

[Place, U. T. (1997). Contingency analysis applied to the pragmatics and semantics of naturally occurring verbal interactions. In J. L. Owen (Ed.), *Context and communication behavior* (Chapter 18, pp. 369-385). Context Press.]

Contingency Analysis Applied to the Pragmatics and Semantics of Naturally Occurring Verbal Interactions¹

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I. Contingency Analysis and the Three-Term Contingency

Contingency analysis is a technique for analyzing the relation between a living organism and its environment based on a generalized version of Skinner's (1969) concept of the "three-term contingency." It can be applied to the analysis of any sequence of events in which a single individual interacts with its environment or, as in the case of social behavior, in which two or more individuals interact with each other. I shall try to show that it is particularly valuable when applied to the analysis of naturally-occurring verbal interactions, such as conversations and business transactions.

II. Bringing together Two Conceptual Schemes

In developing a contingency analysis of verbal interactions, I propose to bring together concepts derived from two different research traditions:

- (1) contemporary *behavior analysis*, as it has developed in the wake of Skinner's book *Contingencies of Reinforcement* which appeared in 1969, long after most psychologists and students of language had ceased to pay attention to what he had to say on such matters,
- (2) the research tradition within ethnomethodological sociology known as "*conversation analysis*," founded by the late Harvey Sacks and his two principal lieutenants, Emmanuel Schegloff and Gail Jefferson.

III. Concepts from Behavior Analysis

From contemporary behavior analysis comes the concept of a *contingency* analyzed, following Lindsley (1964), as a relation between three "terms":

- (A) a set of *Antecedent* conditions which call for
- (B) some *Behavior* to be emitted or omitted by an organism (the 'owner' of the contingency), and
- (C) the actual or anticipated *Consequences* of so behaving.²

Two kinds of Antecedents are distinguished:

- (A1) *discriminative stimuli* or signs which alert the organism to the presence or availability of a particular

¹ Earlier versions of this paper were presented at the Annual Conference of the Experimental Analysis of Behaviour Group, Leeds, April 1988, in a symposium on 'Problems and Methods in Recording, Transcribing and Analyzing Naturally-Occurring Verbal Interactions', at the Annual Convention of the Association for Behavior Analysis, Philadelphia, PA, May 1988, at Temple University's Tenth Annual Conference on Discourse Analysis, Philadelphia, PA, March 1989, at a Conference on 'Conversation, Discourse and Conflict', Trinity College, Dublin, March 1989, with peer commentary by L. V. Baker, P. Drew, J. Schwieso and J. Rae, at the Annual Conference of the History and Philosophy of Psychology Section of the British Psychological Society, Lincoln, March 1989, and at the Cambridge Center for Behavioral Studies, Cambridge, MA, March 1991.

The author wishes it to be known that its inclusion in this collection should not be construed as an endorsement of the doctrines of the late Stephen C. Pepper which, as a professional philosopher, he regards as profoundly misguided, both with respect to the nature of and criteria for the truth of a proposition (Place 1992a) and with respect to the nature of the causal relation and the methods by which the existence of such relations is determined (Place 1996). On the other hand, this repudiation of Pepper's epistemology should not be construed as implying any lack of sympathy for the emphasis in this volume on the importance of context for the understanding of behavior in general and linguistic behavior in particular.

² I am personally indebted to Dr. Ogden Lindsley of the University of Kansas for introducing me to this way of formulating the three-term contingency, when I visited him in Kansas City in 1965. However, Dr. Lindsley (personal communication) is reluctant to take the credit for its introduction. Moreover, in his published account of what he calls the "operant behavior equation" (Lindsley 1964 p. 68), he uses the terms "antecedent" and "consequence", together with "movement" instead of "behavior" and "arrangement" as a fourth element corresponding to the scheduled relation between behavior and consequence

contingency (behavior-consequence relation),³ and (A2) *establishing conditions* (Michael 1982), such as an aversive (unpleasant) stimulus or a state of food deprivation, which give to subsequent events their reinforcing (incentive) or disinforcing (disincentive) properties as the case may be.⁴

This distinction between discriminative stimuli and establishing conditions corresponds both to the traditional distinction within Psychology between *cognition* and *motivation* and to the distinction within linguistics and semiotic between the *semantic* properties of an utterance whereby it *refers* the listener to objects and situations both inside and outside the listener's current stimulus environment, and the *pragmatic* properties of an utterance whereby it constrains the listener's response.

We can similarly distinguish two kinds of Behavior:

(B1) the *emission*, and

(B2) the *omission* of what Skinner, somewhat misleadingly,⁵ calls a *response*.

Likewise, Consequences are classified as:

(C1) *reinforcing*, if the propensity to repeat the same behavior on similar occasions in the future is strengthened, or

(C2) *disinforcing* (Harzem and Miles 1978), if it is weakened.

Use is also made

(a) of Skinner's (1957) distinction between a *mand*, interpreted as the utterance of an imperative or interrogative sentence which specifies its own reinforcement, and a *tact*, interpreted, as I have proposed elsewhere (Place 1985), as the utterance of a declarative or information-providing sentence the propensity to emit which is maintained by distinctive *unspecified* verbal reinforcers (the so-called "back-channels" or "response tokens" of the discourse and conversation analysts), and

(b) the distinction he draws in 'An operant analysis of problem solving' (Skinner 1966/1969/1988) between *contingency-shaped behavior* in which the organism's behavioral propensities are shaped or honed by past experience of the *immediate* consequences of behaving in that way in one's own case, and *rule-governed behavior* in which behavior is controlled by a verbal specification of the relevant antecedent - behavior - consequence relation.

IV. Concepts from Conversation Analysis

From conversation analysis comes the concept of the *sequence* divided into

(A) the *Pre-sequence* or preliminary formalities,

(B) the *Main-sequence* in which the business is transacted, and

(C) the *Post-sequence* or concluding formalities.

These are themselves sub-divided into

(i) *turns* in which one person speaks and the other(s) provide(s)

(ii) *response tokens*, which are either

(a) *continuers* which maintain the speaker in turn, or

(b) *terminators* which acknowledge the completion of the speaker's turn and allow the listener to take over.

An *adjacency pair* may be defined as an utterance followed by an appropriate response token, or two successive turns in which the second is the response demanded by the first. Examples of such pairs are

³ There is reason to think that this way of construing the function of discriminative stimuli which, as I am reliably informed by Dr. Evalyn Segal, is now widely accepted amongst behavior analysts derives from the work of J. R. Kantor.

⁴ Michael's concepts of "establishing condition", "establishing stimulus", and "establishing operation" would seem to have two sources. The concept of an "establishing operation" comes from Keller and Schoenfeld's (1950 p. 269) discussion of motivation where it refers to procedures such as depriving a rat of food which is said to establish a "hunger drive." Another source is J. R. Kantor's (1959) concept of "setting factors" which has been widely adopted by behavior analysts in the form of Wahler and Fox's (1981) "setting events." I prefer Michael's formulation because it brings out much more clearly the contrast between the discriminative and motivating functions of antecedent events and states of affairs.

The terms "disinforcement" and "disinforcer" referring to a consequence which tends to weaken the organism's propensity to emit a response, in the way that the terms "reinforcement" and "reinforcer" refer to a consequence which tends to strengthen it, was proposed by Harzem and Miles (1978).

⁵ From the outset, Skinner (1938) insisted that, in contrast with respondents (involuntary reflexes) which appear only when elicited by the appropriate stimulus, operants are spontaneously "emitted" by the organism. They come under the "control" of discriminative stimuli in whose presence they are subsequently reinforced. Once this "stimulus control" has been established, Skinner allows us to say that stimulus "evokes" a response; but until this stage is reached, the term "response" is, strictly speaking, inappropriate.

Request/Compliance, Question/Answer, Offer/Acceptance, Greeting/Return Greeting, but also Opinion/Agreement, News/Surprise, Joking/Laughter and Troubles/Sympathy.

Preference organization is the term used for the phenomenon whereby listeners systematically avoid giving offence to speakers, or try to minimize the offence when it is unavoidable.

V. Contingency Analysis Applied to Non-Verbal Interactions

We have seen that contingency analysis is a technique for analyzing any sequence of events involving the behavior of one or more living organisms in which the relationship between successive events is construed in terms of the concept of the three-term contingency in its generalized form, consisting of Antecedent, Behavior and Consequence. Although it is applicable to any sequence of events involving the behavior of an organism, it is particularly useful as a tool for the analysis of naturally occurring social interactions between two or more organisms. When applied to the analysis of an interactive sequence, each event is classified, where appropriate, in three different ways:

(a) as *Antecedent* with respect to the behavior of the agent whose behavior constitutes the *next* event in the sequence,

(b) as *Behavior* on the part of the agent whose behavior constitutes the event in question and

(c) as *Consequence* with respect to the behavior of the agent whose behavior constitutes the immediately preceding event in the sequence.

This is illustrated in Table 1.

Table 1. Contingency analysis of non-verbal behavior

EVENT	CONTINGENCY ANALYSIS		
	<i>Agent</i>		
	<i>The noisemaker</i>	<i>The baby</i>	<i>The mother</i>
(1) Someone makes a noise.	Behavior	Antecedent	
(2) The baby wakes up and cries.	Consequence*	Behavior	Antecedent
(3) The mother picks up the baby and gives it a bottle		Consequence/ Antecedent	Behavior
(4) The baby goes back to sleep.		Behavior	Consequence

* In most cases of this kind, this consequence will not impinge on the noisemaker's subsequent behavior unless it is drawn to his or her attention by those more immediately concerned with caring for the baby; but in that case the effective consequence as far as the noisemaker is concerned is the carer's protests rather than the baby's waking up.

A similar analysis of interactive sequences such as this was proposed by Jones and Gerard (1967) in the shape of what they call the "social contingency model" of social interaction. On the evidence of their citation of Skinner (1953) in this connection, it would seem that Jones and Gerard's use of the term "contingency" is suggested by Skinner's use of the term in his earlier writings. However their use of the term differs from Skinner's in that for them a contingency is a complete interactive sequence involving two participants; whereas on Skinner's usage each response that is consequted by one's partner in the interaction constitutes a different contingency with its own distinctive antecedents and consequences.⁶

⁶ I am indebted to an article on the social behavior of baboons by J. K. Chadwick-Jones (1989) for drawing my attention to Jones and Gerard's work in this area.

Table 2. Contingency analysis of verbal behavior - Skinner's examples.

	<i>Speaker</i>	<i>Listener</i>
(1) Skinner (1957) Figure 1, p. 38		
S: <i>Bread, please.</i>	Behavior	Antecedent
L: passes the bread.	Consequence/Antecedent	Behavior
S: <i>Thanks.</i>	Behavior	Consequence/Antecedent
L: <i>Don't mention it.</i>	Consequence	Behavior
(2) Skinner (1957) Figure 2, p. 39		
L: stands in S's way.	Antecedent	Behavior
S: <i>Step aside</i> + threat	Behavior	Consequence/Antecedent
L: steps aside	Consequence/Antecedent	Behavior
S: withdraws threat	Behavior	Consequence
(3) Skinner (1957) Figure 3, p. 39		
L: attracts S's attention	Antecedent	Behavior
S: <i>What's your name?</i>	Behavior	Consequence/Antecedent
L: <i>Lester</i>	Consequence/Antecedent	Behavior
S: <i>Thank you</i>	Behavior	Consequence
(4) Skinner (1957) Figure 6, p. 85		
Telephone request	Antecedent	
S: looks for L	Behavior	
S: sees L	Consequence/Antecedent	
S: <i>Telephone for you</i>	Behavior	Antecedent
L: goes to phone + <i>Thanks</i>	Consequence	Behavior

This means

- (a) that we can think of each contingency as being 'owned' by the individual relative to whose behavior the contingency is defined, and
- (b) that the same sequence of events constitutes a different set of contingencies for each of the participants in an interaction which together constitute that individual's distinctive standpoint with respect to that sequence of events.

This enables us to capture the sense in which an interaction is viewed from a different standpoint by each participant without in any way compromising the objectivist epistemology (Place 1993) which is the foundation of the behaviorist position and the source of its strength.

VI. Contingency Analysis Applied to the Pragmatics of Verbal Interactions

The example of the baby waking up illustrates the application of contingency analysis to an interactive sequence all of whose constituent events are constituted by non-verbal behavior on the part of the three participants. To illustrate the application of contingency analysis to verbal interactions and in order to show at the same time where the idea of contingency analysis comes from, I have set out on Table 2, in the same format as Table 1, four examples of short verbal interactions which are derived from a series of diagrams which Skinner (1957) uses in his book *Verbal Behavior* to explain his concepts of "mand" and "tact." Three of them are taken from Chapter 3 on the Mand and the fourth from Chapter 5 on the Tact.

VII. Some Principles of Contingency Analysis as Applied to the Pragmatics of Verbal Interactions

Pragmatic Principle 1. Verbal Behavior is Contingency-Shaped.

If we apply Skinner's (1966/1969/1988) distinction between contingency-shaped and rule-governed behavior to the case of verbal behavior itself, we see that verbal behavior is predominantly contingency-shaped rather than rule-governed. We sometimes work out what we are going to say to someone on the basis of an estimate of the probable consequences of saying one thing rather than another, but this applies only occasionally, and then only to the initial moves in the sequence. Once the sequence has been initiated the swift reaction that is normally required does not permit this kind of "rule-governed" approach. This means

- (a) that all spontaneous verbal behavior is contingency-shaped, shaped, that is, by the response token that the listener supplies as an immediate consequence of its emission by the speaker, and
- (b) that speakers are for the most part unaware of receiving these verbal reinforcers or "continuers", as the conversation analysts call them, things such as the head nods, *Mmhmmms*, etc, as is the listener largely unaware of supplying them.

Pragmatic Principle 2. Verbal Behavior Consequated at Sentence Completion

The unit of verbal behavior which is "consequated", i.e., the unit of behavior which attracts a response token from the listener as its immediate consequence, is the sentence. In other words a sentence has to be completed before the appropriate reinforcer or disinforcer is received from the listener. This is illustrated in Table 3 which presents an excerpt from the transcript of a recording which I made in the Office of the Leeds University Philosophy Department in October 1985 of an interaction between Mrs Penny Ewens, then a mature student in her second undergraduate year, and the Senior Departmental Secretary, Mrs Rose Purdy. A complete transcript of this recording, together with a detailed contingency analysis of the data, has been published (Place 1991) as Chapter 5 of Hayes and Chase (Eds.) *Dialogues on Verbal Behavior*.

In this excerpt I have marked the points at which the speaker completes a sentence with a vertical arrow [^] in the line below. You will see from this that, in general, the listener places her response, whether it is a continuer such as *yes* or *no* or a terminator such as the initiation of a question, very precisely at the point where the speaker's sentence becomes syntactically complete. There are 15 such sentence completions in this section of the transcript. Of these 11 are immediately followed by a response from the listener. In a further case (lines 11 and 12) the listener's response anticipates the completion of the speaker's sentence at a stage when it is quite clear what the completion is going to be. Of the 11 responses 6 are reinforcers in the form either of a confirmation, an expression of agreement or an acknowledgement of comprehension (5 *yes* or *yeah*, 1 *no*), 2 are questions asking for clarification or confirmation of the current speaker's understanding of the previous speaker's utterance, 1 is an echo of the previous speaker's sentence followed by a request for confirmation, 1 is a sentence emitted in reply to one of those questions and 1 is an unsolicited elaboration of some background information. In only four cases is there no response from the listener to the completion of a sentence by the speaker: (1) on lines 10-11 where there is no apparent response from Penny when Rose completes the sentence *the're all on that list* which echoes Penny's immediately preceding sentence *the're on that list*, and can, perhaps, be regarded simply as a response to that sentence rather than a sentence in its own right, (2 & 3) on lines 13-15 where Penny engages in the extraordinary piece of self-directed reasoning which makes up her final three sentence turn and which, apart from its conclusion, is ignored by Rose, presumably because she is only interested in the conclusion and not in the tortuous mental process by which the conclusion is reached, and (4) on lines 16-17 where Penny's *yes* occurs halfway between the completion of Rose's sentence *and they're going to get the shopping* and the completion of its extension *out of it*; this response can be seen either as a delayed reaction to the first sentence-completion or as an anticipation of the second (extended) sentence-completion at a stage when its form can be confidently predicted, or possibly as both.⁷

⁷ I am indebted to Dr. John Rae for drawing my attention to the inadequacy of my treatment of this point in an earlier version of this paper in the comments which he made on it at the Lincoln Conference of the History and Philosophy Section of the British Psychological Society in March 1989.

Table 3. *The Party 10/85*⁸

Penny:	it's <i>just</i> this bus'ness of (.) th' <i>party</i> ^	[for the <i>first</i> y:e:ars. ^	01
Rose:		[ye:(s) yes=	02
Penny:	=I won't (.) be <i>in</i> tomorrow mo:rning. ^		03
Rose:		no=	04
Penny:	=I've <i>left</i> a <i>notice</i> on the <i>board</i> . ^		05
Rose:		yeah.=	06
Penny:	=and there's a <i>note</i> for them °of the money. ^		07
Rose:		who wants to pick it up?= ^	08
Penny:	=we:ll (.) the:'re on that li: [st. [^		09
Rose:		[oh the're °all on that <i>list</i> .= ^	10
Rose:	= (.) and any-any of these people [can <i>have</i> i_, (.) can they.=	[^ ^	11
Penny:		[yes:: (.)	12
Penny:	=I <i>do</i> :: know John's girl friend <i>knows</i> about it.=	^	13
Penny:	=bu(t) <i>she's</i> not <i>free</i> at the same time as <i>them</i> tomorrow.=	^	14
Penny:	=so:th't <i>lots</i> of people <i>know</i> about it,= ^		15
Rose:	=anan <i>the're</i> goin(g) to <i>get</i> the shoppin(g) <i>out</i> of it. (.) I <i>see</i> =	^ [^	16
Penny:		[yes (.)	17

[Superimposed square brackets : overlapping utterances. = : no discernable gap between consecutive utterances. (.) : micropause. , : upward intonation at the end of the preceding word. ? : upward intonation of the whole, preceding word. . : downward intonation of the preceding word. : : prolonging or stretching of the preceding letter or syllable (repeated: more stretching).]

Pragmatic Principle 3. It is Words and Phrases that are Repeated - Not Sentences

Although sentences are the units of verbal behavior which are consequted, they are not, as Chomsky (1957, etc.) has repeatedly pointed out, the units of verbal behavior that are repeated as a consequence of reinforcement. What are repeated on subsequent occasions are the individual words, phrases and sentence frames which make up the sentence, and the gist of stories, arguments, etc. of which it forms part.

Pragmatic Principle 4. Sentences on a "Win-Shift/Fail-Stay" Contingency

At the level of sentence construction, verbal behavior is on what Harlow (1959) has called a "win-

⁸ [Editor: this table is reconstructed without having access to the published version of the chapter. The above table can contain errors.]

shift/fail-stay" contingency, one in which if your utterance is reinforced by the listener's response you do not repeat yourself, you move on to the next sentence. You only repeat yourself at the time if you fail to get a response first time. Even then, the sentence you construct is invariably slightly different in intonation, if not in other ways, from your first attempt.

Pragmatic Principle 5. Discourse Type on a "Win-Stay/Fail-Shift" Contingency

At the level of discourse type, on the other hand, verbal behavior is on a "win-stay/fail-shift" contingency. This is illustrated in a study by Gail Jefferson (1981) in which she points out that news-telling behavior on the part of a speaker is maintained by expressions of interest and surprise such as *Really?*, *Did you?*, *You did?*. Clearly what is maintained here is not the propensity to repeat the individual news items, but the propensity to continue producing new items that the listener has not heard before. After all, news is only news if you haven't heard it before.

Pragmatic Principle 6. Reinforcers of Mands are specified: Reinforcers of Tacts are Unspecified

A 'verbal reinforcer' is a response on the part of the listener which acts as a reinforcing consequence with respect to the immediately preceding sentence emitted by a speaker. Verbal reinforcers in this sense are of two kinds:

- (a) *specified verbal reinforcers* such as the behavior of answering a question or complying with a request which provides the reinforcing consequence for what Skinner calls "a mand", in other words, a sentence which specifies the behavior on the part of the listener which, if emitted, will reinforce the emission of the mand by the speaker;
- (b) *unspecified verbal reinforcers* by which is meant the reinforcing consequences of a tact or information-providing sentence whose emission is reinforced by what conversation analysts call a "response token", a verbal reinforcer such as an expression of gratitude, sympathy, agreement, comprehension or surprise which is not specified by the sentence which it consequences.

Pragmatic Principle 7. The Intra- and Extra-Episodic Effects of Continuers and Terminators

Unspecified verbal reinforcers may be sub-classified as:

- (a) *continuers* whose effect is mainly intra-episodic in that they serve to maintain on-going verbal behavior on the part of the current speaker;
- (b) *terminators*, as we may call things such as clapping or saying *Thank you* when someone finishes speaking, whose reinforcing function is purely extra-episodic, that is to say, their function is to strengthen the speaker's propensity to emit similar utterances on relevantly similar occasions in the future.

Pragmatic Principle 8. Reinforcement of Verbal Behavior is Response Specific

The reinforcement of verbal behavior is *response specific*; that is to say, each type of sentence utterance or "speech act" has its own characteristic form of reinforcement which is peculiar to verbal behavior of that kind. This is the phenomenon known to conversation analysts as the "*Adjacency Pair*". This is illustrated on Table 4.

Two points need to be made in connection with this table in the light of comments made by Dr. Paul Drew:⁹

- (1) On Table 4 the expression has been extended so as to include the relationship between the different varieties of *tact*, to use *one* of the senses in which Skinner uses that word (Place 1985), and the different kinds of reinforcer in the form of response tokens which, though unspecified in the utterance which they consequence, are nevertheless specific to the type of speech act to which they respond.

⁹ When responding to an earlier version of this paper at the Lincoln Conference of the History and Philosophy of Psychology Section of the British Psychological Society in 1989.

Table 4. Adjacency Pairs

Speech Act Type		Reinforcer
(a) MANDS	-	SPECIFIED
(i) In S's self-interest		
S orders		L obeys
S requests		L complies
S applies		L permits
(ii) In L's interest		
S invites		L accepts
S offers		L accepts
(b) TACTS	-	UNSPECIFIED
(i) Narrative		
News telling		Expressions of surprise
Joke telling		Laughter
Troubles talk		Expressions of sympathy
(ii) Informative		
Instructing		Expressions of comprehension
Directing		Expressions of gratitude
Opinion-stating		Expressions of agreement

(2) Table 4 should not be regarded as in any sense an exhaustive summary of the constraints which an utterance places on the response which it evokes from the listener. By restricting attention to the reinforcing consequences of utterances, it tends to conceal the fact that disinforcing consequences of utterances, though less common than reinforcing ones, are equally adapted to the nature of the speech act to which they are responding. Both positive disinforcers, such as the refusal to comply with a request or an expression of disagreement, and negative disinforcers, such as the listener's failure to supply the expected response within the conventionally established time limits, are constrained by the nature of the utterance to which the listener is responding or failing to respond, just as much as it is in the case where the response is a reinforcer.

Pragmatic Principle 9. Preference Organization - Moderating and Avoiding Listener's Anger

Motivated presumably by the fear of arousing the speaker's anger, the vast majority of the speaker's utterances are appropriately reinforced by the listener. For the same reason, when the listener withholds reinforcement for whatever reason, listeners tend to avoid or minimize the speaker's anger by such devices as copious apologies, excuses or postponing their admission that they are unable or unwilling to comply. This is what is known to conversation analysts as "preference organization".

VIII. Contingency Analysis as Applied to the Semantics of Verbal Interactions

According to the principle of 'Behavioral Contingency Semantics' (Place 1983; 1992a) or plain 'Contingency Semantics' as I am now inclined to call it, sentences exercise discriminative stimulus control over the behavior of (i.e. are "understood" by) listeners, in so far as they "specify" or "depict" one or more terms of a contingency which is "owned" by the listener in the sense that the behavior which has the consequences and is called for by the antecedent conditions is either

Table 5. Contingency analysis applied to semantic content

(a) Instruction: If the baby cries, give it a bottle, and it will go back to sleep.	The baby minder Antecedent Behavior Consequence	
(b) Narrative (Sacks 1972): The baby cried. The mommy picked it up	The baby Behavior Consequence	The mother Antecedent Behavior

- (a) behavior to be emitted by the listener, as in the case of the *instruction* to the baby minder in example (a) on Table 5, or
 (b) behavior on the part of an individual with whom the listener is able to *identify*, as in the case of a *narrative* such as the child's story discussed in a paper by Sacks (1972) as set out under (b) on Table 5.

IX. Principles of Contingency Analysis as Applied to the Semantics of Verbal Interactions

Semantic Principle 1. Presenting Listener's Contingencies as a Condition for Comprehension

In order for a listener or reader to understand and thereby perform the behavior prescribed in a set of instructions, the speaker/writer must present the antecedent conditions, the behavior to be performed and the consequences to be expected in the form and in the order in which they will be encountered by the listener/reader. Where instructions are presented verbally, the listener has the opportunity to ask questions which will have the effect of inducing the instructor to fill any gaps or correct defects of order as they present themselves to the listener. Two such questions appear in the transcript presented on Table 3. Writers of instructions, where the reader has no opportunity to ask such questions, need to take special care to ensure that the reader's contingencies are described in the form and in the order in which they will confront the reader. It seems that failure to follow this simple principle of putting oneself in the reader's shoes is a major source of communication breakdown and the failure to make effective use of complex and expensive equipment.

Semantic Principle 2. Contingency Identification and Narrative Preference

The individual's narrative preferences, in whatever medium the narratives are presented, will depend on the ease with which he or she can identify with the contingencies of the individuals, particularly the hero/heroine, depicted in the story.

Semantic Principle 3. - Completion of Contingency Specification - A Constraint on Turn-Taking

When a speaker is telling a story, the listener cannot take over the turn until all three terms of the reported contingency have been specified. If a speaker omits one of the terms, the listener is constrained to ask a question which will evoke the missing term, and thus ensure that the speaker completes his or her turn before taking over. Take for example the story laid out on Table 6 which comes from a paper by Local, Kelly and Wells (1986).

Table 6. Contingency completion and narrative turn taking

N:	<i>So when he went, I just stuck them bits of cardboard behind and it works great</i>	Antecedent Behavior Consequence
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Now perform the following thought experiments¹⁰ in each of which a different contingency term is removed:

Table 7. A Thought Experiment

Thought Experiment:	Invites the question
(i) <i>I just stuck them bits of cardboard behind and it works great.</i>	<i>What made you do that?</i>
(ii) <i>So he went and it works great.</i>	<i>What made the difference?</i>
(iii) <i>So when he went I just stuck them bits of cardboard behind.</i>	<i>So, what happened?</i>

Semantic Principle 4. The Speaker's Preference for own Contingency Rehearsal

Not only does the semantic content of an utterance determine how easily the listener can relate what the speaker is saying to his or her own contingencies and thereby understand what is being said, the same principle also controls the speaker's utterance. Thus, the reinforcement of a speaker's verbal behavior is maximized in so far as:

- (a) the behavior is frequently reinforced by continuers supplied by the listener;
- (b) the speaker is able to rehearse his or her own contingencies or those of his or her family and friends without sacrificing the frequency of continuers supplied by the listener (interpreted as evidence of the listener's interest in what is being said).

Semantic Principle 5. Speaker's Own Contingency-Presentation - A Barrier to Communication

In business transactions, such as the example of the arrangements for the party which we have already looked at on Table 3, difficulties and misunderstandings arise because the initiating speaker formulates what she wants the listener to do in terms of her own contingencies - the antecedent conditions prompting the speaker to make the request - rather than in terms of the contingencies as they present themselves to the listener.

Semantic Principle 6. Taking Turns at Own Contingency-Rehearsal in Casual Conversation

In casual conversation participants tend to take turns to rehearse their own contingencies and receive the appropriate continuers. These, however, are unlikely to be forthcoming unless the listener can easily

¹⁰ For a discussion of the rationale behind the use of this kind of 'ethnomethodological' thought experiment as a way of throwing light on social norms in general and those governing verbal behavior in particular, see Place (1992b).

identify with and thus maintain interest in the speaker's contingencies.

Semantic Principle 7. Friendship as a Willingness to Share Each Other's Contingencies

A friend is someone with whose contingencies one can readily identify and thus listen to without becoming bored, thereby failing to supply the necessary verbal reinforcers, and who, by the same token, can listen to one's own rehearsal of one's own contingencies without becoming bored by them.

X. Conclusion: Towards an Applied Conversation Analysis

In attempting to integrate the conceptual schemes of behavior analysis and conversation analysis, Skinner's concept of the three-term contingency (antecedent, behavior and consequence) has been used to analyze both the pragmatics of the interaction between the participants in a conversation and the semantic content of what is said. How productive that attempt has been and what the future holds for such an enterprise is for the reader to judge.

For the writer two results stand out, one from the pragmatic analysis, the other from the semantic. From the pragmatic analysis there emerges a conception of the process which Skinner (1981) refers to as "selection by consequences" which is much richer and more subtle than that which springs to mind, if the paradigm case of a reinforcing consequence is the delivery of a food pellet and that of a disinforcing consequence an electric shock. What adds this new dimension to our understanding of the process whereby behavior is shaped by its consequences is the discovery that different types of speech act demand correspondingly different types of reinforcing and disinforcing consequence. That discovery emerges as soon as we begin to examine the kind of detailed study of naturally-occurring verbal interactions which the conversation analysts have shown us how to do in the light of Skinner's concept.

From the semantic analysis the most striking result is the discovery that a major obstacle to interpersonal communication is the fact that a contingency is unique to the individual whose behavior constitutes its defining middle term. This means that in a verbal interaction the interests of speaker and listener are in conflict. What is a reinforcing consequence for the speaker is to be able to rehearse her own contingencies, while receiving the kind of reinforcing consequences for so doing that only an attentive and interested listener can provide. What is a reinforcing consequence for the listener is to hear from the speaker either a specification of reinforcing consequences for behavior which she (the listener) has emitted or can easily and comfortably emit or the specification of similar consequences for behavior emitted by someone else with whose contingencies she can readily identify. How that conflict of interests gets reconciled as the turn passes from speaker to speaker in the course of a conversational exchange is what gives the study of conversation its peculiar fascination.

But the study of conversation is not just intrinsically fascinating. Although the art of conversation is a typical contingency-shaped skill acquired through practice rather than verbal instruction, it seems reasonable to suppose that the better we understand how it works, the better we shall be at giving practical advice, to ourselves as well as to others, on how to communicate effectively. Conversation analysis, as it has been developed hitherto, has paid little attention to the possibility of its practical application. Behavior analysis with its roots in a tradition which emphasizes experimental manipulation and control is much more alert to such possibilities. May it not be that the greatest benefit to be derived from bringing the two research traditions together in the way suggested here will be the development of an applied conversation analysis?

XI. References

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