

## Understanding and the Listener: Conflicting Views

Ted Schoneberger  
California State University, Stanislaus

Skinner's (1957, 1974) distinction between three senses of the term *understanding* is presented. For Skinner, a listener understands if she (a) can repeat back to the speaker what he has said; or (b) can respond appropriately; or (c) knows about the controlling variables. Next, a critique of Skinner's view by Parrott (1984; now L.J. Hayes) is presented. Parrott criticizes the first sense of understanding for simplifying a complex activity; the second for equating understanding with reinforcement mediation; and the third for defining understanding as potential behavior. Next, Parrott's two alternative views are presented. Understanding is (a) having perceptual responses of things when only their "names" are present, and (b) organizing objects and words into relational networks. Lastly, Skinner's and Parrott's views on understanding are evaluated, and Parrott's views are critiqued.

In *Verbal Behavior* Skinner (1957) argued that verbal stimuli evoke specific responses in the listener as a result of the listener's special conditioning history (e.g., pp. 357-366). In his review of Skinner's book, Chomsky (1959/80) asserted that Skinner's claim is false "if we use *conditioning* in its literal sense" (p. 57). However, if we extend *conditioning* to cover such processes as instructing or informing listeners, then Skinner's claim is (Chomsky admits) true, but only in a trivial sense. According to Chomsky, extending the meaning of the term *conditioning* to cover such processes fails to provide any new knowledge about them, while at the same time depriving the term "of its relatively clear and objective character" (p. 57).

More recently, Skinner's account of the behavior of the listener has received some critical commentary from individuals sympathetic to a behavior-analytic approach to verbal behavior (e.g., S. C. Hayes & L. J. Hayes, 1989; Hineline, 1983; Parrott, 1984; Place, 1985). Exemplifying the central thrust of this recent criticism, Place (1985) complained that "Skinner does not adequately account for the way in which the

response of the listener is controlled by the verbal stimuli provided by the speaker's utterance . . ." (p. 46). The current paper discusses whether or not certain parts of this critical commentary are justified.

Much of the criticism derives from attempts by behavior analysts to achieve consensus on the conceptual analysis of rule-governed behavior. Consider, for example, the debate over how to classify rules within the behavior-analytic lexicon. Like Skinner (1966/69), some (e.g., Galizio, 1979; Zuriff, 1985; Vaughan, 1987) have classified rules as discriminative stimuli; however, others (e.g., Malone, 1987; Schlinger & Blakely, 1987) have maintained that rules are *not* discriminative stimuli—or, at least, not "typical" discriminative stimuli (S. C. Hayes, 1986)—when their control of behavior is the product of *indirect* training. For instance, a spoken rule which, upon first hearing, controls a listener's behavior is *not* (on this latter view) a discriminative stimulus because the rule and the behavior have not participated in the same three term contingency. If such verbal control is not a type of discriminative control, then what type of control is it? Is a special name needed with an accompanying special analysis? Expressed in ordinary language terms, these questions may be recast as a single question: What is verbal understanding?

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Borrowing from Wittgenstein (1953, 1958), Deitz and Arrington (1983) pointed out that a question of the form "What is x?" is ambiguous and hence misleading. The person asking the question might be asking either (a) for the conditions under which one correctly classifies something as "x," or (b) for more information about the thing called "x." Thus, the question "What is verbal understanding?" might be asking for the conditions under which a listener is correctly classified as understanding a speaker. On the other hand, it might be asking for additional information about the activity called understanding; for example, it might be asking for the causes and effects of understanding.

Despite the fact that both questions can be asked, Deitz and Arrington (1983) pointed out that the first question takes priority over the second. One must first know what counts as an instance of verbal understanding before one can determine additional information about it. Thus, behavior analysts first need to obtain an adequate answer to the first question. Specifically, the task of developing an adequate explanation of verbal control can be advanced by first determining under what conditions (i.e., with what criteria) can one correctly classify any given behavior/environment interaction as an instance of verbal understanding.

## WHAT IS VERBAL UNDERSTANDING?

### *Skinner's View*

Under what conditions is a listener correctly classified as *understanding* a speaker? In providing an answer to Deitz and Arrington's (1983) priority question, Skinner (1957, pp. 277-280, 357-367; 1974, pp. 141-147) focused on three separate (though not mutually exclusive) senses of the term *understanding*. More specifically, Skinner identified three different criteria to be used in ascribing understanding to a listener. First, in what he called a "trivial sense," a listener understands a verbal stimulus if she is "able to say the same thing" (1957, p. 277), i.e., if she can "repeat it correctly" (1974, p. 141). For example, if a

father tells his teenage daughter to turn down the stereo and she does not comply, the father may follow up by asking "Did you understand me?" By answering "Yes, you said 'turn down the stereo,'" the daughter demonstrates what shall hereafter be called an *echoic* understanding of the father's command.

In Skinner's second sense of the term, a listener *understands* a speaker "to the extent that he tends to act appropriately" (Skinner, 1957, p. 277). There are three versions of this sense of the term. In version A, a listener who blushes when a speaker mentions a social error is acting appropriately "to the extent that his reaction was appropriate to the original event" (p. 277). Thus, a listener who blushes when told about a spilled drink thereby demonstrates understanding because blushing is an appropriate response to the event being mentioned (i.e., the spilled drink). In version B, a listener demonstrates understanding to the extent that she behaves appropriately by taking effective action. For example, a listener shows that she understands the verbal request "Close the window" by complying with the request.

In the two versions (A and B) of Skinner's second sense of understanding so far reviewed—i.e., blushing at the mention of a spilled drink and closing the window when asked—the understanding responses occur soon after exposure to the verbal stimulus. However, responding need not be immediate to demonstrate the listener's understanding. In version C of Skinner's second sense of verbal understanding, when a speaker *instructs* a listener, the listener understands "to the extent that his future behavior shows an appropriate change" (Skinner, 1957, p. 277). For example, students who are told on Monday to bring their books to class next Friday demonstrate their understanding by responding appropriately days later. All three versions of Skinner's second sense of understanding shall hereafter be called, collectively, *appropriate-response* understanding.

Finally, in Skinner's third sense, to *understand* a speaker is to understand why

the speaker says what he does. Elaborating, Skinner stated, "To understand why, I must know something about the controlling variables, about the circumstances under which I should have said it myself" (Skinner, 1974, p. 141). According to Skinner (1974), we "know about" electricity, for example, not only in the sense of having had "contact" with it, but also in the sense of "possessing various forms of behavior" relating to electricity. "We know about electricity if we can work successfully, verbally or otherwise, with electrical things" (p. 138). For example, a listener understands a speaker when he says "The fuse is blown" if she knows under what conditions she herself would make this statement. In this sense of understanding, "We understand anything which we ourselves say with respect to the same state of affairs" (Skinner, 1957, p. 278). This third sense of understanding shall hereafter be called *understanding-as-knowing*.

In summary, Skinner (1957, 1974) proposed three different criteria for ascribing understanding to a listener. First, a listener demonstrates *echoic* understanding by being able to repeat the speaker's statement. Second, a listener demonstrates *appropriate-response* understanding by behaving in a manner appropriate to an object or event identified by the verbal stimulus (version A), or by taking successful action immediately (version B) or later (version C) with respect to a variable. Finally, in Skinner's third sense, *understanding-as-knowing*, a listener understands to the extent that she knows something about the variables controlling the speaker's behavior.

#### *Two Alternative Views*

*Understanding as Perceptual Responding.* Parrott (1984; now L. J. Hayes) proposed an alternative analysis of understanding by beginning with a critique of Skinner's three senses of the term. With respect to the first sense of the term, *echoic* understanding, Parrott found two problems. First, equating understanding with echoic behavior is not "conventional." For example, Parrott asserted that repeating a speaker's utter-

ance in a language with which one is not familiar "is not what is ordinarily meant by the term 'understanding'. . ." Second, by positing echoic behavior as an example of understanding Skinner is guilty of "reducing a complex phenomenon to a simpler one and then changing the meaning of the term to accommodate the simpler phenomenon" (p. 30).

Parrott (1984) also found two problems with Skinner's second sense of understanding, *appropriate-response* understanding. First, it mistakenly identifies understanding with mediating the reinforcement of the speaker's behavior. For example, it mistakenly identifies understanding the command "Close the door" with the act of actually closing it. Parrott's second problem with *appropriate-response* understanding is that it fails to differentiate lack of understanding from other situations in which a listener may fail to act appropriately. Identifying *understanding* a speaker with *reinforcing* a speaker's behavior suggests that if you fail to reinforce a speaker's behavior it means you lack understanding. But this is clearly not always the case. For example, a listener's failure to comply with a request to open the window may indicate, not a lack of understanding, but an unwillingness or inability to comply.

Parrott's critical analysis of Skinner's third sense of the term *understanding-as-knowing*, turns on what it means to "know about." Consider again Skinner's (1974, p. 138) contention that we "know about" electricity not only in the sense of having had "contact" with it, but also in the sense of "possessing various forms of behavior" relating to electricity. As Parrott conceptualized this view, *understanding-as-knowing* is a "construction, not an event" (Parrott, 1984, p. 32). To know something about the variables controlling the speaker's behavior is to be "able to respond" to those same variables. As such, Skinner viewed understanding in this sense as a repertoire of *potential* behavior.

Parrott characterized *understanding-as-knowing* as Skinner's most important form of understanding. Not only is it Skinner's most complex sense of the term (and there-

fore deserving special attention), it is also meant to serve (according to Parrott) as an extension and elaboration of the other two senses of understanding. Consider Skinner's analysis of echoic understanding. Quoting Parrott (1984), "Skinner does refine this analysis to suggest that something more than simple echoic responding may be involved (1957, pp. 277-280)" (p. 30). Indeed, in his discussion of echoic understanding, Skinner (1957) noted that a listener will affirm his understanding not only when he can repeat what the speaker has said but "probably . . . only when he can emit corresponding behavior such as might occur in the language in response to nonverbal or intraverbal stimuli" (pp. 277-278). In short, to talk of behavior that can be emitted is to talk of *potential* behavior, i.e., to talk of understanding-as-knowing.

In a like manner, Parrott argued that Skinner also refined appropriate-response understanding by subsuming it under the more general usage, understanding-as-knowing. For instance, consider Skinner's example of the listener who blushes at the mention of a social error (1957, p. 277). For Skinner, the listener understands in the sense that she behaves to the verbal stimulus as she would if she were to view the actual event. Thus, to say that she understands is to say what she *would* do; it is to characterize her understanding in terms of her potential behavior with respect to the original event. In Parrott's (1984) words, Skinner "is suggesting that these reactions *would* occur given an arrangement of conditions under which they *could* occur" (p. 32). Again, as potential behavior, appropriate-response understanding is a subtype of understanding-as-knowing.

Parrott's critique of Skinner's understanding-as-knowing was that relegating understanding to the status of being potential behavior suggests that understanding "is really nothing at all until it eventuates in some form of overt behavior" (p. 32). Further, given Parrott's argument that Skinner's other two senses of understanding are subtypes of this third sense of understanding, it follows that Parrott viewed all three senses of understanding

as not referring to any occurrent behavior except that of mediating the reinforcement of a speaker's behavior. This, of course, brings us back to one of Parrott's previous critical remarks; namely, that reinforcing a speaker's behavior by behaving appropriately is not the same as understanding a speaker. A listener can understand a speaker and yet not reinforce him. According to Parrott, Skinner's exegesis of verbal understanding does not identify any class of occurrent behaviors which constitute the *act* of understanding the speaker.

What then does it mean to *understand* a verbal stimulus? According to Parrott (1984),

Understanding is not a repertoire of potential behavior. It is an actual occurrence and one which proceeds and conditions subsequent actions, such as the mediation of reinforcement for a speaker's actions. Understanding, further, has no causal role in this sequence. The relationship between understanding and mediating reinforcement is merely temporal . . . (pp. 37-38)

Understanding what the speaker has said is seeing, hearing, touching, or otherwise reacting to actual things and events in the presence of stimulation supplied by their "names" alone. (p. 37)

For Parrott, to understand a speaker is to have a number of perceptual responses. Consider a speaker's request to "Pass the salt." What does it mean to say that the listener "understands" this request? According to Parrott (1987),

It means that upon hearing the word "salt," the listener engages in actions which have frequently occurred in conjunction with hearing this sound, e.g., perceptual activities such as "seeing" a salt-shaker, "tasting" salt, as well as vestigial motor reactions of various sorts. (p. 273)

In the passages just discussed, both Skinner and Parrott attempted an answer to the question "What is verbal understanding?" As previously noted, this question might be asking either (a) for the conditions under which one correctly classifies something as verbal understanding, or (b) for more information about the activity called "verbal understanding." In the passages previously cited, Skinner attempted to answer the first question. He sought to differentiate a few of the conditions under which, in ordinary discourse, one classifies behavior as demonstrating understanding.

To this end, Skinner identified some of the criteria used to attribute understanding to a listener. Parrott, however, criticized each of these criteria for failing to provide an answer to the first question. More specifically, Parrott's general criticism of Skinner is that he failed to adequately answer a specific version of the first question; namely, the question "What occurrent behaviors generally distinguish verbal understanding from non-understanding?"

Consider echoic understanding. Parrott criticized this sense of understanding on the grounds that it "is not what is ordinarily meant by the term 'understanding' . . ." (p. 30). Thus, according to Parrott, echoing a speaker's response is not an occurrent behavior which identifies typical instances verbal understanding. Skinner would not have quarreled with this. Indeed, he stated that echoic understanding is but a "trivial sense" of the term (1957, p. 277). Further, Parrott criticized Skinner's notion of echoic understanding for "reducing a complex phenomenon to a simpler one and then changing the meaning of the term to accommodate the simpler phenomenon" (Parrott, 1984, p. 30). But is this what Skinner did? Echoic understanding was *not* offered by Skinner (as Parrott alleged) as a replacement for all senses of the term understanding. Skinner identified the ability to repeat the speaker's words as but one criterion for attributing understanding.

Skinner's analysis of understanding is reminiscent of Wittgenstein's (1953, pp. 31-36; 1958, pp. 17-20) "family resemblance" approach to conceptual analysis. If one closely examines the faces of a family, one will notice that some members possess the family nose, some the family eyes, some the mouth, and some will have various combinations of these (and other) family features. Although there is no one identifying feature common to all members of the family, they nonetheless share a family resemblance.

Extending this analysis to verbal behavior, Wittgenstein maintained that one need only examine the individual instances of a general term to see that they have no single feature in common which serves to iden-

tify them as instances of the general term. In Wittgenstein's (1953) words:

Consider for example the proceedings that we call "games." I mean board-games, card-games, ball-games, Olympic games, and so on. What is common to them all? . . . if you look at them you will not see something that is common to all, but similarities, relationships . . . Are they all "amusing?" . . . is there always winning and losing, or competition between players? . . . In ball-games there is winning and losing; but when a child throws his ball at the wall and catches it again, this feature has disappeared. Look at the parts played by skill and luck; and at the difference between skill in chess and skill in tennis. Think now of the games like ring-a-ring-a-roses; here is the element of amusement, but how many other features have disappeared! And we can go through the many, many other groups of games in the same way; <we> can see how similarities crop up and disappear. (pp. 31e-32e)

As in Wittgenstein's analysis of games, Skinner's analysis of understanding focuses on discerning different criteria for correctly applying the term. He is not looking for a defining characteristic common to all its instances. Rather, in identifying, for example, echoic capability as a criterion of understanding, Skinner is simply identifying one of a variety of criteria which may be used to ascribe understanding to a listener.

Now consider Parrott's (1984) two objections to Skinner's analysis of appropriate-response understanding. Her first objection was that Skinner's notion of understanding in the sense of responding appropriately "does not contribute to an analysis of understanding as a distinct, contemporaneous segment of behavior." Instead, it identifies this event with another more obvious activity of the listener, namely reinforcement mediation" (p. 30). Is Parrott's interpretation of Skinner correct? Consider Skinner's (1974) words: "I have understood what a person says . . . if I respond appropriately" (p. 141). Contrary to Parrott's interpretation, Skinner did not *identify* understanding with reinforcement mediation; rather, he simply pointed out that, in ordinary discourse, the reinforcement mediational activity of appropriate responding is a *criterion* for ascribing understanding to a listener. Of course, sometimes the listener responds appropriately while lacking

understanding. Skinner's awareness of this fact is clearly revealed in the following humorous passage from Skinner's (1980) *Notebooks* entitled "How to Give Orders to a Baby":

Lisa, just a year old, picks up blocks, shells, and so on and puts them in any convenient receptacle. I took advantage of this when some friends came for cocktails. She tried to pull herself up on a small table and spilled a dish of cocktail tidbits on the floor. I put the dish on the ground and said, "You must pick them all up and put them in the dish." Which of course she did, as I knew she would. Had I not then explained, our visitors would have believed that this one-year-old was obeying a rather complex order. (p. 7)

In this example, Skinner displayed a recognition of the simple fact that a listener's apparent compliance with a verbal directive does not prove that the listener understood the verbal directive. Understanding a speaker and reinforcing the speaker's behavior are, for Skinner, *not* the same. Rather, the listener's act of reinforcing the speaker's behavior serves as reasonable (albeit not incontrovertible) grounds for attributing understanding to the listener. In this example, Skinner presumably did not attribute understanding to Lisa because of what he knew about her recent history. She had apparently not yet responded with sufficient sophistication to verbal stimuli to justify the attribution of appropriate-response understanding. Generally, a speaker attributes understanding to a listener based on appropriate responding when he either (a) has evidence that the listener has responded appropriately in the past to a variety of different verbal stimuli, or (b) infers such a history based upon other, less direct evidence. In short, a speaker attributes understanding to a listener when he judges the listener to be a competent member of his language community (Schoneberger, 1989).

Parrott's second objection to appropriate-response understanding is that it fails to distinguish between instances in which one does not respond appropriately because of a lack of understanding versus instances in which one fails to comply for other reasons. How, for example, do we distinguish the noncompliant child from the child who simply does not understand?

This distinction may be made in several ways. First, the noncompliant child is likely to be engaging in certain types of covert verbal behavior not characteristic of the uncomprehending child (e.g., saying covertly "No! I won't do it"). Second, there are a number of specific behaviors at higher probability available to the noncompliant child than to the child who doesn't understand. For example, if the speaker threatens aversive consequences the noncompliant child is more likely to comply (or protest loudly, etc.) than is the child who doesn't understand. Finally, the noncompliant child may be judged as understanding based on evidence (direct or indirect) lacking for the non-understanding child; namely, evidence that the noncompliant child is a competent member of the same language community as the speaker.

Finally, consider Parrott's objection to Skinner's third sense of understanding, understanding-as-knowing. For Parrott, this sense of understanding obscures the notion of understanding by committing it to the status of potential behavior. To understand in the sense of understanding-as-knowing "is really nothing at all until it eventuates in some form of overt behavior" (Parrott, 1984, p. 32), i.e., reinforcement mediation. For Parrott, however, understanding is an event separate from the event of reinforcing the speaker's behavior. To characterize it otherwise, as Skinner apparently does, is then (according to Parrott) to obscure its true nature. Thus, Parrott's criticism of understanding-as-knowing hinges on her arguments for conceiving understanding as some event other than reinforcement mediation.

As described earlier, Parrott (1987) maintained that understanding a request to pass the salt "means that upon hearing the word 'salt,' the listener engages in . . . perceptual activities such as 'seeing' a salt-shaker, 'tasting' salt, as well as vestigial motor reactions of various sorts." Doubtless these events (covert perceptual responses) often do occur prior to or concurrently with a listener's complying with a request. But *must* they occur before some-

one can demonstrate his understanding by acting appropriately in some manner?

Consider Wittgenstein's (1958) argument against the claim that in order to understand the command "Fetch a red flower," a listener must have a red image. He asked us to consider what happens when you are commanded to "Imagine a red patch." In Wittgenstein's words: "You are not tempted in this case to think that before *obeying* you must have imagined a red patch to serve you as a pattern for the red patch which you were ordered to imagine" (p. 3). So why would one want to maintain, then, that one needs an image of a red flower to understand the command to pick a red flower?

Similarly, consider the command "Imagine a salt shaker." Would we want to maintain that before you can understand and then comply with this command you would first have to imagine (i.e., have perceptual responses about) a salt shaker? It seems unlikely, for such a conception of understanding generates an infinite regress. This leads to the ridiculous conclusion that no one could ever understand commands such as "Imagine a salt shaker" since it would take an infinite amount of time. If one is then forced to admit that understanding the command "Imagine a salt shaker" cannot require another act of imagining, then why insist that understanding and complying with the request "Pass the salt" requires imagining (and other perceptual responses) involving salt-shakers?

A second problem with Parrott's definition of understanding is that it conflicts with ordinary language usage. A listener does not need to have certain perceptual responses before understanding is attributed to him. For example, if a person complies repeatedly with a number of verbal commands and yet maintains that he is not having any corresponding perceptual responses, we would nonetheless attribute understanding to him. We are satisfied that he understands by observing his public behavior. Having certain perceptual responses is not a necessary condition for

understanding. Is it, then, a sufficient condition?

Consider a "motivated" student of German who repeatedly fails to respond appropriately to directives in German, and yet indicates (when asked in English) that he is indeed having the appropriate perceptual responses. For example, when asked (in German) to pass the salt he "sees" salt, "tastes" salt, etc. Unfortunately, he doesn't *pass* the salt. In such a case, we would insist that since he is motivated to comply but nonetheless fails, he simply doesn't understand. Having the appropriate perceptual responses cannot, then, be a sufficient condition for understanding. Expressed in Wittgensteinian terms, the criteria for understanding differ from criteria for having perceptual responses.

In summary, Parrott proposed an answer to the question "What occurrent behaviors generally distinguish verbal understanding from non-understanding?" Her answer, however, seems problematical on several counts. First, in some cases it appears to require that prior to understanding and complying with a request to have a given perceptual response, one would first have to have another perceptual response. To avoid this problem, then, it seems advisable to give up the idea that understanding verbal commands means having such perceptual responses. Secondly, consideration of the ordinary language usage of the term *understanding* suggests that perceptual responses are neither necessary nor sufficient for ascribing understanding. Thus, perceptual responding is not an occurrent behavior useful in distinguishing instances of verbal understanding from non-understanding.

*Understanding as Organizing Relational Networks.* L. J. Hayes (nee Parrott; Hayes, S. C. & Hayes, L. J., 1989) has recently offered yet another answer to the aforementioned question. Suppose an individual complies with the directive "When the bell rings, get the cake from the oven." How are we to explain the fact that the ringing of the bell brings about the fetching of the cake? For L. J. Hayes, the stimulus equivalence phe-

nomenon (e.g., Sidman, Cresson, & Willson-Morris, 1974) strongly suggests an explanation. Her explanation centers on the notion that "the word classes *bell*, *cake*, *get*, *go to*, and *oven* each participate in equivalence classes with the event classes of sounds of bells, actual cakes, actual ovens, and the actual acts of going to things and getting things." As a result of certain properties of these relational classes, "the temporal relation between the bell and the function of going to the oven specified in the rule transfer to the actual bell and actual oven" (p. 179). Thus, when the bell rings, you get the cake. Understanding a verbal stimulus "is the act of a listener framing events relationally, such that they have these functions" (p. 178). Understanding "is an action of organizing verbal stimuli into arbitrarily applicable relational networks so that stimulus functions transfer throughout these networks" (p. 179).

This answer appears to depart from L. J. Hayes' earlier answer. For instance, no reference is made to perceptual responding. Hence, to that degree it escapes some of the earlier criticism. However, like her earlier answer, it also seriously conflicts with ordinary language usage. A speaker's judgment that a listener understands is generally based on observable evidence such as her present and/or past behavior. A listener's alleged act of organizing verbal stimuli into relational networks is *not* a phenomenon observable by anyone (including the listener herself). Thus, the alleged presence of such an act of organizing cannot be used in ordinary discourse as a basis for ascribing verbal understanding when there is considerable observable evidence to the contrary. Similarly, the absence of such an act of organizing cannot be used to ascribe non-understanding when there is considerable observable evidence that the listener, indeed, *does* understand.

While there is no observable event identifiable as the *listener's* act of organizing verbal stimuli into relational networks, one can observe such acts performed by the language community. A listener learns to

respond appropriately to verbal stimuli as a result of a complex conditioning history provided by others. In short, it is the language community which organizes verbal stimuli relationally for the listener. In this regard, consider Skinner's (1977/78) explanation of the phenomenon of word association:

If we say "home" when someone says "house," it is not because we associate the two words but because they are associated in daily English usage. Cognitive association is an invention. Even if it were real, it would go no further toward an explanation than the external contingencies upon which it is modeled. (p. 98)

According to L. J. Hayes' second definition, a listener understands a verbal stimulus when she acts to organize "verbal stimuli into arbitrarily applicable relational networks so that stimulus functions transfer throughout these networks" (Hayes, S. C. & Hayes, L. J., 1989, p. 179). For Skinner, however, a listener understands if she either (a) repeats the speaker's statement, (b) responds appropriately or (c) knows something about the variables controlling the speaker's behavior. Hayes' definition of verbal understanding centers on inferred activities taking place somewhere inside the organism. While Skinner, too, recognizes that when a person becomes a competent listener she undergoes neurological changes, his definition of verbal understanding centers on observable behaviors.

Which approach is preferable? According to Schnaitter (1978),

The behaviorist environmentalizes the changed organism . . . and ascribes the change to a property of a component of the environment. . . . It seems to me that the reason we do this is very simple . . . It has paid off. Environmental talk leads regularly to effective practices of prediction and control. (p. 8)

In a like manner, S. C. Hayes and Brownstein (1986) asserted that "only statements that point to events external to the behavior of the individual organism being studied can directly lead to prediction and control" (p. 176). In the end, of course, the only way to settle the issue will be to compare environmentally-based vs. organocentric explanations to see which yields better prediction and control.



## CONCLUSION

In presenting his three senses of verbal understanding, Skinner took the first steps toward a behavior-analytic account of verbal understanding. However, a more comprehensive conceptual analysis of the listener's behavior is required. Indeed, as Skinner (1989) remarked, "Most of my book *Verbal Behavior* (1957) was about the speaker. It contained . . . little direct discussion of listening" (p. 86). By looking more closely at verbal understanding, behavior analysts will not only gain a more complete mastery of the listener's behavior, they will also supplement the analysis of the speaker's behavior as well. Again quoting Skinner (1989), "if listeners are responsible for the behavior of speakers, we need to look more closely at what they do" (p. 86).

Behavior analysis has been criticized frequently (e.g., Chomsky, 1959/80) for failing to provide an adequate account of complex human behavior. One way to address this shortcoming is by advancing the analysis of behavior under verbal control, e.g., rule-governed behavior. Vaughan (1987) commented:

rule-governed behavior is emerging as a critical class of behavior in analyzing complex human behavior. The descriptive power of the concept is especially revealing (and appealing) when one is analyzing some of the activity referred to by cognitive psychologists as higher mental processes. . . . For under these conditions such behavior is brought within the realm of a science of behavior, subject to measurement in quantifiable terms. (p. 258)

Developing an adequate analysis of verbally-controlled behavior will contribute considerably to a behavior-analytic account of complex human behavior. To that end, the issues remaining to be addressed include (a) providing a more detailed account of the term *understanding* as it is used in ordinary discourse, and (b) determining the role of stimulus equivalence in the acquisition of verbal understanding. A comprehensive *experimental* analysis of the listener's behavior, by itself, cannot adequately address these issues. As Harzem and Miles (1977) put it, "what matters most in psychology is not the find-

ings as such but what one says about them" (p. x). Clearly, an adequate *conceptual* analysis is also needed.

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