

REVIEW OF MILTENBERGER'S  
BEHAVIOR MODIFICATION:  
PRINCIPLES AND PROCEDURES (2ND ED.)

TIMOTHY R. VOLLMER

UNIVERSITY OF FLORIDA

The second edition of Raymond G. Miltenberger's *Behavior Modification: Principles and Procedures* is reviewed. The first section of the review discusses the structure of the book. The second section of the review discusses its content. The third section offers some conclusions and describes a need for more advanced applied behavior analysis textbooks. Overall, the findings of the review are that the text is one of the best available for undergraduate instruction in applied behavior analysis.

DESCRIPTORS: applied behavior analysis, textbooks, behavior modification

The second edition of Raymond G. Miltenberger's *Behavior Modification: Principles and Procedures* (2001) maintains the quality of the first edition while incorporating several modest but effective revisions. The book is intended to serve as an introductory textbook. For that purpose, the book is one of the best of its kind. I currently use it in my own undergraduate applied behavior analysis course. Given that Carr and Austin (1998) reviewed the first edition (Miltenberger, 1997) for *JABA*, the purpose of this review is to present a critique and discussion of the new revisions and to make suggestions for future editions. The first section of the review deals with structure, the second section deals with content, and then general conclusions are drawn regarding the status of and future directions for applied behavior analysis textbooks.

### Structure

The organization of the book was revised by combining some chapters from the previous edition. The reduced number of chap-

ters is a nice feature because some of the topics could be handled easily in the context of other discussions. For example, Miltenberger incorporated basic principles of differential reinforcement into the shaping chapter (chap. 10) and combined material similarly in other chapters.

Most instructors have idiosyncratic approaches to presenting applied behavior analysis material, so it would be difficult to find a perfect sequence for its presentation. Miltenberger's textbook begins with a historical overview (introduction) and then moves to a presentation of measurement and methodology (Part 1). This arrangement seems logical and is consistent with most other textbooks on applied behavior analysis. The next section is on basic principles (Part 2). The order of presentation within this section seems out of sync both historically and conceptually. Specifically, in both editions, I have found the placement of respondent conditioning (chap. 8) to be awkward. Given that respondent conditioning principles were studied first (i.e., Pavlov before Skinner) and given that there is a shift in the level of complexity from respondent to operant behavior, my preference is to have respondent conditioning presented before operant conditioning. The progression from respondent to operant seems historically and

---

Miltenberger, R. G. (2001). *Behavior modification: Principles and procedures* (2nd ed.). Belmont, CA: Wadsworth.

Direct correspondence to Timothy R. Vollmer, Psychology Department, University of Florida, Gainesville, Florida 32611 (E-mail: Vollmera@ufl.edu).

conceptually more correct. In my own teaching, I usually have students read the respondent conditioning chapter before the reinforcement chapter, but it does not quite work, because there are multiple references to operant conditioning in chapter 8.

Part 3 is a section titled "Procedures to Establish New Behavior," and Part 4 is titled "Procedures to Increase Desirable Behavior and Decrease Undesirable Behavior." The chapters within these sections relate to application of the basic principles described in Part 2. Thus, there are several chapters in which the principle is separated from the application. As an instructor in an applied class, I find it difficult to discuss or present the principle without discussing the application (and vice versa). In fact, when I use the Miltenberger textbook, I actually have the students read, for example, chapter 5 (extinction) along with chapter 14 (applying extinction). At times this causes problems because intervening material is referenced in the later chapter. My recommendation would be to have one longer section in which applications are covered along with the basic principle. For example, one extinction chapter would cover both the principle and the application. I can envision several reinforcement chapters including positive reinforcement, negative reinforcement, shaping, schedules, and chaining.

One argument for keeping the principles and applications separate is that the functional assessment chapter (chap. 13) provides necessary information for the student to understand how one knows which reinforcer to withhold (e.g., during the application of extinction) or to present (e.g., during the application of differential reinforcement). However, this could be handled by discussing these applications as if one already has identified the reinforcer. The principle and application chapters could be followed by an assessment chapter (currently the first chapter in Part 4), which could begin with

an introduction similar to the following, "So far we have assumed that the behavior analyst already knows which reinforcers maintain a particular behavior. How is that information typically obtained? That is the purpose of a functional assessment." That chapter could show how the assessment information is directly linked to treatment development. Many behavior analysts learned about the application of basic principles before learning about modern functional assessment methods, so presumably current students could do the same.

Some other features of the structure are a bit confusing. For example, self-management (chap. 20) is placed in the same section as punishment and generalization (Part 4). Self-management seems to be more of a treatment package, whereas punishment and generalization represent specific applications of principles. In other words, phenomena such as punishment and generalization are not specific to any particular treatment. In addition, self-management procedures are likely to incorporate a range of principles including reinforcement, punishment, stimulus control, generalization, and so forth, often in the context of a treatment package. Token economy and behavioral contracts are placed in a later section (Part 5), where self-management seems to fit better. Like self-management procedures, token economies and behavioral contracts frequently involve treatment packages based on a range of principles.

It is not clear why some chapter topics were included and others were left out. For example, there is one chapter devoted to habit reversal but none dedicated to areas in which applied behavior analysis has had equal or even superior influence, such as behavioral education, developmental disabilities, gerontology, behavioral medicine, and so on. Obviously an introductory textbook cannot possibly include chapters on all of the areas of application in behavior analysis,

and presumably Miltenberger includes habit reversal because he is a renowned expert on the topic; nonetheless, it does not seem to require a chapter unto itself any more than a wide range of other topics might. The chapter seems to stand out because it is only one highly specialized area of research in the field, and it was not clear that it should receive special treatment. My recommendation is to include one chapter (or possibly one entire part) that summarizes the various applications of behavior analysis. This chapter (or part) could summarize the topics mentioned in the introduction (chap. 1) but could go into greater detail. I envision it as the longest chapter in the book, saved for the end of the semester.

To summarize, my recommendation for organizational structure in future editions is to keep the introduction and measurement units (Part 1) in their current order. Next, Part 2 (which could be called “Principles and Applications”) would begin with a discussion of respondent conditioning principles and applications of respondent conditioning (e.g., combining chap. 8 and 24). I would combine all principle-oriented chapters (e.g., extinction) with the application chapters (e.g., applying extinction). Next, I would include the “Other Behavior Change Procedures” section (i.e., Part 5 would become Part 4); self-management would be moved to this section, because it is not a specific application of a specific principle. Finally, Part 5 would be a section on various applications across populations (e.g., gerontology, community) and target behavior (e.g., academic).

#### *Content*

In their earlier review, Carr and Austin (1998) noted that the title of the book (*Behavior Modification . . .*) did not adequately describe the content (which is clearly behavior analytic). The criticism is that the book should have “applied behavior analysis” in its

title. On one level, this appears to be a minor criticism, but on another level the limitation can cause problems in teaching, especially because Miltenberger implies that the terms *behavior modification* and *applied behavior analysis* are interchangeable (p. 5). Many behavior analysts make an effort to distinguish the field of applied behavior analysis as one with a strong emphasis on analysis: the inclination to identify why a behavior is or is not occurring and to identify how or why a particular intervention works. Not all applied behavior analysis is behavior modification (e.g., functional analysis as a form of assessment), and not all behavior modification is applied behavior analysis (e.g., a classroom intervention involving tokens, but with no experimental control demonstrated). Presumably there are more college courses entitled “Behavior Modification” than college courses entitled “Applied Behavior Analysis,” so one good argument for keeping the title is that more readers will come into contact with a good discussion of behavior-analytic principles and application. A middle ground solution might be to call the book *Behavior Modification and Applied Behavior Analysis*.

Miltenberger’s textbook is designed to introduce undergraduate students to the field of applied behavior analysis. It does so in a way that is easy to follow, interesting, and technically accurate. It is obvious that Miltenberger’s current involvement in research has kept him informed on recent (even subtle) changes in the field. Thus, the book is probably the most up-to-date source available. For example, in the second edition Miltenberger revised his discussion of interobserver agreement calculations to include those most commonly used in research today. Most textbooks of this sort present information on total agreement for frequency measures (e.g., the smaller number of observed events divided by the larger number of observed events) and a discussion on

agreement calculations as they relate to interval recording. Presumably, with the advent of computer technology, fewer researchers are using interval recording because they can derive actual direct measures of behavior (e.g., rate, duration). Hence, interobserver agreement calculations have evolved, and Miltenberger describes the more current methods. I might argue that the treatment of these methods was a bit brief, but the purpose of the textbook is probably not to bring the student to a level of expertise on agreement calculations.

Another nice feature of the book is that many of the examples stress that principles such as reinforcement, extinction, and punishment are facts of nature. That is, these phenomena occur whether or not they are programmed to occur. It is only a matter of technological advancement that we are able to arrange environmental events to promote desirable behavior and reduce dangerous behavior. Many students have reported to me that the examples of real-life situations helped to clarify their understanding of basic principles. Miltenberger provides a wide range of examples across subject populations and target behaviors.

There were only a few items in various chapters that might benefit from further revision or, at least, consideration for revision. In chapter 4 (reinforcement), I believe that the author should have introduced the notion of automatic reinforcement along with a more direct discussion of common misconceptions about reinforcement. The concept of automatic reinforcement is not introduced until chapter 13 (functional assessment). Although the examples of reinforcement in chapter 4 clearly show that not all reinforcement is necessarily planned or delivered by another person, it may be helpful to the student to receive some direct messages about the way reinforcement works. First, not all reinforcers are socially mediated (e.g., automatic reinforcement). Second,

even if reinforcers are socially mediated, reinforcement contingencies are not always planned or contrived. Third, reinforcement is neither inherently good (e.g., the sensation produced by a drug maintains abuse of that drug) nor inherently bad (e.g., negative reinforcement maintains paying bills on time). These points might help to dispel some of the erroneously limited discussions about reinforcement that students often encounter in, say, general psychology courses. Later in the text, the author could return to these points as important considerations for treatment. For example, an adolescent may smoke cigarettes because the nicotine effects are reinforcing (automatic reinforcement) and because it produces social proximity to a certain peer group (unplanned social reinforcement contingencies). These response-reinforcer relations are obviously much more difficult to interrupt than, say, mild household disruption maintained by parental attention.

In chapters 5 and 14 (extinction), Miltenberger provides a very nice discussion on functional variations of extinction. For example, he notes correctly that extinction does not only involve ignoring (and may not involve ignoring at all). The only concern I have with the extinction chapters is with the use of the term *extinction burst*. Under this heading, the author points out that novel behavior may occur, emotional responses may occur, and aggression may occur. These facts are all potentially true of extinction, and many prior authors have used a similar definition of the extinction burst. However, an alternative interpretation is that the burst refers more specifically to the increased frequency, duration, or magnitude of a response following the onset of extinction. Emotional behavior and aggression seem better described as effects or side effects of extinction. I recommend referring to possible effects (and side effects) of extinction, one of which is the burst. Of course, the

term *extinction burst* is descriptive and is not a technical term, so my interpretation is open to debate.

I found the chapters on punishment to be interesting and technically accurate, with one exception. Negative punishment in the form of response cost is usually distinguished from extinction insofar as negative punishment involves withdrawal of stimuli contingent on behavior and extinction involves withholding stimuli that previously reinforced behavior. Miltenberger distinguishes between negative punishment and extinction by saying “Extinction involves withholding the reinforcer that maintains the behavior. Negative punishment, by contrast, involves removing *some other reinforcer after the behavior; the reinforcer that is removed in negative punishment is not the same reinforcer that was maintaining the behavior* [italics added]” (p. 107). I could find no reference in the basic research literature to support the notion that negative punishment necessarily involves reinforcers other than the ones maintaining behavior. For example, if a person receives money for pressing buttons in one condition and then loses money for pressing those same buttons in another condition, responding is likely to be eliminated and the procedure is called response cost (negative punishment). Money was the reinforcer maintaining button pressing. Similarly, in application, losing access to a stuffed animal for 1 hr following aggression could be response cost, and the aggression may have occurred initially because, in the past, the aggression had produced access to the toy. In short, what distinguishes response cost and extinction is that, in the former, reinforcing stimuli are withdrawn and, in the latter, reinforcing stimuli are withheld. I do not believe the distinction revolves around the nature of the stimulus.

I had some concerns about the definition and discussion of shaping (chap. 9). The author states that shaping is “*used* [italics add-

ed] to develop a target behavior that a person does not currently exhibit” (p. 155). This differs from the orientation presented in discussions on reinforcement, extinction, and punishment insofar as shaping is defined as something that people “use,” which deemphasizes the fact that shaping occurs in nature. True, we can use shaping to our advantage, but shaping is also involved when louder and louder tantrums are shaped during visits to the grocery store (socially mediated but unplanned shaping) or when we learn to effectively manipulate a gear shift or swing a tennis racket (i.e., shaping via automatic reinforcement). In these cases shaping happens; it is not being used. To the author’s credit, many of the examples he presents will allow the student to see how shaping occurs naturally, but the definition may be misleading. On a related point, the author states that shaping occurs “until the person exhibits the target behavior” (p. 155). Again, it is unlikely that loud shouting in the store is something that parents hope to shape or “target.” Perhaps the word *target* could be replaced by *terminal*, and the emphasis could be taken off “using” extinction.

Modeling and imitation are deemphasized throughout the text. Considering the ubiquitous role of modeling and imitation in human learning, I think that an operant account of these phenomena would have been a nice fit in the principles section. As it is, the discussion is limited to “using” modeling and imitation in the context of “Behavioral Skills Training” (chap. 12). Unlike other discussions in other chapters, there is no real emphasis on modeling and imitation as phenomena that occur in nature. In addition, there is no extensive discussion of how imitation can be developed and maintained via reinforcement and, therefore, may occur eventually as a generalized response class. Thus, the discussion is less conceptually interesting than the discussion of other behavioral phenomena, and the astute student

reader is perhaps left with the impression that behavior analysts do not attempt to handle modeling and imitation within their conceptual framework. Indeed, behavior-analytic approaches are frequently viewed as theoretically narrow because they do not provide a full treatment of such ubiquitous phenomena as modeling and imitation. In truth, some very elegant early work on human imitation relates modeling and imitation to contingencies of reinforcement (e.g., Baer, Peterson, & Sherman, 1967; Bandura, 1965). I believe the book would benefit from a stronger emphasis on these related principles.

The final chapter (chap. 25) is on cognitive behavior modification. This chapter is not compatible with the philosophical orientation underpinning the rest of the book. Of course, some publishers and readers would argue that cognitive behavior modification is a critically important area of application. However, such readers would be an unlikely audience for this book. There are other books on cognitive behavior modification and therapy, and an instructor so inclined probably would select those books rather than the undeniably behavioristic approach taken by Miltenberger. As discussed previously, a strong chapter or section on application of behavior analysis to various populations and response topographies could be considered for the last section of the book. It may be possible to incorporate a section describing how applied behavior analysts might handle traditional cognitive phenomena.

### Conclusions

Miltenberger's textbook is among the best available for the intended audience. As I read through the book carefully last semester, in preparation for this review, I found myself looking for a textbook that was somewhat more advanced than Miltenberger's. Although Miltenberger's book is highly appro-

priate for an introductory course, our field is lacking an updated applied behavior analysis textbook with a more detailed and higher level discussion of methods, principles, and procedures. Many training programs have an applied behavior analysis course that is required for incoming graduate students, and some programs have courses for advanced undergraduates who have previously been exposed to basic principles and methods. A more detailed discussion and evaluation of methods (e.g., the pros and cons of various interobserver agreement calculations), principles (e.g., concurrent schedules and matching), and novel procedures (e.g., high-probability request sequences) would be better suited for that audience.

One textbook that approximates a more detailed account, perhaps useful for a more sophisticated audience of students, is *Applied Behavior Analysis* by Cooper, Heron, and Heward (1987). Unfortunately, that book is now somewhat outdated with respect to some measurement, assessment, and treatment issues (e.g., it preceded much of the current work on functional analysis, computer-aided observation methods, etc.). Another book to consider is Kazdin's *Behavior Modification in Applied Settings* (2001), which contains some more advanced discussions of behavioral methods and procedures. In addition, the discussion of principles is nicely blended with application, and it appears to be very technically sound. However, that book is also designed mainly for introductory classes, and the author omitted detailed discussions of some relevant phenomena, such as respondent conditioning. A book by Chance (1998), entitled *First Course in Applied Behavior Analysis*, includes some interesting conceptual discussions not found in other textbooks (e.g., the section on ethics offers a unique perspective, and the inclusion of various discussion articles is a nice touch), but the discussions of methods, prin-

ciples, and procedures are designed at an introductory level.

Thus, instructors of applied behavior analysis have a range of high-quality introductory textbooks to choose from (only a few were mentioned here), but have a limited selection for more advanced undergraduate or graduate teaching. Perhaps a blend of something more advanced (e.g., Cooper et al., 1987), yet up to date (e.g., Miltenberger, 2001), technically sound (e.g., Kazdin, 2001), and conceptually innovative (e.g., Chance, 1998) is the next direction needed for an applied behavior analysis textbook.

I, for one, will keep using Miltenberger (2001) for my introductory applied behavior analysis courses. It generally covers all of the basics and provides an up-to-date account of methods and procedures. Format preferences are subject to the whims of the individual instructor, so for my students' reading assignments I will continue to mix and match chapters (e.g., the principle with the application) and omit discussions of certain chapters (e.g., cognitive behavior modification is not what my course is about) while I present material on facets of the field not covered in the book. Miltenberger has done a nice job

serving his intended audience, but one conclusion of my review is that a more advanced applied behavior analysis textbook is needed.

## REFERENCES

- Baer, D. M., Peterson, R. F., & Sherman, J. A. (1967). The development of imitation by reinforcing behavioral similarity to a model. *Journal of the Experimental Analysis of Behavior*, *10*, 405–416.
- Bandura, A. (1965). Influence of models' reinforcement contingencies on the acquisition of imitative responses. *Journal of Personality and Social Psychology*, *1*, 589–595.
- Carr, J. E., & Austin, J. L. (1998). A review of *Behavior Modification: Principles and Procedures* by Raymond G. Miltenberger. *Journal of Applied Behavior Analysis*, *31*, 159–161.
- Chance, P. (1998). *First course in applied behavior analysis*. Pacific Grove, CA: Brooks/Cole.
- Cooper, J. O., Heron, T. E., & Heward, W. L. (1987). *Applied behavior analysis*. Columbus, OH: Merrill.
- Kazdin, A. E. (2001). *Behavior modification in applied settings* (6th ed.). Belmont, CA: Wadsworth.
- Miltenberger, R. G. (1997). *Behavior modification: Principles and procedures*. Pacific Grove, CA: Brooks/Cole.
- Miltenberger, R. G. (2001). *Behavior modification: Principles and procedures* (2nd ed.). Belmont, CA: Wadsworth.

*Received July 31, 2001*

*Final acceptance August 28, 2001*

*Action Editor, Patrick C. Friman*