

B. F. Skinner (1904–1990)

Skinner's Anti-mentalism

According to Giorgi (1970), Skinner appeared when Watsonian behaviorism was waning and he gave it a second impetus. He would seek to provide the science of behavior with a priority over that of the life-world, i.e., subjective experience. Not only that, his position was that a science of behavior would not involve physiology, that more could be accomplished in the domain of behavior by confining study to behavior alone (Bjork, 1997). Skinner had no intention of studying anything with the aim of inferring something regarding what was not directly studied. Skinner, in this attitude, was indebted to Mach. In Mach's parsimonious model of science, one would infer nothing unseen and would deal with what can be observed and analyzed. Not surprisingly, mind would not be a part of Skinner's program; he did not believe in its existence. In a similar manner, Skinner rejected the idea of intervening variables, as put forward by the neo-behaviorists, as "explanatory fictions" (Goodwin, 2005). One was dealing with pseudo-explanations when one posited a hypothetical factor that mediated between observable stimulus conditions and observable behavior. Curiously, perhaps, according to Skinner (1974), behaviorism did not ignore consciousness, mental states, or feelings. Nor did it neglect innate endowment, cognitive processes, purposes and intentions. Such terms of course, smacked of mind-stuff and that was not for Skinner, so he created his own psychological category—private events—that would encompass thoughts, purposes, feelings, and so on (deGrandpré and Buskist, 2000). Skinner was denying mind but not mental processes, a sort of anti-mentalism mentalism. It is in his attempt to deal with such processes, from the standpoint of his behaviorism, that Skinner becomes completely confounding, even unintelligible. His explanations of cognitive processes and language will, in the end, prove lacking.

Against Teleology

An area of misconception regarding Skinner has been around the issue of reinforcement (deGrandpré and Buskist, 2000). Most consider reinforcement to be due to the consequences of behavior but, in his "three-term contingency," response strength was not altered by the consequences. Rather, what is altered is the strength of the relationship between antecedent stimuli and those behaviors that the antecedent stimuli are the occasion for. The implication of this, and one that is frequently not noticed, is Skinner's rejection of teleology. Some have falsely interpreted the idea of the reinforcer as something that motivates behavior toward itself, i.e., that the reinforcer serves as a goal in the future, or that the punisher is something that motivates behavior away from it. To hold that viewpoint is to suggest that behavior is under the control of future acts or circumstances instead of under immediate stimulus control. Skinner put it quite tersely when he wrote, "future events have no place in a causal analysis" (Skinner, 1957, p. 144). Behavior, quite simply, is under the control of discriminative stimuli and it is the discriminative stimuli that the reinforcement history explains. There is no such thing as free or voluntary behavior:

It does not matter whether behavior is due to a willing individual or a psychic usurper if we dismiss all inner agents of whatever sort. Nor can we make the distinction on the basis of control or lack of control since we assume that no behavior is free. (Skinner, 1953/1965, p. 111)

Skinner was not always consistent in his rejection of purposive behavior directed to future goals. In a symposium on the psychologists' perspective on cultural evolution he seemed to reverse himself as indicated in his response to a query by Henry Murray in the following:

Science permits you to look further ahead, as it did in the early stages of the Manhattan Project. But this is only because science has made it possible to predict a more distant future and hence to bring remote consequences to bear on current activities. (Skinner in Murray et al., 1961, p. 571)

That to me sounds like goals in the future. The Manhattan Project had as its guiding goal the development of the atomic bomb and that remote end was what directed their activities. It was an as-yet unrealized possibility that was egging those scientists onward, not the immediate discriminative stimuli. Be that as it may, such a notion did not fit into Skinner's theory of behavior or of functional analysis.

The Causal Chain in Functional Analysis

In his analysis of causation, Skinner (1953) determined that there were three links in the causal chain of behavior. First there are the external operations that impinge upon an organism, second the internal conditions of the organism itself, and lastly there is behavior. According to Skinner, there is seldom any direct evidence of the second term, the internal conditions, in the chain, but it is sometimes inferred. Such an explanation, given its inference and lack of observability, was simply spurious. While the second link is sometimes inferred from the first, it is not appropriate to dispense with a consideration of the organism's prior history; immediate conditions only have their controlling power due to those contingencies established in the past. It is equally unacceptable to trace back from the behavior to the second link, the internal conditions, and to stop there. Private events are links in a causal chain, at best, and they are usually not that. A person may think before acting but both the antecedent thought and the subsequent behavior are both attributable to the same variables. To report an idea to act prior to acting is not going to provide a sufficient and complete functional analysis. Ideas may precede a behavior but one has to trace further back through the causal chain to identify the truly relevant variables. There was nothing added to explanations of an organism reacting to a stimulus by tracing the path of the stimulus through to the body (Skinner, 1960), even though there is no doubt that internal processes are involved in behavior (Skinner, 1977). Behavior analysis, given this, did not have to wait for neuroscientists to do their work since that would in no way alter the behavioral facts (Skinner, 1989). Neuroscientists may identify other variables that have an effect on behavior but they still require a behavioral analysis to get the clearest account of their effects.

Reframing the Mental

Since at least the time of Watson, behavioral psychologists had known that they would have to account for mental states, purposive behavior, and language. Skinner was no exception. He would allow all into his theory but he would do so only in ways that rendered many of the phenomena unrecognizable, wholly distorted from what the terms normally designated. Skinner (1953) recognized that it was common to explain behavior by some non-physical, inner agent referred to as mind, but this Skinner chose to reject because it lacked the physical

dimension (Skinner clearly accepted the notion of mind as derived from the Cartesian model as disembodied and non-physical). Phenomena such as hunger, or habits, or intelligence, in the course of their analysis (as abstracted from observable behavior) have been *reified* into mental existences, and that leads people to look for what is not there rather than discovering the properties that are behind the intelligent behavior or the hungry behavior. Such looking inside only obscures those variables that are immediately available. Now, in this, Skinner claimed that he was not objecting to inner states, it was just that they were not relevant to a functional analysis. Useful scientific statements have to be confined to observable events and functional analyses and the controlling variables have to be described in physical terms. Skinner intended to include an explanation of so-called mental phenomena but he would do so under his own vision from an objective assessment of observable events rather than upon the basis of some speculations about what cannot be observed.

In his functional analysis, Skinner focused on discriminative stimulus control. Such discriminative control, he pointed out, is usually handled as an example of attention (Skinner, 1953/1965). This, he claimed, reversed the direction of the action since it suggested that the observer attends to the object rather than being under stimulus control. In the traditional perspective, it was the person who determined those stimuli that would be effective under the direction of some inner gatekeeper, called attention, rather than a response to a limited number of impinging stimuli (Skinner, 1971). Attention is a relation of control that exists between a discriminative stimulus and a response and in it the attention of an observer is captured by an object. To attend is to be under special stimulus control and there is no need to invoke fictional mental processes to account for it; the stimulus conditions themselves account for it adequately. The phenomena of generalization, abstraction, and decision making would be given comparable treatment.

Generalization is the transfer of a learned behavior from the original learning situation to one that shares some similarity to the original situation. To a cognitively oriented individual the inclination may be to argue that a concept has formed and is the basis of this transfer of learning. Generalization is not something that is done by the organism. All that the term means is that the stimulus control is shared by similar stimuli. The process of abstraction receives the same treatment.

Behavior changes because contingencies change not because some concept has developed. Mentalistic jargon is just another way of talking about behavior: "Many mentalistic or cognitive terms refer not only to contingencies but to the behavior they generate. Terms like 'mind,' 'will,' and 'thought' are often simply synonyms of 'behavior'" (Skinner, 1977, p. 2). Mind often is a reference to behavior in that 'mind' means little more than 'do'" (Skinner, 1989, p. 17).

Mind and mentalism, while something to be dealt with, are clearly not in line with scientific practice for Skinner. He made this quite clear in a paper he wrote shortly before his death when he proposed that, "There is no place in a scientific analysis of behavior for a mind or self" (Skinner, 1990, p. 1209). Throughout his career Skinner had fought against a scientific psychology that included mind but, just as Watson had concluded before him, if mind exists, it was not within the province of psychology as science. Skinner (1960) had begun to allow, thirty years earlier, for the possibility of inner processes, or the issue of privacy, but he could not see how they fit within a scientific approach. Behaviorists, he noted, had not examined sensations, thoughts, images or other private processes not because they do not exist but because they are beyond the behaviorist methods; they could not be sidestepped.

An adequate science of behavior must consider events taking place within the skin of the organism, not as physiological mediators of behavior, but as part of behavior itself. It can deal with these events without assuming that they have any special nature or must be known in any special way. The skin is not that important as a boundary. Private and public events have the same kinds of physical dimensions. (Skinner, 1960, p. 84)

Private events, as physical events, are acceptable but not mind. Skinner is clearly opposed to mind as substance. He recognized that there was a common tendency to explain behavior by reference to a non-physical, inner agent called mind but he rejected this because it lacked the physical dimension (Skinner, 1953/1965).

On Memory

Reinforcement contingencies change a person but these contingencies are not stored. Mind contains no iconic representation, no stored data, and no mental maps. The person, simply, has been changed such that certain stimuli control certain perceptions. In recall it is not necessary to suppose that one examines some memory storehouse; a tendency to see the object is simpler (Skinner, 1971).

We say that a person *forms a concept or an abstraction*, but all we see is that certain kinds of contingencies of reinforcement have brought a response under the control of a single property of a stimulus. We say that a person *recalls or remembers* what he has seen or heard, but all we see is that the present occasion evokes a response, possibly in weakened or altered form, acquired on another occasion. (Skinner, 1971, p. 184)

An organism is changed by environmental histories but these histories are not stored in the organism. Nothing is stored; contingencies just leave a person changed.

Contingencies change the organism but the contingencies exist outside of the organism (Skinner, 1974). Recall does not involve searching a memory storehouse it is just an increased probability of responding. The effectiveness of future stimuli depends on how they resemble stimuli from earlier contingencies. To be “reminded” is to be likely to be made to respond. If anything is stored it is behavior (Skinner, 1977). What is observed is that a repertoire of behavior has been acquired and the metaphor of storage and retrieval takes one beyond these facts. No “cognitive map” is consulted when describing what is seen when a city is brought to mind (Skinner, 1974). To know a city is just to possess the behavior of getting around in that city; it does not imply any cognitive map that is followed. To visualize a route in order to describe it to another is “seeing as” rather than “what,” i.e., it is not what is seen when actually going through that region. Possession of knowledge implies storage and, for that, cognitive psychologists have created numerous mental surrogates in place of behavior, e.g., images and memories, but, again, if anything is stored it is behavior (Skinner, 1977). To be changed is not to possess knowledge due to experience, it is simply to be under the control of new contingencies, and requires no mental representations.

Skinner is most clearly aiming to rid psychology of reference to any mental images or notions of personal agency. Mind, as substance, is a fiction and anything related to it is a fiction and must be removed and, when necessary, what remains must be given an account of scientifically, i.e., in terms of observable phenomena and environmental determinism. Two

problems that remained for Skinner, as they did for Watson, were the problems of language and thought. It is these that we will consider next.

On Language

Language, or what Skinner (1953/1965) referred to as “verbal behavior,” was subject, as was all behavior, to the three-term contingency pattern. Verbal responses come under the control of verbal discriminative stimuli. The presence of a chair, for instance, makes it likely that the utterance “chair” will be reinforced (for instance with a parent congratulating a child for making the correct assertion). Verbal behavior is a behavior that is generated by, and perpetuated by, a verbal community. Properties of nature are isolated and are responded to with verbal labels and these are maintained by the verbal community and, over subsequent generations, children are taught to recognize abstract properties and to apply to these properties verbal responses.

When a child is taught to call a red ball red, we are surprised to find him calling a green ball red. In our own behavior, the response has long since come under the control of a particular color, but in the behavior of the child the properties of size, shape, and manipulability remain important until a program of differential reinforcement rules them out. (Skinner, 1953/1965, p. 135)

In other words, people in the verbal community through differential reinforcement, or shaping, train children in the correct verbal utterances; the abstract verbal response occurs through the establishment of a contingency relation, by some reinforcing agent, between the characteristic and the verbal response.

Verbal responses are conditioned to objective, environmental events but they can also be conditioned to apply to subjective, private events. This is a little trickier, however, since the verbal community has no access to the private events of, say, sadness or pain. Children are taught to say “it hurts” or “it tickles” because there are public events that accompany the private stimulation. Holding one’s jaw when a tooth aches or squirming when being tickled are public responses that can be associated with private events. The method is clearly prone to being in error, of course, since the relation between the public and the private cannot be corroborated and they can be at variance. A different possibility was that the verbal responses that were acquired for public occurrences were transferred to the private arena upon the basis of common properties, as for instance with metaphorical language used in communications regarding emotional states, e.g., the leader who claims to be “carrying the weight of the world upon her shoulders.” That too is doomed to be questioned since the basis for the transfer from public to private has been upon the basis of properties that are irrelevant. My pain and my sadness will always be condemned to be mine alone and, in the end, not open to public scrutiny and evaluation.

While discussing private events and their personal scrutiny Skinner was not invoking a return to a plane of mind and a withdrawal from the plane of behavior. He had no such intention. Private stimulation is like that which is open to the observation of others with the exception that it is so subtle in its stimulating effects that those effects do not manifest publicly (unless appropriate technological instruments are available). Under such conditions the response to the stimulation, or the behavior, is referred to as being covert, but it is behavior nonetheless.

In 1957 Skinner expanded on his initial treatment of language and attempted to extend his experimental work with animals more fully to the issue of verbal behavior. This, to Skinner,

was not an inappropriate generalization since he believed that “The animal and the experimenter comprise a small but genuine verbal community” (1957, p. 108). As Skinner explained it:

The basic processes and relations which give verbal behavior its special characteristics are now fairly well understood. Much of the experimental work responsible for this advance has been carried out on other species, but the results have proved to be surprisingly free of species restrictions. Recent work has shown that the methods can be extended to human behavior without serious modification. (Skinner, 1957, p. 3)

This is important to appreciate because Skinner will be criticized for this approach later. For instance, it has been charged that the behaviorists “came to view children as ‘rats with language’” (P. Miller, 1993, p. 181). This ‘rats with language’ theory was brought to its fullest expression in Skinner’s (1957) book *Verbal Behavior*.

Continuing the theme he had already established, Skinner (1957) pointed out that verbal behavior is a behavior that is reinforced by others. Given that, in order to provide an adequate explanation of verbal behavior, one only had to deal with enough of the listener’s behavior as would be sufficient to account for the behavior of the speaker. The behaviors of the two together—the speaker and the listener—comprised a “total verbal episode.” When a person speaks in response to the speech of another it is a matter of human behavior and, as such, will be explained by the methods and categories of the experimental approach to behavior. In that regard one has to attend to three events in verbal behavior—the stimulus, the response, and the reinforcement. Regarding reinforcement, most verbal behavior is frequently under the control of an audience through approval (a nod, a smile, or a statement such as “good”). This type of consequence to a behavior is a “generalized conditioned reinforcer,” i.e., an event that normally precedes various reinforcers and is capable, therefore, of controlling behavior because of the reinforcers that it precedes. Audiences become discriminative stimuli for the reinforcement of verbal behavior and as discriminative stimuli they can themselves become reinforcing. Given that, verbal behavior ceases when the audience is unavailable. Besides that, different audiences control different verbal behaviors. The audience selects the subject matter, e.g., discussing sexual exploits during an audience with one’s queen would be unlikely to be reinforced. In all of this, functional analysis was believed to be sufficient to reveal the contingencies that control verbal output and content.

Such a functional analysis of verbal interchanges had been subverted in the past by the fictional explanations based upon “ideas” and, the immediate successor to idea, meanings, and, in its modern incarnation among communications theorists, information (Skinner, 1957). It was suggested that an utterance communicated an “idea” or “meaning” and such meaning was what explained the production of the words as utilized. Given that, the suggestion was that different word combinations convey different meanings. This then suggested a need to search within the verbalizer for an attitude or intention, or whatever inner cause. An explanation based on intention without explaining intention will not satisfy. One might define such terms as “meaning” and “idea” in ways that would satisfy the demands of science (that is, what Skinner demands of science) but the retention of the traditional terminology would have its costs since the formulation on which the terms were based is wrong. An acceptable science seeks causes and, where possible, does so in a way that is amenable to manipulation and measurement. To suggest that that is what the terms “meaning” and “idea” mean would be to distort the original practice.

We must find the functional relations which govern the verbal behavior to be explained; to call such relations “expression” or “communication” is to run the danger of introducing extraneous and misleading properties and events. The only solution is to reject the traditional formulation of verbal behavior in terms of meaning. (Skinner, 1957, p. 10)

The only thing to do was to turn to the principles of behavior for an acceptable scientific approach based on description and explanation. Given the multitude of contingencies in place in a human environment, it will have to be appreciated that once a verbal repertoire has been established it will be open to the influence of multiple causes. To understand this one needs to examine how it is that children build their verbal repertoire (their conditioned verbal utterances).

The teaching of speech to young children involves the reinforcement of successive approximations of correct pronunciation, i.e., shaping. At first, any response that has a resemblance to the usage in the community will be reinforced (producing acceptable consequences from the verbal community) and subsequent reinforcements will be contingent on closer approximations of the correct usage. Those verbal behaviors that have been shaped are retained in strength because of the consistent relation between the utterance and the reinforcement (primarily how mothers respond). Saying “water,” for instance, particularly when in a state of water deprivation, is more likely to occur when the act has been reinforced previously by the provision of water. Were no such reinforcement to be contingent on the verbal response the response would extinguish.

Parents reinforce the children’s repertoire of verbal responses and such verbal operants are maintained in strength by being frequently followed by reinforcement. The strength of the operant is reflected in the strength of the response tendency and that is expressed in characteristics of the verbal report. Response strength falls along a continuum ranging from low to high. A loud “No!,” extended in length, is indicative of a strong response tendency for instance. The height of the pitch of the vocalization may also indicate strength, as may repetition. Thus a person who proclaims, “Beautiful! Beautiful! Beautiful!,” upon viewing a painting, may be indicating a strong response. (Please remember that it is just a strong response and does not “*mean*” that the painting is judged to be pleasing and delightful to behold; exclaiming “Ugly! Ugly! Ugly!” might equally demonstrate the same strength.)

On Meaning

Meaning, as was noted previously, was considered to be a residue of mentalistic explanations. This was not something the science of behavior would give any regard to. To what, then, in language, is a person responding to, and what does it mean to understand? According to Skinner (1957) language is understood if one responds in a way that is in accordance with the prior contingencies that were in place in the verbal environment. To understand is to say the same thing as was said before under the same conditions. To understand the speech of another is to be able to correctly repeat it or to respond to it correctly (Skinner, 1974). What this means is that “meaning is not properly regarded as a property either of a response or a situation but rather of the contingencies responsible for both the topography of behavior and the control exerted by stimuli” (Skinner, 1974, pp. 100–101). The meaning of the response for the speaker is the stimulus conditions that control that response and the meaning for the listener is close to that of the speaker (presumably because the verbal repertoire has been established in the same verbal community) but involves the contingencies for that person’s

subsequent response and what maintains that response. Meanings are not the same for each and perhaps that is why “dictionaries do not give meanings” (Skinner, 1957, p. 9).

Meanings and what the meanings refer to will not be discovered in words. What a word refers to is the environmental aspect that is exercising control over the response. Speakers respond to physical objects and not to abstract entities, i.e., concepts regarding some object; they respond to the contingencies, to the stimulus properties, that control the response. People do not respond to the “idea of a chair,” they respond to “a chair.” One cannot know abstract entities and ideas that embody meanings (as that which is signified) since they are abstract entities. What are called concepts are features of an existing set of contingencies and they are discovered in those contingencies that bring a behavior under their control. What a verbal response “means,” then, is that the verbal response is controlled by certain circumstances and what the verbal stimulus “means” is that listeners respond in a particular way (Skinner, 1977). Contingencies are maintained by the verbal community such that the responses that are made act as stimuli to the listeners who, in turn, act appropriately.

Conversation/communication, as explained by Skinner, is clearly a matter of contingency exchanges between individuals rather than an exchange of information.

One of the unfortunate implications of communication theory is that the meanings for speaker and listener are the same, that something is made common to both of them, that the speaker conveys an idea or meaning, transmits information, or imparts knowledge, as if his mental possessions then become the mental possessions of the listener. There are no meanings which are the same in the speaker and listener. (Skinner, 1974, pp. 103)

While words do not possess meaning in the traditional sense, there has been a close connection made, historically, between language and thought; verbal thinking has been considered a hallmark of human achievement. Talking to oneself without vocalizing is even considered to be a common human function (Farthing, 1992). In fact, a large part of the conscious thinking that people do involves verbal thinking. Language is thus connected to consciousness. That, however, is the traditional position and, as we have seen, Skinner is no traditionalist. Skinner’s treatment, therefore, of language and thought is an extension of his theories of verbal behavior.

On Thinking

A problem that arose in the analysis of verbal behavior was that the speaker, in speaking, is not only stimulating another, he or she responds to that very same utterance, speech is also self-stimulating (Skinner, 1957). Speakers, as Skinner put it, become their own audience. Under ordinary circumstances the withdrawal of the audience results in a cessation of speech as does the cessation of reinforcement (extinction), but something different has occurred because, as speaker-listener, the individual is in a position to reward or punish speech to oneself. The process of speaking to oneself may involve overt speech but it can also take place sub-vocally and when this occurs the person may be said to be thinking (remember that this was essentially the position advocated by Watson). Thought is said to occur, then, when the speaker-listener is engaged in these activities within the skin. In this the person can manipulate and observe personal behavior, continuing it, correcting it, or rejecting it. This does not mean that thought initiates behavior:

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 behavior and the environment in which he lives. (Skinner, 1957, p. 449, emphasis in original)

The process whereby such behavior becomes covert is the process wherein the response strength is insufficient for it to be emitted, weakened by deficiencies in the controlling variables. The behavior may also be expressed covertly so as to avoid punishment socially or when reinforcement has become self-reinforcement. To speak of a self here is not to suggest some mental entity, it is simply a means of representing response systems that are functionally unified (Skinner, 1953/1965) or an organized repertoire of behavior (Skinner, 1974).

Chomsky's Critique of Verbal Behavior

Chomsky (1957/1964) in his review of Skinner's (1957) *Verbal Behavior* leveled a devastating critique of Skinner's reinforcement theory of language acquisition. This, which can only be described as an attack, proved to be a key event in the downfall of behaviorism as the dominant paradigm and in the emergence of a cognitive psychology (Gardner, 1985).

In his review, Chomsky pointed out that Skinner had placed vast importance on the external factors of current stimulation and on the speaker's reinforcement history. It was claimed that the speaker's contribution to the process had been demonstrated to be elementary and trivial. In only specifying the external factors that regulated behavior, those factors that had already been isolated, experimentally, in lower organisms, were considered sufficient for an exact prediction of verbal behavior. While acknowledging that the insights from reinforcement laboratories were valid, Chomsky argued that the findings could only generalize to humans in the most superficial of ways. Not only were such claims not justified, they were downright astonishing. Skinner, in *Verbal Behavior*, had provided no direct reference to any experimental work on language; those experiments that his contentions were based upon were drawn from his bar-pressing experiments with rats. It was these results that were intended to demonstrate the scientific nature of the behavior acquisition system and, then, given that, to make analogical guesses about the extent to which the scope of such findings generalized to human language. This, to Chomsky, created the illusion of a theory that had been tested rigorously and which had a broad scope (minus the demonstration of it). The terms drawn from experimental conditioning of such rudimentary behaviors as bar-pressing were treated as though they served to describe real-life linguistic behavior (which is hardly even covered in the book) with, at best, a vague and superficial similarity.

One of the examples from Skinner's book that Chomsky mentioned, in order to demonstrate what Skinner was proposing about linguistic behavior (verbal behavior to Skinner) was the case of a person exclaiming "Mozart," in response to a piece of music. Presumably the person had been reinforced, in the past, for such an exclamation, perhaps by someone saying "that's right." Another example, which dealt with abstract words, was the elicitation of the verbal response "red," after having looked upon a red chair. The response, in such an instance, was under the control of the abstract stimulus of redness. The same situation could also be under the control of a different abstract stimulus. If, for instance, the person exclaimed "chair" then the verbal response was determined to be under the control of the properties that comprise chairness. Such an approach, in the estimation of Chomsky, was simplistic and utterly empty.

Skinner's use of the term "stimulus," in reference to language behavior, was judged by Chomsky to be lacking in objectivity. The stimuli, rather than being of the physical world, were within the organism. The *concept* "red" and the *concept* "chair" were, apparently, impelling the statement. Whereas Skinner had claimed that his system supported the prediction and control of a person's verbal behavior, Chomsky concluded that the claim was false. The stimulus was identified only after the response had been heard (its identification was post hoc rather than having been predicted). Verbal behavior could not be predicted on the basis of the stimulus environment since the stimuli were not known until after the response had been made. The control of the verbalization thus appeared to be within the person. Any discussion of stimulus control, Chomsky concluded, only served to disguise a wholehearted retreat into mentalism (presumably because the initiating agent was not to be found in the environment). Speech did not appear to be elicited by discriminative stimuli; rather, it was produced. In a sense, Skinner had opened himself to the possibility of control from within when he allowed that the person may be her or his own agent of reinforcement.

Skinner, Chomsky noted, made a strong appeal to the notion of automatic self-reinforcement. People talk to themselves (sub-audible responses) that, to Skinner, 1957, are too weak to be readily detected in observation) and, when they do, it must be because they apply their own reinforcements to such behavior and, in doing so, maintain the self-talk. As Skinner (1957) suggested, it may be reinforced by the fact that it is useful. The behavior thus remains effective despite its being covert:

Moreover, it may remain effective at the covert level because the speaker himself is also a listener and his verbal behavior may have private consequences. The covert form continues to be reinforced, even though it has been reduced in magnitude to the point at which it has no appreciable effect on the environment. (Skinner, 1953/1965, p. 264)

Despite the fact that such behavior is covert it is still behavior to Skinner. Under the same logic Skinner aimed to account for other behaviors that appeared to involve self-reinforcement. The same extends to other behaviors that do not appear to be under outside stimulus control. Musicians play or compose music that had been reinforcing when heard previously and it is now personally reinforcing to play that music; painters paint what has been reinforcing to look at; the writer writes what she has enjoyed reading. The act of production is reinforced by the production of what had been previously reinforcing.

Often, however, as Chomsky suggested, the actor is not around when any real outside reinforcement occurs, e.g., the painter was not present at the sale of a painting (potentially the real reinforcement maintaining the behavior). The reinforcing stimulus does not have to impinge on the person who has thus been reinforced. This type of function is often referred to as *intrinsic motivation* or behavior induced by personal goals or satisfactions (Ferguson, 1976; Buck, 1988) but, in the hands of Skinner, it is meant to imply the internalization of covert control. Skinner's invocation of reinforcement, to Chomsky, lacks explanatory force under these conditions. In fact, it has lost any of its former objective meaning since responses no longer have to be emitted in order to be reinforced and the so-called reinforcer does not even have to exist since it can be imagined and reinforce in being imagined, or it can exist in some hoped for future, e.g., recording a song or publishing a novel. In the case of language, reinforcement has become a blanket term for any factor that supports verbal acquisition or verbal maintenance. Is that all there really is to it?

Suppose, Chomsky suggested, that a person is crossing a street and someone yells out a warning to jump aside. The yelling person, in Skinner's scheme, verbalizes an order that, if acted upon, will be reinforcing to the speaker. Is that what is really happening? Chomsky argued that one could not assume that the jumping was previously conditioned in order to serve as the reinforcement for such vocalizations. Is one to then assume, asked Chomsky, that a person will not respond to a threat of death, and fail to hand over valuables, unless there has been a prior history of the person being killed. It does seem, rather, that one can understand what is referred to by language and that one uses such meaning to direct personal behavior without a need for such reinforcing contingencies to establish said behavior.

While Chomsky attacked Skinner on many fronts, the portion of his critique that has received the greatest attention among psychologists was his assessment of Skinner's account of how children acquire verbal behavior. Skinner frequently claimed that the verbal community arranges reinforcement contingencies for language learning. The claim, however, was not based on any actual observations but was, in reality, an extension by analogy from the results of his experiments with lower organisms. Chomsky acknowledged that children acquire verbal behavior by casually observing and imitating adults but it was not the case that the acquisition of a verbal repertoire was due to careful shaping of speech production. Children will imitate, Chomsky argued, without any effort on the part of parents to teach or to reinforce learning. In fact, he submitted, if one were to consider the children of immigrants, one would observe that they pick up their second language on the street. There is no evidence that shaping is necessary nor is it the case that the parents are involved. There must be some basic processes, he suggested, that are operating apart from environmental feedback. When adults read newspapers, for instance, they often encounter sentences that they have never seen but which are recognized and understood. Sarcastically, Chomsky contended that, "We can look up something in a book and learn it perfectly well with no other motive than to confute reinforcement theory or out of boredom, or idle curiosity" (Chomsky, 1957/1974, p. 562).

All in all, Chomsky found Skinner's account of language acquisition and language maintenance utterly unconvincing (remember that verbalizations that are produced without reinforcement will extinguish). Even worse, he found Skinner's so-called scientific approach woefully unscientific. According to Chomsky, Skinner was only "play-acting at science" (Chomsky, 1957/1974, p. 559). There was nothing in his account that hinted of any truly scientific investigation (or account) of linguistic behavior. In his estimation, Chomsky believed that "what is necessary . . . is research, not dogmatic and perfectly arbitrary claims, based on analogies of that small part of the experimental literature in which one happens to be interested" (Chomsky, 1959/1964, p. 563). Rats pressing bars and pigeons pecking at keys may interest one, and that is fine, but it is wholly another thing when something so limited is foisted upon something so much larger.

To Be Taken Seriously Or Not

From my own perspective, I have long struggled with the question of whether Skinner should be taken seriously or not. If we take him at his word, just as verbal behavior does not, written language does not convey meaning. It is simply what has been reinforced by having been written previously or, if not externally rewarded, it is produced because it is self-reinforcing. If so, and if Skinner truly believes that he is not conveying his ideas and beliefs regarding language, one can rightly assume that past writings along a similar vein have been previously

reinforced and, so, he is simply being guided by those contingencies. Personally, I do not believe that. I think Skinner fully intended that he be taken seriously. He repeated his message for more than two decades. In this, however, Skinner was not always consistent and true to his theory.

In an effort to make his point, Skinner (1989) turned to research into word etymology. His intent was to trace the history of certain words used by cognitive psychologists and philosophers and to demonstrate that those words had their origins as references to behavior:

Words referring to feelings and states of mind were first used to describe behavior or the situations in which behavior occurred. When concurrent bodily states began to be noticed and talked about, the same words were used to describe them. They became the vocabulary of philosophy and then of mentalistic or cognitive psychology. The evidence is to be found in etymology. (Skinner, 1989, p. 13, emphasis in original)

So, according to Skinner, many of the terms that now refer to mentalistic states were initially used to refer to observable behaviors or to the situation in which the behavior occurred. To make this point Skinner examined around 80 words that applied to mental phenomena. These were examined in terms of the prevailing bodily conditions that were in place when people were doing something, or sensing something, or in altering how something was done or sensed (learning), and in terms of how, as a result, they remain changed (memory). The word 'interpret,' for instance, seemed to trace back to an activity of pricing since, in earlier times, to be an interpreter was to broker prices, to evaluate, and that was a behavior. The actual attempt to trace mentalistic words to bodily conditions or situations is not, however, the point of this excursion. The point is that word meaning doesn't matter to Skinner until such time as he can use it to make some case against mentalism by demonstrating that it is, in the end, behavior. Such opportunism does not wash. Meaning is either refuted or it is not; it cannot be both. It cannot be banished and then be recalled as though it had not been denied. Since, however, Skinner opened the door to examining word meaning, I think it most profitable that we examine the words "experience" and "observation."

Experience

As has been mentioned, there was a close relationship between the philosophies of science of Mach and Skinner excepting that Skinner had exchanged stimuli and responses for sensations (Kitchener, 1996). Mach's approach was rooted in mentalism since his subject matter was sensations and phenomena, i.e., things as they are presented to mind. Skinner, of course, eschewed such phenomena as mental states and avoided having to deal with them by going immediately to prior environmental causes of the so-called perception and of the subsequent responses. One could say that, in that regard, Skinner was a direct realist. Observable events would be his focus and the relations that exist between those events. In that regard, however, despite the apparent objectivity of Skinner's approach, we find ourselves with a bit of a conundrum since to "experience" or to "observe" is to imply some sort of mental operation. Skinner may deny the importance of the sensations, perceptions, or other mental conditions to his subjects but he seems to rely on it in order to establish the objective facts that he so obviously cherished.

As an adherent to "empiricism," Mach had allowed only that which was available to immediate experience to serve as the facts of science (whether physics or biology or psychology), and the basis of what can be known, and that the facts for him were sensations. All sciences were ultimately based on observation and were descriptive. The observation of

facts was the bedrock of good science but, in making this proposition, Mach had confined himself to a hopeless subjectivism since real things, objects, people, or whatever, were not accessible. Skinner, by basically asserting direct realism, seems to maintain that the subjectivity associated with observation has somehow been overcome by proclamation. Well and good. He would focus on objects of the real world that are directly accessible and avoid altogether the unobservable. Mental states do not enter into Skinner's psychological science. Mental states are not of the subject matter but they are of the method—to observe and to experience—and to describe what is experienced is to still rely on experience.

Experience, as it has been defined by Runes, (1977), was “the condition or state of subjectivity or awareness” (p. 103) or, as Frolov (1984) represented it, it was the “sensuous empirical reflection of the external world” (p. 137) and thus involved subjective conditions. Among psychologists, it has been conceived of by English and English (1958) as, first, an “actual living through an event or events” (pp. 193–194). Nothing in that suggests mental events and may be what Skinner meant to convey when speaking of the experience of his subjects. Maier and Schneirla (1935, as noted in Kimble, 1961) exemplified this when they proposed that, in their use of the term experience, they were referring “to the effect of stimulation on behavior” (p. 3) thus rendering experience objective. Skinner explained the matter likewise, in referring to the experience and knowledge of his subjects, when he proposed that, “the ‘experience’ from which knowledge is derived consists of the full contingencies” (1974, p. 153), i.e., the environmental conditions that regulate behavior. It is the second sense, however, that applies to his attempts to develop a scientific, descriptive psychology, based on observation. In its second sense the term refers to “knowledge derived from actual participation in events” (English and English, 1958, p. 194), such as would be the case with observation. The term “observation,” then, in that case, is most instructive. Observation, in the sense in which it is being used here, is the “directed or intentional awareness or scrutiny of particulars or facts” (English and English, 1958, p. 353). Or, from another psychological definition, “the intentional examination of an object or process for the purpose of obtaining facts about it or reporting conclusions based on what was observed” (Corsini, 2002, p. 658).

Carrying this idea further, Palys (1992) indicated that, as an epistemology, empiricism proposes that valid truths can be generated by directly observing the world. That, of course, is one of the cornerstones of research methodology. In other words, some phenomenon of interest is focused on rather than all phenomena. The researcher is looking for something (remember that science is “theory laden”). Skinner's interest and focus was the identification of behavioral contingencies and a lack of attention to other observables such as roles, group membership, gender, developmental age, nor even interspecies differences. Following such selection and observation there is the gathering and recording of data. Such observation and recording is so commonplace and unquestioned among social scientists that the epistemological implications are treated as non-existent. It has become part of *vademecum* science and its assumptions have gone implicit. In one such handbook on research conduct, for instance, it was written that, “Social science data are obtained when investigators or others record observations about the phenomena being studied” (Frankfort-Nachmias and Nachmias, 1996, p. 204).

In the final analysis the method of observation is an approach to research that involves a researcher that has a purpose in looking and extracting data, and one whom has the capacity to be aware of objective reality and intentional with regard to it. Purpose, as we know, was not something that Skinner credited his subjects with but it does appear central to his own

efforts (even though he evades that problem). The empiricist approach lays stress on the important role of experience in knowledge and that includes those modes of consciousness to which phenomena are presented (Alston, 1998). Knowledge, which is what one assumes Skinner's scientific efforts are directed at, and despite his denial of it in his subjects, is, from the perspective of empiricism, the result of perceptual experience and it is justified from the perspective of perceptual experience (Leahey, 2001).

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