

SKINNER'S *Verbal Behavior* III HOW TO IMPROVE PARTS I AND II

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In a previous article (Place, 1981a), I argued that to explain verbal behaviour in intensional or mentalistic terms involves the circularity of explaining the acquisition of linguistic skills on the assumption that the speaker and listener already possess such skills, and that only an account, such as that presented by Skinner in his book *Verbal Behavior* (Skinner, 1957), which dispenses with intensional concepts, can avoid that circularity.

In a subsequent article (Place, 1981b), I argued that although an account along the lines of that proposed by Skinner in *Verbal Behavior* is needed in order to avoid this circularity, *Verbal Behavior* as it stands suffers from four major defects. (1) Skinner fails to do justice to the distinction between words which are the repeated and repeatable units of verbal behaviour, but which have a function only in so far as they contribute to the function of the sentences in which they occur, and the sentences themselves which are the functional units of verbal behaviour, but which are seldom repeated word for word either in the mouth of the speaker or in the hearing of the listener. (2) The account given by Skinner of the listener's response to the verbal operant and of the concept of "the discriminative stimulus" which he deploys in this connection is seriously inadequate. (3) Skinner's concept of "the tact" involves a confusion between tacts as words and tacts as sentences. Tacts as words, i.e. names and general terms, designate recurrent features of the common stimulus environment of speaker and listener, both general and particular and contrast with autoclitic words whose function is purely intra-sentential. Tacts as sentences on the other hand are functionally complete verbal operants corresponding to the grammatical concept of an assertion, which act for the benefit of the listener and contrast with mands, sentence utterances corresponding to the imperatives and interrogatives of grammar and logic, which typically act for the benefit of the speaker. (4) Skinner's account fails to do justice to the all-important logical distinction between those tact sentence utterances or assertions which are true and on which the listener can consequently rely and those which are false and therefore unreliable as a source of information from the standpoint of the listener.

In the third and fourth papers in this series, I shall try to suggest some of the changes in the account presented by Skinner in *Verbal Behaviour* which are needed in order to rectify these four defects and thus provide a more adequate account of the phenomena of human language in extensional (i.e. non-mentalistic) terms.

THE MARKS OF VERBAL BEHAVIOUR

Any systematic account of verbal or language behaviour must begin with a discussion of the marks or features which distinguish behaviour of this kind from other forms of organic behaviour. In this respect, Skinner's book *Verbal Behavior* (Skinner, 1957) is no exception. Nevertheless the initial discussion of the distinctive features of verbal behaviour in Chapter 1 of the book is unsatisfactory. Skinner (1957, p.1) begins with the observation that "men act upon the world, and change it, and are changed in turn by the consequences of their actions" and goes on to draw a distinction within the actions that human beings perform between behaviour, such as locomotion or the manipulation of objects, which directly changes the spatial relationships between the organism and the objects which constitute its immediate physical environment in a straightforward mechanical way and the kind of behaviour, of which verbal behaviour is an instance, whose function is to change the environment indirectly by generating a stimulus which modifies the behaviour of another

organism either of the same or of another species. In other words, verbal or language behaviour is a species of sign-generating, signalling, or communication behaviour.

Verbal or language behaviour, however, is only one amongst a variety of different forms of signalling or communicatory transactions which take place between living organisms of the same or of different species. It is therefore essential that any general account of language or verbal behaviour should be able to specify what it is that distinguishes this kind of sign producing behaviour from other forms of communication.

Although he fails to provide an account of the distinction between language and other forms of communication in Chapter 1 of *Verbal Behavior*, Skinner does make a subsequent attempt to deal with this question in an Appendix which bears the title "The Verbal Community" (1957, pp. 451-470). In this appendix, he makes three closely related points concerning the distinction between verbal and other forms of sign producing behaviour. The first is that verbal behaviour presupposes a verbal community, a subgroup of the human species as a whole, within which the sign producing behaviour of different sign producers or speakers is "characteristically reinforced" in such a way that broadly similar signals are emitted by different sign producers in similar circumstances and similar signals are responded to in the same way by different signal receivers. The second point is that although verbal behaviour superficially resembles the sign producing behaviour of other animal species in that animal cries, for example, are emitted by different individuals in the same circumstances and elicit the same response from different individuals, such consistent patterns of sign producing and responding behaviour in animals are instinctive in the sense that "each form of behavior is observed in most members of a given species, when there has been no opportunity for individual learning". The implication here is that the consistent patterns of sign production and response that obtain within a verbal community are learned conventions maintained by reinforcement.

While the principle that verbal behaviour involves a system of sign producing and responding conventions acquired and maintained by reinforcement by and within a verbal community serves to differentiate verbal behaviour from the instinctive sign producing and sign responding behaviour of animals, it does not clearly differentiate between the learned response of the listener to a verbal operant emitted by a speaker and those responses that we learn to make to cues like changes in pupil size or what has been called "body language" which result from "involuntary" movements "unintentionally" emitted by other organisms both of our own and of other species.

What is required in order to distinguish learning to respond to such "unintentionally" provided cues from learning to respond appropriately to the verbal conventions of a language, I suggest, is some way of distinguishing between behaviour emitted by an organism which has the function of providing a stimulus which controls the behaviour of another organism and behaviour which has some other function, but which incidentally provides a stimulus or cue to which another organism has learned or is innately programmed to respond. It is at this juncture that Skinner's third point comes to our rescue by drawing our attention to the "parallel between natural selection and operant conditioning," between "the selection of an instinctive response by its effect in promoting the survival of the species" and "the selection of a response through reinforcement" (Skinner, 1957, pp. 462-463). For, depending on whether the behaviour or other biological characteristic is innate or acquired, we can appeal to one or other of these two principles in order to explain what is involved in ascribing a given function to the behaviour or biological characteristic in question without thereby invoking the intensional-with-an-s notions of "purpose" and "intention".

By appealing to the three points I have mentioned, the notion of language as involving conventions accepted within a verbal community, the notion of language as a system of learned rather than innately programmed sign producing and responding behaviour, and finally the notion of language as a system of signs whose function in controlling the behaviour of the listener is

achieved and maintained by selective reinforcement. Skinner succeeds in marking off linguistic behaviour from most other forms of non-linguistic communication displayed by other species of living organism. There is however, another variety of communication which is seldom found in animals other than man, which we should not ordinarily want to classify as language, but which is not distinguishable from language by any of the criteria mentioned by Skinner. I refer to communication by means of signs or gestures where the effect of the sign on the behaviour of the receiver is learned in accordance with conventions operating within a social group, but which do not constitute true language. This is not, as is sometimes supposed, because such signs and gestures are not vocal signs or written substitutes for vocal signs, but because the individual signs constitute functionally complete acts of communication corresponding to complete sentences in a language rather than to the individual words that are used in language to construct an infinite number of such functionally complete acts of communication. True language is present only when the effect of a sign on the listener depends on learning to use and respond to incomplete units of sign producing behaviour or words which, when combined together in accordance with the syntactic conventions reinforced within the verbal community in question, constitute functionally complete acts of communication or sentence utterances to which the listener is able to respond appropriately without having to learn to use and respond to each sentence individually.

Although he discussed such gestures as the policeman's "Stop" gesture and "familiar gestures having roughly the same 'culturally determined' effects as *Go away!*, *Come here!*, *Pass by!*, *Sit down!* and *Stand up!*" (1957, p. 466), Skinner is prevented by his failure to draw an effective distinction between words and sentences from acknowledging the obvious difference between the gestures and the corresponding mand sentences. For Skinner, such gestures are to "be classed as verbal" just as much as the corresponding sentences, despite the fact that the sentences are composed of two elements, a verb and preposition, or in one case (*Come here!*) an indexical, each of which is constantly reappearing in combination with many other words so as to form an infinite variety of different sentences, a feature for which there is no counterpart in the case of the corresponding gesture.

In the case of gestures and similar functionally complete units of communication such as pictorial or symbolic road signs, the receiving organism must learn to respond to each sign individually and having so learned can do no more than respond in that same relatively stereotyped way whenever that sign appears. In the case of true verbal behaviour, by contrast, the listener can respond appropriately to combinations of words and sentence pattern which he or she may have never previously encountered by emitting behaviour which, though composed of well-rehearsed behavioural elements, may never have occurred before in that particular combination of pattern and elements.

INSTRUCTION STIMULI AND INFORMATIVE STIMULI

It is a commonplace amongst linguists and psycholinguists that the system whereby a finite vocabulary of functional incomplete signs (words) are put together to form a theoretically infinite number of functionally complete sign complexes (sentences) makes possible enormous economies in learning as compared with a system of conventional gestures where each sign is functionally complete and where each functionally complete sign has to be separately learned by both emitter and receiver. What has been less often remarked upon is the way in which the ability to construct new sentences out of old words and old sentence patterns extends the control which a speaker is able to exercise over the behaviour of the listener and allows the listener to benefit from learning experiences reported by other speakers which, though composed of familiar elements, are put together in combinations quite different from those in which they have been previously encountered.

The way in which the ability to construct novel sentences out of words and sentence patterns enables the speaker to control the behaviour of the listener was dramatically brought home to me by Dr Israel Goldiamond when he pointed out¹ that what he called an "instruction stimulus" or "instruction variable," the kind of sentence utterance which Skinner calls "a mand," enables a speaker to elicit and make available for subsequent reinforcement patterns of behaviour which, though composed of well-rehearsed response elements, have never previously figured in the listener's behavioural repertoire, thereby effectively short-circuiting a lengthy process of shaping which would be and is otherwise required in order to secure the emission of similar behaviour in an organism whose behaviour is not susceptible to this kind of verbal control.

A closely related point is made by Harzem and Miles (1978, ch. 12) when they suggest that in order to account for certain features of human verbally-controlled operant responding, we need to introduce the concept of an "informative stimulus" which differs from the related concept of the "discriminative stimulus" (Skinner, 1938) in that (a) informative stimuli "can control responding *even though they were not previously associated with reinforcement*" and (b) they "have their effect on behaviour by providing information about the situation in which that behaviour occurs".² My alternative suggestion here is that, rather than introduce a new concept, what we need to do is clarify, modify, extend, and bring together two of Skinner's existing concepts: the "discriminative stimulus" and the "tact".

As I argued in a previous paper (Place, 1981b, pp. 136-138), Skinner's concept of the "tact" is equivocal as between tacts as words, which contrast with autoclitics, and tacts as sentences, which contrast with mands. Once this distinction is recognised, it becomes apparent not only that when Skinner talks of the tact working "for the benefit of the listener by extending his contact with the environment" (Skinner, 1957, p. 85), it is tacts as sentences rather than tacts as words that he has in mind, but also that tact sentences considered from the point of their effect on the listener constitute what Harzem and Miles call "informative stimuli" in that they "have their effect on behaviour by providing information about the situation in which that behaviour occurs."

But whether we talk, as Skinner does, about tacts "extending the listener's contact with his environment" or, as Harzen and Miles do, about informative stimuli "providing information about the situation in which behaviour occurs", the process whereby verbal stimuli can convey information to the listener, and thus enable him to make contact with aspects of his environment which would otherwise be beyond his reach, remains mysterious and unexplained. In the previous paper (Place, 1981b, pp. 138-141), I argued that, aside from his failure to distinguish words and sentences and hence to distinguish tacts as words from tacts as sentences, the reason for Skinner's failure to provide an adequate account of the referring and information-providing function of language is his preoccupation with the emission of verbal behaviour by the speaker and his consequent neglect of the control exercised by verbal stimuli over the behaviour of the listener.

I pointed out that although he does not actually use the term in this connection, in the only passage which he devotes to this topic (1957, pp. 86-89), Skinner discusses the listener's response to verbal stimuli in general and the tact in particular in terms of his concept of the discriminative stimulus defined in terms of the three-term relationship between stimulus, response and reinforcement. Discussion of Chomsky's criticisms and the two examples which Skinner gives in this connection, the single-word sentences *Fox!* and *Dinner!* suggests the following conclusions:

(1) Although it is true, as both Chomsky (1959) and Harzem and Miles (1978) point out, that a verbal stimulus can elicit an appropriate response without that response having previously been reinforced in its presence, it is true only in so far as the response may not have been reinforced

¹ I have been unable to find a source for this point in any of Dr. Goldiamond's published work. Nevertheless I am reasonably confident that this attribution is correct.

² Harzem and Miles (1978) p.124. The italics are theirs.

in the presence of the exact combination of words used on a particular occasion. Thus, it is the sentence frame *Look! There's an X!* in the presence of which the response, looking in the direction indicated by the speaker, has been reinforced rather than the actual sentence *Look! There's a fox!* (Place, 1981b, p. 140)

(2) As is illustrated by the example of the sentence *Joe is coming*, the behaviour for the emission of which such a tact sentence acts as a discriminative stimulus will vary systematically, depending upon whether the event whose contingency of occurrence is specified by the sentence is positively reinforcing (attractive) or aversive (repulsive) to the listener (Place, 1981b, pp. 140-141).

(3) The grammatical structure of a well-formed sentence "maps onto" the structure of a part or the whole of the actual or possible contingency of either reinforcement or disinforcement (punishment) for which the sentence as a whole acts as a discriminative stimulus. A sentence like *If you look in the cupboard you will find some chocolate* maps onto a complete contingency in that it specifies both the response and its reinforcing consequences. In other cases, the grammatical structure of the sentence maps onto a part rather than the whole of a contingency of reinforcement or disinforcement. The relevant part of the contingency which is specified by such a sentence is either the response on which reinforcement is contingent (specified by a mand such as *Look!* or *Come and get it!*) or else the consequential stimulus event whose occurrence is contingent on the emission of that response (specified by a tact sentence or assertion such as *There's a fox!* or *Dinner is ready!*) (Place 1981b, p. 145).

(4) Simple sentences of both these kinds are composed of a predicate expression or verb phrase which, in the case of the mand, specifies the behaviour to be performed by the listener (*Look, Come, get*) and, in the case of the tact sentence, the consequential event (*There is, is ready*) together with one or more nouns, pronouns, or noun phrases (*it, a fox, Dinner*), which serve to specify the entity or entities, whether animate or inanimate, to which something is to be done in the case of the mand or, as in the case of the typical tact sentence, which either will or will not appear as a consequence of the listener's emitting the appropriate behaviour (Place, 1981b, p. 146).

(5) Every tact word acquires its capacity to act as a discriminative stimulus element by virtue of having been repeatedly followed by contingencies containing the recurrent feature of such contingencies which the word in question serves to specify. But when a predicate expression or verb phrase is combined with a noun, pronoun, or noun phrase with which it has not previously been combined in the learning experience of the listener, or when a familiar word combination is introduced into an unfamiliar context, the speaker acquires a degree of control over the behaviour of the listener, which goes far beyond anything that has occurred in the previous learning history of the listener. In the case of a mand, the speaker can elicit from the listener patterns of behaviour, all of whose elements are well established as part of the listener's behavioural repertoire, but which have never previously occurred in that precise combination or in that context. In the case of a tact sentence or assertion, on the other hand, the speaker is able to provide the listener with a discriminative stimulus complex, all of whose elements have occurred in association with contingencies of reinforcement or disinforcement containing the feature which that discriminative stimulus element or tact word serves to specify, but which, although they have never occurred in that precise combination or in that context in the previous learning history of the listener, are combined in such a way as to orient the listener's behaviour in a manner appropriate to the contingency whose existence in the common environment of speaker and listener is asserted by the tact sentence in question (Place, 1981b, pp. 146-7).

Thus the principle whereby novel discriminative stimulus complexes (sentences) are built up out of what, from the standpoint of the listener, are familiar discriminative stimulus elements (words), gives to mands the property of Goldiamond's "instruction variable" or "instruction stimulus" whereby it enables the speaker to elicit from the listener patterns of behaviour which have not previously been part of the listener's repertoire, while at the same time giving to tact

sentences or assertions the property ascribed by Harzem and Miles (1978) to their "informative stimulus" that of conveying to the listener information about events and states of affairs not available to the listener's sensory inspection.

THE CONCEPT OF THE SIGNIFICANT STIMULUS EVENT

We have seen that in trying to specify what it is that distinguishes verbal behaviour from other forms of sign-producing behaviour, we have already found it necessary to put right, at least in part, three of the major defects in the account of verbal behaviour offered by Skinner (1957) which I identified in a previous paper (Place, 1981b), namely (a) the failure to draw a clear distinction within verbal behaviour between the respective function of words and sentences, (b) the failure to provide an adequate account of the control exercised by verbal stimuli over the behaviour of the listener and (c) the failure to distinguish within the concept of the tact between tacts as words which contrast with autoclitic words and tacts as sentences which contrast with mands. However, the modifications suggested so far are only those which had already been proposed in the course of pointing out those defects in the previous paper.

In order to take the matter further, what is clearly needed is a more detailed development of the suggestion that the structure of a discriminative stimulus complex or sentence maps onto a corresponding structure in the contingency of reinforcement or disinforcement (punishment) with respect to which the sentence as a whole acts as a discriminative stimulus. In developing this suggestion, two ways of proceeding recommend themselves. The first is the traditional procedure adopted by logicians, grammarians, and linguists which begins with an analysis of the typical sentence as a string of words belonging to different grammatical categories combined together in accordance with the "rules" of grammar and logic, classifies different types of sentence in accordance with the different syntactic structures they exemplify, and only then tries to map these different sentence types onto the different extra-linguistic states and events whose existence or occurrence they report or whose coming into existence they command. The alternative to this traditional approach which I propose to follow in preference to it, is to begin with an analysis and classification of the contingencies of reinforcement or disinforcement for which different sentences act as discriminative stimuli and then examine both the different types of sentence that act as discriminative stimuli for the different types of contingency, as well as the different types of behaviour appropriate to the different types of contingency and the discriminative stimuli which "report" their existence.

In order to develop a classification of the different kinds of contingency for which sentences in a natural human language act as discriminative stimuli we need to begin, I suggest, by introducing the concept of the *significant stimulus event*. "A significant stimulus event" may be defined as a type of event whose occurrence acts as a stimulus with respect to the behaviour of human beings, but where the effect on behaviour of stimuli of that type may vary between acting as a reinforcer for one individual on one occasion and acting as a disinforcer or aversive event for another individual or for the same individual on another occasion. The concept of the significant stimulus event so defined is required in order to accommodate tact sentences like the example *Joe is coming* used in the previous paper (Place, 1981b, p. 141), which is "wholly neutral with respect to the nature of the contingency it reports," the same sentence being used regardless of whether the listener's interest in Joe's coming is positive or negative, reinforcing or aversive.

That a discriminative stimulus can report the existence of a contingency regardless of whether, from the standpoint of the responding organism, that contingency is a contingency of reinforcement or a contingency of disinforcement or punishment, is a difficult notion to accommodate within Skinner's conceptual framework, because it implies that the same discriminative stimulus can elicit two diametrically opposite patterns of behaviour, the one approach and the other avoidance, with respect to the same prospective event. The problem is that

Skinner's account of the discriminative stimulus as set out in *Behavior of Organisms* (Skinner, 1938, pp. 177-180) only allows an S^D to be the occasion for the emission of behaviour which has been reinforced in its presence; whereas a listener will respond to a sentence like *Joe is coming* in two different ways, according to whether Joe's appearance is currently reinforcing or aversive, regardless of whether Joe's appearance was reinforcing or aversive on previous occasions when the bearer of the name *Joe* has appeared as a contingent consequence of the occurrence of that name in the hearing of the listener.

We have seen that discriminative stimulus complexes (sentences) which, though composed of familiar elements (words), have never previously occurred in the hearing of the listener, can nevertheless act as discriminative stimuli with respect to contingencies which, though likewise composed of familiar elements, have never previously occurred in the learning history of the listener. We now have to recognize that although for a given bearer of the proper name *Joe*, a tact sentence like *Joe is coming* acts as a discriminative stimulus for the occurrence of the same significant stimulus event for all native speakers of English who know the bearer of that name by that name, the behaviour for which the hearing of that tact sentence is an occasion will vary from listener to listener and for the same listener from occasion to occasion, depending upon whether the significant stimulus event constituted by the appearance of the bearer of the proper name *Joe* is for them a positive reinforcer or an aversive event. Moreover, a discriminative stimulus complex which "reports" the impending occurrence of a significant stimulus event which in the past has always been positively reinforcing will nevertheless be the occasion for the emission of avoidance instead of approach or welcoming behaviour if, in the meanwhile, the significant stimulus event in question has become aversive. For example, the sentence *Joe is coming* will be the occasion for the emission of avoidance behaviour, even if Joe's appearance has always been welcome in the past, if one is reliably informed that the Joe in question is the bearer of some highly contagious disease.

This loosening of the connection between a discriminative stimulus and the behaviour that has been reinforced by its presence goes against the grain of a great deal of traditional prejudice amongst behaviorists, going back to the debates of the 1940s and 1950s between SS Contiguity and SR Reinforcement theories of learning. It is evident from what has been said that no coherent account of the listener's response to a tact sentence like *Joe is coming* can be given without supposing that the opposite behaviour to that previously reinforced in its presence can be elicited by a discriminative stimulus if a change occurs in the valence for the listener of the significant stimulus event whose impending occurrence it "reports". Nevertheless, a psychologist in the tradition that Skinner represents will be reluctant to accept this kind of disarticulation of the discriminative stimulus from the behaviour emitted in its presence unless a much more precise specification can be given of the three-term relationship between discriminative stimulus, the behaviour emitted in its presence, and the significant stimulus event, which occurs or fails to occur as a consequence of that behaviour, and unless the relationships so specified have been demonstrated experimentally under the controlled conditions of the animal behaviour laboratory.

CONTINGENCIES AND EMOTIONAL RESPONSES

Since no such program of experimental investigation designed to investigate the "information-providing" or "reporting" function of discriminative stimuli has yet been attempted, I shall try both to direct and to anticipate the results of such an investigation by indicating what seems to me to be the laws governing the relation between different types of discriminated contingency and the behaviour elicited or "occasioned" by the relevant discriminative stimuli based on the intuitions which are built into what Ryle (1949) has called "the logical grammar" of our ordinary "mentalistic" concepts, in particular, the concepts which comprise what we may call "the language of emotion".

The aspect of the language of emotion which is important for our present purpose is the observation (Place, 1956) that to say of someone that they want something to come about entails that they will be (a) *pleased*, if they think that what they wanted has come about; (b) *excited*, if they think it is about to come about; (c) *worried* or *anxious*, if they think that it has not or will not or will not now come about; and that to say of someone that they don't want something to come about entails that they will be (a) *angry* or *depressed*, if they think that what they didn't want to happen has in fact come about; (b) *afraid*, if they think it is about to come about; (c) *hopeful*, if they think it may not come about, and (d) *relieved*, if they think it has not or will not now come about. Evidence that these predictions are entailed by the statements that someone wants and does not want something is provided by our linguistic intuitions, which tell us that it is self-contradictory for example, to assert that someone wants something, but would not be pleased if he thought that what he wanted had come about, or to assert that someone does not want something to happen, but would not be angry or depressed if he knew that what he didn't want to happen had come about.

The significance of this piece of conceptual analysis for our present purpose becomes apparent when we recognize that what we are saying when we say that somebody wants something to come about is the same thing as is said in operant language when we say that an event acts as a positive reinforcer with respect to the behaviour of the individual concerned, while to say of someone that he does not want something to happen is to say the same as is said in operant language when we say that the event in question is aversive. Given *that* identification, it is not difficult to see that what these two sets of entailments express are the characteristic behavioural reactions to discriminative stimuli which "report" the impending occurrence or non-occurrence of a significant stimulus event, where the behavioural reactions in cases where the significant stimulus event is positively reinforcing (is wanted) are the mirror image of those which apply when the significant stimulus event is aversive (is not wanted).

In order to represent the conditions under which the different emotions of pleasure/relief, hope/excitement, fear/anxiety, and anger/depression are predicted from the knowledge of what someone wants or does not want, we need to make use of two distinctions, one between those contingencies involving the *occurrence* of a significant-stimulus event and those involving its *non-occurrence*, the other between those contingencies where the occurrence or non-occurrence of the significant stimulus event is *conditional* upon behaviour on the part of the organism concerned and those where the occurrence or non-occurrence of the significant stimulus event is *unconditional* in the sense that no behaviour on the part of the organism can affect the outcome one way or the other. Combining these two distinctions with that between contingencies involving significant stimulus events which are positively reinforcing and those involving significant stimulus events which are aversive, we can now distinguish eight varieties of discriminative stimuli classified according to the contingency whose impending occurrence or non-occurrence they "report" and the variety of emotional behaviour characteristically emitted in their presence as set out in Table 1.

SOME DEFINITIONS

Generalising from the above considerations, we may now define or redefine some of the basic concepts of an operant approach to verbal behaviour, beginning with the concept of a *verbal operant*. A *verbal operant* may be defined as a sentence uttered or, to use Skinner's term, emitted by one individual (the speaker) which either as a whole or, more commonly, when its constituent words and phrases have occurred as parts of other sentences have been distinctively associated in the experience of another individual, the listener, with a particular contingency for which it consequently acts or is capable of acting as a discriminative stimulus; where any sentence utterance of the same configuration has been, or is capable of being acquired as, a discriminative stimulus with respect to the same contingency or type of contingency by any member of the verbal

Contingency 'Sentence frame'	Significant Stimulus Event	
	Reinforcing	Disinforcing (Aversive)
Unconditional occurrence 'E has happened'	Pleased	Distressed: Angry/depressed
Conditional occurrence 'E will happen, if or unless you do A'	Excited	Afraid
Conditional non-occurrence 'E will not happen, if or unless you do A'	Anxious	Hopeful
Unconditional non-occurrence 'E has not happened and will not happen'	Frustrated: Angry/Depressed	Relieved

Table 1. **The relation between different contingency types and the emotional reactions typically evoked when a given contingency is discriminated.**

community (consisting of speakers of the same natural language) to which both speaker and listener belong.

A *discriminative stimulus*, as it enters into the definition of a verbal operant, may be defined as a stimulus which either as a whole or with respect to the elements (words) of which, in the case of the verbal operant, it is composed, has been consistently followed in the past history of an organism by the contingent occurrence (S^D) or non-occurrence (S^Δ) of a significant stimulus event or, in the case of a discriminative stimulus element or word, by some common feature of a variety of such contingencies, and which controls the behaviour of the organism in a manner appropriate to the contingency whose existence in the environment is thereby "reported" to the organism concerned.

A *significant stimulus event (s.s.e.)* may be defined as a stimulus event whose occurrence as a consequence of behaviour emitted by an organism acts either as a positive reinforcer or as a disinforcer or punisher with respect to that behaviour.

A *contingency* may be defined as a state of affairs whereby an s.s.e. is liable to occur or not occur within the stimulus environment of an organism where the occurrence or non-occurrence of that significant stimulus event may or may not depend on the emission of certain behaviour on the part of the organism concerned. Contingencies in this sense can be classified objectively (i.e. independently of the response of the organism concerned) according to:

(a) whether they involve the occurrence or non-occurrence of s.s.e. in question;

(b) whether the occurrence or non-occurrence of the s.s.e. depends on the fulfillment of certain "temporal intensive and topographical conditions" (Ferster and Skinner, 1957, glossary entry for *contingency*) or whether the occurrence or non-occurrence of the s.s.e. is unconditional or inevitable. Contingencies can also be classified subjectively (i.e. in terms of the organism's response) according to:

(c) whether the s.s.e. is positively reinforcing (attractive) or disinforcing (aversive, repulsive) for the organism concerned.

For a given contingency type according to the above classification, the effect of a discriminative stimulus on the behaviour of an organism for which the discriminated s.s.e. is reinforcing will be the opposite of that produced by the same discriminative stimulus when the s.s.e. is aversive. Thus a discriminative stimulus for the *unconditional occurrence of an s.s.e.* will act as a conditioned reinforcer of the immediately preceding and ongoing behaviour of the organism (pleasure) when the s.s.e. is a positively reinforcing event, and as a conditioned inhibitor

(Pavlov, 1927) of ongoing behaviour (depression, *cf.* Seligman, 1975), and as a reinforcer of attack behaviour directed towards an object in the immediate vicinity of the organism (anger, *cf.* Ulrich and Azrin, 1962) if the s.s.e. is aversive. Conversely, where the discriminative stimulus relates to the *unconditional non-occurrence of an s.s.e.*, it will act as conditioned inhibitor of ongoing behaviour (depression, *cf.* Seligman, 1975, pp. 54-55) and as a reinforcer of attack behaviour directed towards an object in the immediate vicinity of the organism (anger, *cf.* Azrin, Hutchinson and Hake, 1966) where the s.s.e. is positively reinforcing and as a conditioned reinforcer of immediately preceding and ongoing behaviour of the organism (relief) when the s.s.e. is aversive. Where the discriminative stimulus relates to the *conditional occurrence of an s.s.e.*, it acts as a conditioned reinforcer with respect to any operants tending to instantiate the relevant conditions where the s.s.e. is positively reinforcing (excitement, *cf.* Zimmerman, 1957, 1959), and as a conditioned inhibitor with respect to any behaviour tending to instantiate the relevant conditions (Estes and Skinner, 1941), and as conditioned reinforcer with respect to any operant tending to reverse or prevent the instantiation of the relevant conditions where the s.s.e. is aversive (fear, *cf.* Brogden, Lipman and Culler, 1938). Similarly, where the discriminative stimulus related to the *conditional non-occurrence of an s.s.e.*, it acts as a conditioned inhibitor of any behaviour tending to instantiate the relevant conditions, and as a conditioned reinforcer of operants tending to reverse or prevent the instantiation of the relevant conditions where the s.s.e. is positively reinforcing (anxiety, *cf.* Ferster, 1958), and as a conditioned reinforcer of operants tending to instantiate the relevant conditions where the s.s.e. is aversive (hope).

TACT SENTENCES AND TACT WORDS

So far we have been concerned to provide a more adequate account than that offered by Skinner in his book *Verbal Behavior* (1957) of the difference between verbal behaviour and other forms of sign producing behaviour, an account which puts right the two fundamental defects in Skinner's account to which I drew attention in a previous paper (Place, 1981b), namely, his failure to draw an adequate distinction within his concept of the verbal operant between words and sentences and the inadequacy of his account of the listener's response to verbal stimuli. I have endeavoured to put right both defects by proposing a radical reconstruction of Skinner's concept of the discriminative stimulus. I now want to turn to the task of putting right the first of two consequential defects of the account presented by Skinner in *Verbal Behavior* which I have distinguished: the confusion in his account of the tact between tacts as words and tacts as sentences.

My contention in the previous paper was that once we draw the distinction between words and sentences, it becomes apparent that the verbal operants which Skinner calls *mands* whose primary function is to direct the behaviour of the listener in the interests of the speaker, and which correspond to the imperatives and interrogatives of the traditional grammatical analysis, are in fact utterances of complete sentences, even if, as in the case of *Stop!*, *Go!*, or *Why?*, they are single-word sentences. It follows from this that tacts, in so far as they contrast with *mands*, must likewise be sentences, indicative sentence utterances or assertions, to use the terminology of traditional grammar and logic, which, as Skinner puts it, "act for the benefit of the listener" (rather than the speaker as in the case of the *mand*) by providing him with "information about" environmental contingencies lying outside his immediate stimulus environment.

On the other hand, there are other things which Skinner says about tacts that make it clear that part of what he has in mind when he uses this word are words rather than sentences, the kind of word which tends to be emitted by a speaker in the presence of a particular recurrent feature of the common environment of speaker and listener of which it is commonly said to be the "name". Tact words in this sense occur in all types of sentences, both those that Skinner calls *mands* as well as those he would describe as tacts, and contrast with what Skinner calls "autoclitic" words like *and*, *not*, *if* and *or*, whose function is purely intra-sentential.

In order to take the matter further, we need to examine both these two new distinctions, that between mand and tact sentences or sentence utterances, and that between tact and autoclitic words, in turn and in greater detail. However, as far as the present paper is concerned, we shall be dealing only with the first of these distinctions that between mand and tact sentences.

SYNTACTICS, SEMANTICS, PRAGMATICS AND THE MAND/TACT DISTINCTION

The important point that needs to be made in connection with the distinction between mand and tact sentences or sentence utterances is that there are three different only partly overlapping ways of drawing the distinction. These three ways of drawing the distinction between mand and tact sentences correspond to three branches of semiotic, or the theory of signs, distinguished by Charles Morris in his book *Signs, Language and Behavior (1946)*, "syntactics" which is concerned with the rules or conventions governing the way in which words are put together to form an intelligible sentence; "semantics", which is concerned with the relationship between signs and the thing signified, on the view we are considering, the relationship between a discriminative stimulus and the contingency discriminated; and "pragmatics" which is concerned with the effect of the sign on the behaviour of the listener.

SYNMANDS AND SYNTACTS

The distinction between mand and tact sentences when drawn in accordance with syntactic criteria is the distinction between sentences in the interrogative and imperative moods or *synmands*, as we may call them, and sentences in the indicative mood or *syntacts*. Since syntactic criteria relate only to the way words are put together to form sentences, it follows that the distinction between synmands and syntacts is a distinction between two kinds of sentence, regardless of the circumstances in which the sentences are uttered. Furthermore, although there are syntactic criteria which serve to distinguish all sentences in the indicative mood (syntacts) from sentences in other moods, there is no single set of syntactic criteria which distinguishes synmands as a group, since in English and all other European languages known to me there are syntactic criteria for distinguishing imperatives, another set of criteria for distinguishing interrogatives, but no common features linking the two apart from the fact that it always makes sense to preface any question with the imperative *Tell me ...*

SEMMANDS, SEMTACTS AND SEMMANDTACTS, SEMTACTMANDS AND SEMTACTMANDTACTS

The absence of a single thread running through the syntactic criteria for recognizing a mand in most, if not all, natural languages, reminds us that Skinner's original distinction between mand and tact is primarily a pragmatic distinction based on whether it is the speaker (mand) or the listener (tact) whose interests are served by the utterance of the sentence. Nevertheless, besides the pragmatic distinction there is also a distinction based on a semantic distinction which we encountered in the course of the previous paper (Place, 1981b, pp. 145-146) when we saw in the sentence pairs *Look! There's a fox!* and *Dinner is ready! Come and get it!* the imperative (mand) sentences *Look!* and *Come and get it!* specify the behaviour to be emitted by the listener on which reinforcement is contingent, while the tact sentences *There's a fox!* and *Dinner is ready!* specify the significant stimulus event, in these cases the reinforcement, whose occurrence is contingent upon the emission of that behaviour. We may therefore define a *semmand* or mand in the semantic sense, as a sentence, sentential clause (as in the case of the conditional clause *If you look in the cupboard*) or the utterance of such a sentence or clause which specifies the behaviour on the part of the listener on whose emission or non-emission the occurrence or non-occurrence of a

significant stimulus event is contingent. Likewise, a *sem tact* or tact in the semantic sense may be defined as a sentence, sentential clause (as in *you will find a pair of scissors*, when it occurs as a consequent relative to the antecedent conditional *If you look in the cupboard*) or the utterance of such a sentence or clause which specifies the occurrence or non-occurrence of a significant stimulus event whose occurrence or non-occurrence either is or is not contingent upon the emission or non-emission of certain behaviour on the part of the listener. Where, as in the example *If you look in the cupboard, you will find a pair of scissors*, an antecedent conditional clause is combined with an appropriate consequent so as to include both a *semmand* and a *sem tact* within a single compound sentence, specifying both the behaviour to be emitted and the consequences contingent upon that behaviour, we may speak of a *semmand tact*.

So far the cases we have been considering are ones where sentences map onto contingencies consisting of a response and the consequences of that response. In other words we have been concerned only with cases where a discriminative stimulus gives "promise" of future reinforcement or "warning" of future disinforcement or punishment contingent on the emission of the specified behaviour. We have neglected an important group of verbal operants which act as discriminative stimuli for the listener with respect to the antecedents rather than the consequences of behaviour. These behavioural antecedents are those constituted either by a state of deprivation or by an actively aversive stimulus whose existence or presence constitutes a motivating stimulus for behaviour and whose termination constitutes its reinforcement as when someone says *We haven't any bread!* or shouts *Fire!* Since in these cases we are concerned with environmental factors controlling behaviour rather than with the behaviour itself, it seems right to classify sentences like this which specify the motivating antecedents of behaviour as *sem tacts* along with those specifying the consequences of behaviour in contrast to the behaviour specifying *semmands* that naturally go with them, namely, *Just slip over the road and buy a loaf*, in the case of *We haven't any bread!* and *Let's get out of here!* in the case of *Fire!* We can then distinguish, on the analogy of the *semmand tact*, the case of the *sem tact mand*, a compound conditional sentence which acts as a discriminative stimulus with respect both to the motivating antecedents of behaviour and the behaviour itself, as in the sentence *If the baby wakes up and cries, give it a bottle*, and in the case of the *sem tact mand tact*, a compound conditional sentence which acts as a discriminative stimulus with respect to all three aspects of the contingency, the motivating antecedents, the behaviour and its consequences, as in the sentence *In case of fire break the glass to get at the key to open the door.*³

It is worth noting in this connection that whereas the kind of compound conditional sentence we are calling a *semmand tact* is a sentence which is classified grammatically as an indicative sentence or syntact, the kind of compound conditional sentence we are calling a *sem tact mand* will be classified grammatically as an imperative or synmand and, judging by our example, the same would appear to be true of the *sem tact mand tact*.

In contrast, both to the synmand and syntact, which are sentences and pragmands, and pragtacts which, as we shall see shortly, are always sentence utterances, *semmands*, *sem tacts* and *semmand tacts*, etc., can be considered either as sentences, in so far as there is a class of contingencies for which a given sentence acts as a discriminative stimulus, or as the same sentence uttered under particular circumstances on a particular occasion, when it acts as a discriminative stimulus with respect to a particular contingency or aspect thereof.

PRAGMANDS AND PRAGTACTS

³ Strictly speaking, the final clause *to open the door* makes this a *sem tact mand tact mand*.

Although the distinction between mands and tacts in the semantic sense is important when it comes to determining what constitutes a complete sentence in terms of the theory of verbal operants as discriminative stimuli, it is clear that the mand tact distinction, as Skinner originally conceived it, is a pragmatic rather than a syntactic or a semantic distinction. Nevertheless, it is clear that Skinner's own way of drawing the distinction in which a mand is said to act in the interests of the initial speaker, whereas the tact acts in the interests of the listener, will not do, if for no other reason, because in terms of Skinner's own theoretical standpoint, no operant is regularly emitted by an organism unless it is regularly reinforced and hence "in the interests of" the organism to emit it. It follows from this that it must be equally in the interests of the speaker to emit a tact as it is for him to emit a mand, otherwise the tact would never be emitted.

In order to appreciate what Skinner is getting at when he draws the distinction between mands and tacts in the original pragmatic sense in terms of the different interests of speaker and listener, we need to make use of what is perhaps Skinner's most important single contribution to our understanding of verbal behaviour, his recognition that the (sentence) utterance in which the (prag)mand consists is simply the first element in the three-part interaction between speaker and listener, consisting of (a) the speaker's initial emission of a mand, (b) the response of the listener in emitting the behaviour which is specified by the speaker's mand, which acts as a reinforcer with respect to the speaker's emission of this and similar mands on subsequent occasions and which may be non-verbal, as when the speaker's mand is an imperative, or verbal, as when it is interrogative, and (c) the response of the initial speaker in reinforcing the listener's response either by an expression of gratitude or by the withdrawal of an implicit or explicit threat.

Skinner (1957, pp. 38-39) gives three examples of such three-part interactions. His first example is in fact a four-part interaction in which the listener responds by reinforcing the initial speaker's reinforcement of his (the listener's) initial response to the initial speaker's mand. It begins with the initial speaker's mand *Bread, please* followed and reinforced by the listener's response of passing the bread to him, followed by the verbal reinforcer *Thank you* emitted by the initial speaker, followed in its turn by the listener's verbal reinforcer *You're welcome*.

Skinner's second example resembles the first except that in this case the positive verbal reinforcement of the listener's response to the initial speaker's mand provided by the words *Thank you* is replaced by non-verbal negative reinforcement in the form of the removal of an aversive stimulus (S^{av}), or threat provided partly by the tone of voice in which the mand *Step aside* is uttered and partly, no doubt, by the facial expression in the form of a frown which accompanies it. The sequence of events in this case is the emission of the mand *Step aside* accompanied by the threat (S^{av}) in the form of intonation and facial expression, followed and reinforced by the listener's stepping aside, which is in turn reinforced by the withdrawal of the threat by the initial speaker.

Skinner's third example is important not only because it introduces a mand in the form of an interrogative to which the listener's response is therefore, verbal rather than non-verbal, as in the two previous examples, but also because the listener's verbal response to an interrogative mand provides a paradigm case of a tact in the sense of an information providing assertion which acts for the benefit of the listener (who in this case is the initial speaker) rather than for the benefit of the speaker who actually emits the tact in question. The sequence of events in this example is the emission of the mand *What's your name?* followed and reinforced by the listener's emission of the tact *Lester* (short for *My name is Lester*), followed in turn by the emission on the part of the initial speaker of the verbal reinforcer *Thank you*.

Not surprisingly, in view of the confusion surrounding Skinner's concept of the tact, his corresponding examples illustrating the role of the tact in interactions between speaker and listener leave much to be desired. His first example in the chapter on the tact (Skinner, 1957, figure 5, p. 84) is an example, not of an independently functioning tact in the sense of the utterance of an information-providing sentence, but of the process whereby a child comes to learn the correct use of the tact word *red* as the name applied to red objects. His second example *does* involve the

emission by a speaker of the information-providing sentence *Telephone for you* which elicits two responses from the listener, the non-verbal behaviour of going to the phone and the verbal reinforcer *Thanks*. But although *Telephone for you* is the first move in the verbal transaction between the two people concerned, it is in fact a response to a mand emitted by a speaker at the other end of the telephone line requesting to speak to the listener to whom the tact sentence *Telephone for you* is addressed. In other words, what we have here is a three-part verbal transaction - a mand followed and reinforced by a tact, followed and reinforced by a verbal reinforcer - which differs from the case of the interrogative mand *What's your name?* by the fact that the initial mand consists of an imperative requiring the listener to communicate information to a third party rather than in an interrogative requiring the listener to communicate information to the initial speaker. Another feature of this example which makes it less than typical of the pure information-providing tact sentence utterance is that the sentence *Telephone for you*, although clearly a tact in both the syntactic and semantic senses, operates as a mand in the pragmatic sense in that its primary function is to elicit from the listener the behaviour of going to the phone. This contrasts with the sentence *My name is Lester*, for which the single-word utterance *Lester* in Skinner's third example is short, where the sentence calls for no specific response on the part of the listener who in this case is the initial speaker. Its function is purely information-providing.

Although pure information-providing tact sentence utterances or pragtacts frequently occur in response to a question or interrogative mand and are reinforced by expressions of gratitude for information received, there are other cases where pure information-providing sentences are emitted spontaneously by a speaker rather than in response to an antecedent question. A typical case of this kind is one where the speaker makes an observation about the current state of the common stimulus environment of both speaker and listener, such as *Nice day, isn't it?* which is followed and reinforced not, as in the case of a tact sentence emitted in response to a question, by an expression of gratitude, but by an expression of assent or agreement, such as *Yes! It is!* or *Isn't it delightful?* The function of such observation sentences and their subsequent reinforcement by an expression of agreement in reassuring the speaker both that his use of words and his judgments about reality agree with those made by others will be discussed in a subsequent paper when we come on to consider the distinction between true and false tact sentence utterances and the way they are discriminated by the listener. For our present purposes, its importance lies in helping to bring out what it is that differentiates the *pragtact* or tact in the pragmatic or functional sense from the *pragmand* or mand in the pragmatic sense.

We cannot say, as we might be tempted to do, that what distinguishes a *pragmand* from a *pragtact* is that a *pragmand* specifies the behaviour on whose emission by the listener reinforcement is contingent. In the first place, this definition would not differentiate a *pragmand* from a *semmand*. In the second place, there are a number of cases, such as the example which I gave in the previous paper (Place, 1981b, pp. 150-151), where my wife uses the indicative sentence *I haven't any cigarettes* as a way of asking me to go out and buy her some. This is clearly a mand in the pragmatic sense, although both syntactically and semantically it qualifies as a tact. Evidently *pragmands* of this kind do not specify the behaviour they elicit from the listener and whose occurrence reinforces their emission by the speaker.

What we have to say, I suggest, is that a *pragmand* is a sentence utterance whose emission by the speaker is reinforced by the reciprocal emission by the listener of behaviour which may be either verbal or non-verbal which is *specific* to the sentence in question as uttered on that occasion. A *pragtact*, on the other hand, is a sentence utterance whose emission by the speaker is reinforced by a *generalised* verbal or other social reinforcer emitted by the listener, which may be either an expression of gratitude for information received or an expression of agreement with, or acceptance of the truth of what is asserted.

The same point can be put in a slightly different way by saying that a *pragmand* is a sentence utterance which acts for the listener as a discriminative stimulus for a reinforcement

contingency in which reinforcement, in this case *controlled by the speaker*, is made contingent upon the emission by the listener of a specific pattern of verbal or non-verbal behaviour. By the same token, a *pragtact* is a sentence utterance which acts for the listener as a discriminative stimulus for a contingency of reinforcement or disinforcement, as the case may be, in which the occurrence of the significant stimulus event in question is *beyond the speaker's control* and may or may not be contingent upon the emission by the listener of a specified or specifiable pattern of behaviour.

Pragmands and pragtacts, so defined, are necessarily sentence utterances rather than sentences as such, since the first of our two definitions defines the difference between pragmands and pragtacts in terms of the different ways the two types of operant are reinforced and an operant can only be reinforced in so far as it is emitted, while on the second definition, where the difference is specified in terms of the type of contingency for which the sentence utterance acts as a discriminative stimulus, the fact that the respective contingencies are differentiated in terms of whether or not reinforcement is under the control of the speaker restricts the application of the definition to sentences that have a speaker and hence to those that are emitted or uttered on particular occasions.

THE INDEPENDENCE OF THE DIFFERENT MAND/TACT DISTINCTIONS

Although there is a common thread running through the mand/tact distinction in the three senses we have distinguished, and although it is probably true that most synmands are also semmands and pragmands and that most syntacts are also semtacts and pragtacts, it is also true that the three distinctions are independent of one another, with the result that there can be and are examples of sentence utterances which qualify as mand in any one of the three senses which qualify as tacts in the other two senses or which qualify as tacts in any one of three senses and qualify as mand in the other two. Examples of all permutations of each way of drawing the mand/tact distinction are given in Table 2.

Example of	Example(s)
1 a synmand semmand pragmand	<i>Shut the door, please!, What's the time?</i>
2 a synmand semmand pragtact	<i>Take a No.1 or No.4 bus to City Square.*</i>
3 a synmand semtact pragmand	<i>Do you see the mess that I see on the floor?</i>
4 a synmand semtact pragtact	<i>Do you see that bus stop over the road?*</i>
5 a syntact semmand pragmand	<i>You ought to reply to that letter.</i>
6 a syntact semmand pragtact	<i>A little oil on the moving parts will help</i>
7 a syntact semtact pragmand	<i>I haven't any cigarettes.</i>
8 a syntact semtact pragtact	<i>It's five past four, Nice day!</i>

* In reply to the question *How do I get from the University to the Railway Station?*

Table 2 **Examples illustrating the independence of the different mand/tact distinctions.**

CONCLUSION

In this paper I have attempted a revision of the account of what it is that distinguishes verbal behaviour from behaviour of other kinds which is presented in chapter 1 of Skinner's book *Verbal Behavior* (1957) and refined in the Appendix on "The Verbal Community". In so doing, I have tried to put right the two basic defects of Skinner's account, to which I drew attention in the

preceding paper (Place, 1981b) namely (1) the failure to draw an adequate distinction between words and sentences and hence to recognize the way in which familiar words can be combined to form new sentences which can both elicit new patterns of behaviour and provide "information about" contingencies of reinforcement and disinforcement that have not been previously encountered by the listener, and (2) the failure to provide an adequate account of the stimulus control exercised by the verbal operant over the behaviour of the listener.

Having suggested an account of the stimulus control of listener behaviour in terms of a revision of Skinner's concept of the *discriminative stimulus* which links it to a revised concept of *contingency*, I then attempted to apply this revised theory in putting right the confusion resulting from Skinner's failure to distinguish *tacts* as words from *tacts* as sentences, in particular as it applied to the distinction between *mands* and *tacts* which as I pointed out, is a distinction between two types of sentence or sentence utterance. The subsequent discussion of the three different ways of drawing the mand/tact distinction using syntactic, semantic and pragmatic criteria completes the discussion of the material dealt with by Skinner in Parts I and II of *Verbal Behavior* (1957, pp. 1-226).

The fourth paper will deal with topics discussed by Skinner in Part IV and Part V of the book (1957, pp. 311-452) beginning with his concept of the *autoclitic* and its relationship to *tacts* considered as words rather than as sentences, and concluding with a discussion of self-directed verbal behaviour or thinking and its function in helping us to put right the final defect in Skinner's account as identified in the previous paper (Place, 1981b, pp. 146-151), the inadequacy of his account of truth and falsity and of the way in which the listener learns to discriminate between true and false indicative utterances. Since the criticisms made in the previous paper do not affect the mainly literary issues discussed in Part III of *Verbal Behavior* (1957, pp. 227-309), no discussion of this part of the book is included here.

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