

COOPER, HERON, AND HEWARD'S APPLIED BEHAVIOR ANALYSIS
(2ND ED.): CHECKERED FLAG FOR STUDENTS AND PROFESSORS,
YELLOW FLAG FOR THE FIELD

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At last, the field of applied behavior analysis has a beautifully crafted, true textbook that can proudly stand cover to cover and spine to spine beside any of the expensive, imposing, and ornately designed textbooks used by college instructors who teach courses in conventional areas of education or psychology. In this review, I fully laud this development, credit Cooper, Heron, and Heward for making it happen, argue that it signifies a checkered flag for students and professors, and recommend the book for classes in applied behavior analysis everywhere. Subsequently, I review its chapters, each of which could easily stand alone as publications in their own right. Finally, I supply a cautionary note, a yellow flag to accompany the well-earned checkered flag, by pointing out that, as is true with all general textbooks on applied behavior analysis, a major portion of the references involves research on persons who occupy only a tail of the normal distribution. To attain the mainstream role Skinner envisioned and most (if not all) behavior analysts desire, the field will have to increase its focus on persons who reside under the dome of that distribution.

Key words: textbooks, applied behavior analysis

This is the kind of textbook the field of applied behavior analysis deserves. I said that to myself as I tore open the packaging holding my review copy of the second edition of Cooper, Heron, and Heward (2007). I had yet to read a page, however, and was therefore tacting only its form, not its function. Nonetheless, its form is important. Human history reveals that the differential value of form versus function is the focal point of some of the most divisive debates of all time, with recalcitrance on both sides. There is the letter versus the spirit of the law, essence versus existence in philosophy, structuralism versus functionalism in psychology, style versus practicality in the world of fashion, and so on. Here I do not argue for the superior value of form or function; rather, I submit that a balanced perspective, one that attends to form and function in approximately equal measure, seems optimal in most cases. Yet, insofar as its textbooks are concerned, function has consis-

tently trumped form in applied behavior analysis.

Formal Desiderata

Until the publication of this book, no books devoted to applied behavior analysis that I know of looked much like actual textbooks. Some came close, such as the first edition of this book (Cooper, Heron, & Heward, 1987) and one by Sulzer-Azaroff and Mayer (1977); but the first edition of this book is substantially smaller in width, length, and height than the second, and Sulzer-Azaroff and Mayer is smaller still (and long out of print). Something similar could be said about function trumping form in the textbooks in the general field of behavior analysis. Since the publication of the venerable Honig and Staddon (1977), nothing has come along to take its place or come even close to competing with its tall, wide, hard cover enclosing a thumb's width of pages, densely etched with text and richly illustrated with tables, figures, and photos. Catania's books on learning (e.g., Catania, 1998) appear to be the primary competition, but a comparison of their

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dimensions with those of Honig and Staddon underscores my observation that it has no textbookish peer or formally similar substitute in any of the domains of behavior analysis: basic, applied, or conceptual.

There are undoubtedly many advantages that accompany the diminutive form and predominately paper-based construction of most books that convey the science of applied behavior analysis, most notably cost. Diminished size and paper-based binding usually exert reductive influences on pricing. But there may be a nonmonetary price to be paid in terms of the extent to which the importance and influence of a field is symbolized by the form of its seminal texts. Two of the most important and influential fields of human endeavor in recorded history are the Jewish and Christian religions. Their seminal texts have been the object of enormous creative energy over centuries gone by, and among their various versions are some of the most ornate and creatively rendered books of all time.

On a less grand scale, there are textbooks for college courses on subjects such as abnormal psychology, a class I taught in my days as a university professor. In the weeks preceding each class, instructor copies of multiple editions of abnormal psychology textbooks, each elaborately crafted and in forms approaching coffee table book size, would begin to appear as courtesy offerings from publishers who hoped I would select theirs for my class. My bookshelves would veritably groan under their weight. Among the many impressions I had about these books and their relevance to applied behavior analysis, I remember five very distinctly.

The first was that much of the information contained between their covers was sourced by a rather arbitrary method of doing science. For example, if the .05 p value, arbitrarily selected as a cutoff for statistical significance, were reduced to say .02, almost all of the research supplying the empirical predicates for the information would be wiped out. The second was that

much, maybe even most, of the information also had a "sell by" date beyond which it would comprise historical curiosities rather than present-day facts. The publication day of the next edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*; cf. American Psychiatric Association, 1994) would be that date. With each edition of the *DSM*, classifications from previous versions have been discarded for new or upgraded classifications, thus rendering textbooks that rely heavily on the classifications in earlier versions out of date. The third was that I did not have either the first or second impression of books about applied behavior analysis. Very little of the information they supplied was arbitrary; virtually all of it was derived from direct observation and experimental analysis, not correspondence with social conventions (e.g., classifications of mental disorder), and thus it was likely to have a much longer shelf life. The fourth was more like the pained yawp of an adolescent than the well-informed impression of a university professor. I recall it as something like "Man oh man, why can't applied behavior analysts have textbooks that look and feel like the ones used in other courses such as abnormal psychology?" The fifth was that the answer to the fourth probably involved market forces.

The Checkered Flag

Regarding that fifth impression, abnormal psychology is a universally popular course with undergraduates at universities across the country, and publishing companies know that having their textbook adopted produces large revenue streams. To increase the chances of that happening, each company invests considerable creative effort and material resources in the design (i.e., form) of their books. Those that are most popular (e.g., Barlow & Durand, 2008) are big and beautiful with lots of snazzy color photographs, cartoons, inserts, and user-friendly teaching materials such as CDs. Publishing companies do not invest in these features on a hope and a prayer. They do market analyses,

and if a large market is revealed, they create and supply a product for that market. The large number and elaborate forms of abnormal psychology textbooks are pretty clear evidence that publishing companies view abnormal psychology as a sizable, potentially lucrative market. The small number and minimalist forms of applied behavior-analytic textbooks could be construed as evidence that publishing companies do not view applied behavior analysis in quite the same way. True, they do see a market, as indicated by the increasing number of relevant books (e.g., Alberto & Troutman, 2008; Chance, 2008; Malott, 2007; Martin & Pear, 2006; Miltenberger, 2007). But these are trade-type paperback books. None are big, bold, hard bound, heavy textbooks like those provided for courses such as abnormal psychology; at least none till now. With the second edition of *Applied Behavior Analysis*, I assert that the field has arrived as a major market for publishing companies. Thus, just on the basis of its form, this book signals a victory, a checkered flag, so to speak, for students who study applied behavior analysis and the professors who teach it to them. But what about the book's functions?

Function Junction

As almost anyone reading this review knows, function has a strong relation with "why" type questions. Why did the famous fugitive Willie Sutton rob banks? "Because that's where they kept the money," Willie replied when asked, indicating that the function of his robbing was to get that money. Why did Pearson invest so heavily in this book, we might ask? For my money, a big part of the answer is on the inside front and back covers of the book. There the reader will find the Behavior Analyst Certification Board (BACB), Board-Certified Behavior Analyst (BCBA), and Board-Certified Associate Behavior Analyst (BCABA) Task List (3rd ed.). This task list, and its prominent location within the book, represent important developments within the field.

One important development is the expanding role of the BACB itself, which is indicative of the extent to which applied behavior analysis has matured as a profession. One of the hallmarks of a mature profession involves credentialing, and the BACB is a (the) credentialing agency for behavior analysis. Its existence and expanding role are evidence of the applied value of the current body of knowledge in behavior analysis. The amount of that knowledge is now large enough to allow practitioners to operate independently as applied behavior analysts and to receive remuneration for their efforts; not just from their clients, but increasingly from third party payers who represent those clients in their time of need. In other words, behavior analysts are now joining the ranks of other professions who similarly serve clients on a fee-for-service basis and are credentialed by sponsoring agencies and recognized as suitably credentialed by state boards (e.g., clinical psychologists, social workers, and drug and alcohol counselors). The BACB is the sponsoring agency, and its roots extend back to the credentialing movement that achieved considerable success in the state of Florida years ago (e.g., Shook, 2005).

Another development is a rapidly growing market for the services that credentialed providers supply. The Lucy character in Charles Schulz's cartoon creation called *Peanuts* set up a psychology booth and announced via a sign that she was selling her services for five cents. Nobody came, and that was the joke. Is a similar joke being played on behavior analysts? Will newly credentialed psychologists set up shops, so to speak, and sit in them awaiting clients who never come? The answer to that question can be found in the classified sections of numerous trade magazines, on bulletin boards in human services programs, and at job fairs around the country. Quite simply, the market for applied behavior-analytic services appears to be considerably larger than the number of certified professionals to supply

them. In an attempt to lure behavior analysts, some programs are offering large salaries. For example, last year an ad on the bulletin board outside my office solicited behavior analysts for a residential program for individuals with developmental disabilities. The starting salary for bachelor-level candidates was larger than the average starting salaries for assistant professors at major universities and clinical psychologists entering into established practices. To address this gap between the existing market and available providers, universities across the country are inaugurating behavior-analytic programs and coursework sequences that meet the major requirements needed to obtain a credential from the BACB.

What is the market for these services? As reflected by the solicitation for behavior analysts in the residential setting mentioned above, the market primarily appears to involve services needed for individuals with developmental disabilities, especially children afflicted with autism. Although this market for behavior-analytic services represents something of a “silver cloud” for behavior analysts, it mostly involves one population, and a small one at that, which may represent something of a “dark lining.” I will say more about this point in the *Yellow Flag for the Field* section below. This cautionary note notwithstanding, these are indeed halcyon days for applied behavior analysis; the field is flourishing. Memberships in its professional organization, attendance at that organization’s annual conference, submissions to its flagship journal, publications by that journal, other journals that publish relevant content, and graduate programs that specialize in relevant content are all expanding.

This brings me back to Pearson and why they invested in a genuine textbook focused on applied behavior analysis. I speculate that they merely behaved consistent with a time-honored maxim for success in business: “Find a need and fill it.” This, in turn, brings me back to the list and the BACB. The book is organized

specifically for professors who hope to prepare their students for credentialing as behavior analysts and for students who hope to be so credentialed. Unfortunately for authors of other books that have been used in applied behavior-analytic courses, this book may herald a bit of bad news; specifically, it produces something close to “one-stop shopping” for students and professors. Although some supplementary materials will be needed, as the authors themselves acknowledge, the book provides as complete a description of the technical details of applied behavior analysis as one is likely to find in any other single source. I truly wish it had been available when I was in graduate school.

Even more attractive to professors who hope to successfully prepare their students for certification, the authors, aided by cooperative consultation with senior BACB board members, coordinated the content of the book with tasks that the BACB has deemed necessary for functioning as a behavior analyst. Whether the third edition of the BACB Task List optimally represents the information that students need to know to qualify as behavior analysts is potentially subject to debate. To establish their position in the debate, were it to take place, readers should consult publications on the process that produced the list (e.g., Moore & Shook, 2001; Shook, Johnston, & Mellichamp, 2004; Shook, Rosales, & Glenn, 2002) as well as the list itself at the BACB Web site, www.BACB.com. Personally, I am satisfied with the depth and breadth of the list. Although there is always “more west to go” in the process of mastering behavior-analytic principles, if a student who could discuss and perform behavior consistent with every item on the list competently could not qualify as a certified applied behavior analyst (providing they possessed necessary coursework, supervised practice, and college degrees), I do not know who could. The outcome of the consultation with the BACB is a book with well-organized task-list relevant content, the mastery of which

would surely aid students in their pursuit of a passing score on the BACB examinations. Nonetheless, the authors dutifully warn readers that the examinations themselves require knowledge beyond what can be found in this or any introductory textbook.

Meanwhile, back to benefits for professors and students, each chapter begins with a description of the task-list items that are covered within. There is considerable overlap of coverage of these items across chapters, which is a virtue, given the complexity and conceptual depth and breadth of behavior-analytic principles and practices. There is also an appendix that includes a user-friendly guide leading readers to places in the book where information on each task-list item can be found. One cannot help but wonder whether the initial pitch the authors made to Pearson included informing that publisher of the large and growing influence of the BACB, number of students seeking to become certified, and number of university-based classrooms and curricula designed to serve those students and then showing how a book specifically constructed to assist the certification process would be alluring to all involved. I myself am not board certified. Were I to pursue certification (and it seems inevitable that I will), I would spend most of my preparatory time with this book. In terms of an efficient, effective, and comprehensive certification preparatory textbook, I am aware of no superior source.

What's New Pussycat?

Obviously the emphasis on the BACB Task List is a major departure from the original version of this book, because the BACB did not exist in 1987. Another major difference is that the original version was written entirely by Cooper, Heron, and Heward, and several chapters in the current version were authored or coauthored by others (Iwata, Michael, Neef, Peterson, Sundberg, Martinez-Diaz, Freeman, Normand). Quite obviously these adjunctive authors were not chosen at random. With

respect to the subjects of their respective chapters (discussed below) they are all well recognized as experts and, in at least two cases, arguably the most recognized experts on their respective topics on the planet (i.e., Iwata and Michael). Other major differences in the book reflect changes in the field that have occurred over the past 20 years.

For example, the new chapter on "Improving and Assessing the Quality of Behavioral Measurement" reflects mounting concerns with reliability and validity of measurement and the increasing number of ways behavior analysts have used to estimate them since the first edition. Increased concerns about measurement are a natural and logical progression in the science. The first two decades of applied behavior analysis were mostly focused on producing demonstrations that methods derived from the experimental analysis of behavior could be used to create socially significant behavioral changes. Some early seminal papers did not even include estimates of interobserver agreement (e.g., Azrin & Nunn, 1973; Azrin, Nunn, & Frantz, 1980; Miller, Weaver, & Semb, 1974), others did but only on a small percentage of observations (e.g., Azrin & Foxx, 1971; Risley, 1968), and many provided sufficient estimates but little information on the collection of the observations and the calculation of the estimates (e.g., Drabman, Spitalnik, & Spitalnik, 1974; O'Brien, Bugle, & Azrin, 1972; Risley). That interobserver agreement was not a fundamental concern is evident from the numerous instances of authors providing a formula for estimating observer agreement that yielded a whole number and not a percentage (e.g., dividing the number of agreements by the number of disagreements and multiplying by 100). I elect not to supply a reference because the error was so common that it would be unfair to single out one or two authors who made it (scan early issues of the *Journal of Applied Behavior Analysis* [JABA] for your own examples). Regarding validity, al-

though some early studies stressed its importance in measurement and employed methods to establish it (e.g., Bushell, Wrobel, & Michaelis, 1968), these are very much the exception and not the rule. As a science advances, however, so too does the sophistication of its measurement system and, in recognition of this fact, the authors include the informative chapter on the quality of measurement. The chapter is uniformly helpful, and distinctions drawn among reliability, accuracy, and validity should be particularly valuable for students.

Other significant changes from the first edition include the chapters by the authors mentioned above. The first of these is on negative reinforcement, and it is notably authored by Brian Iwata and Richard Smith. Although negative reinforcement was covered in the first edition, it was allocated only a bit more than two pages, which was a small part of large chapter on operant reinforcement. That it has its own chapter in the current version is perhaps a reflection of the authors' awareness of just how frequently the concept of negative reinforcement is misunderstood. In the lay community, it has become synonymous with punishment. For example, lay media frequently use the term when authors apparently want a softer, more technically sophisticated term for punishment (e.g., Brick, 2004; Santoli, 2008). I contacted Santoli at *Barron's*, and he promised to avoid the error in the future. The letters editor of the *The New Yorker* was not as cooperative; he argued that the term had acquired a colloquially synonymous relation with the word *punishment*. It is important to note that before students become students of behavior analysis, insofar as the technical language of behavior analysis is concerned, they are much more likely to be informed by lay sources and colloquial usages than they are by accurate, authoritative textbooks. Giving negative reinforcement a full chapter and bringing the authority of Brian Iwata and Richard Smith

to the job of writing it should do much to expand the number of persons who are technically conversant with the term.

Another major departure from the first edition is the chapter on motivating operations by Jack Michael. Although Michael's classic paper that distinguished motivating operations from discriminative stimuli appeared in the early 1980s (Michael, 1982), the concept of motivating operations did not begin to appear in the applied literature with any real frequency until the 1990s (e.g., *JABA*, Winter 2000; Vollmer & Iwata, 1991). Thus, it is not a surprise that it was only minimally covered in the first edition of this book. What a difference two decades can make. On the one hand, the index of the first book provides no primary listing of the words *motivate*, *motivating*, *motivation*, or *motivational* (it provides one sublisting under the primary listing of the term *stimulus*, and it distributes directly relevant content over just four pages). On the other hand, the new book not only presents motivating operations in a full chapter authored by the world's leading expert, but the index provides a primary listing for *motivation operations* with 12 sublistings, and it distributes directly relevant content throughout the book. This expanded coverage represents an extremely important advance, not only for the book but for the field in general. By incorporating the concept of motivation into its technical armamentarium, applied behavior analysis establishes an experimentally fortified encampment in the conceptual territory formerly dominated by mainstream approaches to behavior such as clinical or social psychology, fields whose encampments are mostly fortified merely by correlational analyses of hypothetical concepts.

Another advance also involves a departure from the first edition. Specifically, this version includes an extensive chapter on functional assessment authored by Nancy Neef and Stephanie Peterson. Rather slow in gathering momentum (it was being recommended de-

comes ago; e.g., Goldiamond, 1974), functional assessment has more than made up for lost time in terms of its expanding role in clinical and educational planning and treatment. It is arguably one of the major reasons for the expanding influence of applied behavior analysis. For example, the Individuals with Disabilities Education Act requires that functional assessment be an integral part of the planning for special education programming. In other words, this legislation encodes functional assessment into one of the most important institutions of modern American life, formal education. Functional assessment also has its own literature that includes a large body of peer-reviewed papers, a hallmark of which is a special issue of *JABA* (Summer 1994), a large number of single-authored books (e.g., Chandler & Dahlquist, 2005), edited books (e.g., Repp & Horner, 1999), training manuals (Watson & Steege, 2003), and related book reviews (Dunlap & Kincaid, 2001; Ervin, Fuqua, & Begeny, 2001).

Although success has many parents, there are two primary sources that appear to have led to the current broad-based use and influence of functional assessment. The first was a publication on hypothetical origins of self-injurious behavior (E. G. Carr, 1977), and the second was one that demonstrated a functional analytic method for testing them (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994). These papers brought functional analysis to the forefront of the field, and it became the experimental cornerstone of the more general area known as functional assessment, the fundamental purpose of which is to identify variables that maintain problem behavior. Similar to motivational operations, the expanding influence of functional assessment is reflected by its differential presence in the two editions of this book. In the first edition, the terms *functional assessment* and *functional analysis* do not appear in the index. In this edition, the terms are the subjects of one of the longest

chapters in the book and comprise one of the largest primary entries in the index.

The chapter on verbal behavior authored by Mark Sundberg is also new, and it is my favorite chapter in the book. This verdict is not meant to detract from any of the other chapters, nor is it meant to distinguish his chapter from the others in terms of his writing. It is indeed written very well, but so too are all of the other chapters. The verdict reflects the fact that I learned the most from reading Sundberg's chapter, probably because it involves content with which I have the least fluency. I am certainly not alone in my appraisal of *Verbal Behavior* (Skinner, 1957) as the most complex and difficult in the Skinner canon. I hazard a speculation that most behavior analysts could read it cover to cover many times and find new material or obtain new perspectives on old material with each reading. The most meritorious aspect of Sundberg's chapter is that it provides a user-friendly précis of Skinner's book and supplements it with a description of the expanding body of research focused on its major concepts. It also describes Skinner's 1945 paper on private events in a way that should make it easy for professors to discuss this challenging paper with undergraduates and graduates alike, integrate its concepts with those *Verbal Behavior* presents, and better prepare students to address spurious yet rampant criticisms of behavior analysis as a science incapable of addressing complex human behavior.

Another addition is the chapter on ethics by Martinez-Diaz, Freeman, and Normand. Although the first edition attended to some ethical considerations (e.g., use of extended baselines, punishment) the coverage was situated within chapters devoted to other subjects, and the subject of ethics was not given a chapter of its own. As the field evolves sufficiently to include a professionalized practice, however, ethical considerations become increasingly important. The new chapter is thus a representation of that evolution and a welcome one.

Above I have drawn attention to the additions to the book that occurred in the form of new chapters by the book's authors and new chapters by contract authors. I also drew attention to the creative integration of book content with the third edition of the BACB Task List. With one exception (the glossary described below), these represent the most obvious differences between the first and second editions of the book, but not the only differences. The remainder of the book has hewed mostly to the structure of the first, which is not surprising. Applied behavior analysis is a science with a standardized set of fundamental concepts, and any book purporting to teach students about the content of this science would have to sequence and discuss those concepts. Both books do that, and both use mostly the same sequence (although there is increased thematic symmetry in the sequence of chapters in the new edition). Yet another difference between the first and the second editions, and a laudable one, is that the second edition presents thoroughly updated literature on each of its major content areas. An impressive indicator of the degree of updating is the difference in the size of the respective reference sections. The first edition supplied 892 references, and the second supplied a whopping 1,538 (yes I counted them, so please allow for a small margin of error due to dizziness). A final addition in the new edition, one that many readers might place near the top of the list of changes if it were to be arranged in order of value for the reader, is a 19-page glossary of technical terms. In my library there are only two books with glossaries that suitably serve the behavior analyst in me, Ferster and Skinner (1957) and the later editions of Catania's series on learning (e.g., Catania, 1998). I am now quite pleased to have a third, and I predict that virtually all other readers will be as well. In closing this section, I again submit that, for students who study applied behavior analysis and the professors who teach it to them, the publication of the second edition of this

book represents a checkered flag: a win, especially in terms of the book's impressive form, abundant scholarly content, and integration with the BACB Task List.

Subjects That Are Absent Without Leave

No book is perfect, however, and this one does have some gaps in important subjects, the diminutive or absent coverage of which is incongruent with the large size of their relevant literatures. Three notable examples include behavioral pharmacology, organizational behavior management (OBM), and clinical behavior analysis (e.g., acceptance and commitment therapy [ACT], functional analytic psychotherapy). All three areas have large literatures, broad multi-disciplinary influence, and many adherents. For example, the section of the online encyclopedia *Wikipedia* devoted to behaviorism describes OBM as having "a particularly strong following within behavior analysis, as evidenced by the formation of the OBM network and the influential *Journal of Organizational Management* (... recently rated as the third highest impact journal in applied psychology...)." The same section discusses ACT and states that "researchers and practitioners in RFT/ACT have become sufficiently prominent that they have formed their own specialized organization, known as the Association for Contextual Behavioral Science." *Wikipedia* does not include behavioral pharmacology as an entry, but one recent issue of *JABA* is devoted entirely to the topic (Winter 2008). This issue is large, and it is one of the few devoted to a single subject that *JABA* has published in its history, which is pretty clear evidence that the area is important to the field. I suspect I need supply no more evidence to support my argument that all three are large and growing specialized areas of applied behavior analysis. That I could, however, is readily indicated by cursory searches on *Google Scholar*, *Psych Info*, Amazon.com, and in university libraries.

But that is not really the point I want to emphasize. My main point is that the field of

applied behavior analysis is a much bigger tent now than it was when the first issue of this book was published, and that is very good news. The field is truly prospering. The not-so-good news is that the mainstream of applied behavior analysis, of which this book is an avatar, does not routinely showcase the broad-based relevance of the field to human life. This brings me to the yellow flag for the field.

Yellow Flag for the Field

Applied behavior analysis has flourished under one tail of the normal distribution of human social problems (Friman, 2004, 2006, 2008). For example, the normalization movement of the late 20th century established a philosophical framework for reducing the population of, and in some cases emptying, residential facilities for, persons with developmental disabilities. But it was applied behavior analysis that supplied most of the interventions that made the move from institutional to community settings workable. Behavioral interventions significantly reduced or eliminated the aggression, extreme self-injurious behavior, and severe deficits in self-care and communication skills that were obstacles to community placements and more normalized lives. More recently, behavioral interventions have significantly increased the velocity of development in children with autism spectrum disorders; expanded food preferences, intake, and self-feeding skills in children with life-threatening feeding disorders (e.g., Bachmeyer et al., 2009); and improved language skills and quality of life in persons with psychotic-level mental disturbances. There are many other examples. Such successes represent the extraordinary power of applied behavior analysis to produce socially significant behavior change as per the promise of its inaugural document (Baer, Wolf, & Risley, 1968). A monumental amount of supportive evidence for this assertion is found in the book. Also worth mentioning is the fact that, in many instances, practitioners of applied behavior analysis were the only professionals

who would address such serious problems with nonmedical interventions. Thus, applied behavior analysis has often been the primary portal from the formerly bleak life of confinement and drastically limited possibilities to the improved life with multiple freedoms and rational optimism for the future that many persons with developmental disabilities or severe psychiatric conditions now have.

But these successes involve extreme problems in extreme populations, those found in the tail of the normal distribution. If applied behavior analysis has the power to improve such extraordinary problems, it certainly has the power to do the same for less severe, more frequently occurring problems that are faced by mainstream populations, those found under the dome of that distribution. Skinner's vision of behavior analysis was that it would become a mainstream science relevant to virtually all behavioral concerns that afflict humankind. That vision has not yet been realized, but progress toward it could be achieved by extending the applications of behavior analysis out from the tail to the vastly more prevalent and less extreme problems under the dome.

It seems evident that the authors share my concern, at least implicitly. Most of the chapters have a consistent narrative structure that reveals the concern, but again, only implicitly. The book introduces a concept, supplies hypothetical but highly plausible examples for illustration, and supplies experimental examples for empirical support. The authors' implicit recognition of my concern is revealed by the differences in the ages, developmental levels, and settings of the persons who populate the examples as well as the severity of the problems they face or pose. In the hypothetical examples, most of the persons are typically developing and in noneducational or nonclinical settings. In the experimental examples, most of the persons have developmental disabilities and are in educational or clinical settings. There are some persons in the experimental examples that are

typically developing, but most of them are young children in educational or care-based settings. In addition, in the hypothetical examples, persons typically face or exhibit routine problems of everyday life (i.e., not clinically significant). In the experimental examples, persons typically face or pose extreme problems such as self-injury or significant deficiencies in communication or self-care.

For example, in segments devoted to the source and context of negative reinforcement (pp. 295–296), the hypothetical examples involve routine problems in the everyday life of typically developing persons, such as headaches, cycling during inclement weather, and children reluctant to clean their rooms. All three experimental examples, however, involve behaviors of persons with severe disabilities (Iwata et al., 1982/1994; Smith, Iwata, Goh, & Shore, 1995; Weeks & Gaylord-Ross, 1981). In segments devoted to concurrent schedules (pp. 316–318), the hypothetical example involves a typically developing girl receiving an allowance for homework and cello practice. The seven experimental examples involve children with autism (Adelinis, Piazza, & Goh, 2001; Hoch, McComas, Johnson, Faranda, & Guenther, 2002; Piazza et al., 1999); pervasive developmental disabilities (Piazza et al.); severe behavior disorders treated with some combination of therapy, special education, and medication (Neef, Bicard, & Endo, 2001; Romaniuk et al., 2002); and adults with severe disabilities (Cuvo, Lerch, Leurquin, Gaffaney, & Poppen, 1998; Reid, Parsons, Green, & Browning, 1988). The behaviors of experimental concern also all involved severe behavioral problems or deficits. As a final example, (but I could go on and on) in the section on programming common stimuli (p. 632), the hypothetical examples involve activities that coaches, music teachers, and theater directors use to prepare their athletes, musicians, and actors. The experimental examples involve methods researchers used to teach adults with disabilities

to eat in fast food restaurants (van den Pol et al., 1981) and children with spina bifida to self-catheterize (Neef, Parrish, Hannigan, Page, & Iwata, 1990).

So what is going on here? On the one hand, to illustrate the principles of applied behavior analysis the authors use hypothetical examples that involve familiar, nonclinical behavior that is widely represented in the population at large. On the other hand, to supply an empirical basis for those principles, the authors use examples that involve unfamiliar, clinically significant, and often highly deviant behavior that is minimally represented in the population at large or examples that involve the behavior of young children in educational settings. I did not interview the authors about this question, so I can only speculate about the answer they might offer.

I speculate that the authors share my view of applied behavior analysis as a generic science, widely relevant to virtually all of the concerns faced by people in the ordinary course of their lives. Thus, they were comfortable presenting examples of those concerns to explain the relevance of the principles of applied behavior analysis to everyday life. But when they searched the literature for experimental examples to empirically undergird their points, they found, as I have, that the literature is dominated by experimental study of exotic or unusual problems exhibited by extreme populations. In addition to the examples I provided above, I invite the reader to scan the reference list in the book and see how frequently terms such as *developmental disabilities*, *learning disabilities*, *autism*, *retardation*, *disruptive behavior*, *pre-school*, and *elementary school* populate the titles in the array of references. This is not to say that all of the experimental examples involve specialized problems, however.

There are experimental examples that involve behaviors that are widely represented in the population at large, such as slouching (Azrin, Rubin, O'Brien, Ayllon, & Roll, 1968),

littering (Bacon-Prue, Blount, Pickering, & Drabman, 1980), smoking (Axelrod, Hall, Weis, & Rohrer, 1971), off-task talking (Deitz & Repp, 1973), story writing (Ballard & Glynn, 1975), organizing day-care environments (Doke & Risley, 1972), car pooling (Jacobs, Fairbanks, Poche, & Bailey, 1982), and seat belt use (Geller, Paterson, & Talbot, 1982). But there were far fewer of these types of references, and most were published two decades or more ago. The yellow flag for the field is that although applied behavior analysis is a generic science, its more current experimental basis, the one the authors were constrained to draw from, seems to suggest it is a specialized science, one applicable mostly to statistically deviant populations or the behavioral concerns of young children.

Articles published in the first two decades of *JABA*, however, suggest otherwise. Therein my nonscientific cursory search yielded many examples of research on a wide range of populations and behaviors. Although many studies published in the early years of *JABA* focused on the behaviors of children and persons with disabilities, that portion of studies appears to be smaller than the similarly focused portion of studies published in the last two decades of *JABA*. There also appears to be a much greater diversity in populations and problems examined in those earlier years. Is this actually true, and if so, what happened? In these questions is a basis for at least two studies that could be informative. The first would involve a time series study of subject matter in *JABA* from its inception to the current issue. If, as I suspect, the study shows definitively that the subject matter has narrowed over the years, a second study would involve a search for the functional variables that brought about this unfortunate state of affairs, and I would like to nominate one for consideration.

Specifically, within the field of applied behavior analysis there has been a longstanding vein of criticism of the extent to which its

research has focused on technical demonstration rather than, or possibly even at the expense of, theoretically driven, experimental study (e.g., “Unless applied researchers show an interest in basic, theoretical development, many key basic questions will never be asked,” Hayes, 1991, p. 420). This criticism has emerged in various forms, including emphasizing the value of science over technology (Deitz, 1978), theory over application (Hayes, 1991), experimental analysis of behavior over applied behavior analysis (e.g., Pierce & Epling, 1980), and functional analysis over behavior modification (e.g., Mace, 1994). This latter criticism has gathered so much traction that in an otherwise laudatory review of Miltenberger’s first edition of *Behavior Modification* (1997), the reviewers listed the title as one of the book’s weaknesses, suggesting it should have been titled *Applied Behavior Analysis* instead (J. E. Carr & Austin, 1998). Among reasons why one might disagree is that the preferred title had already been taken by the authors of this book, thank you very much.

I suspect that the critics have won this debate, more or less, despite some rather eloquent attempts to rebut their positions or at least slow their momentum (e.g., Baer, 1981, 1991). The result appears to be a significant advance in the precision and theoretical orientation of applied behavior analysis, but one that has occurred at the expense of its scope—its generic applicability. This result is reflected in the schism between the hypothetical and experimental examples the new edition of this book employs to achieve its didactic purposes. The hypothetical examples involve plausible scenarios, with target behaviors of the sort that were often represented in the technical demonstrations that densely populated the early pages of *JABA*, just the sort that appeared to arouse the critical attention of those who thought the field was becoming “technological to a fault” or some variation on that concern (e.g., Deitz, 1978; Hayes, 1991; Mace, 1991, 1994; Pierce & Epling, 1980).

I am favorably disposed towards the concerns of the critics of technical demonstrations being a dominant part of the field. The development of the science, or any science for that matter, requires theoretically driven research conducted with precision. But doing so requires high levels of experimental control, and the high-frequency, low-intensity problems of persons in the mainstream of day-to-day life usually occur in environments in which such control is very difficult to establish. The problems of persons with serious disabilities or persons who are very young often occur in environments in which establishing experimental control is much easier. The nudge from critics of mere technical demonstrations, coupled with the much lower effort needed for establishing experimental control, appear to have resulted in the majority of applied behavior analyses being conducted on the problems of special populations. But if the field is to have a chance at inhabiting the mainstream role it could occupy, the one Skinner envisioned it would occupy, demonstrations of its relevance to the concerns of everyday persons will have to move from the imaginations of applied behavior analysts into published studies produced by active researchers. And if those studies exhibit diminished theoretical orientation or precision to some degree, well, I suspect that problem would be more than offset by advances in the scope of the science. In other words, in a third edition of this book, if there is to be one, the authors would not have to consult their imaginations so much in their attempt to describe the widespread applicability of applied behavior analysis.

A Laudatory Conclusion—With Hope

In conclusion, this is a terrific book. It has the look and feel of a real textbook, one that, in terms of form, could easily compete with any of the textbooks on my shelf, those on abnormal psychology and all the rest. Within is a treasure trove of technical information on all aspects of the field composed in a way to maximally aid students who aspire to become certified (or just

well-informed) behavior analysts and the professors who assist them with their aspirations. As indicated in the title of this review, this book represents a checkered flag for those students and their professors. It has some limitations but they are few, and what book does not? Even the sacred tomes of the great religions have their problems. The yellow flag I mentioned above does not involve the book as much as it does the field at large. With the exception of the gaps in coverage that I mentioned, the book represents applied behavior analysis very well. Regarding the future of the field, if the yellow flag is heeded, as it were, and applied behavior analysis expands the diversity of its subject matter to include more problems of everyday life, then perhaps in the weeks preceding classes, instructor copies of multiple editions of textbooks covering applied behavior analysis, each elaborately crafted and in forms approaching coffee table book size, would begin to appear as courtesy offerings from publishers who hoped the professors would select the publisher's book for their classes, just as publishers now do with professors who teach abnormal psychology. The publication of this book has given me that hope.

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