

A Guide to Supplementary Papers and Links

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Any chapter on the behavioral approach to language must necessarily be either superficial or quite selective. We chose to address a few topics that seem to pose formidable difficulties to a behavioral perspective, reasoning that the reader can get an overview of the field elsewhere and see how it handles most challenges without any guidance from us. On this page of the website we offer links to a few sources that will help flesh out the topics in the chapter. **Study questions to the text** can be found at **Heading #1**.

Skinner's Verbal Behavior

For an overview of the behavioral position, the reader is referred to Skinner's book, *Verbal Behavior*. Recall that in any domain of complex human behavior, science must supplement experimental analysis with heavy doses of interpretation, for it is usually difficult or impossible to control subjects' histories and other disturbance variables as much as one might like. Interpretation is the analysis of the data that are available in light of principles that have been established in other domains under tight experimental control. (For further discussion, click **Heading #2, Interpreting Verbal Behavior**.) Skinner's *Verbal Behavior* is a comprehensive interpretation of the field and offers an excellent framework for both experimental analysis and further interpretative work. The book was published in 1957 by Prentice Hall and was reprinted in 1992 by the B. F. Skinner Foundation. Inexpensive paperback copies can be purchased from www.bfskinner.org.

Skinner worked on his interpretation of verbal behavior for over 20 years, taught courses on the subject on several occasions, and in 1947 delivered the William James Lectures at Harvard University on the topic. Two documents, Ralph Hefferline's notes of Skinner's 1947 class at Columbia University and the transcript of the James lectures, are available at **Heading #3: Skinner's Early Documents on Verbal Behavior**.

Chomsky's Review of *Verbal Behavior*

The reader is undoubtedly aware that *Verbal Behavior* was critically reviewed by Noam Chomsky in 1959 and that the review has been influential in discouraging consideration of Skinner's position among philosophers, linguists, cognitive scientists, and the educated laity. Almost any objective reader of both documents will notice that the review is both highly polemical and factually flawed. For links to **Chomsky's review**, **responses to the review**, and other relevant papers, click **Heading #4**.

A Behavioral Interpretation of Grammar

Whatever one may think of Chomsky's position, the challenges of accounting for verbal phenomena—particularly grammatical phenomena—are formidable, regardless of

one's position. The kinds of subtle grammatical regularities that are of central interest to the structural linguist have been largely ignored by behavioral psychologists. Chapter 11 identifies a few variables that appear to us to be central to a behavioral interpretation of such regularities. Papers on this topic can be found at **Heading #5 – A Behavior Analytic Interpretation of Grammar.**

Multiple Control

A central thesis of *Verbal Behavior*, but one that is overlooked by Chomsky and other critics, is that verbal behavior is almost invariably multiply controlled. A widespread misunderstanding of the book is that every utterance can be classified as one or another of the elementary verbal operants. One can find relatively pure examples of verbal operants in therapeutic, educational, and experimental settings, but in natural settings multiple control is the norm. Moreover, extended segments of verbal behavior almost invariably require a complex interpretation:

Saying "bear" in response to a bear track found near an empty picnic table is a metonymical tact. Saying "A bear has been here" is much more. In a normal occurrence, "That animal is a lion" is also more than a tact. The expression contains two tacts: *animal* and *lion*. It also contains additional material serving a function that in my book I call "autoclitic." It includes what linguists call syntax or grammar. If we are to stick closely to demonstrated behavioral processes, only the increased probability of saying *lion* in the presence of a lion is the relation called a tact.

--Skinner, 1988, p. 178. From A. C. Catania & S. Harnad (Eds.), *The selection of behavior: The operant behaviorism of B. F. Skinner: Comments and Consequences* (pp. 207-208). Cambridge: Cambridge University Press.

Multiple control can be found in all advanced examples of verbal behavior and is central to poetry, humor, and great literature. For an overview of the topic of **Multiple Control**, see **Heading #6.**

Atomic Repertoires

A distinguishing feature of human behavior is the great extent to which the selection of complex behavior can be accelerated by inducing critical variations in baseline behavior. Speaking of echoic behavior for example, Skinner remarked, "It makes possible a short-circuiting of the process of progressive approximation, since it can be used to evoke new units of response upon which other types of reinforcement may then be made contingent." (1957, p. 56) For example, if we want someone to learn that Garibaldi was an Italian general, we could shape up the statement through successive approximations of undifferentiated vocal behavior, a task that might take hours. Alternatively, we can simply tell him as much; provided he has an echoic repertoire in English, the form of the verbal response can be acquired in a single trial.

"By *atomic repertoire* I mean a set of fine-grained units of behavior, each under control of a distinctive stimulus, which can be evoked in any permutation by the arrangement of corresponding stimuli. Like letters on a page that can be arranged to display a great variety of expressions, atomic responses can be arranged to meet a great variety of contingencies. Examples of atomic repertoires include rule-governed behavior, imitation, echoic behavior, textual behavior, transcription, and tacting, among others. The grain of such units depends on one's history of discrimination training and is therefore idiosyncratic. The important feature of atomic repertoires is that they permit the induction of a criterion variation in behavior in a single trial, or in a few." (Palmer, 2012)

As noted, verbal behavior is not the only source of atomic repertoires, but it is a major one. A discussion of this topic can be found in a paper on **Atomic Repertoires (Heading #7)**. This paper also offers an interpretation of **Delayed Observational Learning**, a topic that has hitherto been only poorly analyzed in the behavioral literature.

Controversies Within Behavior Analysis

A field as complex and as difficult to study as verbal behavior offers scope for alternative interpretations. It takes but a few seconds for a speaker to rattle off a long sequence of verbal responses. The performance is dazzling in its complexity: The diaphragm is moving up and down, the larynx is changing shape, and the lips, tongue, and throat are shifting with lightning speed. Since many utterances are novel, it must be the case that controlling variables are shifting with comparable speed. Weaving an interpretive account from plausible episodes in the speaker's history together with current controlling variables and the topography of the behavior is a formidable task. We prefer Skinner's approach, namely, a very fine-grained interpretive account, one that captures the moment-to-moment shifts in stimulus control. However tentative such an interpretation may be, it has the advantage of ready integration with established behavior theory.

Relational frame theory (RFT) attempts to analyze verbal behavior at a coarser resolution. It draws upon a well-established empirical finding: When given a sufficient history of similar relational tasks under distinctive conditions, most verbal adults will generalize the relation to novel arbitrary stimuli under those same distinctive conditions. Emergent relations and functions often emerge. For example, given a certain history, and the presence of appropriate contextual stimuli, Stimulus A can be established as the "opposite" of Stimulus B, and B the "opposite" of C, even if A, B, and C are otherwise meaningless symbols. Subjects will often show control by emergent relations, for example, by behaving as though C were the "same" as A. RFT argues that such relational behavior can be interpreted as a generalized operant: Given sufficient examples of conditional relations, "relational behavior" will generalize to novel exemplars.

Since it is often difficult to provide a moment-to-moment account of emergent verbal relations, relational frame theorists have argued that RFT provides a better interpretive framework for understanding such phenomena than Skinner's account. (See

Hayes, S. C., Barnes-Holmes, D., & Roche, B. (2001). *Relational Frame Theory: A post-Skinnerian account of human language and cognition*. New York: Kluwer Academic/Plenum.) We don't agree. No doubt it is a healthy thing for a field to spawn variations, and the excitement generated by relational frame theory may ultimately be beneficial to the field as a whole, just as the explosion of work in applied behavior analysis has benefited unrelated basic and conceptual analyses. However, we don't believe that procedures like multiple exemplar training and matching to sample, the staples of RFT research, are fine-grained enough to permit an adequate interpretive account of verbal behavior. **For papers discussing our view of the limitations of RFT, along with links to articles to contrary points of view, click Heading #8.**

Mathematics and Logic

Mathematics and logic are examples of verbal behavior, but they pose thorny interpretive problems, for they seem to be essentialistic, at least in their most common forms. Mathematics is a formal model of nature, or a set of such models, and such models are the natural domain of essentialism. Moreover, such models have proven to be exceptionally powerful in describing and predicting natural phenomena. The puzzle of how verbal behavior can give rise to such powerful essentialistic models has not been satisfactorily addressed by behavior analysis, **but see Heading #9 for a paper that attempts to make some headway on this topic.**

An Overview of Thorny Problems in the Interpretation of Verbal Behavior

Heading #10 links to a **Handbook Chapter** on verbal behavior that identifies many of the challenges facing a behavioral account. It offers a good overview of the many topics discussed in Chapter 11 and the supplementary papers.

Special topics in Verbal Behavior

We are including papers on several special topics in the domain of verbal behavior. Within the field, the concept of *intraverbal behavior* is used inconsistently. It is most often used as a kind of catch-all category for verbal behavior in response to a verbal antecedent, but an alternative approach confines the term to verbal responses to a verbal antecedent that occur *because of the reinforcement of prior contiguous usage*. For example 48 would be considered an intraverbal response to *What is 6 times 8?* because of a history of saying the former in the presence of the latter. But saying *I went to the movies with Eric and then went to Sam's bar* would not be an intraverbal response to *What did you do last night?* because it is not a response that has been reinforced before in the presence of that question (assuming that this is the first time you have answered that question in this way). **For a paper that expands on the definition of the intraverbal, see Heading #11.**

Latent behavior is behavior that is being called by a current discriminative stimulus but is not strong enough to be emitted at the present time, perhaps because other behavior is currently stronger. It is a somewhat controversial topic in the field, but

Skinner did not hesitate to discuss it. **For a brief discussion of the concept of latent behavior, see Heading #12.**

One of the effects of verbal stimuli on a listener is to occasion a cascade of discriminative responses. When we listen to a story, or read one, we often “act and feel along with the characters.” This behavior is usually covert and impossible to measure, but it is undoubtedly important. **For a discussion of the role collateral behavior might play, see Heading #13.**

A good story can have a powerful effect on a listener by evoking the collateral behavior mentioned above. Among other effects, we tend to remember stories much more easily than an arid disquisition. **For a brief discussion of the power of narratives, see Heading #14.** For a family of other papers on the topic, see *Perspectives on Behavior Science*, 2018, vol. 41.

The topic of a behavioral interpretation of aesthetics was analyzed in a major document by Francis Mechner published in *The Psychological Record* in 2018. **For a brief response to Mechner that offers an interpretation of aesthetics in literature, see Heading #15.**