A Comparison of Skinner's "Verbal Behavior" to Kantor's "Psychological Linguistics"

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Abstract

A comparison of B. F. Skinner's (1957) and J. R. Kantor's (1977) terms, assumptions, and objectives for language-related behaviors reveals major differences in their conceptualization of the subject matter and in their explanations. Kantor's subject matter is simultaneously occurring stimulus functions and response functions (i.e., "interbehaviors"), whereas Skinner's subject matter is functional stimulus and responses sequences. Skinner conceived explanation as description of a method of prediction and control. He argued that explanation is incomplete until the "causes" are identified, whereas Kantor saw explanation as a description of the field of interacting events: interbehavioral history, setting factors, stimulus medium, stimulus functions, and response functions. Neither Skinner's nor Kantor's account of language-related behaviors was derived from laboratory findings or analysis of actual conversation. Although the similarities of the two accounts far outweigh differences, a successful rapprochement has not emerged.

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Skinner's Operant Approach

Skinner (1957) proposed three primary forms of verbal behavior: (a) *mands*--verbal operants occasioned by deprivation or aversive stimulation, and reinforced by means of listener behavior, (b) *tacts*--verbal operants occasioned by the property of a tangible stimulus object or event, and reinforced by the verbal community, and (c) *intraverbals*--verbal operants occasioned by verbal stimuli to which they have no phonic resemblance (i.e., not an *echoic*). Skinner's examples included the following hypothetical transcripts and settings: "Bread please" (in the presence of a listener) as a mand; "Red" (in the presence of a red object) as a tact; and "four" following "two plus two" as an intraverbal. These three conceptual categories were based on neither the topography of the operant nor the schedule of reinforcement, but on the form of the discriminative stimuli that precede them and the reinforcers that followed.

The selection of the terms *mand*, *tact*, and *intraverbal* suggested a linkage between conditioning functions and conversational functions of verbal behavior. Mand implies conversational functions such as demanding, commanding, requesting, or ordering. Tact implies contacting (i.e., naming, indicating and describing). Intraverbal implies such conversational functions as answering, replying, elaborating, and concluding. Skinner did not, however, suggest that such linkages were essential or even helpful in his analysis.

Skinner's objectives in writing *Verbal Behavior* (1957) may be best understood when considered in a developmental context. A scenario described in Skinner's biography, *The Shaping of a Behaviorist* (1979), provides an account of the challenge that he accepted in writing *Verbal Behavior*. The incident occurred in the early 1930s at one of the weekly dinners held by the Society of Fellows at Harvard. Alfred North Whitehead, a regular at the dinners, was engaged in conversation with Skinner. Skinner wrote:

We dropped into a discussion of behaviorism, which was then still very much an "ism," and of which I was a zealous devotee. Here was an opportunity which I could not overlook to strike a blow for the cause, and I began to set forth the principal arguments of behaviorism with enthusiasm. Professor Whitehead was equally in earnest--not in defending his own position, but in trying to understand what I was saying and (I suppose) to discover how I could possibly bring myself to say it. Eventually we took the following stand. He agreed that science might be successful in accounting for human behavior provided one made an exception for verbal behavior. Here, he insisted, something else must be at work. He brought the discussion to a close with a friendly challenge: "Let me see you," he said, "account for my behavior as I sit here saying, 'No black scorpion is falling upon this table.'"

The next morning I drew up the outline of a book on verbal behavior. My qualifications were limited. (pp. 149-150)

Skinner assumed the task of accounting for verbal behavior with the principles of behaviorism, or more specifically, behavior analysis. It is apparent that in writing *Verbal Behavior*, Skinner was addressing scholars such as Whitehead, rather than behavioral psychologists. In fact, one of Skinner's most critical readers turned out to be a linguist, Noam Chomsky (1959).

Skinner's objectives in writing *Verbal Behavior* (1957) can also be found in the book itself. There, Skinner stated:

We have not had to assume that there is anyone who "knows what he is saying" or "wants to say," or "how to say it."

Converting the speaker into an interested bystander is certainly the direction in which an analysis of behavior will first move. As a causal agent responsible for the structure and character of verbal behavior, the speaker is threatened by the causal relations identified in the course of a scientific analysis. Whenever we demonstrate that a variable exerts functional control over a response, we reduce the supposed contribution of any inner agent. (p. 311)

Skinner's objective, then, was to account for verbal behavior without hypothesizing some internal initiating or controlling agent (e.g., mind, brain, homunculus, etc.).

Most students of behavior would agree that Skinner's three-term operant paradigm (i.e., discriminative stimulus, operant, and reinforcer) could indeed be applied successfully to the shaping, maintenance, and control of verbal behavior. However, with his new conceptual categories of mands, tacts, and intraverbals, Skinner went further to stipulate specific contingencies to be considered in verbal behavior. He presented no evidence that normal conversation could be reliably or usefully partitioned into mands, tacts and intraverbals, nor

did he demonstrate that all aspects of conversation could be shaped or maintained by the application of the proposed contingencies. Uncharacteristically, Skinner had not analyzed actual conversations before offering his account of verbal behavior. He generalized from his paradigm, rather than providing an examination and analysis of actual conversational behavior. It was by no means certain that a field study of actual conversations would yield categories of verbal behavior and functional relations between speaker and listener that correspond to, or that were limited to, Skinner's contingency categories of verbal behavior.

Kantor Interbehavioral Approach

In contrast to Skinner's causal explanation of verbal behavior, Kantor's systems approach was presented as general description more than an explanation. Kantor sought only to identify the relevant factors and the range of linguistic interbehaviors, and the explanation of interbehavior would result from observation, analysis, and description, at the actual level of occurrence. The nature of the contingencies controlling verbal behavior did not directly concern Kantor, who advocated an approach in which each behavioral event was viewed as an interaction (or "interbehavior") between an organism and a stimulus object in a field of relevant factors. The psychological field for a conversational event included, among other things, a speaker and two stimulus objects (i.e., the listener and the referent).

Kantor (1959) defined "psychological interbehaviors" as acquired interactions between the organisms and stimulus objects. A descriptive account of an interbehavioral event necessarily included the following factors: 1) the relevant psychological history of the organism (i.e., the developmental history of the interaction), 2) the setting (contextual stimuli and conditions of the organism), 3) the stimulus medium through which the interaction occurred (e.g., light waves, sound waves, etc.), 4) the sequence of preceding interactions, and 5) the existing stimulus-response functions (i.e., the inseparable effects of the stimulus on behavior and the behavior on the stimulus). Once all of these relevant factors were accounted for, then the psychological interbehavior (e.g., conversational interbehavior) was understood. Skinner may not have disagreed, but he would have presumed that the relevant stimulus-response functions

were those inherent in his conditioning paradigm, and that the essential psychological history was the reinforcement history of the relevant operants.

Kantor (1977) depicted the following scenario: The rain is falling and James says "Rain!" Mary replies "What a bore." Kantor described this conversational episode as James (the *referor*) referring Mary (the *referee*) to rain (the *referent*). Mary was referred to the rain and her reply (i.e., "What a bore!") may have been seen either as a *verbal formula* (i.e., a habitual response) or a *reference* to her feelings about the rain. By way of comparison, if Skinner's terms were applied, this scenario might be presumed to be a tact (i.e., "Rain") followed by an intraverbal (i.e., "What a bore!"). Or perhaps Mary's reply would have been a tact of her covert or private emotional behavior.

A complete interbehavioral account of the event in which a speaker says "Rain!" would entail a description of the setting in which the conversation occurs (i.e., the contextual stimulation of the room, the physiological state of the speaker, etc.); the relevant history of the speaker, such as many similar conversations with the listener; the physical media (e.g., the light and air); the stimulus functions, such as the effects of the rain and of the listener on the speaker's behavior; and response functions (e.g., reactions of the speaker to the rain and the listener).

Kantor (1970, 1959) distinguished among the stimulus objects or events, the physical energy they generated or reflected, and the stimulus functions evinced in the subject's response. He presented the response functions as occurring interactively and simultaneously with the stimulus functions rather than as consequences of the stimulus functions. That is, Kantor presented the stimulus-response unit as an inseparable, simultaneous interaction, not as a causal stimulation and a subsequent reaction or effect.

Contrasting Skinner and Kantor

Skinner's (1957) example of mand (i.e., "Bread please") focuses on the listener as a mediator of reinforcement. Bread may or may not be present, and therefore may or may not function as a controlling stimulus. In Kantor's paradigm, both the referent (i.e., bread-- whether present or not) and the listener's behavior (e.g., attending to the speaker) are

considered to be stimulus objects or events with stimulus functions inseparable from the speaker's response functions. Kantor would have emphasized the listener's compliance more as a predictable subsequent psychological event (or "interbehavioral segment") than as a reinforcing stimulus.

Skinner's (1957) example of a tact (i.e., "red" in response to the presentation of a red object) focuses on the red object (i.e., the referent in Kantor's terms) as the controlling stimulus, rather than on the stimulus value of the listener or audience. Skinner would, however, see the listener's subsequent reaction to the operant, "red," as a potential reinforcing stimulus. Kantor's "bistimulational" view stressed both the stimulus functions of the listener's behavior and the stimulus functions of the referent as aspects of ongoing speaker behavior. That is, speech was presented as a function of the ongoing behavior of the listener and referent.

Skinner's (1957) example of an intraverbal (i.e., "four" occasioned by "two plus two") emphasized the importance of the foregoing verbal stimulus in controlling the verbal behavior, "four." Kantor's account would present such a predictable reply as a "verbal formula" entailing no referential functions. Thus, this behavior would not be seen as a function of some referent stimulus by either Kantor or Skinner. Even in this non-referential case, however, Kantor's view would place special emphasis on the ongoing stimulus functions (e.g., listener attention). Stimulus events in the preceding example (i.e., the statement "two plus two") would not be presented by Kantor as a stimulus controlling behavior in a subsequent interbehavioral segment (i.e., the reply "four"); rather the sequence of events would be seen as predictable within this setting and from histories of the conversers. For example, answers following questions are predictable in conversational settings for individuals with a history of such conversational interactions.

Kantor's broad predictive account would accommodate the relevance, if not the preeminence, of reinforcement history. Correspondingly, Skinner's paradigm could, in certain instances, accommodate Kantor's bistimulational account; that is, the bistimulational account could be seen as a case in which there were two concurrent discriminative stimuli (i.e.,

audience and tacted stimulus) for the same operant behavior. However, these two stimuli would be presented by Skinner as controllers of, rather than merely as functional participants in, the speaker's behavior. In the more normal application of Skinner's paradigm, the stimulus conditions in the first interbehavioral segment would be causally related to responding observed in the second interbehavioral segment.

Kantor (1977) noted that referential behavior can be *mediative*; that is, the referential speech may mediate or result in non-referential listener behavior. This concept was similar to Skinner's concept of mand. However, Kantor did not limit mediative speech to cases in which the listener's non-verbal behavior followed the speech and served as a means of reinforcement. Kantor applied the term mediative to all referential narrations of behaviors. Mediative behavior could include demands and requests, but it could also narrate ongoing or completed behaviors. That is, verbal mediation (or narration) could precede, accompany, or follow the narrated behavior.

Level of analysis

Skinner's level of analysis was at the functional operant unit. In accounting for verbal behavior, Skinner's (1957) approach was to analyze events into a predictable sequence based in stimulus control, conceiving psychological events in the elemental terms of stimulus and response contingencies. Regardless of the complexity of the operant, understanding was a product of sequentially and causally analyzing events into discriminative stimulus, operant behavior, and reinforcing events. Behavior was presumed to be predictable from, and therefore explained by, reinforcement contingencies.

Kantor (1977) took a molar and complex system approach, in which behavior was presented as an interactive event, embodying simultaneous stimulus and response functions. He saw psychological events as complex interactional adjustments. In application of Kantor's analysis, the total system of factors (i.e., history, setting, stimulus medium, stimulus functions, and response functions) must be addressed before the description of interbehavior (i.e., psychological events) between the organism and the stimulus object is complete.

Metaphysical assumptions of the two paradigms

In his reserved commendation of behavior analysts, Kantor (1970) pointed to evidence of mechanistic thinking in the use of Skinner's paradigm:

> So far as performance is concerned, the analyses turn about such variables as frequency, ratio, latency, and rate. There is thus the suggestion of a mechanistic type of operation, or at best something analogous to the action of a purely physiological organism. (p. 104)

Skinner's radical behaviorism did not rely, however, on the mechanistic models suggested by conditioned reflex accounts of learning theories. Skinner (1957) depicted behavior not as a simple reflexive process but rather as controlled by, and in that sense caused by, specific environmental events. The typical predictive sequence was environmental stimuli controlling response rates (i.e., *discriminative* stimuli controlling the *operant* response rates), in which stimuli functioned to control behavior (i.e., stimulus–>response), and responses functioned to produce stimuli (i.e., response–>stimulus). This laboratory-derived conditioning paradigm was based on inputs to, and outputs from, operant conditioning chambers, and this implied a mechanistic view of the organism. Similarly, Skinner occasionally used the traditional experimental terms "independent variable" and "dependent variable" when discussing input contingencies and output behaviors, respectively, in his analysis of behavior (e.g., p. 28).

In the tradition of behaviorism, Skinner (1957) rejected the spirit half of Cartesian mind-body dualism and retained the corpus with its behavior. The mind as a causal or determining agent was replaced by physical events in the environment and, to some lesser extent, the behaviors of the internal organs; that is, Skinner did not consider himself to be a pure environmentalist. Skinner (1979) stated:

> I was never able to come very close to Robert Kantor's way of thinking about behavior, although our differences were trivial compared with our similarities. (p. 325)

> We differed on one point. Robert seemed to be the pure environmentalist. (p. 326)

Kantor disagreed with this assessment (personal communication, August 9, 1983); he did not consider himself to be an environmentalist, and did not see environmental events as the causes

of behaviors. The psychological event occurred in an interactive field in which environmental factors were functional elements in, not causes of, the psychological adjustment.

Kantor (1959) did not reject the mind half of mind-body dualism, he rejected dualism. For Kantor, all natural forces were to be distinguished from verbal constructions of transpatial or spiritual forces. The verbal traditions of deism, vitalism, and dualism were all rejected. The functioning organism as confronted, not its body or mind as conceived by philosophers, was retained as the subject of study. The causal agent role once ascribed to the mind was not transferred to the environment or to an internal organ, rather a system analysis replaced the causal analysis. For Kantor, the predictive sequence of behavior consisted of each interbehavioral segment leading to subsequent interbehavioral segment for the given setting, organism history, and stimulus object. In each evolving segment of interacting factors, no element of the interbehavior was placed as the sufficient cause of subsequent elements; that is, he did not set one aspect of the system as the cause of another. In Kantor's paradigm, the organism *interacted with* stimulus objects (i.e., stimulus<–>response); that is, stimulus functions were presented as inseparable from, and not causes of, response functions.

Nature of understanding and explanation

Whereas Kantor (1977) provided a framework for a *descriptive account* of conversation, Skinner extrapolated from his three-term operant paradigm to provide a *causal explanation* of even the most specific aspects of conversation. Skinner (1957) contended:

> The 'understanding' of verbal behavior is something more than the use of a consistent vocabulary with which specific instances may be described. (p. 3)

> ...what conditions are relevant to the occurrence of the behavior--what are the variables of which it is a function? (p. 10)

> The extent to which we understand verbal behavior in a "causal" analysis is to be assessed from the extent to which we can predict the occurrence of specific instances and, eventually, from the extent to which we can produce or control such behavior by altering the conditions under which it occurs. (p. 3)

At least in terms of a primary criterion, Kantor seems to agree that the ability to predict and control demonstrates understanding. Kantor (1959) stated:

> In a rounded-out scientific system, interpretations or explanations take their place beside the descriptions of events and the operational procedures required to measure and manipulate them.
>
> Only when valid interpretive propositions can be formulated has the requisite understanding of events been achieved, an understanding which is basic to control and prediction. (p.139)

The nature of explanation and the demonstration of understanding differ slightly for the two paradigms. Kantor saw prediction and control as the test of understanding, whereas Skinner considered his paradigm for prediction and control to constitute an explanation of the behavior.

Both Kantor (1936, 1977) and Skinner (1957) were faithful to the principles of behavioral inquiry--with one exception. Neither began the analysis of verbal behavior with systematic observation of conversational events and the systematic collection of data. There are two plausible reasons for these omissions: Either conversation and texts were ubiquitous and, therefore, had been observed enough, or they agreed that observation should be preceded and structured by an elaborated paradigm. Neither option seems warranted. With regard to the former, in an empirical science there is no substitute for systematic observation and data; in the latter case, explanations that precede observations invariably constrain observations, often to the detriment of the analysis. This was, perhaps, less a problem for Kantor's descriptive account than for Skinner's explanatory account.

Bridgman (1927) said "...an explanation consists in reducing a situation to elements with which we are so familiar that we accept them as a matter of course, so that our curiosity rests" (p. 37). This quote perfectly describes the success of, and problem with, Skinner's (1957) operant explanation of verbal behavior. Skinner reduced verbal behavior to the familiar elements of operant conditioning, thereby satisfying the curiosity of those most familiar with, and accepting of, the operant conditioning paradigm, and eventually provided a significant stimulus for research on verbal behavior.

The progress of normal science

Skinner (1957) saw an understanding of behavior arising ultimately from laboratory experiments, and, as noted earlier, he went so far as to interpret behavior in terms borrowed from experimental design--treatments were labeled as *independent variables* and observed behaviors as *dependent variables*. Accordingly, Skinner argued for a causal view in which individual responses are controlled by discriminative stimuli. Thus, Skinner's paradigm invited active intervention and analysis, and was, perhaps, better suited to behavior control than to description of normally occurring conversations.

Skinner assumed that by demonstrating how the three-term operant contingency could accounts for all human behavior (with, of course, the exception of respondent or reflexive behaviors) psychology would be advanced. According to Skinner, the task was to demonstrate that verbal behavior could be described adequately with the three basic terms of operant conditioning. The three-term contingency template was to be mapped onto conversation, breaking the flow of events into functional sequences of overlapping discriminative stimulus–>operant–>reinforcer (S^D–>R–>S^{r+}) links. In his 1975 book *The Message in the Bottle*, Walker Percy accurately describes a tendency evident in Skinner's writing on verbal behavior: "The behaviorists in fact seemed more anxious to fit the model to the phenomenon than to take a good look at the phenomenon" (p. 32).

When the operant model was applied to the description of typical conversational comments, each verbal event was identified as mand, tact, or intraverbal. That is, the mands, tacts, and intraverbals were functional templates onto which naturally occurring conversations were mapped, and observed conversational behaviors were thereby explained. For example, if a person says "a beer please" and is given a beer, behavior analysts might maintain that the behavior was occasioned by the presence of the listener and maintained with contingent presentation of beer, and that this account causally described, and thus explained, the event. In short, the behavior would be classified as a mand. Subsequently, an experimental contingency could be arranged to test the causal analysis, by demonstrating that the inferred contingencies could control the occurrence of the verbal behavior in question.

Kantor (1936, 1959, 1977) had no such causal template in search of a behavior. He saw the task as one of establishing metascientific principles that prescribe a sequence of observation, description, and analysis--followed by further observation, description, and analysis. He insisted on an account that acknowledged the interactive nature as well as the sequential flow of all natural events. If someone says, "Is it still raining?" and another says, "Yes," Kantor's approach suggests that each interbehavioral segment (i.e., the question, the answer, etc.) was a complete psychological interaction. The questioner interacted with a listener, the answerer interacted with a listener, and the speaker/listener roles reversed from question to answer. Kantor would not stipulate that the notion that Segment A was a stimulus and Segment B a response entails a causal sequence. For him, each segment constituted one response-stimulus event, occuring in a predictable sequence of such events. Kantor (1970) said about the accounts offered by behavior analysts:

> The bottom stratum consists of an entirely false philosophical notion of cause. Stimuli are taken to be prior independent entities or energies that bring about an effect which succeeds it in time. (p. 106)

Arguably, Skinner was not guilty of this simple mechanistic use of the term *cause*. In describing his approach, Skinner (1957) did employ the term *cause* (albeit with the grammatical caveat of enclosing it in quotation marks), but his traditional preparation (i.e., the key light discriminative stimulus, the key peck operant, and the food-presentation reinforcer) entails a discriminative stimulus that "occasions" rather than "causes" the operant.

In Kantor's terms, the actual events of Skinner's preparation would not be the stimulus-response-stimulus sequence, causal or otherwise. Kantor's perspective suggests three interbehavioral segments occurring in the conditioned sequence of contrived events: Segment A involves attending to the discriminative stimulus; segment B is appetitive interaction with the manipulandum; and Segment C is consuming the available food. Segment B, for example, would be presented as predictable from, but not caused by, previous segments.

Kantor's (1959) model would accommodate the Skinnerian concept of reinforcement in terms of the relationship among the sequence of interbehavioral segments. In the example above, Segment C would reinforce Segment B following Segment A. The interactions with the

three stimulus objects (i.e., the discriminative light for Segment A, the key for Segment B, and the activated food hopper for Segment C) would be essential for the sequence of adjustments, and reinforcement, to occur. The necessary stimulus-response functions in each segment would have emerged not only from reinforcement history but from all interactional history (e.g., perceptual history, foraging history, etc.), and each would be interrelated with setting factors (e.g., the stimulus context of the apparatus and biological state of the organism). Although the three-term operant contingency may appear, in Skinner's analyses, to be offered as a complete account, behavior analysts are not unmindful of the relevance of stimulus context and historical variables (see, for example, Marr, 1984; Morris, 1984).

Parent paradigms

The simple stimulus-response paradigm of the earliest behaviorists was taken from physiology, and Skinner's methods (1938) could be seen as analogous to the laboratory methods of physiology. His subject matter was prepared in the laboratory, steady states were established, and the effects of experimental probes were then recorded and analyzed. That said, Skinner's operant view did not suggest a simple reflex but rather an acquired stimulus-response connection.

In contrast, Kantor's (1959) methods resembled the descriptive methods of astronomy. The subject matter was interactions among the objects in an interrelated field of events, and no individual event could be understood without consideration of all the forces of which it was concurrently a function. The interaction between the organism and the stimulus object was presented as an event in a system of events. For example, the earth-moon interaction occurs as an event in the context of the solar system.

The concept of referent

The concept of referent is central in Kantor's (1977) description of conversation, but he does not restrict referents to current stimulus objects that are present and tangible; a speaker could refer to events past, present or future, real or imagined. Even though Skinner's (1957) account of verbal behavior does not rely on the concept of referents, referents might be

inferred in three instances: the object or event that was *tacted*, the behavior that was *manded*, and the verbal stimulus of which the intraverbal was a function. Because these things and events were conceived as functioning either as discriminative stimuli or as reinforcers, Skinner saw no advantage to using the term *referent*. Indeed, he saw the term *referent* as suggesting that verbal behaviors have meanings beyond their behavioral functions. Skinner said:

> We cannot plausibly explain the response *I opened the window yesterday* by pointing to the stimuli generated by the actual event. These lie in the past history of the speaker and cannot be the "referent" of the remark in the sense of the controlling variable in the functional analysis. It does not explain such behavior to say that the act is described "from memory." (p. 142)

Skinner disallowed past events to function as tacted stimuli; that is, he denied the relevance of the apparently tacted stimulus (i.e., the closing of the window), because the stimulus event was not concurrent with the statement. A question remains, is the statement a tact or an intraverbal? Skinner could have stipulated some controlling verbal behavior (i.e., "Was the window left closed?") to satisfy the criterion for classifying "I opened the window yesterday" as an intraverbal; or he could have proposed the window in its current state (open or closed) as the stimulus tacted. When describing "from memory," it is possible that a discriminative stimulus event may precede the response it controls. For example, in the matching-to-sample paradigm, the sample stimulus may precede the selection response, and there is no apparent need to place a limit on the length of delay between the stimulus controlling the selection and the controlled response. The limit lies in the functional analysis of each situation, not in Skinner's paradigm. Furthermore, there is reason to stipulate some measurable probability that yesterday's events may control today's behavior, especially in the case of human behavior.

Skinner did see the relevance of past events in his analysis, at least to the extent that past events produced conditioning of behaviors. For example, Skinner (1957) stated:

> What happened yesterday is important for the effect which it has on the behavior of the child today. If a child learned to ride a bicycle yesterday, he will ride one more skillfully today.

> But when a child says *There was an elephant at the zoo*, he appears to be reacting to his past history rather than merely profiting from it. This is a verbal

achievement brought about by a community which continually asks the child such questions as *Was there an elephant at the zoo*? The answer must be understood as a response to current stimuli, including events within the speaker himself generated by the question, in combination with a history of earlier conditioning. (p. 143)

Past events, as well as related "events within the speaker," were presented in Skinner's analysis as necessary for understanding verbal behavior--but not as functional stimuli in a tact. The role of past events was limited, perhaps unnecessarily, to "history of earlier conditioning."

Skinner (1987) stated, "The belief that meanings reside in words, that sentences have some kind of power, is hard to resist" (p. 108). However, Skinner did not always distinguish between words referring and speakers referring. In his writings, words as things are often not distinguished from words as verbal operants. For example, contrast the following statements from Skinner (1987):

Perhaps there is then no particular harm in using traditional words and saying that *fish* "refers to a fish" or means "fish," where the meaning or referent is simply the fish as the principle controlling variable. (p. 83)

When asked what I am doing, I say "I am fishing for a letter I want to show l you." The fish on the wall has strengthened *fish* as a tact and has entered into the choice of a synonym. (p. 83)

In such case we do not say that *fishing* refers to the fish on the wall, even though it has been strengthened by it. (p. 83)

Similarly, Skinner (1957) stated:

When we say that the word *Caesar* refers to Caesar, dead though he has been for these two thousand years, we are clearly not talking about the behavior of a contemporary speaker. A response of this form is almost certainly intraverbal....
(p. 129)

The referent for a word or sentence as a stimulus is not clearly distinguished from the referent for the verbal behavior. Giving Skinner the benefit of presumption (i.e., that the speaker, not the word, was doing the referring, or rather, according to Skinner, not doing the referring), his analysis certainly burdened the concept of intraverbal. The hypothetical speaker's comment about Caesar was, according to Skinner, not influenced by stimulus functions inherent in referent; that is, the behavior was to be understood solely as a function of preceding verbal behavior.

Kantor (1977), like Skinner, rejected the traditional notion that referents provide meaning of words and sentences, but Kantor relied strongly on the notion that the speaker's behavior is best described as *referring*. Kantor presented the speaker as someone who refers a listener to a referent. The referent's stimulus functions were being activated for the listener, and they were essential to the listener's referential adjustment. Kantor suggested that the behaviors of the speaker and listener were functions of the referent, even when the referent was neither present nor concrete. That is, the referent was a stimulus (real or imagined, present or not) of which the speaker's (and the listener's) behavior was a function. The referent stimulus function, not the referent stimulus object, was essential. The speaker's reference activates the referent stimulus function for the listener, but Kantor did not provide a direct explanation of how the referent functions were activated for the speaker (or "referor").

If the speaker's behavior were to be a function of a referent object or event that is not present, what activated the referent stimulus functions? Kantor would probably have argued that the referor interacted with the referent in the process of referring, and that the *substitute stimuli functions* that activated those referent stimulus functions could have been associated with any stimulus object or event present, including what the speaker was saying. That is, to some extent, the referor would refer himself as well as the listener to aspects of the referent.

Perhaps because it would have raised the specter of an internal controlling agent, Skinner did not suggest that imagined or envisioned referents controlled behavior; but for Kantor (1977), envisioning was just another category of interbehavior, not an internal controlling agent. In response to Skinner's comment about Caesar as a referent, Kantor might have noted that many educated persons could envision Caesar, and he might have gone further to note that even nonentities (e.g., Lewis Carroll's "mome rath" that "outgrabed" in the poem *Jabberwocky*) could be referred to and imagined. Kantor presented instances in which either the referent or the referee were imagined, thereby asserting that referential interbehavior could be a function of envisioned stimuli. It should be noted that Kantor considered imagining, like all interbehaviors, to be an adjustment of the total organism, not an event inside the organism (see Kantor and Smith, 1975).

Kantor (1959) argued that no psychological event could be accounted for with only the current conditions occasioning it. All psychological events were acquired through experience with stimulus objects. According to Kantor (1977), the setting that occasions an interbehavior, and the past experiences that make it possible, are essential components in the functional description of the current psychological event. He saw all psychological events within a historical continuum (i.e., what we experience is but an extension of what we have experienced). And, therefore, stimulus functions occasioned by a visible baseball are derived from the same history of experience as are the stimulus functions of an envisioned baseball. A referential statement can instigate envisioning of the baseball and thus the referent stimulus functions of the baseball. For example, the reactions to the statement "Imagine a large red snake on the banister" would include reactions to an imagined red snake on the banister. A comment about a red snake on the banister would be described by Kantor as a speaker referring the listener to the referent, the imagined red snake on the banister. Because stimulus functions are a product of individual history, Kantor would presume that the referent/snake, whether present or envisioned, is functionally different for the speaker and the listener. Obviously, Kantor's use of the term *referent* (for objects for which the conversers have acquired stimulus functions) differs from the linguistic notion of ideas as referents of *words* and also from the more common notion of referents simply as tangible objects.

Private stimuli

Skinner (1957) considered stimuli that were under the skin to be "private." For example, Skinner noted that a tact can be occasioned by a private stimulus (e.g., a toothache). He did not suggest that such private stimuli function differently from other stimulus functions, only that they are reported by the subject; and he did not, of course, suggest that they are non-physical in form.

For Kantor the toothache is not private in any sense, but occurs in the same public domain as all psychological events. It is simply a matter of perspective. Who is doing the observing? The dentist observing the aching tooth has another perspective, but the aching tooth, like all stimulus objects, is (or was, if the discussion is later) public (Observer, 1981). Kantor

considered pain as no more private than recognizing an old friend. In either case, the researcher could note the *stimulus objects* and the *stimulus functions* evinced in the person's behavior. Kantor (1970) stated:

> I suggest that while observing behavioral events we must distinguish between objects, stimulus objects, and stimulus functions. (p. 106)

By distinguishing the stimulus object from its stimulus functions for the organism, Kantor made the notion of a private stimulus unnecessary.

The units of analysis

Skinner (1957) likened the simple description of verbal behavior to topography. He stated:

> Our first responsibility is simple description: what is the topography of this subdivision of human behavior? Once that question has been answered in at least a preliminary fashion we may advance to the stage called explanation....
> (p. 10)

Skinner's preliminary step, however, was nothing more than a restatement of the structural descriptions of language provided by linguists and physiologists. He noted the structural units of speech sound (i.e., phonemes), the structural units of languages (i.e., morphemes, words, phrases, sentences, etc.), and the biological morphology of speech organs. These various structural units were treated as topographic features of verbal operants. Skinner's explanatory account of verbal behavior included these topographic elements of verbal operants within a functional account of verbal behavior. In his functional account, he proposed contingency categories of verbal behaviors (i.e., mands, tacts, and intraverbals), and acknowledged traditional conversational functions as subdivisions of mands and tacts. Skinner (1957) stated:

> Just as we can classify mands as commands, requests, advice, and so on, by appealing to different aspects of the listener's behavior, so tacts can be classified as mentioning, announcing, proclaiming, stating, naming, and so on. (p.186)

> We can define subclasses of this sort by appeal to the same contingencies of reinforcement which characterize the principal types of verbal operants. We have no reason, however, to go into such detail here. (pp. 186-187)

Skinner, therefore, posited more traditional categories of conversation as subclasses of mands and tacts, which, if need be, could be discussed at some later time. These subclasses were also to be defined by identifying the contingencies of reinforcement.

Kantor (1977) did not discuss the traditional structural units or response topographies of verbal behavior; rather, he conceived the organism's psychological behavior as an integrated whole. He stated:

> ...the psychological aspects of language differ in many respects from those in the domain of general linguistics, in which language is treated mainly as things, that is, word forms or signs, structured and organized in various ways. (p. 251)

> Since every linguistic act is the adjustment of the organism to a stimulus object or situation, the total organism, with all its anatomical and physiological features, participates in speech responses. (p. 14)

> The basic assumption [in conventional linguistics] is that speech is an oral utterance and that the speech of children is the acquisition of a progressive facility of uttering sound, words, and sentences as foreshadowed by the structuralistic analysis of the word-things of conventional linguistic theory.

> What is overlooked is that linguistic behavior consists of adaptations to surrounding things similar to all other adjustmental performances. (p. 190)

Kantor (1936) noted:

> Because of its very adjustmental character, language is spontaneously developed and takes on all manner of forms. (p. 35)

Thus, Kantor went a bit further than Skinner. He did not even consider the physiological and linguistic structural analyses to be relevant in his analysis of psychological linguistics. For Kantor, the psychological unit of conversation was neither biological (e.g., laryngeal) topography nor linguistic structure (e.g., words and sentences). The psychological event was the interaction between the organism and stimulus objects (e.g., referring a listener to a referent).

Skinner's (1957) terms of analysis did not describe an interbehavioral segment as such, but rather components of the behavioral segment corresponding to operant contingencies. Skinner treated the verbal event as an interplay or sequence of reinforcement contingencies, whereas Kantor treated it as an interbehavioral segment in a flow of interbehavioral events. For Kantor,

the whole organism made each adjustment. For Skinner, the organism's operants were differentially controlled by stimuli.

Two forms of linguistic behavior

Kantor (1977) emphasized the difference between literate behavior and conversational behavior. He stressed a general distinction between *referential language* (e.g., typically conversational behavior) and *symbolistic language* (e.g., typically reading or writing), and he went to some lengths to distinguish both categories of linguistic behaviors from linguistic things (e.g., grammatical order) or linguistic stimuli (e.g., notes, essays, books, etc.). Kantor saw a functional difference between referring and the literate behaviors that involved understanding of symbols, and he saw linguistic things as mere products of actual behavior. His distinction corresponded to the traditional separation seen in teaching a child to converse and much later teaching a child to read and write.

Kantor saw referential language as a simultaneous adjustment to the other converser (or conversers) and to the referent, whereas reading and writing involved adjustment to symbols and to what the symbols represented. Writing was a representational adjustment and reading was a deciphering adjustment. Whereas referential behavior entailed a social adjustment to another converser, symbolistic behavior lacked that social stimulus.

Kantor (1977) asserted that symbols represent things--to those who understand them as representations. For example, the alphabetic symbols written here represent speech sounds to those who can read English. Similarly, iconic symbols represent things they resemble, and cryptic symbols represent prescribed things. However, Kantor's concept of representation was limited to his account of symbolizing acts and deciphering acts. That is, the stimulus function of the symbol was the only issue raised. Reading (or writing) was to be analyzed to determine if the reader (or writer) understood what the symbols represented. Effective readers and writers must respond to the representational functions of the symbols, which were ascribed no "meaning" apart from these effects on readers and writers.

Skinner (1957) made no distinction between spoken and written verbal behavior, other than to note that they were "different media" which must be conditioned separately. He also

noted that speaking and writing often entail different vocabularies. Skinner's terms *textuals* (i.e., reading) and *transcriptions* (i.e., writing) corresponded roughly to what Kantor called symbolistic language; tacts and mands to referential language; and intraverbals to either symbolistic or referential behavior.

Skinner and Kantor both placed imitative speech in a distinct category. Skinner's *echoics* corresponded to what Kantor called *echolalic* behavior. Skinner presented textuals, transcriptions, and echoics (like intraverbals) as verbal behaviors under the control of verbal stimuli. Textuals were preliminary to other behaviors that were reinforced, whereas transcriptions and echoics were presented as behaviors reinforced directly, requiring no secondary or criterion response.

The listener

Skinner (1957) has been criticized for his failure to give a more extensive account of the listener's psychological adjustments (Parrot, 1984). He did, however, make several references to listener behavior. Skinner's listener appeared to function either as a discriminative stimulus or as a mediator of reinforcement for the speaker. The listener's behavior was presented as a function of the speaker's behavior, just as the speaker's behavior was presented as a function of the listener's behavior. Skinner indicated that the listener's behavior was, at least in part, made up of conditioned reflexes, especially conditioned emotional reflexes, to what the speaker says; but he also said that the listener's behavior was predictable from past consequences, and therefore to some extent the listener's behavior was an operant (i.e., a response controlled by it's consequences).

Kantor's (1977) recognition of the bi-stimulational and interactional nature of conversation placed strong emphasis on the on-going role of the listener's behavior. Kantor's speaker was presented as someone actively and continually making bi-stimulational adjustments to the listener and the referent; accordingly, the listener was presented as someone actively and continually making a bi-stimulational adjustment to the speaker's behavior and to the referent. That is, the speaker was presented functionally as a *referor* and the listener as a *referee*.

Understanding and verbal behavior

Skinner (1957) stated, "The listener can be said to understand if he simply behaves in an appropriate fashion" (p.277). Similarly, Kantor (1977) said:

> ...the person who understands some thing or situation can perform proper actions with respect to the presently confronted stimulus object. (p. 161)

> Linguistic understanding is essentially a matter of a listener or referee being effectively oriented with respect to the referent. (p. 164)

Although their views were similar, there were minor differences. Kantor's treated understanding as a subtle orientating behavior, whereas for Skinner understanding was only a property of observed behavior--"appropriateness." Furthermore, Kantor stressed the understanding of the referent more than the understanding of the act of referring. Neither Kantor nor Skinner presented understanding as an underlying state of mind, that controlled behavior, but rather as a behavior or behavioral aspect. For a more detailed analysis of listener understanding, see Parrott (1984).

Thinking and verbal behavior

Both Kantor and Skinner presented thinking as a behavior, specifically a behavior relevant to verbal behavior. Skinner (1957) stated:

> Tradition and expedience seem to agree in confining the analysis of human thought to operant behavior. (p. 449)

> ...when the behavior of the speaker with respect to himself as listener, particularly when his behavior is not observable by others, is set aside as a special human achievement called "thinking." (p. 433)

> The simplest and most satisfactory view is that thought is simply *behavior*-- verbal or nonverbal, covert or overt. It is not some mysterious process responsible for behavior but the very behavior itself in all the complexity of its controlling relations, with respect to both man the behaver and the environment in which he lives. The concepts and methods which have emerged from the analysis of behavior, verbal or otherwise, are most appropriate to the study of what has traditionally been called the human mind. (p. 449)

> When we study thought, we study behavior. (p. 451)

Skinner's discussion of the term *thinking* suggested that his conception was influenced by the common sense notion that thinking is "having something in mind." He treated thinking as a

general, almost amorphous, class of various behaviors, whereas Kantor saw thinking as a more specific class of active adjustments. Kantor (1977) stated:

> Thinking interbehavior is excellently exemplified by acts of planning, judging, evaluating, deciding, criticizing, and similar types of adjustments. (p. 168)

> The main characteristic of thinking behavior which promotes or at least supports a similarity to linguistic behavior is that they are implicit in the sense that they operate in the absence of their ordinary stimulus objects by means of substitute stimuli. (p. 170)

> While it is undeniable that linguistic behavior is the most effective agent for carrying on thinking behavior of every sort and the most constantly interrelated with such other activities, there are other sorts of behaviors which also are closely interconnected with thinking behavior. (p. 170)

Obviously, both Kantor and Skinner saw verbal behavior and thinking as interrelated or overlapping classes of behaviors, and neither saw thinking as a psychic process controlling verbal behavior. Kantor did, however, note that verbal behavior could profit from preceding thought.

Neither Kantor nor Skinner equated verbal behavior with thinking, although Kantor (1977) did go to some lengths to explain why others have seen thinking as verbal behavior. He stated:

> Psychologists interested in displacing psychic modes of interpreting complex behaviors have hit upon the notion that thinking behavior in its various forms could be identified with speech and in fact with the action of the larynx [as J. B. Watson once thought]. However meritorious the intention is to dispense with mentalistic mythology the outcome is to misinterpret both thinking and language behavior. (p. 171)

Skinner's (1957) comment that the "behavior of the speaker with respect to himself as listener... is set aside as a special human achievement called 'thinking' " (p. 433) comes close to defining thinking as a type of verbal behavior. Skinner (1987) also stated, that a "sentence is not the expression of a thought; it *is* the thought" (p. 87), but this does not define thinking so much as it defines sentences.

Affective and verbal behavior

Skinner (1957) presented emotions as anatomical behaviors (i.e., gasping, crying, weeping, turning pale, laughing, etc.). He attributed some emotional behaviors to unconditioned reflexes, some to Pavlovian conditioning, some to operant reinforcement, and some to a

combination of the conditioning procedures. Skinner also said: "One form of emotional expression may be simply a heightened probability of acting in a given way or to achieve a given effect" (p. 216). In some instances, Skinner presented affect as an aspect of, or related to, verbal behavior. He noted that certain tacts express anger, certain emotional responses (of the listener) are punishing or reinforcing consequences of verbal behaviors, that verbal behaviors can evoke certain emotional behaviors, and that emotions are evinced in verbal behaviors (e. g., stammering, mispronouncing, etc.). Furthermore, Skinner (p. 217) noted that emotional "conditions" generate verbal responses (e.g., I am angry); that is, these "conditions" serve as "public or private" stimuli for tacts.

While both Skinner and Kantor presented affect as a factor in verbal behavior, neither gave affect a central role; that is, neither saw affect as a central feature in the description of each verbal behavior. Kantor's treatment of the affective aspects of conversation focused on the listener. According to Kantor (1977), the listener will "appear to be strained or relieved, calm or excited, depressed or gay, etc." (p. 126) in reaction to what the speaker says.

Rule governed behavior

Both Kantor (1936) and Skinner (1957) acknowledged the grammatical and phonological order or patterns found in verbal behavior, but neither saw this order as a product of an internal guiding rule. As order was found in all behavior, verbal behavior was not a special case requiring new principles.

Kantor acknowledged grammatical order at both the universal and individualistic level; however, his analysis of grammar proceeded more from the nature of the referent than from the logical order found in statements. Kantor (1936) stated:

> ...we must turn from the artificial organization of words to the study of reference adjustments to stimuli. In general, then, we classify references on the basis of their particular pattern and the conditions influencing that pattern. I may or may not have some definite reason for performing such equivalent responses to the same stimulus situation as *John strikes Jack*, or *Jack is struck by John*. Perhaps the invention by grammarians of the logical and psychological subject, predicate, and object signifies their recognition of the differences between linguistic adjustments and sentence or utterance analysis. (p. 138-139)

Kantor (1936) noted the artificiality of *word* as a unit. He stated:

> Whether or not linguists notice the contrast between word-things and actual speech, they have not escaped the question whether isolated words have any speech reality. (p. 153)

> When we resort to word-thing translation, there is great danger of misinterpreting the nature of a group's speech. (p. 157)

Kantor (1936) treated the "parts of speech" as parts of reference, the interbehavioral adjustment. He stated:

> References to qualities of things spoken of are adjectives. (p. 187)

> Verbal speech [verbs] consists of references to actions.... (p. 187)

> As language behavior, adverbs may be described as conventional ways in which the speaker refers to the conditions and circumstances of the adjustment stimulus object, the how and wherefore of things. (p. 188)

> Speech references to all sorts of relations constitute prepositional speech. (p. 189)

> The term substantive [nouns and pronouns] describes what is essentially a reference to the adjustment stimulus object. (p. 185)

In summary, for Kantor, the analysis of grammatical order found that transcripts or word-things did not address the true nature of language as a psychological adjustment to a listener and referent.

To account for grammatical order, Skinner (1957) relied largely on the concept of the *autoclitic*. Succinctly put, an autoclitic is an element or aspect of the verbal operant for which the discriminative stimulus is an element or aspect of the operant. To some authorities, this appears to be a "fudge factor" (Winokur, 1976), but in fact, conceiving of behavior A as a stimulus for behavior B has, in one way or another, always been a part of behavioral accounts. Skinner applied the term *autoclitic* to verbal behavior elements not addressed by the concepts of tact, mand, and intraverbal, including words (e.g., if, that, therefore, not, no, all, always, some, maybe, etc.) and preliminary or final phrases (e.g, I see, I hear, I recall, I guess, I believe, I hesitate to say, I don't doubt, listen here, that is all I have to say, etc.). Also, Skinner used the autoclitic label for grammatical tags such as the *s* in boys.

The function of autoclitics lay in their effects on listeners. That is, autoclitics were additional grammatical elements that expanded and modified mands, tacts, and intraverbals. These autoclitic elements were occasioned by previous parts of the speaker's verbal behavior and were reinforced by listener behavior. Skinner (1957) stated:

> The ultimate explanation of autoclitic behavior lies in the effect it has upon the listener.... (p. 344)

> The larger segments of verbal behavior resulting from autoclitic activity are usually called sentences. (p. 345)

> The verbal community which makes the distinctions carried by various types of autoclitics generates this tendency to respond in larger characteristic units [sentences]. (p. 346)

The autoclitic was presented by Skinner to get "rid of the speaker entirely" (i.e., get rid of the speaker as a controller of his or her own behavior), as well as to account for many otherwise unidentified grammatical elements found in speech. Skinner also used the term *autoclitic* to account for the grammatical order in texts, or what Kantor had called linguistic things. Although Skinner repeatedly made functional distinctions between actual verbal behavior and texts, his terms were applied freely to text material (e.g., text taken from novels).

At no point did either Kantor (1936, 1977) or Skinner (1957) resort to the notion that rules govern behavior. That is, the order found in verbovocal behavior did not impel either writer to resort to the notion of internal controllers. Both accounts were decidedly opposed to attributing the control of verbal behavior to rules inside the speaker. Skinner (1987) stated, "Most of the time, for example, we speak grammatically because of the prevailing contingencies in the verbal community" (p. 99).

Talking to oneself

Skinner (1957) noted several instances in which the speaker had no listener. He discussed the possibility of self-echoics, self-textuals, self-intraverbals, as well as tacts in which the speaker was the listener. In addition, his notion of self-manding also seems applicable in some instances of talking to oneself.

According to Kantor (1977), neither the referee nor referent need be present in order for a referential event to occur. Kantor implied that a present stimulus could, by substitution, effect functions of the listener and/or referent. He argued that stimulus objects with which the subject was interacting could be imagined or envisioned, and he also noted that talking to oneself may occur as an aid to recall. For example, the speaker may repeatedly recite a phone number, in lieu of writing it down. In this non-referential case, neither a referent nor a referee would be relevant. Kantor also accepted the notion of "expressive" speech in which the speaker served as his own referee or audience. Skinner rejected such notions of expressive speech as suggestive of internal, mentalistic causes of speech, since no tangible stimulus is presented as the controlling stimulus.

Non-referential speech

Kantor used the term "verbal formula" for such non-referential statements as "How are you?" and "Fine how are you?" Gardner (1987) saw such non-referential communication as social cuing. *Cuing* was defined by Gardner as a behavior of one organism (or person) that influences the behavior of another. Cuing regulates the social behavior of all species, and is interlaced with human referential behavior. Such behaviors may occur without regard to consequence, that is, they may, in Skinner's terms, be regarded as respondent rather than operant behaviors.

Skinner (1957) had no place for referents in his analysis, and would have considered all verbal behaviors to be "non-referential." What Kantor saw as a verbal formula would be accommodated in Skinner's terms as an intraverbal, but Skinner's concept of intraverbal covers a far broader range of verbal behavior than the few events that Kantor saw as non-referential. The intraverbal construct would apply to all speaker comments for which the listener's (or speaker's) verbal behavior provided the controlling stimulus.

Potential for merging the two paradigms

Morris, Higgins and Bickel (1982), Morris (1982) and Kidd and Natalicio (1982) explored the compatibility of Kantor's and Skinner's explanatory paradigms. Morris, Higgins and

Bickel gave several examples in which Skinner acknowledged having profited from his association with Kantor, and they suggested that Kantor's interbehavioral paradigm could continue to contribute to behavior analysis. Kidd and Natalicio went so far as to propose "an interbehavioral approach to operant [or Skinnerian] analysis."

Skinner's three-term paradigm could easily be expanded to incorporate Kantor's notion of simultaneous and reciprocal stimulus-response functions: that is, a discriminative stimulus implies a discriminative response function, an operant response implies manipulandum stimulus functions, and the reinforcing stimulus implies a consummatory response function. Morris (1982) presented a detailed treatment of this type accommodation.

Perhaps linkages between Kantor's and Skinner's concepts are gratuitous. Even though Kantor recruited Skinner to Indiana University, where they taught a course together, neither saw great value in citing the other's views. Furthermore, in light of Skinner's (1988) strident attack on interbehaviorists, in which he invited them to resign from the Association for Behavior Analysts, proponents of the interbehavioral perspective may find little advantage in a conceptual accommodation of Skinner's views. Similarly, those behavior analysts inspired by the attack might take interbehaviorists to be the homeless philosophers and spoilers of science that Skinner's commentary created in order to reject.

There is also a more basic problem in finding an accommodation of their objectives. Skinner's avowed objective was to provide a "causal" explanation of responses, whereas Kantor's objective was to generate a descriptive account of psychological events. These conceptual differences, although intriguing, may not matter in the final analysis. All who study behavior must, as Kantor has suggested, eventually proceed through the corrective process of confronting events in nature, and those events will inexorably shape our analyses and conceptions.

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