# APPLIED BEHAVIOR ANALYSIS FOR TEACHERS

TENTH EDITION

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

# Applied Behavior Analysis for Teachers

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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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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:

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## 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:

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## 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

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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.

### CHAPTER OUTLINE

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.

**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?

**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.

## 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

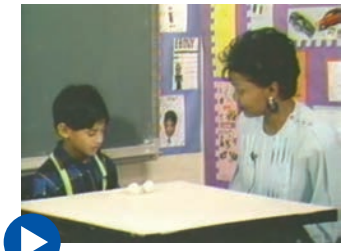
Both developmental theories we have discussed are inclusive; they apparently explain a great deal of human behavior, cognitive and affective, normal and atypical. Verifiability, however, is another matter. Although Piagetian theorists have repeatedly demonstrated the existence of academic and pre-academic 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."

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.

Educators who espouse gestalt theory encourage "discovery learning."

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

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.