

CHAPTER TWO

THE BEHAVIOR ANALYTIC APPROACH TO LANGUAGE AND THOUGHT

In psychologists' attempts to explain the nature of language and thought, all pretense of building an axiomatic system was laid aside. The severely limited success of formal axiomatic systems in psychology eliminated most of the desire to even attempt such a project shortly after Hull's work was completed. Whatever axiomatic qualities psychological theories possess, they are rarely expressed as such. We have seen that Dollard and Miller (1950) translated some Freudian principles into those of Hull, and although they demonstrated the similarities that existed between the two theories, this never induced Freudians to change their vocabulary or their theoretical concepts to those of Hull. Freudian theory was so extensively interpretative and so removed from direct experience that it was unimaginable that it could be restructured in a formal, or even semi-formal, axiomatic manner. However, as we have seen, since Skinner developed a system that lent itself to axiomatic arrangement, a successful attempt to account for the functional aspects of language and thought through the principles of behavior analysis would constitute a major advance in psychological theory.

The System

The postulates, corollaries and theorems of behavior analysis discussed in Chapter 1 are assumed to form the basis of the interpretation of verbal behavior which Skinner presented in 1957. That is, the acquisition and emission of various verbal behaviors, as described below, are thought to be acquired and emitted under the same kinds of arrangement of environment and organism as are depicted in fixed and variable ratios and fixed and vari-

able intervals of reinforcement. Verbal behavior is, therefore, no different in its operative properties than any other form of behavior. Of course, the fact that verbal responses are made at all is determined by conditions which Skinner assigns to the human behavioral repertoire. The behavior analytic postulates were, as we have seen, established in the classic scientific manner of performing many experiments which confirmed the validity of the predictions which were derived from the postulates of the system. The system works perfectly well under laboratory controlled procedures, but is difficult to directly apply to human behavior change *in situ*. This problem was partially alleviated by the introduction of the matching law. However, there are still difficulties in the application of laboratory results to natural human behavior since with environmental control it is often not ethically or practically possible to precisely construct a reinforcement schedule. This means that the systematic application of reinforcement schedules to human beings is restricted to only certain activities and to captive audiences such as school children, convicts or military personnel. However, on this account, behavior analysis is no different from any other psychological theory, all of which are restricted in the same manner. The problem does not arise in the natural sciences in the same way that it does in psychology. Gases behave the same way in a laboratory container as they do in their natural context. Objects fall at the same rate in the laboratory as they do from a tree. Because psychologists are always dealing with human beings or other animals, the problem of laboratory behavior compared with behavior in a natural context is always an issue. Skinner understood this and provided an interpretation of verbal behavior, particularly what we commonly call speech and thinking, based upon the postulates gleaned from laboratory experimentation on the acquisition of behavior in nonhuman animals. To my knowledge, Skinner did no experiments on the acquisition of verbal behavior although he did do some on word association and the verbal summator. Instead he constructed what he believed to be the most parsimonious account of how speech was acquired and used. The label "verbal behavior" assigned to what others called speech and thinking was, of course, necessary given Skinner's position regarding the centrality of the idea that behavior is determined by its consequences in the environment and that non-operational, mediational concepts are useless in predicting and building a theory of animal activity. For Skinner, language is defined by its structure and verbal behavior by its function (Catania, 1997). We shall see in the next chapter that the language in its structural substance is the subject matter of many cognitive psychologies.

One of Skinner's main contentions about human behavior in general is that its effect is on other humans more often than it is on other aspects of the environment. The effects of verbal behavior are only on other human beings or oneself. Consequently, language and the way it is used is deter-

mined by the way it functions in verbal exchange. In addition, verbal behavior is subject to the influence of the behavioral repertoire as is any behavior. This approach to understanding the nature of language and thought considers what we conversationally call meaning to be totally accounted for by the relationship existing between the word or words at issue and the environmental conditions which constantly accompany them. These conditions always involve another speaker and listener although they could also include various objects and processes as well, as when a speaker asks a listener for a glass of water. Thinking is conceptualized as the speaker and listener being the same person, that is, "within the same skin" (Skinner, 1957, p. 11). Thinking, therefore, is subject to the same principles of acquisition and use as is verbal behavior between two individuals.

The Mand

Skinner defined verbal behavior as "behavior reinforced through the mediation of other persons" (Skinner, 1957 p. 14). This included, for example, non-vocal behavior such as clapping hands to gain someone's attention. However, vocal verbal behavior is of most interest to both Skinner and the rest of us and is the one on which he concentrated.

It has been demonstrated that children speak nouns before other parts of speech. If we consider a child's first word, usually dutifully recorded by parents, it is likely to be a one syllable name for some common household object or toy such as clock, book, or ball. The initiation of such words in the vocabulary of the child is most likely imitative or, as Skinner calls it, "echoic." The mother pronounces a word such as "ball" and eventually the child imitates the sound. In this case the child saying "ball" is under the control of a verbal stimulus. Many mothers will often encourage echoic behavior by exclaiming "Say 'ball!'" to their child. Skinner calls this form of verbal behavior a "mand." This neologism was inspired by such English words as "demand," "command," and "countermand." A mand is defined as vocalization (a verbal operant) which is reinforced by a consequent in the environment and which is, therefore, "under the control of relevant conditions of deprivation or aversive stimulation" (p. 36). Presumably after the child has exhibited initial echoic behavior, the imitated word may evolve into a mand by the successive instances of reinforcement which follow its use. For example, the echoic "ball" may be followed by the mother presenting a ball to the child. This reinforcement sequence increases the probability that the child will utter the same word under similar conditions of deprivation in the future, that is, when the ball is not within reach. Generally a mand specifies its reinforcer as in our example, "Ball!" or "Stop!" or "Bread!" or "Go!" It is not possible for a listener to determine whether or not an utterance is a mand from its form

alone. We need to know the utterance's controlling variables. As we shall see below, it might easily be confused with another aspect of verbal behavior by the listener. The reinforcement for the listener in providing the object or process specified in the mand by the speaker takes two forms. The listener may avoid aversive stimulation initiated by the speaker by reinforcing the mand as when the speaker strikes the listener if the mand is not reinforced by the listener. Conversely, the listener may be rewarded by the speaker's behavior after he or she has received the object or process specified in the mand by the speaker saying "Thank you" or simply smiling. If the speaker says "Thank you" this reinforces the listener's mand-responding behavior, and a "You're welcome" reinforces the speaker's "Thank you." Of course, receiving the object or process specified in the mand also reinforces the speaker's "Thank you" as well as it increases the probability of such a response occurring in succeeding similar situations.

The Tact

It is immediately apparent that when a child utters a verbal response such as "Ball!" it can not initially be clear to a listener whether the child is uttering a mand because the child is under some state of deprivation or aversive stimulation, or whether it is simply providing information. Even an adult might utter "Ball" when it wants the ball in some cases and when it is simply indicating the presence of a ball to a listener in other cases. When a speaker utters a word in the presence of the stimulus which, incidentally, provides information to a listener or potential listener, Skinner calls the utterance a "tact." Skinner formally defines tact as "a verbal operant in which a response of given form is evoked (or at least strengthened) by a particular object or event or property of an object or event (p. 82). The neologism "tact" is suggested by the idea of "making contact with." The question arises as to how we know whether the speaker is "manding" or "tacting" when a single word is spoken. The reinforcement for using a tact, as in the above example, comes from the response of the listener who in turn can only discriminate a tact from a mand by depending upon reinforcement from the speaker. If a child uses the single word "ball," as in the example given above, a listener will conclude that the child has manded when it accepts the presentation of an actual ball, and probably conclude that it has tacted if the child pushes the ball away thus indicating that it didn't "want" the ball, but was merely indicating its presence. The development of categories of speech other than nouns solves this problem at a later stage in development. When the verb precedes the noun as in the phrase "Give ball" the listener discriminates the fact that the speaker is manding rather than tacting. When only "Ball!" is spoken the listener may assume the speaker is tacting. Once pronouns and

definite and indefinite articles are used by a speaker, the discrimination of a tact from a mand is made simple as in the difference between the phrases, "Give ball" and "That a ball." In each of these examples the reinforcements are reciprocal between speaker and listener in that the "correct" use of a word or phrase by the speaker is reinforced by the behavior of the listener, and the listener is reinforced by the behavior of the speaker. Should a child say "ball" when pointing to a toy automobile, the listener might shake her head, say "no" and then supply the word "car." When the child says "ball" and points to a ball, the listener's reaction is likely to be quite different. Through this procedure repeated in countless numbers of instances, a child eventually learns a natural language. The listener's behavior is, in turn, reinforced by the child's verbal responses as when corrective behavior is initiated by the listener under circumstances when the child utters the incorrect word or phrase and supportive behavior is initiated when the child utters the correct word or phrase. All tacting does not necessarily produce a consequence and thus will not be reinforced. Tacting involves stimulus control through the medium of verbal behavior and, of course, tacted stimuli are sometimes private, that is, only available to the speaker as when we say we are not feeling well (Catania, 1998).

An interesting interpretation of the greeting response, universal among human beings, can be made from the perspective of Skinner's concept of the tact. When encountering a friend whom one sees daily, there is a virtually universal proclivity to engage in verbal, but not necessarily vocal, greeting behavior. Greeting behavior, of course, can consist of the waving of a hand, the inclination of the head, or a verbal operant such as "Hello." In any case, the idea seems to be to acknowledge the presence of the other person. Greeting behavior is so common and expected that it can occur without any other accompanying covert verbal behavior (thought). However, the absence of greeting behavior can cause a person expecting it to become upset and wonder if the other person is angry with her or is punishing her for a previously perceived slight of some sort. It is clear that a greeting is usually more noticed in the breach than in the observance. A greeting is a tact that acknowledges the presence of the other person. Thus it provides information to the listener that his or her presence has been noted. Skinner called such greetings, and other similar verbal behavior, intraverbals.

The Intraverbal

The word "please" is often appended to a mand as in, "Please pass the salt." Pass the salt is sufficient to communicate to the listener the appropriate behavior expected by the speaker. However, the intraverbal "please," which frequently is a discriminative stimulus for the intraverbal response, "Thank

you," has its own history of reinforcement. Mothers often insist that their children use this word in conjunction with a mand on pain of punishment. Other intraverbals consist of responses such as "Washington" to "What is the capital of the United States?" One verbal stimulus begets another without necessary connection to an object or process in the environment other than the utterance itself unlike, for example, the situation that produces a mand. Common word associations such as responding with "up" when hearing "down," or with "husband" when hearing "wife" are also classified as intraverbal responses. Skinner also discusses what he calls textual behavior as when one is reading, as well as other details of the acquisition and use of verbal behavior, but only one other category need be discussed for our purposes.

The Autoclitic

In general, the mand, echoic behavior, the tact and the intraverbal consist of a repertoire of responses under the control of environmental variables peculiar to the history of the speaker. The speaker thus becomes, as Skinner puts it, "an interested bystander" (1957, p. 311), in that he or she speaks and listens in a manner predictable from the functional relationships existing between speech and conditions existing in the environment. The speaker invents nothing when her verbal behavior can be described as the result of causative processes occurring in her environment which are linked by reinforcement to speaking. However, all verbal behavior, Skinner contends, has not been accounted for when one considers only mands, tacts, echoic behavior, intraverbals and textual behavior. Verbal responses such as "if," "that," "as," "therefore," "I infer," "I surmise," "I deduce," and a host of other such responses are not accounted for by these categories. Words and phrases used in indicating what are called "intentions" and "propositional attitudes," need to be placed within the context of vocal speech as verbal behavior with the same kind of relationships existing between response and environment as with any of the other forms just discussed.

With the autoclitic, Skinner attempted to give an account of that aspect of verbal behavior which is often associated with what most people call thought, especially that thought which is private. Private thought is, by definition, not necessarily shared with other people since it can occur subvocally although we do use the phrase "thinking aloud" to refer to shareable thoughts. No one denies the existence of private verbal behavior (thought) regardless of the theoretical position he or she may hold concerning the nature of language. Skinner notes that these private responses often form the core of what some regard as the "inner self." He considers this term a label for those systems of response where one is based upon the other. There are upper and lower systems where the upper can only be understood in terms of its rela-

tions to the lower. The upper system seems to guide or change the lower, but both systems are behavior and do not refer to a controlling inner self in the sense in which that term is used colloquially. The speaker is aware of knowing, in addition to knowing what is known, so two systems are operating, but both are understandable within the terms of the reinforcement of behavior. The "knowing that one knows" is the core of the behavior system that Skinner wishes to explain when he introduces the notion of the autoclitic: "clitic" refers to "back formation," thus the term autoclitic, meaning "self-back formation," was intended to refer to this two layered behavioral system and the reciprocity between them that was required to understand this most complicated form of human language and thought. This "knowing," as is expressed in assertion, negation, intention, and propositional attitudes of all sorts, is itself dependent upon both the lower system of verbal reinforcements such as tacts and mands and on reinforcements from the verbal community. Skinner divides the autoclitic into several types. Most basic are the descriptive, qualifying and quantifying autoclitics.

The descriptive autoclitic consists of verbal behavior which describes one's own behavior. As we have seen, a mand or tact is reinforced by an event involving another person, an object or a process in the environment of the speaker. The descriptive autoclitic involves verbal behavior under the control of other verbal behavior. The speaker, in short, can speak about herself speaking as in "I said I am going to the movies." One can also read what one has written. The control of this self-descriptive behavior lies in the verbal community, which will be discussed more fully below. Even though we may talk to ourselves, it is clear that the means for doing so lie in the controlling contingencies fashioned by this community. We are reinforced to use autoclitics in self description by the verbal community asking certain questions such as "Why did you say that?" "What did you mean by that?" etc. Skinner reiterates the point that there is a difference in nonverbal knowing and knowing that you know. Later behavior analysts (e.g., Hineline, 1983) express the same idea by describing these two processes as "knowing how" and "knowing that." Humans and other animals "know how" when they are able to successfully negotiate their environment for food on a regular basis. "Knowing that" they know how to do this is a characteristic of autoclitic verbal behavior and is thus likely restricted to human beings, although it may appear as a rudimentary ability in other primates.

So far I have emphasized that Skinner's view of the nature of the autoclitic is that of verbal behavior reinforced by other verbal behavior as in an individual thinking or speaking to herself. However, autoclitics are obviously used in speech directed toward other people as well. We have common phrases for this activity such as "shared thoughts," or "a discussion of abstract principles." When these autoclitics are used in a conversation with other

people, we are essentially structuring our verbal behavior in order that a listener may respond in the same way that we do to the same speech without there necessarily being any external referents present in the immediate environment even though these referents might have been necessary to establish some of our verbal behavior in the past. For example, if I say "It follows that if there are no clouds in the sky, it will not rain," I am indicating an environmental event that I have observed many times in the past to which the verbal community has assigned the words "rain," and "sky," etc. which have been reinforced in the manner described earlier in the sections on mands and tacts. In addition, the phrase "it follows that" is autoclitic in nature and is used as a result of the process of reinforcement that lies in the verbal community. The reader will recognize that the above predictive sentence is of the *modus ponens* type discussed in Chapter 1. Indeed, the terms and premises of logic and mathematics are almost all autoclitics and consequently, so are the terms used to indicate theoretical expressions in science.

Skinner makes a clear distinction (1957, p. 418) between the behavior maintained by a community and the devices used to maintain this behavior such as effective discourse. The rules of logic and mathematics control that effective discourse that we call science. These rules function to precisely control the way a process, specified in an empirical statement, is identified and classified such that a practical manipulation is made possible. For example, once we are able to successfully apply Boyle's laws to gas stored in containers, this results in our being able to manipulate gases in a manner that reinforces our future behavior regarding the handling of gases. In short, we have acquired useful, practical behavior. This behavior which is both verbal and nonverbal, in turn, reinforces the verbal rules which were necessary to reach the precision required to establish the practical manipulations. Thus these verbal rules are largely autoclitics which have been established in the appropriate, in this case scientific, community. The dissemination of these rules to interested parties is accomplished by a number of means, most of which depend heavily upon the acquisition of a variety of autoclitics. An unabridged dictionary is an attempt to store all of those verbal units we commonly call words in a single place for a particular natural language. The acquisition of an autoclitic is keenly illustrated by the way one uses a dictionary. If the "meaning" of a word is unknown to the reader, a dictionary can be consulted. To say that one does not understand the meaning of a word is to say that one has not been reinforced for speaking it by the verbal community. By consulting a dictionary, we agree to abide by the verbal stimuli given to represent a particular word. If I read that "calculate" is defined as "to ascertain or determine by mathematical processes" and speak that word when I am referring to these ascertaining or determining processes, I will continue to use the word in the same manner if the person to whom I have spoken

continues the conversation so as to indicate that he uses the word in the same way that I do. For example, if I say to a listener "I am going to calculate this month's grocery bill," and the listener responds by saying "Do you think it will be greater than last month's total?," I am reinforced in the way that I have used the word "calculate" by the listener referring to the process of calculation in a variation of the way I have used it, but which is still intelligible to me. Since autoclitics can be reinforced only by other verbal responses, using a word "correctly" means using it so that one is reinforced by a listener in the manner suggested above, or by a dictionary or some such similar device which is accepted by the verbal community as the reference as how a word is to be used, or by reference to the way it is used by others when one is a listener.

The fact that scientists require, at some point in the development of an explanation, that one defines the key words in terms of an object or process, indicates that the uses of autoclitics have some connection to environmental stimuli. Operationally defining the terms used in scientific formulations, although enduring periodic controversy, remains an ultimate necessity for most practitioners. Science seeks to restrict the verbal responses made to verbal stimuli such that the nonverbal circumstances responsible for the acquisition of these verbal responses are easily determined. In short, certain societal uses of autoclitics can and do interfere with the scientific process of determining the functional relationships among various objects and processes. As Skinner puts it, "The test of scientific prediction is often, as the word implies, *verbal* confirmation. But the behavior of both logician and scientist leads at last to effective non-verbal action" (p. 429). It follows that the study of verbal behavior, therefore, must have two distinct, but related aspects — the way verbal units are reinforced in their link with environmental objects and processes, and the way verbal units are linked with one another. The mand and the tact, for example, are Skinner's attempt to explain the former process, and the autoclitic his attempt to explain the latter.

Qualifying Autoclitics

In Skinner's description of the qualifying autoclitic the virtual inseparability of mands, tacts, echoics, intraverbals, and the autoclitic itself used in single verbal clusters is apparent. The qualifying autoclitic makes a listener's response effective although it does not alter the nature of the reaction (p. 322). These autoclitics qualify mands made upon the listener. Qualifying autoclitics also serve to modify tacts. "No," or its variants "not," "never," and "nothing" can be used as qualifying autoclitics as in saying "I do not drink alcohol." Since there are many things one may not do, it is clear that the use of the negative in this sentence is used as a response to other verbal behavior which

suggests the behavior of drinking alcohol as in the question "Do you drink alcoholic beverages?" This latter sentence is a verbal response reinforced by appropriate environmental conditions involving the actual imbibing of alcoholic beverages or the avoidance of such behavior. The responses "no," as in "No, do not eat that cookie!" is a qualifying autoclitic that functions as a mand.

Quantifying Autoclitics

Some autoclitic expressions such as "some," "none," or "all," indicate quantity. These autoclitics modify the reaction of the listener to the sentence in which they are found. If one says "All gases expand when heated," this is not to imply that one has observed all gases in this state, but rather that "all" indicates that the sentence is a general proposition which always can be stated because we have observed certain environmental conditions and their effects on gases in the past which have reinforced our saying this under certain speaker-listener conditions. Hence "all" modifies the behavior of the listener to the proposition that "Gases expand when heated." The effect of "all" is on the listener, not on the gases.

Grammar and Syntax

Clearly, what we ordinarily mean by grammar and syntax must be considered more or less autoclitic in Skinner's interpretation of verbal behavior. Skinner is not interested in the formal properties of grammar and syntax, but rather in the variables that control those verbal responses that are called syntactical and grammatical in other descriptive systems. Skinner must account for words such as "shall," "of," "than," and other connectives and prepositions that form the core of syntax and grammar. Such words are relational in that they are not emitted unless they have an effect on other verbal behavior.

The ordering and grouping of verbal behavior, which is the subject matter of the study of syntax, is also autoclitic in nature according to Skinner. He gives the example (1957, p. 322) of the effects on the listener of the final "s" in the verbal response "The boy runs." He calls it a "fragmentary tact" that is under the control of the actual nature of running which is a process rather than an object or property of an object (i.e., the fact that "the boy" and no one else is running, and the fact that the running is occurring now and not in the past or the future). Skinner admits, however, that this analysis advances our understanding of the process little beyond the traditional description that run is a "verb in the third person singular and the present tense" (p. 322). Skinner's intent, however, is to provide the behavior-environment relationship that accounts for the use of the final "s" in the way it is

explained by traditional grammarians. It is a relational autoclitc indicating that the subject "the boy" is singular and not plural. The use of an "s" at the end of a verb agreeing with the singularity of the noun and the dropping of the "s" when the noun is plural, as in "the boys run," is verbal behavior reinforced by the linguistic community. These autoclitc arrangements are initially arbitrary and could as easily have been reversed, for example, where an "s" ending is used to agree with a plural noun and a noun that did not end in "s" agreeing with a singular noun.

Skinner minimizes the usefulness of most syntactical analyses in dealing with a relational autoclitc when he says that phrases and sentences are sometimes unitary as are nonverbal responses. He equates, for example, the ringing of a gong with the verbal response "Come and get it!" There is no need to analyze the verbal response syntactically or grammatically. The verbal response and the nonverbal response are equivalent in their consequences.

Manipulative Autoclitics

Although Skinner did not define "manipulative autoclitc" in *Verbal Behavior*, his illustrations reveal the process with which he identified the phrase. Words such as "but" modify other verbal responses with the same expression. "But" alerts the listener that something is to be excluded or made an exception of. "All may go, but George must stay" excludes George from the activity in question. The "but" makes an exception of George. "And" alerts the listener to an inclusion or addition to what is referred to before it is used as in "You and I are going to the movies." The differences between Skinner's manipulative autoclitc and qualifying autoclitc seem slight and indistinct as both "qualify" the other verbal behavior which they accompany in the manner of any autoclitc. The distinction may simply be a way of distinguishing among what traditionally has been called the various parts of speech such as nouns, verbs, adjectives, articles etc.

In general, autoclitics serve to make verbal responses more precise in their function as discriminative stimuli for other verbal responses and for nonverbal responses which they precede or follow. By saying "Bread" a child or an adult might be quite successful in having the listener present bread after hearing that response. However, it is clear that simple mands without autoclitc embellishment will allow only a certain degree of success in the manipulation of one's social environment. It is conversely true that a system of verbal behavior which is extremely heavy in the use of autoclitics no longer provides discriminative stimuli which elicit appropriate non-verbal or verbal responses. Under these circumstances, the request or command is too complicated to comprehend and consequently the listener is not able to supply the expected reinforcement whether it be another verbal response or a non-

verbal response. In short, if instead of saying "May I please have food," I say "I would be in your debt should you favor me with the presentation of some victuals," I might go hungry. Notice that "should" (if) in the above sentence is a manipulative autoclitic while there is none in the first sentence. The differences in the effectiveness of the two verbal responses in eliciting a food-giving response from the listener likely favors the first response rather than the second.

Autoclitic Self-Stimulation

Some verbal responses may affect the speaker before they affect the listener and lead to changes in that behavior to which only the speaker is privy. Speakers and writers self-edit their verbal behavior. A verbal response made sub-vocally by a speaker who pauses in addressing a listener may be changed before it is vocalized to a listener. The non-vocalized response is extinguished because it has been followed by punishment of some sort in the past history of the speaker or because punishment is expected even though it hasn't been vocalized in the past, but is sufficiently like another verbal response which has been punished. If one is about to speak to one's mother with the words "That was a damn fine meal, Mom," a pause occurring just before the response "damn" allows the speaker to sub-vocally edit it out and instead to make the response "That was a fine meal, Mom." The "damn" is eliminated because that response made by the speaker in the past has been punished by a frown or verbal admonishment from Mom. Probably vocal responses tend to be self-edited when they have been followed, in the past, by aversive stimuli supplied by the listener with such verbal responses as "I don't understand what you are saying," or "You really ought to make an effort to be clearer in what you say." In addition, verbal responses which reach the listener may also be edited as when the speaker says, after having responded verbally, "I didn't mean that," or "What I meant to say was" Non-verbal consequences following verbal responses may also lead to self-editing as when a lecturer observes members of his audience open their eyes widely or frown in order to communicate lack of comprehension. Catania (1998, p. 275) has put it this way: "We say that someone understands something that's been said when the individual repeats what's been said not because the other person said it but for the same reasons that the other person said it."

Written responses are self-edited in a similar manner when the writer crosses out a word or phrase and replaces it with others. The reinforcements which control these self-editing responses are of a similar nature to those which control the self-editing of speech. As we shall see in Chapter 7, one of the principal deconstructive analyses begins with this very process of self-editing, particularly of written material. Where Skinner makes little of those responses

which are edited out, some deconstructionists take this as the very core of the meaning of written explanation. To a deconstructionist, the "crossing out" Skinner mentions indicates that other responses have been reinforced in the history of the speaker which are part of the complexity of any emitted, edited final response. Skinner passes over this point although it is partially captured by Herrnstein's matching law (Postulate V in Chapter 1) in that a response is a function not only of the reinforcement contingent on that behavior, but also of other reinforcements present at the same time and on other behavior, and other reinforcements not contingent on any behavior. In short, the writing of a word and its substitute not only involves reinforcement directly associated with the word in the history of the subject, but also a number of other reinforcements and responses present in the history of the subject.

Skinner is somewhat puzzled at the rapid and virtually automatic quality of this self-editing process that apparently takes place even before sub-audible emission. A covert review of these sub-audible forms seems impossible. Here Skinner runs into the possibility of innate domain-specific or -general tendencies, to be discussed in Chapter 4, which he could attribute to the behavioral repertoire, but does not specifically do so. He says (1957, p. 371) "Evidently stimulation associated with the production of verbal behavior is sufficient to enable one to reject a response before it has assumed its final form. The subject is a difficult one because it has all the disadvantages of private stimulation." He does not pursue the solution to this problem and, of course, one can recognize that this is one of the problems to which an attempted solution forms part of the core of the cognitive position regarding the nature of overt and covert verbal behavior. We will come back to this issue in the next chapter.

As part of this self-editing process, verbal behavior is rejected by the speaker before it is spoken because it has been punished in the past. The result is that the response is made into an aversive stimulation signaling the threat of punishment. If the response is strengthened to the point of emission, it becomes aversive and is avoided by the speaker. This reduces its aversive quality. Rejecting this response is the final step in what is an avoidance conditioning process. If the rejected response is one which the verbal community generally considers offensive, as in speaking obscene words, then the avoidance or successful repression is considered salutary both by the individual and the community.

Logical and Scientific Verbal Behavior

The rules of logical and scientific verbal behavior (knowing that) are consistently reinforced by the verbal community because they lead to effective behavior (knowing how). Following a logical process to state the principles by which some activity occurs has practical effects which reinforce the use of the

process. The axiomatic arrangement of empirical statements, as we saw in Chapter 1, is considered highly desirable by psychologists because it has been so successful in the natural sciences in increasing the probability of stimulus control. Other ways of describing the properties of the organism and its environment as may be appropriate to art, fictional literature and rhetoric in general are either not reinforced by the scientific community or are accompanied by mention of the controlling stimulus associated with the descriptive term. To define anger by using the metaphor "it is as a great boiling turmoil of the heart," may be acceptable in the literary verbal community, but not in the scientific one. Additional contingencies would have to be added to this metaphor to allow for appropriate verbal or non-verbal behavior on the part of scientists. The specification of these additional contingencies has sometimes been called "operationally defining terms." Thus "heart" can be physically indicated and "great boiling turmoil" might be assessed by increased heart rate above a steady state. The remaining verbal responses in the phrase are mostly autoclitics. I suspect that most scientists enjoy the extended metaphors of literature and even of ordinary conversation; however, they insist that the non-verbal circumstances responsible for verbal behavior be specified when they are engaged in studying the subject matter of their own field. Autoclitics such as "I observe," "I deduce," "I induce," and "I conclude" are frequently used by logicians and scientists. Virtually all mathematics aside from arithmetic which involves counting are completely verbal with usually little or no interest on the part of the mathematician in the non-verbal consequences of their mathematical expressions. Physicists and engineers, however, are usually very interested in the non-verbal consequences of mathematical verbal behavior when this mathematical verbal behavior is used as the autoclitic frame from which the data of physics are predicted and the physical constructions of engineering are realized.

Thinking

Having established the principles of the acquisition and use of vocal and sub-vocal verbal behavior to his satisfaction, Skinner has no problem with providing an explanation for thinking. Being both speaker and listener is the basis for the behavior of thinking. Thinking is a person talking to herself either sub-vocally or vocally. Since people only occasionally "talk to themselves" out loud, thinking is largely described as covert or sub-vocal verbal behavior. The same processes of reinforcement strengthening covert verbal behavior are presumed operative as those involving overt or vocal verbal behavior. The covert quality of thinking probably came about because overt thinking, not specially directed toward a listener, is generally punished by members of the verbal community. Speaking aloud to no one in particular is

frequently frowned upon by an inadvertent listener by declarations that the speaker is "mad" or at least "peculiar."

Of course, thought is not all verbal behavior. One may review or "picture" swimming behavior without actually swimming or without emitting verbal behavior and most people consider this thought. Skinner accepts this proposition and notes that, nonetheless, it is covert verbal behavior that is most often identified as thought and is usually of the most interest to people. It is also true that we "are at a loss for words" under circumstances where certain verbal responses have not been reinforced by appropriate non-verbal responses. A listener may conclude that the verbal description of a non-verbal event is far from adequate in describing it or his non-verbal responses to it. Many people consider that verbal descriptions of such mundane activities such as describing a taste are routinely inadequate. Words fail when one attempts to verbally communicate the nature of the taste of chocolate or sage to one who has not tasted (non-verbally responded to) either. The best we can usually do is to verbally respond by indicating another taste to which the listener has non-verbally responded as when we say "Sage tastes a little like thyme," but we also say "I can't even describe the taste of chocolate, it's unique." This observation that non-verbal behavior may remain unconnected to verbal behavior is an apparently inadvertent recognition by Skinner of the very situation that is part of the basis of the phenomenological perspective. The phenomenologists, of course, focus on this non-verbal behavior, but call it "immediate experience" and place it in the center of their interpretation of human activity. Their position is that a person is not the outcome of various causal agencies. One is but a bit of the world. We enjoy access to what consciousness holds as an idea. This direct access to the world comes through our perception. Language itself, being symbolic and abstract, separates one from direct experience (cf. Lana, 1976, 1991, for a more detailed discussion of phenomenology). I do not mean to imply that the phenomenological concept of immediate experience is isomorphic with that of Skinner's non-verbal behavior, but rather that Skinner has recognized that verbal responses are often lacking in their connection with non-verbal behavior and that this is a key focus of the general position of phenomenology.

Finally, with regard to the limitations of the description of thinking as verbal behavior, Skinner states "All behavior, verbal or otherwise, is subject to Kantian a priori's in the sense that man as a behaving system has inescapable characteristics and limitations" (1957, p. 451). Little has been made of this statement by behavior analysts in their reading of *Verbal Behavior* since it was written forty-five years ago. The statement is a recognition of limitation as is Skinner's description of the lack of total isomorphism between non-verbal and verbal behavior — a recognition not of the inadequacies of his system, but rather a recognition of its conceptual borders. That is, the immediate

experience of the phenomenologists which they chose to explore, and the "categories of mind" which Kant chose to explore are beyond the scope of the analysis of verbal behavior. At this point in the discussion, it remains to be seen whether these other systems are complementary to Skinner's in explaining verbal behavior or whether there are points of contradiction among the three.

The Verbal Community

In *Verbal Behavior*, Skinner, understandably, places discussion of the verbal community in an appendix. He was not ready to grapple with the idea nor did he, to my knowledge, ever do so. To have attempted such an analysis within the context of the acquisition of verbal behavior would have required him to consider the particular history of a specific language, an enterprise very different than the one in which he chose to engage. Instead, he concentrated on the terms of acquisition of language rather than its specific content. He said "If brought into a current verbal community, he would probably develop elaborate verbal behavior. What was lacking was not any special capacity for speech but certain environmental circumstances. The origin of languages is the origin of such circumstances" (1957, p. 461). He goes on to say that a verbal environment could have been generated from non-verbal sources with the resulting behavior shaped from generation to generation because of its increasing effectiveness. As we shall see in the next chapter, the position most often contrasted with Skinner's is that of Noam Chomsky (1959) who believed in the agency of a genetically given word-using ability which was independent of the requirement that specific environmental circumstances were necessary for speech to occur. For Chomsky the verbal community appears as people form words because they are able to, and this is part of the way their brain functions regardless of environmental circumstances.

There are different verbal communities which enjoy mutual recognition as when one expects to be spoken to in Italian in Italy and in German in Germany. We find it relatively simple to acquire the appropriate verbal responses of a verbal community not our own when we set out to learn Italian or German. Assuming one is a member of the English language community, part of the process of learning a language is to match an English word to the foreign one which will result in the same non-verbal reinforcement as accompanies the English word. Hence we match the English "dog" with the Italian "cane" and the German "Hund." The three words are very different from one another in both visual appearance and sound because they have different historical origins. Words such as "construe" which is "costruire" in Italian and "konstruieren" in German are similar to one another because the word is Latin in origin and the Latin language asserted a great

deal of influence on the formation of other European languages. It did so because the Romans initially provided the non-verbal reinforcement necessary for the acquisition of Latin since they were the rulers of most of Europe and thus possessed the means of reinforcement to a greater extent than did the people they ruled. Later, after the demise of the Roman Empire, Latin maintained its influence over the development of European languages because it was the one language through which the lettered of various countries could communicate with one another. That is, it still maintained much of its reinforcing properties. Since it remained the principal language of the European intelligentsia for many years, it is not surprising that most mands and tacts in various languages are significantly different from one another as in the use of "dog" above since the appropriate verbal response in all countries was reinforced before the Romans arrived. However, many of the Latin derivatives of a language are autoclitics, as in "construe" above. Since autoclitics are reinforced by other verbal responses, they appear more frequently in the verbal behavior of, for example, mathematicians, scientists, and writers than they do in the verbal behavior of the general public.

If the verbal community can be reasonably described as a developing set of verbal responses which are reinforced because of their social consequences (effects on other people, i.e., they are discriminative or reinforcing stimuli), then an attempt to recover these processes can only be made historically given the ethical and methodological difficulties of shaping verbal behavior in a controlled environment. The current verbal responses of a given community have been shaped over many years and the details of the shaping of the behavior may only be available to us by examining the history of the verbal community. There are undoubtedly many aspects to the historical and current nature of a particular verbal community. One such aspect is presented here.

In every modern country of some complexity there is a standard way of speaking the language. The verbal responses most reinforced by the verbal community are taught in the community's schools. The particular verbal responses (language) which are considered standard are part of a natural language such as English, Italian, or German, but are not necessarily spoken by all or even most members of the community. It is proclaimed the standard language because it is either the language of the group who holds most of the means of reinforcement in the community, that is, the group in power, or it is simply the language chosen by the group in power. In nineteenth and early twentieth century India, the standard language was English because the English held most of the means of reinforcement. In today's India, even though the English are no longer in power, the Indian rulers of the country have chosen English to be one of the official languages of the country (the other is Hindi) for fundamentally the same reasons that Latin was the lan-

guage of choice for most of the ruling classes of Europe for so long even though the Romans were no longer in power.

The business of a community government is almost always carried out in the standard language. People who speak it fluently generally enjoy greater prestige than those who do not, which means that they are reinforced for those verbal responses. Those who speak a non-standard form of the language are either not reinforced or are punished when emitting those non-standard verbal responses. Since everyone speaks some language, why doesn't everyone within a given verbal community speak the standard language since there are obvious reinforcements to be gained by doing so? Those verbal responses commonly called dialects, non-standard accents, and various jargons are often punished by the verbal community.

In very old communities which have been isolated from the larger verbal community for many years, there are dialects spoken as well as the standard or "school" language. Differences in vocabulary, grammar, and pronunciation distinguish a dialect from its root language. Dialects develop because they are usually simpler, and therefore easier to acquire and use, than the root language from which they are derived. Differences in historical circumstances, including the influences of other natural languages, affect the shaping of a particular dialect. For example, there are more dialects spoken in Italy than in any other European nation. The southern dialects spoken in Naples, Calabria, Basilicata, etc. shade one into another and have similar pronunciations, but nevertheless remain different in some of their particulars. As one moves north, the sound of the dialects changes, although those of Lombardy, the Piedmont, Umbria, etc. are somewhat similar to one another. Probably because of its commercial, artistic and technological development during the Renaissance and the long-time reverence paid to Dante, the Tuscan dialect, with some changes, emerged as the standard language taught in Italian schools. Although without the extensive distinctions in dialects prevalent in Italy, similar patterns of dialect emerged in Germany since it has been unified as a nation for a relatively short period of time. Fewer such language distinctions are found in France and Great Britain because of their longer histories of unification.

Language is usually more complex in its early phase of development than in its later phases. The complexity of a verbal response makes it difficult for the listener to reinforce it. From old to middle to modern English, declensions were lost as was the requirement of gender agreement within morphemes. The declensions of Latin were eventually eliminated in Italian, its modern derivative, although gender agreement remains. This change from complexity to simplicity of verbal responses continues and is simultaneous with the development of dialects which are simpler in structure and pronunciation than is their root language. For example, "casa" (house) in Italian becomes "ca" in

the Venetian dialect as does "calle" (alley or narrow street). There is, of course, a limit to which a language may simplify since, as we have seen, various non-verbal processes can be complex and need to be matched in this complexity by the verbal responses required to communicate.

One of the several things we do not know about verbal behavior is why gender agreement exists in some modern languages and not in others. The definitive answer to this question might not be available to us; however, it is possible to construct a plausible explanation if we assume that this difference was produced by different reinforcement sequences. In understanding the nature of the verbal community, it is virtually impossible to reconstruct these reinforcement sequences since they were active over a long period of time and are no longer available for observation. What is available now are the current differences among languages which we can describe in detail. The exact manner of acquisition of these differences is not known even though, from a behavior analytic perspective, we are confident that they would have to have been established by some reinforcement process. We would be describing part of the behavioral repertoire of human beings living in various verbal communities. This process of acquisition is bracketed (is epistemologically inert) and the content of the behavior is described (is epistemologically active). This is usually the case with the examination of social behavior because the specific elements of acquisition (but not the general ones) are not, nor will they ever be, available to us. Consequently, in describing a verbal community we are left with the current nature of a given language and some historical information as to the changes which have occurred in its development.

A verbal community has an extensive history that requires several types of analyses in order to comprehend the nuances of various elements of speech which are available. Etymological analysis can reveal the influence of other verbal communities and grammatological examination can reflect the problem-solving style of a language group. Although the specificity of a natural language must clearly be acquired during the early course of a lifetime, there is a question about whether the language capacity in general is also learned or whether it is part of the biological aspect of the behavioral repertoire. This issue was extremely important in the early modern history of language explanation and remains, in more sophisticated form, important today. An examination of this issue begins in the next chapter.