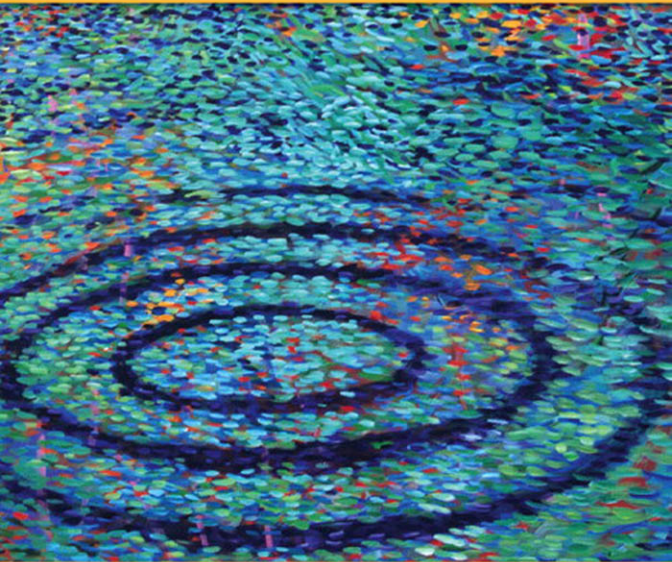


Applied Behavior Analysis *for Teachers*

Ninth Edition



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APPLIED BEHAVIOR ANALYSIS FOR TEACHERS

NINTH EDITION

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PREFACE

It's hard for us to believe that we started working on the first edition of *Applied Behavior Analysis for Teachers* over thirty years ago. Although the principles which have guided us have not changed, the field in which we work has made great progress. As professionals in the field we have learned so much about the influences that antecedent events, even distant ones, can have on behavior. We have learned to pay much more attention to the function of behaviors that in the past we have simply deemed inappropriate. We have learned that aversive consequences are much less frequently necessary than we believed in the past. We have learned to emphasize teaching students to manage their own behavior as much as possible. We have even earned enough respect from educators in general that the principles of applied behavior analysis are frequently used to implement school wide systems to support appropriate student behavior and positive social interaction. All of these advances are reflected in the contents of the ninth edition.

We initially prepared the text 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 also to know how to apply those concepts in classrooms and other settings. Applied behavior analysis is much more than a system for making students behave nicely. We believe, and our belief is supported by research, that it 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 in any event: 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 do believe so strongly 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 lectures 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 generalizing 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.

Instructors will be interested in knowing that the text is as technically accurate and as well documented as we could make it. In this edition we have increased our emphasis on making the text readable and user-friendly. We've continued to include lots of 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.

NEW TO THIS EDITION

In preparing this new edition, we took to heart suggestions from colleagues and thoughtful letters from students using the book. The ninth edition has thus been revised to include:

- more examples of and applications for the general education inclusive classroom
- revised chapter-ending discussion questions

- new information about the use of applied behavior analysis with students with Autism spectrum disorders
- more information about positive behavior support with new coverage of schoolwide prevention and intervention strategies
- expanded and, we believe, an improved chapter on functional assessment and functional analysis

We believe these tools, along with the development of behavior support plans, promise to provide teachers with powerful ways of dealing with some of the most challenging behaviors students display, often without resorting to traditional, aversive, or punitive methods. We have therefore decreased our coverage of such methods.

In addition:

- **Readers can address ethical issues at the beginning and apply this understanding throughout the rest of the course.** The chapter “Responsible Use of Applied Behavior Analysis Procedures” has been updated, expanded, and moved up to the chapter 2 position.
- **Readers will become familiar with the impact culture may have on students’ behavior and reactions to interventions through** increased attention in examples and anecdotes to the increasing diversity in educational settings and the need for sensitivity to this diversity.
- **In response to reviewer feedback, the text has been substantially revised to increase its accessibility.** Research citations no longer interrupt the flow of the text and are gathered together at the ends of paragraphs. The complexity of the language itself has also been revised for greater accessibility.
- **Chapter 9 (former Chapter 8)** has been heavily revised. The concept of punishment is acknowledged to be controversial and the multiplicity of viewpoints is addressed. Any “how to” information relating to aversive stimuli has been deleted.
- **A new appendix explaining how to create a graph using Excel** has been added

We have, as always, searched the professional literature so that we can share with you the latest developments in the field. After rigorous consultation with various experts, including nieces, nephews, and grandchildren, we have updated our examples and tried to use current slang expressions and address contemporary interests of children and young adults. We also found ourselves, once again, updating the prices of items whenever money was mentioned.

We have continued to update our series of classroom “snapshots” showing teachers implementing the principles of applied behavior analysis in a variety of settings. We hope these anecdotes will give you a sense of what it’s like to be a teacher using these principles and of the powerful effects they can produce. We also hope that you will sense the joy, pride, and just sheer fun that teachers using the principles experience. The snapshots are included at the end of Chapter 13, but you might enjoy reading them earlier to see if you recognize some of the principles about which you’re learning.

SUPPLEMENTS

The following instructor supplements to the textbook are available for download on www.pearsonhighered.com/educators. Simply enter the author, title, or ISBN; and select this textbook. Click on the “Resources” tab to view and download the available supplements.

Online Instructor’s Resource Manual and Test Bank, 0-13-265610-8, and MyTest Test Bank, 0-13-265608-6: The Online Instructor’s Manual is organized by

chapter and contains chapter objectives, summaries, key terms and definitions, in-class activities, homework assignments, video resources, additional text resources, and test items (including multiple-choice, true/false, short-answer, and essay questions). The computerized test bank software, MyTest, is a powerful assessment generation program that helps instructors easily create and print quizzes and exams. Questions and tests are authored online, allowing ultimate flexibility and the ability to efficiently create and print assessments, any time anywhere. The Pearson MyTest includes a rich library of assessment items that can be edited to fit your needs. Access Pearson MyTest by going to www.pearsonmytest.com to log in, register, or request access.

Online PowerPoint Lecture Presentations, 0-13-265609-4: The lecture presentations highlight key concepts and summarize and expand content for each chapter in the text.

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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.

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Roots of Applied Behavior Analysis

CHAPTER

1

Did you know that . . .

- There may be some validity in your mother's claim that "You're just like your father"
- Chemicals in your brain may affect your behavior
- Pretzels preceded M&Ms as rewards for good behavior
- Benjamin Franklin used applied behavior analysis

Chapter Outline

The Usefulness of Explanations

- Biophysical Explanations
- Biochemical Explanations
- The Usefulness of Biophysical and Biochemical Explanations

Developmental Explanations

- Psychoanalytic Theory
- A Stage Theory of Cognitive Development
- The Usefulness of Developmental Explanations

Cognitive Explanations

- The Usefulness of Cognitive Explanations

Behavioral Explanations

- Positive Reinforcement

- Negative Reinforcement

- Punishment

- Extinction

- Antecedent Control

- Other Learning Principles

- The Task of the Behaviorist

- The Usefulness of Behavioral Explanations

Historical Development of Behaviorism

- Historical Precedents

- Psychological Antecedents

Summary

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

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

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),

*Words printed in **boldface** in the text are defined in the glossary at the end of the book.

and black bile (melancholy)—theorists have searched for explanations 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.

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



Professor Grundy Traces the Cause

Having observed an undergraduate student's behavior for some time, Professor Grundy noticed that the student was consistently late for class (when he came at all), invariably unprepared, and frequently inattentive. Because Grundy 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 just like that in high school," said Ms. Marner. "He just didn't get a good background in middle school."

Professor Grundy then went to visit the middle school. "You know," said the guidance counselor, "a lot of our kids are like that. They just don't get the foundation in elementary school." At the elementary school, Professor Grundy talked to the principal. "DeWayne was like that from day one. His home situation was far from ideal. If we don't have support from the home, it's hard to make much progress."

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 just like that."

Genetic and Hereditary Effects DeWayne's mother explained his inappropriate 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 mental retardation, which results 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 (Abrahams & Geschwind, 2008; Szatmari, Paterson, Zwaigenbaum, Roberts, Brian, & Liu, 2007). Many emotional and behavior disorders, such as anxiety disorder, depression, schizophrenia, oppositional defiant disorder, and conduct disorder, appear to have some genetic origin (Bassarath, 2001; Burke, Loeber, & Birmaher, 2002). Attention deficit disorder and attention deficit hyperactivity disorder also appear to be genetically related (Larsson, Larsson, & Lichtenstein, 2004), as do some learning disabilities (Raskind, 2001).

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.

Some children with disabilities show biochemical abnormalities.

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 mental retardation 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.



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?"

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 retardation, 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, 2000), 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.

Hyperactivity is not necessarily caused by brain dysfunction.

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 (Castles, Adams, Melvin, Kelsch, & Boulton, 1999; Chasnoff, Wells, Telford, Schmidt, & Messer, 2010; Nozyce et al., 2006; Smith et al., 1995). 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 mental retardation 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			✓

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

**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.”



“Well, well, Professor Grundy, did you lose something or are you just doing ‘research’ on the things you professors throw away?”

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 preacademic 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 do not provide 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 teacher to excuses as unproductive as those prompted by biophysical explanations. Teachers, particularly teachers of students with disabilities, may wait forever 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.



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.”

II COGNITIVE EXPLANATIONS

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 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 (Brooks, 1990). “Rather than behaviours or skills as the goal of instruction, concept development and deep understanding are the foci” (Fosnot, 1996, p. 10).

*Educators who
espouse gestalt theory
encourage “discovery learning.”*

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 extremely 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.