner was B. F. Skinner (1904–1988), who first distinguished operant from respondent conditioning.

Respondent conditioning, you will recall, deals with behaviors elicited by stimuli that precede them. Most such behaviors are reflexive; that is, they are not under voluntary control. Examples include sweating, blushing, and pupil dilation. Operant conditioning, on the other hand, deals with behaviors usually considered voluntary rather than reflexive. Examples include pulling, pushing, walking, talking, writing, and contorting—the types of behaviors important in schools. Operant conditioners are concerned primarily with the consequences of behavior and the establishment of functional relations between behavior and consequences. The behavioral view described earlier is that of operant conditioning, which will be the emphasis of the entire text.

> Operant behaviors are emitted voluntarily; respondent behaviors are elicited by stimuli.

Skinner's early work was with animals, primarily white rats. In this, he followed in the tradition of earlier behaviorists, to whom this particular animal was so important that one researcher (Tolman, 1932) dedicated a major book to Mus norvegious albinius, a strain of white rats. Bertrand Russell, the philosopher, is said to have suggested facetiously that the different emphases in European (primarily gestalt, introspective, and theorizing) and American (primarily behavioral, active, and observational) studies may have resulted from differences in the breeds of rats available. Whereas European rats sat around quietly waiting for insight, American rats were active go-getters, scurrying around their cages and providing lots of behaviors for psychologists to observe.

Skinner also worked with pigeons. He explained (1963) that, while in the military during World War II, he was assigned to a building whose windowsills were frequented by these birds. Because there was very little to do, he and his colleagues began to train the pigeons to perform various behaviors. This subsequently developed into a rather elaborate, successful, although ultimately abandoned before fully operational, project to train pigeons to deliver guided missiles to enemy vessels. The pigeons, of course, were limited to one delivery. Although "Project Pigeon" was a source of personal and professional frustration to Skinner, it is credited with moving his interest firmly and finally from the laboratory into applied settings (Capshew, 1993).

Early application of operant conditioning techniques to human beings was directed toward establishing that the principles governing animal behavior also govern human behavior. The use of these principles to change human behavior—initially called *behavior modification*—did not really emerge in nonlaboratory settings until the 1960s. One of the authors remembers being told in an experimental psychology course in 1961 that there was some indication operant conditioning could be applied to simple human behavior. As an example, the instructor laughingly described college students' conditioning their professor to lecture from one side of the room simply by looking interested only when he stood on that side. The instructor insisted, rather pompously, that it would not be possible to modify his behavior in this way, because he was aware of the technique. He was wrong; he was backed into one corner of the room by the end of the next lecture.

> Applied behavior analysis must deal with socially important, observable behaviors. Relationships between behaviors and interventions must be verified.

At that time, however—in spite of Skinner's (1953) theoretical application of operant conditioning techniques to complex human behavior and pioneer studies such as those of Ayllon and Michael (1959) and Birnbrauer, Bijou, Wolf, and Kidder (1965)—few people anticipated the enormous impact that the use of such principles would have on American psychology and education and other disciplines. The application of behavior modification in real-life settings had become so prevalent by 1968 that a new journal, the *Journal of Applied Behavior Analysis*, was founded to publish the results of research. In Volume 1, Number 1, of the journal, Baer, Wolf, and Risley

(1968) defined applied behavior analysis as the "process of applying sometimes tentative principles of behavior to the improvement of specific behaviors, and simultaneously evaluating whether or not any changes noted are indeed attributed to the process of application" (p. 91).

Baer and his colleagues (1968) suggested that for research to qualify as applied behavior analysis, it must change socially important behavior, chosen because it needs change, not because its study is convenient to the researcher. It must deal with observable and quantifiable behavior, objectively defined or defined in terms of examples; and clear evidence of a functional relation between the behavior to be changed and the experimenter's intervention must exist. In a more recent retrospective analysis of the progress of applied behavior analysis since 1968, the same authors (Baer, Wolf, & Risley, 1987) suggested that in spite of considerable opposition and in light of many failures of the procedures in real settings, applied behavior analysts should persevere. They stated, "current theory has worked far too well to be abandoned in the face of what are more parsimoniously seen as technological rather than theoretical failures" (p. 325). In other words, we still cannot always make what we know ought to work actually work, but that is a problem of implementation, not an indication of the inadequacy of applied behavior analysis as a discipline. Applied behavior analysis is more rigorously defined than behavior modification. In our earlier vignette, Professor Grundy apparently succeeded in modifying behavior, but he failed to meet the criterion of analysis—he had no way of knowing for sure whether his techniques changed behavior or whether the change was mere coincidence. Maintaining data about behavior change (or the lack of it) is a fundamental tenet of applied behavior analysis. It is required for many procedures necessary for students with disabilities, including functional analysis of behavior, discussed in Chapter 6, and Responsiveness to Intervention (RTI) (Bradley, Danielson, & Doolittle, 2007) used as part of the identification process for students with special needs. This book is designed to help teachers become applied behavior analysts, effective modifiers of behavior, and efficient analyzers of the principles of learning involved in all aspects of their students' performance.

Teachers who learn and practice the principles of applied behavior analysis can help their students master functional and academic skills in a systematic and efficient manner and can document their students' progress for parents and other professionals. They can manage behavior positively so that their focus remains on learning. They can teach students to get along with peers and adults and to make good choices. By providing learning environments that are safe, joyful, and successful, they can make enormous differences in students' lives.

Classical vs. Operant Conditioning
Pearson eText
Video Example 1.5
In this video, the key differences between operant and classical conditioning are reviewed. Operant conditioning is based on the application of reinforcement and punishment. What are some examples of operant conditioning that you have experienced?

https://www.youtube.com/watch?v=H6LEcM0E0io

Summary

We described a number of approaches to explaining human behavior. We evaluated these approaches in terms of their inclusiveness, verifiability, predictive utility, and parsimony. We also described an explanation of human behavior that appears to us to be the most useful—the behavioral explanation.

In tracing the history of the behavioral approach to human behavior, we emphasized the development of a science of applied behavior analysis. We discussed the necessity for concentrating on socially useful studies of human behavior and on careful observation of the establishment of functional relations. We also provided a rationale for learning and using the principles of applied behavior analysis and some examples of their use in various educational settings.

Discussion Questions

1. Mr. King is a consultant teacher for students with special needs in an elementary school. He is working with Ms. Lowe, a third-grade teacher, who wants Jaylon, one of her students, to stop wandering around the room and to finish, or at least attempt to finish, his assignments. When Mr. King suggests a program using stickers to reinforce Jaylon's appropriate behavior, Ms. Lowe states that the boy is ADHD and that nothing will help until his parents agree to put him on medication because ADHD is a medical problem. What should Mr. King say to Ms. Lowe?

2. Mr. King has suggested to Ms. Nakamura that she use stickers that can be traded for free time to help Maria, one of her kindergarten students who becomes easily frustrated and cries a lot when asked to work independently. Ms. Nakamura decides to give Maria a sticker whenever she works independently for several minutes and reports that she doesn't think Maria is crying as much and that the program seems to be working. She thanks Mr. King for his help. Is Ms. Nakamura practicing applied behavior analysis? Does it matter? Should Mr. King tell her?

Chapter 2

Responsible Use of Applied Behavior Analysis Procedures

Learning Outcomes

2.1   Describe three factors that lead to concerns about the use of applied behavior analysis procedures.

2.2   List the criteria for verifying that procedures for behavior change are being ethically implemented.

2.3   Describe the effectiveness of providing accountability when using applied behavior analysis procedures.

2.4   State the justification for ensuring that professionals working with individuals with challenging behaviors understand the theoretical basis of the procedures that they implement.

CHAPTER OUTLINE

This chapter addresses many of the issues raised by those who practice applied behavior analysis and those who disagree with its use. First, we will consider some of the concerns often expressed and some possible causes of these concerns. Then we will examine and respond to some of the specific criticisms of behavioral procedures, particularly as these methods are used in educational settings. We will suggest ethical guidelines for using procedures, Professor Grundy will answer some common questions asked by people new to applied behavior analysis, and we will submit reasons for thoroughly understanding procedures and principles.

Concerns about Applied Behavior Analysis

Learning Outcome 2.1   Describe three factors that lead to concerns about the use of applied behavior analysis procedures.

Resistance to the use of operant procedures to change behavior has come from several sources. The term *behavior modification*, which was historically used to describe such techniques, has caused some confusion. Because the word *modification* is synonymous with *change*, the term *behavior modification* has often been misused to refer to any procedure that has the potential to change behavior. This contamination of the term is one reason that we prefer the term **applied behavior analysis**.

Other objections to operant procedures have come from those who feel that any systematic effort to change behavior is coercive, and thus inhumane. Those who take this position often describe themselves as "humanists." Their objections are based on a rejection of a deterministic viewpoint and advocacy of free will and personal freedom. The intuitive appeal of these humanistic values makes humanists' rejection of behavioral procedures a formidable objection, although as we shall see, such objections frequently rely on a rather shaky logical foundation.

The very effectiveness of applied behavior analysis procedures is one source of much concern about this approach. It is ironic that many people are comfortable with ineffective techniques or with techniques whose effectiveness lacks verification. This is sometimes because those less-effective techniques are easier, faster, and less costly to implement, such as medication. Implementing assessments and procedures based on applied behavior analysis are more time consuming, and also quite effective.

The battle to bring about "the destruction of the behaviorist evil and the hegemony of the cognitive good" (Schnaitter, 1999, p. 209) reached its peak in the 1970s and 1980s, and the fervor of the criticisms is well characterized by Schnaitter's description. Applied behavior analysis was virtually ignored by researchers and teachers outside of special education during the 1980s (Axelrod, Moyer, & Berry, 1990), perhaps because its critics perceived that the battle had been won and "behaviorism" defeated. Two of us were in graduate school when the debate was in full swing and one of our fellow students was confronted with the statement "behaviorism is dead!" "What?" she replied, "Have they repealed the laws of behavior?" Applied behavior analysis again became the target for attack (Haberman, 1995; Kohn, 1993, 2018), even by some special educators (Pugach & Warger, 1996). Axelrod (1996) suggested several possible reasons for this:

- Behavioral approaches are too much work and provide too little reinforcement.
- Behaviorism contradicts the popular developmental views of education and psychology.
- Behavior analysis is a threat to the prevailing power structures in education and psychology.

Some people believe that changing behavior invariably infringes on personal freedom.

- Positive reinforcement is a practice that often lacks social acceptability.
- Behavior analysis fails to glorify human beings as do other psychologies and philosophies. (pp. 248–253)

Anyone who has ever taught reading using a direct instruction approach (Engelmann et al., 1988; Fishley et al., 2017; Kamps et al., 2016; Kourea et al., 2018), derived from behavioral principles, can attest that it is a lot more work than, for example, providing students with a literacy-rich environment and waiting for literacy to emerge. Implementing behavior support plans is a lot harder than sending students to the principal's office and subsequently suspending or expelling them.

In addition to addressing Axelrod's (1996) concerns, we will discuss some other reasons why applied behavior analysis continues to be controversial.

Confusion with Other Procedures

Much of the public outcry against what is historically called *behavior modification* results from the use of this term to describe procedures that are totally unrelated to applied behavior analysis. Popular journalists (Holden, 1973; Mason, 1974; Wicker, 1974) and even behavior modification professionals (McConnell, 1970) caused incalculable harm to the image of applied behavior analysis during the years when its use with human beings was in its developmental phase by including unrelated treatment procedures under the heading of behavior modification. Hypnosis, psychosurgery, brain implants, drug therapy, and electroconvulsive shock treatment have all been lumped under this label. Such procedures undoubtedly change behavior, but they are not related to the systematic changing of behavior by application of behavioral principles. It would be equally logical and equally erroneous to list under the title of behavior modification the entire array of therapeutic interventions including "psychoanalysis, Gestalt therapy, primal screams, lectures, books, jobs and religion" (Goldiamond, 1975, p. 26). Although many criticisms of applied behavior analysis were reactions to its use many years ago, more recent publications have blamed behavioral procedures for everything from the failure of public education to teach large numbers of children to the destruction of the American work ethic (Haberman, 1995; Kohn, 2001, 2018).

One of us has heard several times, "Oh, you're a behaviorist – are you going to shock me?" This is such an unfortunate association given that the father of behaviorism, B. F. Skinner, was vehemently against the use of punishment and aversives (Skinner, 1953). He abhorred the use of corporal punishment in schools and in the military, and implored members of society to instead use positive reinforcement. Applied behavior analysis certainly does not include such treatments as electroconvulsive therapy or brain surgery; neither does it involve the use of drugs. The effective application of appropriate behavioral procedures often reduces the need for such drastic interventions. This was strongly demonstrated many years ago in studies using positive reinforcement as an alternative to medication for children labeled *hyperactive* (Ayllon, Layman, & Kandel, 1975) or as having *attention deficit disorder* (Rapport, Murphy, & Bailey, 1982). It is possible that behavior modification, in the proper sense of the term, will ultimately diminish the use of surgery, drugs, and other such behavior-change techniques. It is therefore particularly unfortunate that the improper use of the term has caused so much public hostility to a technology that is so potentially benign, and so potentially effective. Rather than *behavior modification,* we suggest teachers use the term *applied behavior analysis.*

Applied behavior analysis refers only to procedures derived from the experimental analysis of human behavior. Because of the negative connotations of *behavior modification*, administrative staff, fellow teachers, and other professionals may be as confused about how applied behavior analysts use these terms as parents and school board members. Some textbooks and other materials widely used in preservice teacher

Misconceptions about ABA
Pearson eText
Video Example 2.1
In this video, a speech and language pathologist shares her view of ABA. In what ways does her presentation of ABA align with and differ from this text? What misconceptions about ABA does she hold?

Applied behavior analysis is not hypnosis, prefrontal lobotomy, brain implants, drug therapy, or shock treatment.

education programs may well contribute to this confusion. We must work to undo these negative associations and explain the many benefits of applied behavior analysis. The use of terminology has consistently caused problems for behaviorally oriented practitioners. It may be that it is not what behaviorists do that disturbs people but the way they refer to it. Teachers should be careful how they talk about procedures, even among themselves. Problems may arise because of the way programs are described, even when the programs themselves are appropriate.

Risley (1975) described a time-out procedure that was disallowed primarily because staff members referred to the free-standing structures built for short-term exclusion as "boxes" and to the procedure as "putting him (the resident) in the box." That the "boxes" were large, adequately lighted structures made no difference. The use of the wrong words resulted in withdrawal of approval for the program. Those of us who tend toward flippant labels would be especially wise to guard our tongues when discussing procedures with people who might misunderstand.

Carr (1996) suggested that we modify our language even more drastically when addressing the general public, including parents and educators who are not behavior analysts. He advocated using the language of ethics, focusing on values such as compassion, dignity, and honesty rather than the technical language of concepts and procedures. In other words, rather than saying that we use positive reinforcement to increase the future probability of behavior, we should say that we use it because "it is a humane procedure (compassion) that can help individuals lead better, more fulfilling lives (dignity), and we offer it sincerely (honesty) as feedback" (p. 266). This is certainly not an attempt at deception; we believe that most behavior analysts are honest, compassionate, and supportive of the dignity of every individual. Critchfield et al. (2017) further recommended using everyday language with non-behavior analysts to help disseminate the effective science and set of practices.

Reaction to Controversial Procedures

Not all misunderstanding or hostility has resulted from those outside the field. Both professionals and the public frequently reject procedures derived from the experimental analysis of behavior. Some parents and educators even reject the use of positive reinforcement, stating that students should be intrinsically motivated and that systematic positive reinforcement reduces intrinsic motivation (Balsam & Bondy, 1983; Deci, 2016; Kohn, 2001, 2006, 2018). There is actually very little evidence for this claim (Cameron, Banko, & Pierce, 2001). Cameron and Pierce (1994) examined 96 published studies and found that intrinsic motivation is more often increased than decreased when positive reinforcement is used (see also Cameron et al., 2005).

It is easier to understand people's rejection of procedures that cause pain or discomfort and the use of exclusion. Although these are only a few of the tools of the applied behavior analyst, their use has received a disproportionate share of attention from the press, the public, and the judiciary (Connolly, 2017; Stolz, 1977). It is sufficient to note that aversive or exclusionary procedures may create problems in two ways:

1. Their misuse is common and often described by users as behavior modification.
2. Their use, even when appropriate, causes more concern than other behavioral procedures.

Guidelines for the use of aversive and exclusionary procedures will be provided in Chapter 9.

It is fully understandable that procedures causing pain or discomfort to any individual, but particularly one who is disabled, are reasons for concern. The controversy about aversive procedures will be discussed later in this chapter and at length in Chapter 9.

Concerns about Coercion

The notion that applied behavior analysis is inhumane rests on the assumption that each human being should be free to choose a personal course of behavior. It follows, for those who criticize behavioral procedures, that any systematic attempt to alter the behavior of another human being is coercive and thus inhumane.

This criticism of behavioral techniques is based on the philosophic concept of free will. Advocates of the assumption of free will tend to attribute human behavior to forces arising from within the individual, and thus not subject to prediction or control. This is an example of the glorification of human beings described by Axelrod (1996). In other words, people are different from animals in that they just do what they do because they decide to do it. A deterministic position, on the other hand, holds that even human behavior is **lawful behavior** (subject to prediction) and its causes can be identified in environmental events. A determinist recognizes systematic relationships among such events (Chiesa, 2003) and considers human behavior as part of the system. This contrasting view concludes that human behavior is subject to lawful prediction. People do things, or decide to do things, because of past events and present circumstances. It is important to distinguish between the use of the term *lawful,* in the sense of an orderly relationship between events, and any implication of authoritarian control. Many criticisms of applied behavior analysis are predicated on a misunderstanding of that simple concept (Dollard, Christensen, Colucci, & Epanchin, 1996; Nichols, 1992). *Lawful,* in the sense used here, refers to relationships among events that occur naturally, not to attempts to legislate human behavior.

Applied behavior analysts, by definition, are also determinists. Their position is predicated on solid evidence that "the assumption of **determinism** is both justified and essential in dealing with human behavior" (Craighead, Kazdin, & Mahoney, 1976, p. 172). This confirmation has come from a large body of psychological research, some but by no means all of it conducted by those who call themselves applied behavior analysts. The assumption of lawful relationships among events and behavior does not imply a rejection of human freedom. For the applied behavior analyst, "freedom is defined in terms of the number of options available to people and the right to exercise them" (Bandura, 1975, p. 865). It is unfortunate that because of "misunderstandings of Skinner's thought, it is believed that, somehow, behavior analysis has the power to remove the ability of the individual to choose alternative responses" (Newman, Reinecke, & Kurtz, 1996, p. 277). The goal of the behavior analyst is to increase, not decrease, such options or alternative responses and thus to increase the freedom of the individual. The high school student who repeatedly fails English is not free to attend college. The child who is afraid to interact with peers is not free to make friends. People who have severe behavioral deficits may have no options at all; they cannot move around, take care of their basic needs, or control their environment in any way. This emphasis on options or choices will be addressed later in this chapter and throughout the text. It is the cornerstone of providing appropriate educational services to every individual.

A crucial concept in understanding the deterministic position is that the relationship between behavior and the environment is reciprocal (Bandura, 1969; Craighead et al., 1976). Environmental events control behavior, but behavior inevitably alters the environment as well. This reciprocal relationship exists between people. The behavior modifier's behavior is changed by the actions of the subject of the modification. Thus, everyone influences and controls others' behavior. It is impossible to abandon control; we inevitably influence the behavior of other people (Bandura, 1975; Rogers & Skinner, 1956). For example, a child who seldom smiles is not very pleasant to be around, so teachers and other children may avoid him. If his teacher systematically

> A belief that behavior is lawful does not imply that human beings are not free to choose what they will do.

> Behaviorists define freedom in terms of a person's ability to make choices and to exercise options.

reinforces his occasional happy facial expressions, the child will smile more. Because a smiling child is pleasant to be around and to interact with, he will himself become more reinforcing to others, including his teacher. She will then have more opportunities to reinforce smiling.

Seen in this context, behavioral technology is neither dehumanizing nor inhumane. When goals are **humane**, we must offer the most effective means available to reach them. In many cases, the proven effectiveness of applied behavior analysis procedures makes them the most humane choice.

Ethical Use of Applied Behavior Analysis Procedures

Learning Outcome 2.2   **List the criteria for verifying that procedures for behavior change are being ethically implemented.**

All teachers—whether or not they are also applied behavior analysts—are concerned with ethics. Before describing ways in which teachers can behave ethically, we will discuss the concept of ethics itself. A decision or action is ethical if it is right. That, of course, is a deceptively simple statement. The determination of what is right, according to whom it is right, and how we decide it is right has occupied philosophers and others since the days of Aristotle. Very simply stated, a teacher who is doing the right thing is behaving ethically. Doing the right thing, however, means far more than avoiding censure or even complying with a set of ethical guidelines or standards. Several associations, including the Council for Exceptional Children (2010) and the Behavior Analyst Certification Board (BACB, 2014; Bailey & Burch, 2016), provide such guidelines, and teachers and other professionals should certainly be familiar and comply with those applying to them. We, however, are not "more concerned that … teachers follow the rules than that … teachers become ethical beings" (Watras, 1986, p. 14). Simply because something is accepted practice does not ensure that it is right (Kitchener, 1980). People following rules (or obeying orders) have done some very wrong things over the centuries, and no set of rules can ever cover every eventuality. Teachers must be prepared to act ethically in the absence of guidelines and even when their actions are in conflict with guidelines or instructions.

The ways prospective teachers become ethical beings has been the subject of intense interest among teacher educators. A volume of the *Journal of Teacher Education* (1986) was almost entirely devoted to the issue. The consensus appears to be that discussing ethical dilemmas in a forum of other interested prospective and practicing professionals best develops ethical reasoning. Ethics should not be addressed in a single course but should permeate all courses (Pastrana et al., 2018). If ethical issues do not arise and are not discussed in your classes, we suggest you bring them up.

Although the primary reason to behave ethically is to act consistently with what one believes is right, there is another reason. Teachers must always be aware that other people are concerned with teachers' doing the right thing. Previous sections have acknowledged that people are especially apt to worry about ethics when behavioral techniques are used. Unless teachers take particular care to act ethically and to assure others that they do, they may find noneducators seeking and acquiring more and more control over what may and may not be done in classrooms.

Those who practice applied behavior analysis have agreed for many years that a number of factors must be considered when attempting to determine whether a proposed intervention is ethical. These include "community standards, laws, prevailing philosophies, individual freedom and responsibility of the clients through informed consent as well as the clients' attitudes and feelings" (Sulzer-Azaroff, Thaw, & Thomas, 1975). In the case of schoolchildren or residents of an institution,

Awareness of potential criticism may help avert interference from uninformed persons.

it is important to seek the opinions of the parents or guardians of the students to ask them how they feel about procedures being used or proposed for use with their children. It may seem strange for behaviorists to concern themselves with such subjective criteria as attitudes and feelings, but Wolf (1978) made a strong case for considering these factors. If participants do not like a program, he said, "They may avoid it, or run away, or complain loudly" (p. 206). Wolf suggested that social validity should be established for goals, procedures, and outcomes. **Social validity**, or consumer satisfaction, is simply the acceptability of a program or procedure to its consumers (Carter & Wheeler, 2019; Common & Lane, 2017). To assess the social validity of interventions, applied behavior analysts sometimes give questionnaires, interviews, and surveys to the parents and other teachers of the students. Even though applied behavior analysts do not typically use such subjective means of data collection due to cautions about their validity, "it is entirely possible that even quite invalid queries into social validity are better than no queries at all: Giving consumers any opportunity to express complaints and discontents that otherwise would go unnoticed may save at least some programs from fatal backlashes, at least if the offended consumer is moved enough by simply the existence of an otherwise inadequate social-validity assessment form to write in its margins or talk to the appliers" (Baer, Wolf, & Risley, 1987, p. 323).

There are several more objective means of assessing social validity. If teachers or other interventionists continue using an intervention and the students maintain their skills, this is an indication that the teachers accepted the use of the intervention (Kennedy, 2002). In addition to asking teachers and parents, applied behavior analysts may be interested if the students themselves find an intervention socially valid. A way to assess this is to expose a student to multiple interventions, such as functional communication training and extinction, and then letting the student choose one of those procedures for continued use (Hanley, 2010). Many, but not all, articles published about research using applied behavior analysis address the issue of social validity (Park & Blair, 2019; Snodgrass et al., 2018).

There is an interesting relationship between social validity and procedural integrity. Procedural integrity is the extent to which a teacher implements a procedure as it is written or described. When teachers have poor procedural integrity, the student's behavior change is minimal (Brand et al., 2019). When researchers or consultants ensure high procedural integrity through effective training, there are higher levels of social validity (Park & Blair, 2019). In other words, when teachers know how to implement an intervention correctly, they find the intervention acceptable. Conversely, when there is a high degree of social validity, there is a high degree of procedural integrity (Strohmeier et al., 2014). That is, if a teacher finds an intervention acceptable and doable, she is more likely to implement it correctly.

Teachers using behavioral procedures concern themselves with factors occurring outside of their classrooms. Goals, procedures, and outcomes must be acceptable to the consumers of education—students, parents, and the community. Stainback and Stainback (1984) suggested that increased attention be given to qualitative research methods that provide "more attention to the social and educational relevance of research efforts" (p. 406). Leko (2014) used qualitative research to assess the social validity of a direct instruction reading intervention with middle school teachers. Based on this work, Leko provided a more robust definition of social validity in terms of evaluating "(a) macro- and micro-goals; (b) procedures for planning, delivering, and assessing instruction; (c) intervention materials; and (d) outcomes related to instructional quality, stigmatization, and students' achievement, socio-emotional development, and engagement" (p. 284). Additionally, it is critically important for teachers and researchers to be attentive to the wide cultural diversity present in most communities and to select goals, procedures, and outcomes congruent with that diversity (Fong et al., 2016).

We hope we have convinced you that it is in your best interests to behave ethically. Although we acknowledged earlier that guidelines are necessarily incomplete, we believe it would be unethical not to provide some. It would be difficult to imagine an ethical position that did not focus on protecting students' rights. The Ethical Code of the Behavior Analyst Certification Board (BACB, 2014) contains 10 sections related to functions of behavior analysts in schools and other settings. We summarize five of these sections most pertinent to teachers using applied behavior analysis in schools: responsible conduct of behavior analysts, behavior analysts' responsibility to clients, assessing behavior, behavior analysts and behavior-change programs, and behavior analysts' ethical responsibility to colleagues.

In addition, a statement approved by the Executive Council of the Association for Behavior Analysis (ABA) from 1988 includes a list of individual rights that provides teachers with the basis for making ethical decisions about many issues. The statement begins: "We propose that individuals who are recipients or potential recipients of treatment designed to change their behavior have the right to (1) a therapeutic environment, (2) services whose overriding goal is personal welfare, (3) treatment by a competent behavior analyst, (4) programs that teach functional skills, (5) behavioral assessment and ongoing evaluation, and (6) the most effective treatment procedures available" (Van Houten et al., 1988, p. 111). We integrate some of these topics into the themes from the BACB and then address the remaining topics.

A Responsible and Competent Behavior Analyst

Responsible Conduct of Behavior Analysts (BACB, 2014)

Behavior analysts demonstrate responsibility when they are honest, follow through with commitments in a timely manner, and show respect to people from diverse backgrounds. They are ethical when they base their assessments and interventions on published research and continually engage in professional development to stay current on research. Behavior analysts must practice within their scope of competence. That is, if a new behavior analyst completed a supervised practicum in a classroom with students with autism and other developmental disabilities, she is qualified to work with students with autism but not necessarily with students who have bipolar disorder. Behavior analysts do not have multiple relationships, conflicts of interest, or exploitative relationships. This includes not having sexual relationships with clients or students and not giving or accepting gifts from clients or students. However, some argue that gift-giving should be allowed as it aligns with the values of certain cultures (Witts et al., 2018).

Treatment by a Competent Behavior Analyst (Van Houten et al., 1988)

These days, becoming a Board-Certified Behavior Analyst requires a great deal of training and experience. This is generally a minimum of a master's degree, seven courses in applied behavior analysis, 1500 hours of supervised practical experience, and passing a four-hour board exam. Not all teachers using applied behavior analysis will be board certified, but this gives an indication of the amount of training needed to be fully competent in using the concepts and procedures. Sometimes teachers attend a workshop on applied behavior analysis, and because some of the procedures seem simple, such as praising good behavior, they feel they can implement the procedures correctly in their classrooms. However, it is not possible to learn in a few days enough about applied behavior analysis to implement ethical, effective programs. Professionals providing professional development workshops to teachers sometimes think their workshop will change the teachers' practices; this has been shown to be false (Kirkpatrick et al., 2019). One of the authors attended a meeting many years ago during which she was asked to develop a packet for other faculty members that would enable them,

after a few hours' reading, to include applied behavior analysis techniques in their methods courses and thus obviate the need for a separate class on behavior management. When she retorted that she had taken eight courses in applied behavior analysis and had been practicing the procedures for 17 years, and was still learning, the reaction was typically: "But ABA is so simple!"

A concerning outcome of this thinking is that people who do not adequately understand the concepts and procedures often misuse them. A common example is that teacher who attends the workshop, buys a bag of candy, and proceeds to hand out "reinforcement" indiscriminately. When this doesn't improve the students' behavior, the teacher may conclude that applied behavior analysis does not work. An unfortunate side effect is that the children treated in this manner may become *more* disruptive because the teacher provides it even when they being disruptive. Moreover, parents become upset because their children's teeth are decaying and their appetites are spoiled; the principal expresses annoyance because she receives numerous irate phone calls from those parents; other teachers become enraged because their students demand candy, too; and the escutcheon of applied behavior analysis suffers another blot.

The principles of applied behavior analysis are indeed easy to understand. Their effective implementation, however, is not so simple. In addition to a thorough understanding of the principles, acquired from qualified instructors, supervised practice is critical. This is particularly important for difficult procedures, such as shaping, functional analysis of challenging behavior, and transfer-of-stimulus-control techniques.

In contrast, what has been shown to work is direct training of teachers or other staff members to implement procedures based on applied behavior analysis. This commonly is in the form of *behavioral skills training*, which consists of providing instructions, modeling the procedures, role-playing, and providing feedback (Brock et al., 2017; Davenport et al., 2019; Fetherston & Sturmey, 2014; Hogan et al., 2015; Homlitas et al., 2014; Kirkpatrick et al., 2019; Sawyer et al., 2017; Smith & Higbee, 2020). This is also referred to as competency-based training, with the idea that training ends when the teacher or staff person has implemented a procedure with a high degree of accuracy (Reid, 2017).

> Implementing these procedures is not always as easy as it sounds.

> Good supervision includes training, observation, and evaluation.

Scope of Competence
Pearson eText
Video Example 2.3
In this video, a behavior analyst describes how to practice ethically by identifying areas of competence. How might these practices be useful for educators utilizing ABA procedures?

https://www.youtube.com/watch?v=5DP8Ifko7qA

Behavior Analysts' Responsibility to Clients and Consent

Behavior Analysts' Responsibility to Clients (BACB, 2014)

It is important to determine who is the "primary ultimate beneficiary of services" (p. 6)—usually the student—and maintain collegiality and communication with parents and other professionals involved. Behavior analysts should make clear to all involved their specific duty, such as providing direct teaching or consultation. The confidentiality of information and documentation about a student must be protected, and consent for video or audio recording of the student must be attained from parents. Finally, "clients have the right to effective treatment" (p. 8); that is, a behavior analyst must identify the best intervention for a client based on research and implement that intervention as much as needed to achieve a meaningful improvement.

Services Whose Overriding Goal is Personal Welfare (Van Houten et al., 1988)

It may seem obvious that the behaviors targeted for change should be those whose change will benefit the student. Nevertheless, accusations have been made that residential institutions (*Wyatt v. Stickney*, 1972) and schools (Winett & Winkler, 1972) use behavior-change programs primarily to reduce behaviors that disrupt the smooth functioning of the institution or school but are not detrimental to residents or students. Winett and Winkler examined articles detailing behavior-change programs in the

Journal of Applied Behavior Analysis from 1968 through 1970. They stated that the majority of the articles concerned the attempted suppression of talking, moving around, and such disruptive behaviors as whistling, laughing, and singing. Winett and Winkler concluded that the technology of applied behavior analysis was being used merely to establish "law and order" (p. 499) rather than to serve the best interests of students. Winett and Winkler's famous phrase is that too many programs were only teaching students to "be still, be quiet, be docile" (p. 499).

We have come a long way since the early 1970s, but even nowadays, teachers of students with severe disabilities sometimes emphasize goals related to sitting in a chair, reducing loud vocalizations, reducing stereotypic behavior, and putting hands in the "ready position." These goals are often cited as being prerequisites to learning academic, communicative, and social skills. However, public school teachers today are required to align teaching goals with state curriculum standards, even with students with severe disabilities (Saunders et al., 2017). Readiness, functional, and academic skills must all be balanced in curricula for students with severe disabilities. Even back in the early 1970s, although O'Leary (1972) agreed with Winett and Winkler (1972) that careful examination of goals is important, he disagreed with their conclusions. He cited numerous studies that demonstrated the researchers' concern with such behaviors as academic response rates, talking, prosocial interactions, and language and reading skills. O'Leary did agree with Winett and Winkler's call for "extensive community dialogues concerning those behaviors and values we wish to develop in our children" (p. 511). We must continue pushing this agenda forward.

> Applied behavior analysis procedures may be abused if students' rights and best interests are not considered.

For selected goals to be in the best interests of the students, they or their parents must voluntarily agree to the goals. Federal legislation, as well as the BACB (2014) and ethics codes of related disciplines, such as school psychology (Jacob et al., 2016), requires that parents or guardians consent to programs planned for their children with disabilities. Such a requirement is intended to ensure that participation in programs is voluntary. It is not necessary to acquire parental consent for all aspects of a teaching program, however. Martin (1975) suggested that widely accepted strategies for overall classroom management and student motivation do not require anyone's consent, even if the teacher decides to change from one strategy to another. Consent is required for procedures not yet widely accepted and for those applied only to individual students.

The consent that ensures voluntary participation in behavior-change programs must be both informed and voluntary (Rothstein, 1990). **Informed consent** is based on full understanding of the planned program. Informed consent does not occur unless parents or other advocates demonstrate that they comprehend all aspects of the program, including possible risks. If necessary, information must be provided in the native language of those involved. Educational services based on applied behavior analysis are occasionally delivered through teleconsultation, such as by using videoconferencing. Peterson et al. (2019) suggested three components of teleconsultation that require consent: providing the teleconsultation; video or audio recording the sessions; and consent for assessments, such as a functional behavior assessment.

Ethical Guidelines for Conducting Assessments

Assessing Behavior (BACB, 2014)

Behavior analysts must conduct assessments, such as a functional behavior assessment, before recommending or implementing interventions. They must obtain consent to conduct assessments. They must share the results of assessments in understandable ways. To evaluate and make decisions regarding interventions, behavior analysts must collect, graph, and share data.

Behavioral Assessment and Ongoing Evaluation (Van Houten et al., 1988)

Ethical teachers cannot and do not arbitrarily decide what to teach students to do or to stop doing. Goals and objectives for each student must be based on careful observation of what the student does under a variety of conditions. After goals are selected and programs implemented, the ethical teacher keeps track of how the program is going. It is insufficient to make statements like "I started using counters to help Ben with his math and he seems to be doing better." We want you to be able to say, "I observed that for 4 days Ben got only 2 to 3 of 10 one-digit addition problems right. I gave him 20 counters and showed him how to use them. He got 6 right that day, 7 yesterday, and 9 today. When he gets all 10 right for 3 days in a row, I'll go on to subtraction." We will teach you how to say that in "behaviorese" in Chapter 4, which covers using data collection to assess and evaluate the results of procedures.

> Information for goal setting comes from many sources: tests, records, observation, parents, teachers, and the students themselves.

Behavioral Strategies and Least Restrictive Environment

Behavior Analysts and Behavior-Change Programs (BACB, 2014)

Behavior analysts must base individualized interventions on behavior analytic principles. They must obtain consent before implementing or changing interventions and they may involve students in planning interventions. Behavior analysts set objectives for interventions, specify the needed settings, and set criteria for terminating services. Because the use of punishment procedures is controversial and can be dangerous, there are several ethical guidelines for their use. Because of the sensitive nature of these guidelines, we quote them here:

(a) Behavior analysts recommend reinforcement rather than punishment whenever possible.
(b) If punishment procedures are necessary, behavior analysts always include reinforcement procedures for alternative behavior in the behavior-change program.
(c) Before implementing punishment-based procedures, behavior analysts ensure that appropriate steps have been taken to implement reinforcement-based procedures unless the severity or dangerousness of the behavior necessitates immediate use of aversive procedures.

(d) Behavior analysts ensure that aversive procedures are accompanied by an increased level of training, supervision, and oversight. Behavior analysts must evaluate the effectiveness of aversive procedures in a timely manner and modify the behavior-change program if it is ineffective. Behavior analysts always include a plan to discontinue the use of aversive procedures when no longer needed. (p. 13)

Another way to state a major guideline regarding punishment is that punishment should be a "last resort" after documenting the ineffectiveness of procedures based on positive reinforcement. Similar to (a) above, behavior analysts use the least restrictive procedures; that is, procedures not more restrictive than are needed to accomplish desired behavior change. For example, time-out is more restrictive than functional communication training. Additionally, similar to the cautions with using punishment, behavior analysts must not use positive reinforcers that may be harmful to students' health. For example, decades ago, teachers or researchers used cigarettes as positive reinforcers for the newly learned skills of adults with disabilities; can you imagine doing that today?

A Therapeutic Environment (Van Houten et al., 1988)

The environment for students with disabilities must be the least restrictive environment for those individuals. The least restrictive environment is not necessarily the general education classroom or even a regular school for all students. It is that environment that "imposes the fewest restrictions necessary, while insuring individual safety and development. Freedom of individual movement and access to preferred activities, rather than type or location of placement, are the defining characteristics of a least restrictive environment" (Van Houten et al., 1988, p. 112).

Recently some educators have suggested that the only appropriate environment for any child, however severe the disability, is in a general education classroom, with peers of the same chronological age. Discussions of this practice, known as *full inclusion* (Guralnick et al., 2008; Kauffman et al., 2020; Zigmond et al., 2009), should certainly include the issue of whether it is possible to provide a safe, humane environment that is responsive to individual needs for every child with a disability in a general education classroom. Those who advocate full inclusion of students with disabilities argue that the effects, positive or negative, it will have on typical students or those with disabilities are not an issue. Separate classes for students with disabilities constitute segregation. Inclusion is a civil right and it is *unethical* to exclude any student (Stainton & Clare, 2012). Providing a safe environment is unarguably necessary. Doing so requires such simple and obvious, but too often neglected, steps as removing any potentially dangerous items or storing them so students do not have access to them. When a student stabs another student with the teacher's 4-inch pointed scissors, our first question is why, in a classroom where some students are known to have violent outbursts, the scissors were not locked away.

Students' safety outside the classroom must also be assured. Students with disabilities are especially vulnerable, for example, to verbal, physical, and sexual abuse from their peers. Such bullying, which has become a nationwide concern for all children, may be an even greater danger for these students (Maiano et al., 2016). Students' safety must be monitored in halls, restrooms, cafeterias, playgrounds, and buses. Peers are not the only ones who may abuse or neglect students, and regular schools and classrooms are not the only places where abuse or neglect can occur. Recently, in the city in which one of us lives, a student living in a residential treatment facility was left on a school bus overnight. His parents thought he was at the facility, and the staff at the facility assumed his parents had taken him home for a visit, as they sometimes did. Someone should have checked.

Providing a humane environment means more than refraining from neglecting or abusing students. Every human being has a right to be treated with dignity. "Minimally dignified treatment requires sanitation, cleanliness, comfort, and attempts at respectful communication and consent" (Schroeder, Oldenquist, & Rohahn, 1990, p. 105). This means, among many other things, not talking about students' problems in front of them, even if they are too young or too low functioning to understand. It means not having a student "do his thing" for visitors, even if his "thing" is funny. It also means not treating older students with disabilities like babies by, for example, changing their clothing in front of others. An attempt was made recently to introduce one of us to a 20-year-old man who was seated on a portable toilet shielded from the rest of the classroom by a screen. That was a violation of dignity both inhumane and unethical (Pennington et al., 2016; Turnbull, 2017).

An environment sensitive to individual needs provides each individual with a comfortable place or places to sit, interesting things to look at and do, and opportunities to engage in age-appropriate and functional activities. It allows students some choices about what they will do, when they will do it, and how they will do it. There has recently been an increasing emphasis on providing choices for individuals with disabilities (Kautz et al., 2018; Skerbetz & Kostewicz, 2015) as a strategy for increasing appropriate academic and social behaviors, but also as something to which everyone has a right. The right to make choices, particularly for children and for older persons with disabilities, must be balanced with the responsibility of their caretakers to help them make appropriate ones (Bannerman, Sheldon, Sherman, & Harchik, 1990). Of course, children will inevitably have to do things they do not want to do. These tasks should lead to positive reinforcement and a feeling of accomplishment. After all, adults often do things they dislike, but are glad they did them. For example, we, like Dorothy Parker, loathe writing but love having written.

Therapeutic Environment
Pearson eText
Video Example 2.4
In this video, an educator is working with several young students. Which features of a therapeutic environment do you notice in this setting? How does this educator emphasize reinforcement in her practices?

Additional Ethical Guidelines for Teachers

Behavior Analysts' Ethical Responsibility to Colleagues (BACB, 2014)

This final guideline we share from the BACB's Ethical Code is: "Behavior analysts promote an ethical culture in their work environments" (p. 15), and they hold colleagues accountable for violating ethical or legal guidelines with students or clients.

Teachers and applied behavior analysts, especially those working with students with disabilities, always function on a team, such as an Individualized Education Plan (IEP) team. Behavior analysts are required to model ethical behavior and defend their actions using the BACB ethical code, if needed. If behavior analysts observe colleagues breaking the ethical code, they must raise the infraction to the person, the supervisor, and possibly the BACB.

Programs that Teach Functional Skills (Van Houten et al., 1988)

Students need to learn skills that will enable them to function effectively in their environment. Teaching those skills should be the primary focus of every student's educational program. What skills are functional will be different for each student. It is functional for some students to learn algebra so they can learn geometry and trigonometry. It is functional for others to learn household skills so they can be contributing members of their families. In every case the choice of skills must be based on the assumption that "unless evidence clearly exists to the contrary, an individual is … capable of full participation in community life and [has] a right to such participation" (Van Houten et al., 1988, p. 113).

This assumption is a cornerstone for educators. It means, in our opinion, that it is unethical to believe that any young child, even if poor, at risk, or disabled, is not capable of learning academic and pre-academic skills. As a resource teacher and friend said, "I teach as if every one of my 6-year-olds will be going to Harvard." We believe equally strongly that it is unethical to waste the time of students for whom there is clear evidence that they are not capable of mastering traditional academics. An individual with a disability who can take care of her personal needs, help around the house, do simple shopping, entertain herself, behave appropriately in public, and perform routine tasks, including those related to paid employment, if possible, has functional skills. Such skills should be the focus of her education. It is of great importance that the particular environment in which an individual lives be considered when decisions about functional skills are made (Schroeder et al., 1990). The customs and values of a given community are as important as the resources available.

It is sometimes necessary to eliminate or reduce the rate of some student behaviors. A child who bites himself must be stopped from doing so. A student who hurts others cannot be allowed to continue. Students who are so disruptive that they cannot be maintained in a classroom must learn to stop running, screaming, or destroying property. Merely eliminating such behavior, however, is indefensible in the absence of a plan to develop constructive behavior. A student who just sits quietly doing nothing is not much better off than she was before intervention. Teachers must pay attention to developing behaviors in the student that will lead to improved learning or social interaction. Attention to functional assessment and analysis, as discussed in Chapter 7, will enable teachers to substitute appropriate behaviors for those that are disruptive or dangerous.

In some cases, inappropriate behavior may be decreased by reinforcing constructive behavior rather than by directly attempting to decrease destructive behavior. For example, increasing functional communication, self-control skills, and "life skills," such as tolerating the delay of reinforcement and being "friendly," may result

in decreased inappropriate behavior (Luczynski & Hanley, 2013; Robison et al., 2020; Charlop-Christy et al., 2002). In general, for students who display any appropriate behavior at all, the teacher should try reinforcing such behavior and monitoring the effects of this procedure on the inappropriate behavior. Some students' repertoires of appropriate behavior are so limited and their performance of inappropriate behavior so continuous that there is little or no opportunity for a positive-reinforcement approach. In such cases, after a rigorous functional analysis, the teacher may first have to undertake elimination of the maladaptive behavior. This should be only a first step, however, and should never be undertaken without a detailed functional analysis (BACB, 2014). As soon as possible, the student must be taught to substitute constructive behaviors that lead to the acquisition of functional skills.

The Most Effective Treatment Procedures Available (Van Houten et al., 1988)

"Before behavior analysis, custodial care was often the best anyone could do. But that's not true anymore. Generally, a right to effective intervention now means a right to a behavioral intervention" (Malott et al., 1997, p. 414). We believe this statement, which the authors made about persons in residential treatment, has broad application. There is no excuse for programs, in schools or elsewhere, in which the goal is merely to keep students just quietly occupied or merely kept from harming themselves or others.

Many behavior analysts are amused when colleagues bring up the "new" requirement for "evidence-based treatment" or "evidence-based practice" and the difficulty of providing the evidence. We have been requiring it and providing the evidence for decades.

A primary consideration that guides professionals and parents in designing a program to change a student's behavior is the proven effectiveness of a technique in changing similar behaviors in similar students. The most ethical and responsible procedure to use in changing both academic (Heward, 2003) and social behavior is one that has been established as most effective (Travers, 2017). Throughout this text, we will discuss research related to changing specific behaviors and provide suggestions about effective procedures. Teachers who plan behavioral programs should also continually review current professional journals in order to keep abreast of new developments (Carr & Briggs, 2010). Many journals provide information on behavior-change procedures for use with students who have specific disabling conditions and with students in general education classes who display certain deficits or excesses (Gillis & Carr, 2014).

In some cases, it may not be possible, ethical, or legal to use a procedure that has been proven effective. Recent reports of abuse and misuse of restraint and seclusionary procedures in particular have led to numerous legislative and policy statements attempting to regulate or even forbid such procedures. Although there is no general agreement as to whether such procedures are ever necessary or appropriate, there is general agreement that training, oversight, and supervision are critical (Council for Children with Behavior Disorders, 2009; Luiselli et al., 2015; Ryan, Peterson, & Rosalski, 2007; Vollmer et al., 2011). Before using any aversive or exclusionary procedure, teachers should examine their employers' guidelines or regulations pertaining to such procedures, because rules may vary considerably. The unauthorized use of even short-term exclusion, a relatively mild but effective technique, may result in criticism or misunderstanding.

The use of aversive or seclusionary interventions should, in any event, be reserved for severely maladaptive behaviors that have not been modified successfully using positive means. Many behaviors targeted for deceleration may be eliminated using positive or nonaversive procedures that we will describe later in this text.

We discussed the movement toward inclusion of students with disabilities earlier in the context of safety, but it is also important to consider placement of students in

Techniques for decreasing behavior will be described in Chapter 9.

terms of its effects or outcomes. Research on the outcomes of inclusion has focused on social effects (Carter et al., 2016; Fryxell & Kennedy, 1995), academic effects (Duchaine et al., 2018), and on-task behavior improvements (Reeves et al., 2013), which are often positive for all students (Agran et al., 2020; Barrett et al., 2020). Educational success of students with disabilities does not come from simple placement in a general education classroom; rather, teachers must use procedures to promote learning in inclusive classrooms (Brock & Carter, 2016; Lovelace et al., 2013; Obiakor et al., 2012), also termed "curricular inclusion" (Giangreco, 2020; p. 25). Some practices for promoting inclusion are cooperative learning, universal design for learning, and embedded instruction (Alquraini & Gut, 2012). Inclusion appears not to have deleterious effects on the academic performance of typical students (Stahmer & Carter, 2005) but there are indications that the academic performance of some students with disabilities may suffer in comparison with those served in more traditional special education placements, such as pull-out resource programs (Fuchs et al., 2015).

Accountability

Learning Outcome 2.3   **Describe the effectiveness of providing accountability when using applied behavior analysis procedures.**

Accountability implies publication of goals, procedures, and results so that they may be evaluated. Applied behavior analysis lends itself easily to such accountability. Goals are stated behaviorally, procedures described clearly, and results defined in terms of direct, functional relations between interventions and behaviors. It is impossible to conduct applied behavior analysis as described by Baer, Wolf, and Risley (1968) without being accountable. The entire process is visible, understandable, and open to evaluation. The result of such accountability is that parents, teachers, administrators, and the public can judge for themselves whether an approach is working or whether a change is needed.

Teachers should not view the requirement of accountability as negative or threatening. It is to a teacher's advantage to verify the effectiveness of his or her teaching. This approach enables teachers to monitor their own competence and to demonstrate this competence to others. It is much more impressive to face a supervisor at a yearly evaluation conference armed with charts and graphs showing increases in reading ability and decreases in disruptive behavior than it is to walk in with only vague statements about a pretty good year.

To whom are teachers accountable? In terms of ethical behavior, the answer is "to everyone." Teachers are accountable to their profession, the community, their administrative superiors, the parents of their students, those students, and themselves.

The teacher who follows the suggestions provided in this chapter should avoid many problems associated with the use of applied behavior analysis procedures in the classroom. Table 2.1 summarizes these suggestions. No amount of prevention can forestall all criticism; nor can a teacher avoid making mistakes. Systematic attention to the ethical standards in the ABA's statement, however, can minimize criticism and enable teachers to learn from mistakes rather than become discouraged by them.

Table 2.1 Suggestions for ethical use of applied behavior analysis

Assure competence of all staff members.
Choose appropriate goals.
Ensure voluntary participation.
Be accountable.

Accountability is a major benefit of applied behavior analysis.

Effective and Account-able Practice

Pearson eText

Video Example 2.5

In this video, an educator meets with the parent of a student to discuss a student's program. What layers of accountability do you notice in this video? Does this parent appear satisfied with the services provided to her child?

Let's listen in on Professor Grundy, whose workshop discussion may address concerns you have. All of the questions the professor answers here are inevitably addressed to everyone who undertakes a career as an applied behavior analyst.

Professor Grundy Conducts a Workshop

The superintendent of schools in a large metropolitan area near the university asked Professor Grundy to conduct a 2-hour workshop on applied behavior analysis for elementary and secondary teachers. Although aware of the limitations of such short-term workshops (Kirkpatrick et al., 2019), Grundy concluded that if he confined himself to a description of basic learning principles, no harm would be done. On the appointed day, Grundy, dressed in his best tweed coat with leather elbow patches, stood before 700 teachers, and wondered how he got himself into this mess.

After a slow start, during which several teachers fell asleep and numerous others openly graded papers, Grundy hit his stride. He delivered a succinct, snappy talk full of humorous anecdotes and sprinkled with just enough first-name references to his friends, all "biggies" in applied behavior analysis and all totally unfamiliar to the teachers. As Grundy reached the conclusion of his presentation, glowing with satisfaction, he noticed to his horror that he was coming up about 45 minutes short of the amount of time agreed to in his contract. Over the thunderous applause (resulting at least partially from the fact that the teachers thought they were going to be released early), Grundy called faintly for questions. There was consider-able rumbling and shifting about, but when the superintendent mounted the stage and glared fixedly at the audience, the hands began to go up. The nature of the questions made Grundy vow never to be caught short again, but he did his best to answer each.

Question: Isn't what you're suggesting bribery?

Answer: I'm glad you asked that question. [Grundy fumbles with his smartphone, thumbing the in-fernal thing, then begins reading.] According to the interweb, bribery is something given to pervert the judgment or corrupt the conduct of a person. In that sense, the use of the principles I have described is certainly not bribery. Teachers use the principles of learning to motivate their students to do things that will benefit them—things such as reading, math, and social skills.

A second definition is that a bribe is anything promised or given to induce a person to do something against his or her wishes. Some people might say that's exactly what I'm advocat-ing. As a behaviorist, I have some difficulty with the word *wishes*, because I cannot see wishes but only actions. It appears to me that students have a free choice as to whether they will perform a behavior for which they know they will receive a reinforcer. My interpretation is that if Joanie, for example, chooses to perform the behavior, she has demonstrated her "wishes." The word *bribery* definitely implies something underhanded. I prefer to think of applied behavior analysis procedures as open, honest attempts to change students' behavior in a positive direc-tion. Any other questions? If not …

Question: But shouldn't children be intrinsically motivated? Surely they don't have to be re-warded for learning. They should want to learn.

Answer: Madam, why are you here today? I'm sure that given the choice of spending the day at the mall or coming to an in-service session, your intrinsic motivation for learning might have wavered just a little. All of us here are being paid to be here; most adults, even those who enjoy their work enormously, would not continue to perform it in the absence of some very concrete application of the law of positive reinforcement. Why should we expect children to perform dif-ficult tasks for less than we expect of ourselves?

Question: But won't our students expect rewards for everything they do?

Answer: Certainly. And why not? As your students become more successful, they will begin to respond to the reinforcers available in the natural environment—the same reinforcers that maintain the appropriate behavior of students who are already successful. Good students do not work without reinforcers. Their behavior is reinforced by good grades, by parental approval, and, yes, by the love of learning. When doing good work has been consistently reinforced, it eventually does become a secondary, or conditioned, reinforcer. We cannot, however, expect this to happen overnight with students who have had very little experience with success in learning tasks. Does that answer your questions? Thank …

Question: At our last in-service session, the speaker told us that using rewards will decrease intrinsic motivation.

Answer: That's a rather widespread notion nowadays (Kohn, 2018). Not everyone agrees, however, and many question the validity and interpretation of the studies cited as evidence for it (Pierce & Cameron, 2002; Slavin, 1991). There's so much evidence of the effectiveness of behavioral procedures that, in my opinion, it is unethical not to implement them.

Question: Doesn't this kind of behavior management just suppress the symptoms of serious emotional problems without getting at the root cause?

Answer: Oh, my. That's a very complicated question. Behaviorists don't accept the concept of emotional problems caused by some underlying root cause. We have found that if we deal with the problem behaviors, the roots just seem to die out. Human beings are not like weeds whose roots lurk under the surface of the ground waiting to send up shoots as soon as it rains.

Question: Yes, but everyone knows that if you suppress one symptom, a worse one will take its place. Doesn't that prove there are underlying problems?

Answer: No, sir, everyone does not know that. Human beings are no more like piston engines than like weeds. Just because one symptom "goes down," another one will not necessarily "pop up." My colleagues (Baer, 1971; Bandura, 1969; Rachman, 1963; Yates, 1970) have reported extensive research indicating that removal of so-called symptoms does not result in the development of new ones. As a matter of fact, when children's inappropriate behaviors are eliminated, they sometimes learn new, appropriate behaviors without being taught (Chadwick & Day, 1971; Rapp et al., 2004). Even if new maladaptive behaviors do occur—and they sometimes do (Balson, 1973; Schroeder & MacLean, 1987)—there is no evidence to show they are alternative symptoms of underlying deviance. Functional analysis generally indicates that those behaviors served a communicative function for the individual and that new behaviors are a continued attempt to communicate some need. If appropriate behaviors are taught that meet the same communicative purpose, the inappropriate ones will go away. Now if . . .

Question: Isn't what you're talking about based on the behavior of animals such as rats and monkeys? That's how you train a dog, for heaven's sake: Give him a treat when he does a cute trick and hit him with a rolled-up newspaper when he's bad. Isn't it unethical to treat our kids like animals?

Answer: Early research studying the laws of behavior was conducted with animals. This doesn't mean we control human beings as if they were nothing but white rats or pigeons, or even dogs. Such animal research provides only a basic foundation for studying behavior. Decades of research have applied those principles to humans—children and adults—in classrooms and other real-world settings to generate the types of strategies that can help your students. These procedures take into account the complexity of human behavior and the undeniable freedom of human beings to choose their course of action. What's unethical is not learning and applying all we can from whatever source.

Question: This stuff may work on those special education kids, but my students are smart. Won't they catch on?

Answer: Good heavens, of course they'll catch on. The laws of behavior operate for all of us. We can change behavior in youngsters with very severe disabilities, but it's a very complex process. With your students, you can shorten and simplify the procedure. You just tell them what the contingencies are. You don't have to wait for the students to learn from experience. Applied behavior analysis procedures work on everyone, even professors. Take punishment, for example. If I ever agree to do another workshop, it'll be a cold day in . . . Pardon me. Any more questions?

Question: But how can applied behavior analysis work with my kids? I don't care how much candy you gave them, they still couldn't read.

Answer: Applied behavior analysis is not just giving students candy. If your students do not respond verbally to the written word, then you must bring their responses under stimulus control. That's applied behavior analysis. If they have no vocal language, you shape it; that's applied behavior analysis. If they just sit there and do nothing, you get their attention. AND THAT'S APPLIED BEHAVIOR ANALYSIS! ARE THERE ANY MORE QUESTIONS?

Question: I think the whole thing sounds like too much work. It seems awfully tedious and time consuming. Is it really worth the trouble?

Answer: If … it's … not … worth … the … trouble, … don't … do … it. Behaviors that are serious enough to warrant more complicated procedures take up an enormous amount of your time. You don't use a complicated procedure to solve a simple problem. Try timing yourself with a stopwatch. How much time is this problem taking the way you're handling (or not handling) it now? Try applying systematic contingencies and keeping records. Then compare the amount of time you've spent. You might be surprised! Now, I really must …

Question: I have only one student with really serious problems. If I use some systematic procedure with him, won't the others complain? What do I say to them?

Answer: The problem will not occur as often as you think. Most students know that a student who is not performing well needs extra help and are neither surprised nor disturbed when he gets it. Few students will even ask why that student is treated differently. If they do, I suggest you say to them, "In this class everyone gets what he or she needs. Harold needs a little extra help remembering to stay in his seat." If you consistently reinforce appropriate behavior for all your students, they will not resent it when a more systematic procedure is implemented for a student with special problems. If that's all, I …

Question: Most of my students with problems can't learn much because they come from very bad home situations. There's just nothing you can do in such cases, is there?

Answer: Pigeons can learn to discriminate between environments and to perform the behaviors that will be reinforced in each. Are you implying your students are less capable than birds? Such an assumption is inhumane. Blaming poor learning or inappropriate behavior on factors beyond your control is simply a refusal to accept responsibility. Now coming to school with basic needs met, such as enough food and sleep, is critical. If you can have discussions with parents about that, that will likely serve you well. However, although you have little influence on your students' environment outside your classroom, you have an enormous influence on that classroom environment. It is your job to arrange it so your students learn as much as possible, both academically and socially. What do you think teaching is, anyway? Teach is a transitive verb. You're not teaching unless you're teaching somebody something.

Question: Have you ever taught school?

Answer: At this point Professor Grundy became incoherent and had to be helped from the podium by the superintendent. As he drove home, he realized he had made a number of mistakes, the first of which was agreeing to do the workshop. He had assumed that teachers expecting to receive concrete help with classroom management problems would be interested in a theoretical discussion of learning principles. He had also assumed that the teachers would immediately see the relationships between these principles and the behaviors of their students. Grundy realized it was unreasonable of him to expect this. He did decide, however, that he needed to include more practical applications in his courses on applied behavior analysis.

Misconceptions about ABA in the Classroom
Pearson eText
Video Example 2.6
In this video, an educator clarifies a common misconception that ABA can only be practiced by behavior analysts. How might behavior analysis and education work effectively together?

Theory or Recipes?

Learning Outcome 2.4 State the justification for ensuring that professionals working with individuals with challenging behaviors understand the theoretical basis of the procedures that they implement.

Professor Grundy was undoubtedly correct in his belief that the effective use of applied behavior analysis requires knowledge of the basic principles. Teachers often reject theory and seek immediate practical solutions to specific problems. It is human nature to hope that simply asking how to solve a specific problem will result in a specific answer applicable to all students in all situations. It was once suggested that we include an alphabetical list of behavior problems with a solution for each as an appendix to this text. Such a cookbook approach, however, has serious limitations. Although students supplied with cookbook methods may acquire competencies more quickly, the students who are required to spend more time on basic principles tend to show more competence in the long run (White, 1977). In other words, teachers must