JOURNAL OF THE EXPERIMENTAL ANALYSIS OF BEHAVIOR 1999, **71,** 115–120 NUMBER 1 (JANUARY)

OPERANTS WERE NEVER "EMITTED," FEELING IS DOING, AND LEARNING TAKES ONLY ONE TRIAL: A REVIEW OF B. F. SKINNER'S RECENT ISSUES IN THE ANALYSIS OF BEHAVIOR

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This final collection of Skinner's papers was intended for the professional, although other readers will find much of interest. The first five chapters are devoted to what Skinner called "theoretical issues" and include clear presentations of his positions on "feelings" and on the "self" as an apparent agent of volition. Skinner skillfully discusses thinking, the origins of cognitive-mediational theories, and a favorite topic: the similarity of processes occurring in the histories of species and of individuals. The next four chapters cover what he called "professional issues," including the often-misunderstood philosophy known as radical behaviorism as well as the operant aspects of behavior therapy and attempts to influence educational practices. He seemed disappointed in the lack of acceptance of programmed learning methods and pessimistic about the possibility of improving education practices. This pessimism was evident in the final section, "personal issues," in which he expressed doubt that the powerful and self-serving forces of government, business, and religion will ever permit the changes that could be wrought by the application of behavior analysis to the great problems of society. Two other chapters in the last section will be useful to historians who are curious about the influence of logical positivism on Skinner's thinking (apparently there was not much influence) and to sophisticated readers who are interested in Skinner's retrospective consideration of his work.

Key words: B. F. Skinner, behavior analysis, radical behaviorism, history of psychology, applied psychology

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The title of this review calls attention to a number of interesting conclusions drawn by B. F. Skinner in what I assume is his last book. During the final years of an extraordinarily long and productive career, when most of us would rest on our laurels, Skinner not only continued his struggle against cognitivism but also reconsidered and revised opinions that he had held for decades. For example, in a revised introduction to *The Behavior of Organisms,* comprising the last chapter of this book, Skinner wrote:

> I was not yet wholly free of the traditional view. For example, I spoke as if behavior were inside the organism before it came out. . . . I also said that operant behavior was "emitted," and later I tried to justify that usage by pointing out that the light emitted from a hot filament was not in the filament. . . . An operant response was not emitted; it simply occurred. (p. 130)

Skinner, B. F. (1989). *Recent issues in the analysis of behavior.* Columbus, OH: Merrill.

I thank Natalie Cruchon for assistance with the final version of this review.

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He did not go further, to propose that operants, respondents, reinforcers, and discriminative stimuli, like the "emission of operants," were also words that might best be put to pasture; I half wish that he had, as I have noted before (Malone, 1987). Those conditioning terms originated in the company of the mediational behavioral theories of a half century ago, chiefly those of Hull and Tolman and their associates. Beginning in the 1960s, those theories, particularly Hull's S-R associationist system, were vigorously condemned during the celebration of so-called "biological boundaries" and the "cognitive" revolution. However, the principal features of those discredited theories were incorporated in the new cognitive psychologies, based first on symbolic information processing and later on neural network models. The revolutions were a sham (cf. Leahey, 1987; Wearden, 1989) and it was only the conditioning language that was discarded. It is the mediationism of those theories, the according of special causal status to gratuitously inferred events, that Skinner has so vigorously criticized as "cognitive psychology." How does Skinner's psychology differ from others?

Skinner's radical behaviorism has never been an associationist S-R theory; rather, it emphasizes order in behavior–environment relations that extend over time (see Hineline & Wanchisen, 1990). Further, it deals with private experience in a way that is compatible with recent phenomenological views (e.g., Kvale & Grenness, 1967), a feature by no means true of present or past cognitive theories. Radical behaviorism and phenomenological views are specifically opposed to the subject–object distinction, Plato's division of experience into *known* and *knower,* and to the corresponding categories of *stimulus* and *response.* This opposes radical behaviorism to cognitive theories, which always feature some variant of the ghost and the machine.

This is clear in many of Skinner's writings, but becomes blurred in many textbook presentations and in summaries presented by critics. The basic terms, discriminative *stimulus* classes and operant *response* classes, appear in textbooks as S-R. Whatever else the text may say, the reader is thus led to conclude that Skinner's is an S-R theory, different from Hull's only in detail, an irony resulting in large part from the use of common terms having very different referents. A good start might be to replace *operant* (response) with *activity* or *action* (see Catania, 1992) and retire *discriminative stimulus* in favor of *situation* or *context.* I believe that anyone who reads this collection of Skinner's last works will agree that he would approve.

What Is in This Book?

The 12 chapters are presented in three sections, which correspond to three kinds of issues: theoretical (first five chapters), professional (next four) and personal (final three). All but two chapters were originally published elsewhere, but only four appear in scholarly journals in which they are apt to have been widely read. There is a lot of old stuff, of course (although the publication dates of the 12 entries range from 1986 to 1989), but I found enough of interest to warrant attention from even those who know Skinner's interpretations intimately well. Readers who believe that ''conditioning does not really occur in humans'' or that ''behaviorists treat people like machines'' should seek more basic and systematic introductions to Skinner's theorizing. Much of the material in this book would perplex them. In fact, Skinner noted in the preface that it was intended primarily for psychologists and behavior analysts, unlike some of his recent popular pieces.

On Reading Skinner

Many readers fail to recognize that Skinner's prose can be devilishly difficult; I find that for the most part it remained so to the very end, although the final chapter (from which I quoted from the book under review here) was uncharacteristically clear. In general, however, Skinner retained his prose style, which at a glance suggests that a child could easily read it, but which is effectively the distillation of pages that were reduced to paragraphs, and paragraphs that were reduced to sentences. ''What is wrong with me?'' we the reader ask, noticing that the few pages we just read went by so effortlessly, because the material on those pages ''did not change us so that we can now respond to it,'' as Skinner would put it. A layperson or a cognitivist would say that we did not remember it. The fluidity of Skinner's writing lulls the reader into reading it as ordinary prose, with the result that we often miss its meaning (we do not respond to it properly while reading it).

But Skinner's style also serves him well on many occasions. For me, the reading is maintained largely by the occasional priceless expressions and turnings of phrase that are scattered throughout. How many offices and laboratories must bear the expression ''cognitive science is the creationism of psychology'' on their walls? In this collection, I marked 53 such items. Their value lies not in literary merit, but in their insights. I include some short quotations below and then paraphrase some that are less easily quoted. For example, ''No word seems to have originated as the name of a feeling'' appears on page 9. That is, of course, a favorite topic of Skinner's and is the subject of chapter 2. Where *did* names for feelings originate, and what does that tell us? A partial answer appears in another memorable sentence on page 114: ''No feeling or state of mind has ever been unambiguously identified or defined without referring to its antecedents or consequences, and they are not what is seen through introspection.''

''To remember what something looks like

is to do what we did when we saw it. We needed no copy then and we need none now'' is found on page 17. But if we have no copies, what is the function of the nervous system? And what is cognitive psychology without copies of some sort, because its stock in trade is ''representation''? ''Weight is as abstract as guilt'' (p. 22) is surely something to ponder, as is ''What happens inside the body is not a beginning'' on page 24. Or, try this: ''Modeling is verbal, although not necessarily vocal, in the sense that reinforcement is mediated by other persons'' (p. 29).

Skinner's explanation for why the ''real self,'' when finally uncovered, always seems to be so bad and primitive, can be found on page 30; why chess moves are verbal, and how business practices are often the source of behavior we call sinful or criminal, appear on page 42. Learn how it is that writers and artists act as both speakers and listeners as they work (p. 47), and how to demonstrate to Griffin that he need not ''mindlessly'' infer consciousness and intentional thought in chimpanzees and even in bugs just because they behave in ways that suggest such things. For a clue regarding how to do that, consider this sentence and penultimate example from page 50: ''We have no more reason to say that an individual designs its own behavior than to say that a species does.'' If an act said to require intentional thought can be trained using operant methods, such as a chimpanzee learning to catch termites with a toothpick, then similar behavior could also arise in the course of evolution, because variation and selection in phylogeny directly parallel operant conditioning in ontogeny. So, if we see chimps using things to spear termites, we need not infer any more consciousness or intentional thought than when we see them groom, feed, copulate, or do other ''natural'' things.

Skinner even tells us why theories of psychopathology are cast in the way they are.

> Psychotherapists must ask people what has happened to them and how they feel because the confidential relationship of therapist and client prevents direct inquiry. . . . Psychoanalysts, for example, specialize in feelings. Instead of investigating the early lives of their patients or watching them with their families, friends, or business associates, they ask them what has happened and how they feel about it. It is not surprising that they should then construct theories in terms of memories, feelings, or states of mind. (p. 66)

Skinner's analysis places personality theory, especially psychoanalytic theory, among the ''other behavioral sciences,'' like sociology and anthropology, because, like the humanities (and like the savage), their descriptions and explanations are cast in the vernacular and rely on internal causes (p. 70). The favorite inner cause is the mind, operating through its assumed biological counterpart, the brain. But, Skinner argues, ''mind is what the *body* does . . . what the person does . . . it *is* the behavior.'' Regarding brain and mind, Skinner noted that ''the word *neurology* was invented . . . at about the same time as *phrenology*'' (p. 81).

Many other brief, inspiring, and entertaining insights such as these are scattered through the collection; in addition, there are good points that do not lend themselves to brief excerpting of quotations or summarizing.

Good, Novel, and New

Skinner noted that at his age it is difficult to do anything but plagiarize oneself. Readers familiar with his writing know pretty much what to expect in the way of general opinions, and the question is only how the opinions will be expressed this time. Is there anything at least *relatively* good, novel, and new in this collection, given that all of the pieces included were written since the mid 1980s? For the most part, I far prefer his writings of 45 to 50 years ago, but this collection includes some good points that are novel and new.

First, there is a clear discussion of his treatment of feelings, a topic that many of his followers and critics ''feel'' has never been made clear, even in *About Behaviorism* (1974), which is generally the best source for his positions explicitly addressed to traditional categories of psychology. The first chapter of the present collection, which originally appeared in the *London Times Literary Supplement,* includes a straightforward definition of emotional feeling (e.g., pain) as sensory action, as is the case with seeing and other sensing. Like any other behavior, feeling is partly determined by both species and personal histories, including cultural history. Hence, the effects of

LSD and other drugs that act as ''imperfect simulators'' of feelings are partially due to setting factors, so there is great variability in their effects. Like Melzack (e.g., 1961), Rachlin (e.g., 1985), and others, Skinner viewed pain, as well as more innocuous feelings, as multiply determined.

I was also impressed by the third and fourth chapters, reprinted from edited 1989 and 1988 volumes, titled ''The Initiating Self'' and ''The Listener.'' I cannot claim that the first equals James's (1890) classic, but it *is* good, and it is similar in several respects to James's treatment. For example, Skinner suggests that the belief in a creative self arises because we do not attend to process (which would require the introspective observation of our bodies as we behave), but only to product; hence, in retrospect we ''see'' a creator—the self. James suggested that such retro-introspection leads us to count the same observation twice, generating belief in a self; clearly a similar view. Had Skinner been familiar with historical views (he definitely was not), he might have noted not only James's opinion but the similarity with Hume's contention that there is no impression or set of impressions corresponding to the self.

Like James, Skinner proposed a lot of ''selves'' (observed, responsible, esteemed, confident, and rational), each relating to specific causes (the body, aversive factors, other people, successes, and rules). This theme is continued in chapter 4, titled ''The Listener,'' in which he discusses the many ways in which the many selves observe and manage one another. The same argument appeared in sketchier form in *Science and Human Behavior* (1953) and makes an awkward situation for those of Skinner's followers who object to Mahoney and Bandura's (1972) use of ''self-reinforcement'' (e.g., Catania, 1975; Goldiamond, 1976; Rachlin, 1974). These authors argued that such a designation is redundant, misleading, or both, but Skinner seemed to disagree. It should be no occasion for surprise when different selves arrange contingencies of reinforcement for one another, at least as far as Skinner was concerned.

One notices also Skinner's recent and frequent reference to *priming,* not as the term is used in studies of implicit memory but as a common way of engendering purely imitative behavior. He had mentioned the phenomenon decades ago (e.g., the *echoic,* or imitative vocalizing that may be common in infants), but now it takes on special importance, because he also repeatedly emphasizes *one-trial learning*. This, too, is actually old stuff, discussed in some detail in 1938 (pp. 69–73), but seldom noted by Skinner or by commentators (an exception is Malone, 1990). Together, priming and one-trial learning make Skinner's view of learning extremely similar to that of Edwin Guthrie. The method by which Skinner's daughter learned 15 lines of poetry (p. 90) via the prime-prompt-vanish method (and recalled it 25 years later) would no doubt have gratified Guthrie.

What Skinner Emphasized

Skinner continued to dislike cognitive psychology, hardly surprising, especially to anyone who has seen the transcript of his final address to the American Psychological Association in August, 1990, or the similar published version. And no wonder! Cognitive psychology *is* the psychology of the layperson. As such, it would be rejected by Wundt, James, and Titchener, who might even agree with his asserting that it is the ''creationism of psychology'' and that the scholastics were indeed the ''cognitivists of the Middle Ages'' (p. 44). It is easy to be a cognitive psychologist, participating in a viewpoint that has been popular for decades now, but it is not so easy to identify accomplishments of cognitive psychology, especially pragmatic ones (p. 93 and *passim*).

Although he disliked cognitive psychology, Skinner very much liked the broad outlines of evolutionary theory, emphasizing often that variation and selection are the basic processes in the history of the species, of the individual, and of the culture. This alliance of ethology and behavior analysis is particularly stressed in the first seven chapters. Chapter 5, ''Genes and Behavior,'' is a reworking of his splendid 1966 paper, ''The Phylogeny and Ontogeny of Behavior.'' In that paper, Skinner attempted to show the direct parallels between operant conditioning and selection of action patterns. But in this piece, first published in 1988, the concern was far more general: Selection in phylogeny, ontogeny, and in cultures will leave ''less for a creator to do,'' as he wrote in chapter 3, ''The Initiating Self.'' Like the 1966 paper, this essay showed

how phenomena like altruism or aggression could be due to selection in phylogeny or ontogeny. Unlike that paper, this essay walloped what he saw as simple-minded cognitive theory, represented by Griffin's (1984) willingness to attribute minds to insects and his (and everyone's) willingness to interpret the dance of the honeybee as ''speaking and listening.'' In addition, he again stressed *priming* as an important source of variations to be subjected to selection.

Finally, as in many of his earlier writings, Skinner yearned for wider application of behavioral methods, *any* behavioral methods, in solving the problems of education, overpopulation, war, consumption, pollution, and other global ills. I have always been disinterested in such arguments, knowing the powerful forces that oppose any solution to such problems. Those forces are represented by governments, businesses, and religions, and their self-serving positions are not about to change, a conclusion also drawn by Skinner. He noted on page 119 that a politician who proposed lowering the birthrate, limiting consumption and possessions, and weakening national and religious commitments would ''soon lose the power to sponsor anything.'' By the same token, businesses are not about to attempt to sell less attractive things, and the church *must* treat this world as expendable, for the alternative would be to place less emphasis on the hereafter. To make matters worse, one triad of government, business, and religion is competing with other triads, meaning that it will take a world government, a truly catholic church, and a global economy to stop it. Even then, suggested Skinner, who has become no Pollyanna, the world government, universal religion, and global economy might compete with one another. When that happens, ''basic human goodness,'' ''benevolent deities,'' and other time-honored saviors are no longer reliable guardians of our future.

Skinner's Views on the Recent History of Psychology

Chapters 10 and 11 provide interesting firsthand accounts of the history of psychology during this century, particularly the relationship of logical positivism to early behaviorism. Skinner agreed with Laurence Smith, whose book (Smith, 1987) on the subject he reviewed (p. 198), asserting that there really was no relation, even with the methodological behaviorisms of Hull and Tolman. As is well known, Skinner's inspiration came from Mach's positivism, a view with which one can disagree, but one that has none of the stigma of logical positivism. Logical positivism is the traditional philosophy of science, popular during the first half of the 20th century but far less influential during the past few decades. It has been expressed in the introductory chapters of countless textbooks in both the physical and the social sciences. Mach's positivism, on the other hand, simply questions the usefulness of inferred entities—what we would call intervening variables and hypothetical constructs.

Outside of personal ''he lived it'' observations, Skinner's knowledge of history remained sketchy (unlike his knowledge of literature and the arts). By my reading, he never really understood Sherrington and Pavlov, although a close reading reveals that a large fraction (I judge it almost a third) of *The Behavior of Organisms* (1938) was an attack on Pavlov's findings and interpretations. I was surprised to see such praise in the final pages for the work of Guttman and Kalish (1956). This was research on stimulus control, never a priority for Skinner. In any event, as Norm Guttman, my teacher and friend pointed out in a discussion of his research (1963), the hypotheses he helped to test were Hull's, not Skinner's.

Skinner also appeared to misunderstand John B.Watson, which is odd indeed, because they shared so many fundamental beliefs. Both viewed conditioning as changing the ''whole organism''; both pointed out that ''vocal'' was not the same as ''verbal''; and both saw thinking as ''everything a person does,'' including artistic ''communication.'' Yet, Skinner charged Watson with replacing mind inside the organism with habits inside the organism. Bizarrely, he included Watson as an example of those who look within for causes (p. 61)! Skinner must have known that this was not the case, just as he must have known that a very youthful Edward Thorndike only briefly treated satisfiers and annoyers as internal hedonic processes (p. 61), although overemphasizing that aspect of Thorndike's position was a misinterpretation made by Watson as well (e.g., 1930).

After the first few times I encountered them, I stopped counting Skinner's references to things ''being reinforcing,'' and to someone finding something ''especially reinforcing.'' These frequent appeals to hedonism comprise a bad habit that he had for a long time, but his remarks on page 83 were almost beyond endurance! Anyone who wants to criticize Skinner as a hedonist at bottom need look no further (but I shall not quote it; potential critics must see for themselves). In fairness, I am sure that although Skinner might hold that reinforcers are what make us ''feel good,'' he would hold that they are effective whether we feel good, bad, or unaware. The contact with a pencil that reinforces my reaching for it is not really all that pleasant (his 1938 example).

In Conclusion

What a wonderful life B. F. Skinner had. He retired before he turned 60 and lived to be 86, while continuing his work to within a week of his death. (I was sent an original of the photograph taken while he gave his last speech, and he looked fine.) He could impress philosophers who knew nothing of his fame in animal conditioning research (Steinar Kvale, personal communication), and he inspired researchers in hundreds of laboratories around the world. He may have failed to revolutionize education, as has everyone else, but thousands of behavior therapists in schools, universities, and hospitals throughout the world found and continue to find their inspiration in his teachings. He kept alive the practices of behaviorism, which are, he knew, the only ones that work. And, like Watson, he tried to remove the impediment of an ancient point of view, of which cognitive psychology is only a recent incarnation. Skinner described it well on page 84:

> For thousands of years philosophers have talked about the behavior of people with whom they have had no contact and about whose feelings or states of mind they could not ask. Instead they have disembodied mental events and discussed them quite apart from anyone in whom they occur.

Only in that way could ''thinking'' be abstracted and treated as different from everything that a person does and only in that way could questions like ''how do we explain cognition?'' be taken as a central issue.

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Received March 2, 1998
Final acceptance September 22, 1998