Fifteen introductory psychology textbooks are examined to determine the accuracy and completeness of their treatment of B. F. Skinner's approach to human activities commonly referred to as cognitive processes. Six of the textbooks ignore Skinner's contribution to the study of cognitive variables altogether, four deny that Skinner had anything to say about such processes and five textbooks acknowledge elements of Skinner's viewpoint, though the acknowledgments are incomplete and suffer from inaccuracies. Discussion encourages textbook writers and publishers to present a more accurate and complete picture of the discipline of psychology for the introductory student.

His work spawned a division of the APA (Division 25, Experimental Analysis of Behavior); an independent professional organization (the Association for Behavior Analysis) with more than 2,200 members; two private foundations dedicated to the advancement of behavioral psychology; and a host of journals—at least 23 by one count... Among the personal accolades bestowed... that reflect the impact of his work are 30-odd honorary degrees from colleges and universities around the world, consistent ranking by psychologists as among the most important thinkers in both contemporary psychology and in the history of psychology. (Lattal, 1992, p. 1269)

Thus is summarized the depth of the influence in psychology of the late B. F. Skinner. Skinner's breadth is measured by psychologists in the United States—both recognized historians of psychology and nonhistorians alike—who acknowledge Skinner as the leading figure in the discipline. In addition, these same psychologists judge his contributions as the most important event of post-World War II developments in psychology (Gilgen, 1982).

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Skinner's work embraced the whole of psychology, beginning with a methodology that defined a subject matter for psychology (behavior) and provided a means by which to examine systematically the lawful relations that might exist between that subject matter and aspects of the environment. His investigations led to discoveries of such lawfulness and resulting statements of basic behavioral principles including the most basic statement, the Law of Effect (behavior is a function of its consequences). Other principles identified the strengthening and weakening effects that environmental consequences have on behavior (reinforcement and punishment) and the significance that stimuli antecedent to behavior come to have when behavior is reinforced or punished in their presence (stimulus control). According to Skinner, human behavior is not a simple machine-like product of a stimulus, but is something dynamic, changing and in flux, as the environment is in flux. And behavior is seen to be active, that is, behavior acts on the environment. The environment in turn acts back on the behavior and on the behaver as well: Both are changed as a result of this reciprocal behavior-environment interchange (Skinner, 1953).

Furthermore, Skinner's radical behaviorism embraced both public behavior and the private parts of our experience, those psychological activities that are not yet accessible by empirical observation. A quick reading of the table of contents of books written by Skinner shows an examination of topics which are close to the marrow of both academic and popular psychology including thinking, perceiving, the self, feeling and emotion, and knowing (Skinner, 1953, 1957, 1968, 1969, 1974, 1989). These activities, typically referred to as cognitive processes, were said by Skinner not to differ in essence from those behaviors open to public observation (Skinner, 1953):

We need not suppose that events which take place within an organism's skin have special properties . . . . A private event may be distinguished by its limited accessibility but not, so far as we know, by any special nature or structure. (p. 257)

Activities such as thinking, problem solving, and remembering are behaviors, and as such are subject to the same laws that account for the development of publicly observable behavior (Reese, 1986; Stemmer, 1992).

Unfortunately, distortions and misinterpretations of the principles and methodology of Skinner's radical behaviorism occurred throughout his life. Averaging 18 citations per year for the last 10 years, according to the Social Sciences Citation Index (1995), the most widely referenced misinterpretation is perhaps Noam Chomsky's (1959) review of Skinner's (1957) Verbal Behavior. Yet there is rarely, if ever, mention of Kenneth MacCorquodale's cogent critique of that very review. MacCorquodale (1970) correctly pointed out that Chomsky, lacking an understanding of Skinner's radical behaviorism, spent much of his time attacking theories
of drive reduction and S-R principles, both of which are unrelated to the functional analysis of verbal behavior proposed by Skinner. MacCorquodale further points out that, contrary to the mythology perpetrated in many textbooks, Chomsky did not prove or even demonstrate Skinner’s analysis to be faulty, “he merely asserted it” (MacCorquodale, 1970, p. 84). Other misunderstandings by writers outside of psychology can be found in Montague and Matson (1983), who, for example, wrote that Skinner regarded humans as “mechanical robots” (p. 80) and “ignored subjective experience entirely” (p. 78).

Within psychology one group of writers that needs to be addressed are scientists well-schooled in the behavioral perspective who express sincere differences of thought with Skinner’s radical behaviorism with respect to cognitive processes. For example, Herrnstein (1977) wrote that empirical findings contrary to the law of effect could be accounted for by factors that Skinner rejected or neglected citing motivational drives in the first case and the “shifting hedonic values of the response forms of the species studied . . . [i.e., considering] behavior itself a potent source of reinforcing stimuli” (p. 601) in the second. More recently, Mahoney (1989) argued that the “apparent decline of radical behaviorism” (p. 1372) was due to a continued adherence to the philosophical standards of positivism, operationalism, and Newtonian “billiard ball” determinism long since cast off by their originators.

None of these criticisms have gone unanswered, however. Skinner (1977) replied to Herrnstein with an examination of the errors of fact and logic that had led to Herrnstein’s conclusion. A similar dissection of Mahoney’s argument was conducted by Catania (1991), who ended his critique as follows:

Darwin wrote: “Great is the power of steady misrepresentation; but the history of science shows that fortunately this power does not long endure” (Darwin, 1872/1962, p. 421). Surely you will help to confirm his statement by getting your characterizations of radical behaviorism and behavior analysis right in the future and by making every endeavor to avoid the misrepresentations that were evident in your paper. (p. 68)

For those of us teaching, more significant are those writers whose distortions of B. F. Skinner’s ideas find their way into psychology textbooks. Todd and Morris (1983) evaluated introductory psychology textbooks as well as textbooks in social, cognitive, personality, and developmental psychology. They documented a variety of misconceptions including (a) a near-exclusive focus on nonhuman animals, (b) a rejection of phylogenetic contributions to behavior, (c) the absence of activity occurring inside the skin, (d) a simplistic view of language development, and (e) the limited applicability of behavioral principles. Todd and Morris (1992) continue to chronicle the “steady misrepresentation” of Skinner’s radical behaviorism, examining how academic folklore has become the medium which reproduces misconceptions from one generation of scientists to the next.
Our research focuses on recent introductory psychology texts to determine if they present a more informed view of Skinner's radical behaviorism with regard to the topics of thinking, perceiving, and so forth, that is, activities commonly termed cognitive processes or what Skinner (1953) called activity occurring inside the skin. The general question we wanted to answer was whether and how well Skinner's radical behaviorist approach was presented in introductory psychology textbooks. Introductory psychology textbooks were selected because there is consensus among authors of these texts that their purpose is to present in some depth the dominant theories of the field and the broad range of methods and facts on which these theories are based (e.g., Carlson, 1993; Rathus, 1993; Smith, 1993). Divergences among current theories and issues arising out of such divergences need to be presented so that students can see psychology as a science and a discipline in development. In addition, students' critical thinking skills will presumably be fostered by an examination of differing psychological theories. Comparing differing theories highlights, among other things, differing assumptions, strengths and weaknesses in logical analysis, and provides practice in drawing different conclusions from the same data (cf. Browne & Keeley, 1994).

Introductory psychology texts regularly include a consideration of Skinner's impact on psychology, particularly in the learning chapter. The chapter on learning typically concludes, however, with an examination of topics that purport to show the limitations of his radical behaviorism with respect to human behavior. In particular, the student will be presented with the assertion that cognitive events are necessary to explain such phenomena as insight and latent learning. Radical behaviorism is said not to be able to account for such observations. Yet an adequate critique would need to present first what it was that Skinner and other radical behaviorists had in fact written about these and other activities that fall under the general heading of cognitive processes.

To assess the adequacy of the presentation of Skinner's treatment of cognitive processes by authors of introductory psychology textbooks, we asked three specific questions: First, did the text acknowledge that Skinner and radical behaviorism had something to say about these cognitive activities? If so, and secondly, did the acknowledgment include the basic elements of Skinner's analysis of these cognitive activities? The third question asked about the completeness and accuracy of the presentation.

We believe that an adequate examination of Skinner's writings would embrace the following three basic elements:

1. Inner activities are behaviors. Activities such as thinking, problem solving, feeling, and the self do not differ in principle from public human activities such as driving a car, talking, greeting another person, and so forth. That is, psychological activities occurring inside the privacy of one's skin are behaviors.
2. **The nature of inner behavior.** Psychological activities occurring inside the skin are viewed as either phylogenetic or ontogenetic in nature. That is, some of them will be *wired in* to the individual through the evolution of the species while others will be acquired during the person's lifetime. Those phylogenetic responses that are associated with the autonomic nervous system (e.g., sweaty palms, racing heart, contracting stomach and upper back muscles) can be elicited by particular environmental stimuli without any previous experience. Such responses are typically (but not exclusively) respondents and come to be elicited by new parts of the environment through classical conditioning.

Yet so much of what occurs inside the skin is not wired in, but has been acquired in one's lifetime along with behaviors that are subject to empirical observation. In either case, the radical behaviorist would view these as behaviors developed, maintained, and made more or less probable by contingent relations with the environment. For example, children first come to talk out loud and later they come to talk inside their own heads (privately). The whispering and silent mouthing of words encouraged by parents and teachers are likely steps along the way to the talking that goes on inside one's head. A talking environment is necessary for the child to talk out loud and privately—talking people who provide models for the child to imitate, who occasionally shape words out of the child's vocalizations, and who respond to the child's talking. The process unfolds by means of the adult's talking in response to the child's talking and later praising more specifically when the child is talking privately and/or when there is a product of such private talk, as when the child has completed a sheet of arithmetic problems or written the answers to questions over a passage just read.

3. **The role of the environment.** The relation between these private activities and the environment is a critical dimension of Skinner's viewpoint. As the learning chapter in introductory psychology texts makes clear, learning is a relatively permanent change in behavior that is a function of experience. *Experience* translates into lawful and changing relations between respondents and operants and the environment through their respective conditioning processes (classical and/or operant conditioning). What is crucial here is that for either respondents or operants, the environment is a significant, if not the significant, determining variable.

Similarly, a significant determining variable for thinking and other cognitive processes is the environment. Where those behaviors are operants occurring inside the skin, they are prompted and consequated by the environment, particularly the social environment. We prompt children to think, to talk to themselves, to perform arithmetic operations silently, to solve
problems in their heads, and so on. To the degree that the teacher or parent is an effective thinker and can do publicly what she or he does privately, the teacher or parent can be an effective model for the youngster learning to think. In addition, when the adult provides consequences (for instance, by telling the child “What a neat solution to that problem!”) for the child’s public accompaniments of private activity, then both the public and the private activity are strengthened for the future, that is, they are reinforced (Moore, 1995; Skinner, 1969, 1974).

The questions we used for our evaluation of the textbook presentations were as follows: (a) Did the textbook acknowledge Skinner’s treatment of cognitive activities such as thinking and problem solving? (b) If so, was there some description of the behavioral treatment of cognitive activities? and (c) How complete and accurate was the description?

Method

Examination of the Textbooks

We examined 15 introductory textbooks that had been sent to us during the late fall of 1992 and spring of 1993 (see Table 1). We read through each index to identify page numbers for any references to behaviorism, radical behaviorism, learning and cognition, and behaviorism and consciousness. In addition, we went to the author index for page references to B. F. Skinner.

Table 1

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We independently read relevant text sections, answering the questions described above. Following these independent evaluations we met to compare our conclusions and to resolve any differences.

Results of the Textbook Evaluations

Acknowledgment of the Radical Behavioral Viewpoint

Of the 15 textbooks examined, four of the authors (Atkinson, Atkinson, Smith, & Bem, 1993; Rubin, Peplau, & Salovey, 1993; Sdorow, 1993; Weiten, 1992) not only failed to acknowledge the treatment of cognitive events by Skinner, the authors actually denied that Skinner and
the radical behavioral viewpoint dealt with any private activities such as thinking or feeling. For example, Rubin et al. (1993) wrote:

Another reason for this emphasis was the insistence of psychologists of the behaviorist school, such as John B. Watson and B. F. Skinner, that only observable responses can be studied scientifically. Because we can’t observe the knowledge that may be inside people’s heads, these psychologists felt, it could not be seriously considered. (p. 127)

Atkinson et al. (1993) claimed that “by and large, behavioral psychologists have chosen not to conjecture about the mental processes that intervene between the stimulus and the response” (p. 10). Sdorow (1993) remarked “Despite Skinner’s efforts, the influence of the behavioral perspective has waned in recent years in the face of growing dissatisfaction with the lack of attention that strict behaviorists give to mental processes” (p. 17).

Six of the textbook authors ignored altogether the behavioral treatment of unobservable activity (Carlson, 1993; Feldman, 1992; Matlin, 1992; Myers, 1992; Pettijohn, 1992; Rathus, 1993). These six authors did not outright deny a behavioral treatment of cognitive events, but they made no mention of any radical behavioral examination of cognitive processes that can be found in the literature. Pettijohn (1992), for example, presents an accurate account of Skinner’s critique of cognitive psychology, but he does not acknowledge that Skinner himself had theoretically accounted for the topics of concern to cognitive psychologists.

Five textbooks acknowledge Skinner’s approach to activities occurring inside the skin (Allen & Santrock, 1993; Kalat, 1993; Shaver & Tarpy, 1993; Smith, 1993; Wade & Tavris, 1993). Allen and Santrock (1993) and Wade and Tavris (1993), for example, acknowledge such an approach in different ways. Allen and Santrock correctly note that Skinnerians “do not deny the existence of thinking processes” (p. 140). Wade and Tavris attempt to present a quite balanced account of the behavioral viewpoint. Their effort begins in Chapter 1 with a challenge to the common misconceptions people hold about behaviorism (Wade & Tavris, 1993):

Critics of behaviorism sometimes accuse behaviorists of denying that ideas and thoughts exist—of believing “that human beings do not think or ponder or worry, but instead only think that they do” (C. Sherif, 1979), but this is a misconception . . . . It’s true that Watson wanted to eliminate thoughts, emotions, and visual images as topics of psychological study, but as we will see in Chapter 6, Skinner held that private events could be studied, so long as they were treated as types of behavior. Verbal reports, said Skinner, could provide imperfect clues to these events. Where Skinner and other behaviorists parted company with
nonbehaviorists was in their insistence that mental events could not explain behavior. For behaviorists, thoughts and feelings were simply behaviors to be explained. (p. 14)

Completeness and Accuracy of the Presentation

Unfortunately, none of the textbooks evaluated presented a complete picture, as defined above, of B. F. Skinner's account of cognitive processes. Allen and Santrock (1993) affirm the radical behaviorist's belief in thinking processes, but they claim incorrectly that for Skinner "no room is given to the possibility that cognitive factors, such as memory, thinking, planning, or expectations, might be important in the learning process" (p. 140). The reader new to the field of psychology does not know just how behaviorists view thinking, memory, planning, and so forth, nor is the student given any information regarding the behavioral view of the relationship between such thinking processes and the learning process.

In Wade and Tavris (1993), the idea that cognitive activities need themselves to be explained disappears by Chapter 6. The way in which the radical behaviorist might indeed account for these activities is absent. For example, in their discussion of delayed performance (latent learning), observational learning, and insight learning, Wade and Tavris acknowledge a behaviorist viewpoint; however, with the exception of insight, they are unable to demonstrate how that viewpoint can account for the observations presented. For example, the section dealing with observational learning reflects neither the definition of learning with which the authors begin the chapter, nor the capacity of behavioral principles to account for the behaviors observed. The Bandura, Ross, and Ross (1963) study cited by Wade and Tavris is a classic study in which children were first exposed to aggressive models and then to "bobo" dolls. The fact that these children then displayed significantly more aggressive behavior than children not exposed to aggressive models is used to show that Skinner's behavioral principles are not sufficient to account for the aggressive behaviors of the children. Rather, cognitive intervening variables are said to be required. Absent is the analysis that the children were not acquiring aggressive behavior, but were in a situation where the occurrence of such behavior, already part of the children's repertoire, was made more or less likely. Such a situation could readily be accounted for by the behavioral principles of stimulus control (Baer & Sherman, 1964; Poulson & Kymissis, 1988).

Wade and Tavris's discussion of insight is devoted almost entirely to the imaginative work of the radical behaviorist Robert Epstein and his colleagues (Epstein, Kirshnit, Lanza, & Rubin, 1984). Although correctly concluding that "to behaviorists, insight is the result of learning" (p. 233), Wade and Tavris ultimately minimize the implications of the results of Epstein et al. (1984) when they write "in truth, psychologists do not yet have much insight into how insight operates" (p. 233). The reader is left to conclude that a well-designed study with valid results offers little or no
insight into human behavior and, in particular, a behavioral approach has little to offer.

**Accuracy of the Presentation**

Not one of the textbooks presents a completely accurate picture of Skinner's approach to cognitive processes. Elements of Skinner's position can be found in some of the textbooks, but in a way that isolates them from any context of behavioral theory. For example, Kalat correctly illustrated for the reader a pitfall in the use of dispositional (internal) explanations for behavior (Kalat, 1993):

We commonly “explain” people's behavior in terms of their motivations, or emotions, or mental state. However, behaviorists insist that such explanations explain nothing:

Q: Why did she yell at that man?
A: She yelled because she was angry.
Q: How do you know she was angry?
A: We can tell she was angry because she was yelling.

(p. 278)

This brief statement accurately reflects Skinner's analysis and shows the circularity of such mentalistic explanations. The problem is that presentations such as these are far from complete. Perhaps more confusing to the reader is what frequently follows these brief passages. Kalat (1993), for example, wrote: “Indeed, some [behaviorists] criticize Skinner's extreme focus on description and apparent lack of interest in the underlying processes that produce behavior” (p. 278). The reader is left with two erroneous ideas: (1) that processes such as reinforcement and punishment do not underlie behavior; and (2) Skinner had no interest in psychological activities that occur inside a person's skin.

**Discussion**

In that the purpose of the introductory psychology text is to present to the reader new to the discipline of psychology a complete and accurate picture of the main elements of that discipline, the textbooks we reviewed are unsuccessful with regard to B. F. Skinner's view of cognitive processes. Skinner's viewpoint is either said not to exist, is distorted in a brief acknowledgment, or is simply ignored. The result is that the student receives an incomplete or distorted picture of the discipline and one of its key thinkers.

One could argue that such distortions will be clarified as the psychology major progresses through more advanced psychology courses. The research of DeBell and Harless (1992) suggests that this is not the case. Advanced undergraduate and graduate psychology students in their study were more likely to believe distortions of the radical behavioral viewpoint than were first-quarter freshmen. And one
cannot argue in this fashion with regard to the larger numbers of students who are not psychology majors and for whom the introductory psychology text will be their principal source of information about psychology. It is important, therefore, that authors and publishers accurately and completely present the ideas of the psychologist ranked recently by psychology department chairs as the most important historic figure in the discipline (Korn, Davis, & Davis, 1991).

References


