An Orderly Arrangement of Well-Known Facts: Retrospective Review of B. F. Skinner's *Verbal Behavior*[1]

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During the Spring semester of 1957, I and a half dozen or so other Columbia College undergraduates met weekly for a seminar jointly conducted by three faculty members: Ralph F. Hefferline, Fred S. Keller, and W. N. Schoenfeld. During the first several weeks, we spent our time on a mimeographed version of B. F. Skinner's William James lectures, which he had delivered at Harvard University in 1947. Each class began with a thorough summary of the current material by one of the faculty members. Typically they all wore green visors, which kept us from knowing whether any of them might be dozing as one or another occasionally slumped down with his head bowed. We finished with the lectures somewhere midway through the course, when the book based on the lectures finally became available. The book, of course, was *Verbal Behavior*, which had by then been awaited for roughly a decade. As we progressed through the published book we had the advantage of having read the earlier version, with which we compared it.

Speaking Engagements and Utter Disagreements

I went on to the Harvard Department of Psychology as a graduate student in the Fall of 1959, but the book played a small part, if any, in my formal course work there. Skinner's main interests had moved in other directions. We heard something about language from an MIT linguist named Noam Chomsky, who gave a colloquium at some point during that academic year. The colloquium was not about his review of *Verbal Behavior* (Chomsky, 1959), which appeared at about the same time and overshadowed other more favorable reviews (Knapp, 1992). I spent most of my effort in those days on basic behavior processes and didn't come back to Skinner's book until some years after, once I had established my own laboratory and done some teaching (though I did devote some time to Chomsky: e.g., Catania, 1972).

Since then I've used Skinner's book in courses of my own perhaps a dozen times. Along the way came MacCorquodale's (1970) belated reply to Chomsky, which argued that the book that Chomsky had reviewed wasn't really Skinner's (the reply had been rejected by *Language*, the journal that had published Chomsky's review); one part of MacCorquodale's case was that Chomsky's criticisms were relevant to the learning theories of Clark L. Hull rather than to Skinner's. Also came the comparison of Skinner's work with Wittgenstein's treatment of language games by Day (1969), its extension to poetry by Smith (1968), some passing comments on Chomsky by Skinner (1972), the occasional reassessment of Skinner's book and Chomsky's review (e.g., Andresen,

1990), a renewed interest in the role of learning in the acquisition of language by children (e.g., Bates & Elman, 1996; Hart & Risley, 1995; Horne & Lowe, 1996; Moerk, 1992), and a growing body of experimental work on verbal behavior (especially in the *Journal of the Experimental Analysis of Behavior* and a relatively new journal, *Analysis of Verbal Behavior*).

Most recently, at the start of the Spring semester of 1997 and forty years almost to the day since I had attended the first meeting of the seminar that introduced me to *Verbal Behavior*, I walked into an undergraduate class with a copy of the reprinted edition and began talking about it. I knew that it would be less accessible to these students than a more contemporary text, and also that I could hardly manage with thirty-odd of them what three faculty members had accomplished with half a dozen or so. Furthermore, when I took my course we'd all had Keller's introductory course and had read Keller and Schoenfeld's (1950) book; most if not all of us had also read Skinner's (1938) *Behavior of Organisms*. Not so for my students: Some were psychology majors with a background of several courses and even one or two of mine, but others had taken only introductory psychology. But I went ahead anyway. In the evaluations that my students submitted anonymously near the end of the course, most said that their textbook (and the course) was hard, but most also said that they valued what they'd learned

Talking Points

I learned from the course too. For example, it reminded me of what you should know before reading *Verbal Behavior*, and what you should watch out for. The writing is dated in style, and though Skinner became diligent about expunging such usages in his later writings, by today's standards it's often sexist. Consider the very first sentence: "Men act upon the world, and change it, and are changed in turn by the consequences of their action" (p. 1).

Skinner appealed to just a few basic concepts: e.g., reinforcement, discriminative stimulus, motivation, aversive control. His terms provided a taxonomy of function rather than structure (for example, they identified verbal classes by their effects rather than by their topographies). He applied this modest apparatus to a broad range of phenomena, and pointed out early that the book would be interpretive rather than experimental:

> The emphasis is upon an orderly arrangement of well-known facts, in accordance with a formulation of behavior derived from an experimental analysis of a more rigorous sort. The present extension to verbal behavior is thus an exercise in interpretation rather than a quantitative extrapolation of rigorous experimental results (p. 11).

Because the basic concepts were first instantiated in the laboratory, it's too easy to view them narrowly. But reinforcement in Skinner's hands was much more than presenting a bit of food or some other tangible item. The opportunity to enter another room can reinforce the opening of a door, and a smile or a nod can reinforce something said. Any consequences of behavior that keep the behavior going count as reinforcers.

When Skinner considered how one word may change the likelihood of saying another in word association and related processes, he wrote:

> The intraverbal relations in any adult repertoire are the result of hundreds of thousands of reinforcements under a great variety of inconsistent and often conflicting contingencies. (p. 74).

He could hardly have been writing about M&M's. An appropriate response to something said is usually sufficient, and most of us talk enough to generate those thousands upon thousands of instances easily.

The roles of motivation and aversive control (avoidance and punishment) were straightforward enough. Those of discriminative stimuli in the three-term contingency were crucial (the three-term contingency was the theoretical innovation that separated Skinner from stimulus-response theorists). In a three-term contingency, a discriminative stimulus sets the occasion on which a response with some probability produces consequences (as when the consequences of stepping on the gas pedal depend on whether a traffic light is green or red). The three-term contingency does much of the work in *Verbal Behavior* (e.g., as when some situation sets the occasion for saying something that someone else can act on).

The superficial simplicity of Skinner's apparatus can trip the reader up. He meant it when he said that a tact (essentially, his term for discriminated responding as it occurs in verbal behavior) must occur in the presence of the tacted stimulus. Saying "apple" on seeing an apple is a tact, but saying it on having seen one an hour ago isn't (the student of memory who treats a direct response to some event as different from an encoding of the event and its later recall will appreciate the distinction). The term tact must not be read as if it implied naming or reference or some other established relation.

Similar cautions hold for other subtleties and surprises. For example, the emphasis on the production of verbal behavior means that there is much about the behavior of the speaker and relatively little about the behavior of the listener (but see Skinner, 1989); there are units of verbal behavior, but they are of no particular size (in vocal verbal behavior, they can range from phonemes to entire texts, such as Hamlet's soliloquy); engaging in textual behavior, or vocal verbal responding that has point-to-point correspondences with written verbal stimuli, is not reading or is at best only a small component of reading; and verbal behavior is not defined by modality (it can be written as well as spoken, and not all vocal behavior need be verbal). When you read Skinner, you must take him at his word.

The feature no doubt hardest to come to terms with is Skinner's consistent treatment of words as behavior rather than as a vehicles for something else. The pervasive metaphor in everyday language is of words as carriers of thoughts or ideas or meanings (the conduit metaphor: cf. Lakoff & Johnson, 1980), but spoken or written words don't contain other entities (where would those entities be when nobody is listening to the words or reading them?). Even after Skinner has persuaded the reader to question the status of thoughts or ideas or meanings, it's counterintuitive to treat words this way. It isn't easy to talk about sentences without referring to them as containing ideas, though Skinner's account shows that doing so has potent consequences.

Telling Arguments

So far I've mainly addressed some of problems and potential pitfalls. But it's more important to ask what you should expect to get out of the book once you get past them. You mustn't expect to find a lot about grammar. Though Skinner occasionally mentioned it, he was much more concerned with the functions of verbal behavior than he was with the structure of particular languages or of language in general:

> As Epictetus said, "When you are to write to your friend, grammar will tell you how to write; but whether you are to write to your friend at all, grammar will not tell you" (p. 44).

Certainly Skinner never attributed grammatical structure to sequential dependencies arising from stimulus-response chains. He was well aware of Lashley's (1951) arguments that behavior sequences could become integrated units in their own right. Skinner's taxonomy of verbal behavior included verbal responses attributable to chaining as only one of several distinct functional classes of verbal behavior (his verbal taxonomy might be called modular). He labeled these responses intraverbals (e.g., completing a line of poetry given the first few words, responding "four" to "two plus two"), distinguishing them from other verbal classes that came about in other ways.

One of the major contributions of *Verbal Behavior* is its elaboration of multiple causation, a ubiquitous property not just of verbal behavior but of behavior in general. A particular verbal utterance is likely to be determined jointly by discriminative stimuli, prior verbal responses, possible reinforcing or aversive consequences, the condition of the speaker, and the nature of the listener. Selecting from these categories, Skinner conducted the reader on an entertaining tour through literature and puns and word games, demonstrating how much richer an analysis of causation can be than is suggested by other more linear presentations.

Expect to find other fascinating topics, such as the ways in which novel verbal behavior can emerge from interactions of basic processes (cf. Catania & Cerutti, 1986), or clues to how, in echoic behavior, articulations can be shaped by their vocal consequences (a sort of ontogenic analogue of natural selection: cf. Catania, 1994; Risley, 1977). But above all this book is about knowledge, and especially self-knowledge: How do we come to know ourselves? *Verbal Behavior* addresses these issues in two complementary contexts: one is an account of the origins of an individual's vocabulary of private events (as in reports of pain or other feelings); the other is a treatment of what Skinner called autoclitic processes, in which some features of verbal behavior depend on how well speakers discriminate other features of their own verbal behavior (as when you modify what you've said with a negation or with a statement of your degree of confidence in it).

Public Speaking (and Private Events)

With regard to private events, the issue is not their existence; rather, it's how we learn to talk about them. Skinner (1945) had presented his arguments on private events

earlier, but that classic paper was burdened with his renunciation of operationism; the arguments are more lucid in *Verbal Behavior*. The problem is how a verbal community can create and maintain verbal responses when it doesn't have access to the relevant stimuli. Parents can teach children color names because they can see the colors that the child sees and so can respond appropriately to the child's correct and incorrect color naming. With private events, however, the vocabulary can be taught only through extension from events to which the verbal community has access (e.g., parents can only teach a child words for pain because they have access to overt manifestations such as the event that caused injury or the child's crying; they can't feel the child's pain).

We ordinarily think of private events such as our feelings and thoughts as ones to which we have privileged access. But in the phenomenon of referred pain, a bad tooth in the lower jaw may be reported as a toothache in the upper jaw; in this case, the dentist is a better judge than the patient of where the pain really is. We learned the relevant words from others, and all they had access to in teaching them to us were the public correlates. If we can be mistaken even about the location of a toothache, what assurance do we have that our other reports of our private events are reliable?

Skinner outlined the "four ways in which a reinforcing community with no access to a private stimulus may generate verbal behavior with respect to it" (pp. 131). The verbal community may differentially respond to reports of private events based on (1) common public accompaniments, (2) collateral behavior, (3) shared properties of public and private events, as in metaphorical extension, and (4) generalization from public to private behavior along the dimension of response magnitude. For example, a child's report of pain (1) may follow something public that produced it (e.g., a cut); (2) it may also be accompanied by behavior (e.g., crying). Furthermore, (3) the vocabulary of pain derives from properties of public objects that produce kinds of pain (e.g., sharp edges produce sharp pains). Finally, (4) a report of talking to oneself can generalize from cases in which the talking is overt to those in which it's no longer of public magnitude.

In more than half a century, no other plausible alternatives have been added to Skinner's list. The list gives force to Skinner's conclusions: "It is only through the gradual growth of a verbal community that the individual becomes 'conscious'" (p. 140), and "It is because our behavior is important to others that it eventually becomes important to us" (p. 314).

But another part of the account is that important features of verbal behavior depend on whether individuals can discriminate properties of their own behavior. You can't say whether you are pleased or sorry about something you're about to say unless you know what you'll be saying. *Verbal Behavior* deals with such phenomena in terms of hierarchical processes that are called autoclitic and that modify the effects of other verbal behavior on the listener (as in responding differently to a message depending on whether the speaker begins with "I'm sure that..." or "I'm not sure that..."). Again, the surprise is in how far the argument can be taken. Even words like is or not typically have autoclitic function.

The analysis of autoclitic processes is an issue of behavior and not logic. Saying "This is so" or "That's probable" or "It can't be" is verbal behavior with respect to

other verbal behavior. To reduce such sentences to symbolic logic or the mathematics of probability may be useful in solving problems of logic or mathematics, but the reduction is irrelevant to the discriminations of our own behavior that are prerequisites for our verbal behavior. We owe those discriminations to the verbal community, but our verbal behavior would also be impoverished without them; in fact, a large part of it would be impossible.

Enough Said

I managed to cover the topics above, and more, in the course I taught that Spring. Late in the course, our discussion moved to the word understanding: its common usages, its metaphorical origins, and the different ways in which it functioned for different students. For some, you understand something if it seems somewhat familiar and you can say a little about it; for others, it doesn't count as understanding unless you're confident you can answer virtually any question on the topic that might come up in an exam. For some, you can understand something but not be able to put it into words; for others, understanding and adequate verbal behavior are inseparable. We talked about the different histories that might have shaped these different usages and some of their possible consequences (one is that different judgments of when a student has understood something affect the student's judgment of when it's okay to stop studying it). The analysis of understanding was a good example of the shaping of verbal practices by different verbal communities and of their practical implications. Later on, some of the students told me that they'd never again be able to think about words and their understanding of them the way they used to. For them at least, I had chosen the right textbook.

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