B. F. SKINNER'S ANALYSIS OF VERBAL BEHAVIOR
History, Controversy, Implications, and Applications
HISTORY
April 1933

Original caption:
B. F. Skinner is one of the students chosen by Harvard to become the new fellow at the new “Super school.”
“No black scorpion is falling upon this table.”
Sir Alfred North Whitehead
“Really, what experiment did he do?”

<table>
<thead>
<tr>
<th>Unique feature</th>
<th>Language</th>
<th>Nonlanguage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of R? No</td>
<td>Striped muscle R</td>
<td>Any muscle or gland R</td>
</tr>
<tr>
<td>Type of S that evokes R? No</td>
<td>Visual, auditory, tactile</td>
<td>Any sense mode</td>
</tr>
<tr>
<td>Type of rfmt for R? No</td>
<td>Any type of $S^R$ or $S^r$</td>
<td>Any type of $S^R$ or $S^r$</td>
</tr>
</tbody>
</table>

How R produces rfmt? Yes

Indirectly, only through someone else's behavior

By direct contact with the environment

Credit: Jack Michael
MO: SD —> Behavior —> Consequence

The verbal operant is the unit of analysis, both in terms of form* and function.
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*This concludes my lecture on non-verbal communication. Any comments or questions?*
Elementary Verbal Operants

Form of the response is controlled by

<table>
<thead>
<tr>
<th>Motivative Operation</th>
<th>Discriminative Stimulus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mand</td>
<td>Verbal Stimulus</td>
</tr>
<tr>
<td></td>
<td>Non Verbal Stimulus</td>
</tr>
</tbody>
</table>

- Pt to Pt Correspondence
- No Pt to Pt Correspondence

<table>
<thead>
<tr>
<th>Formal Similarity</th>
<th>No Formal Similarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Echoic Copying text</td>
<td>Textual Taking</td>
</tr>
<tr>
<td>Mimetic</td>
<td>Dictation</td>
</tr>
</tbody>
</table>

Credit: Bill Potter / Jack Michael
Greenspoon (1955)
Conger & Killeen (1974)

Image source: https://c1.staticflickr.com/3/2148/2163760529_914e576884_b.jpg


![Graph showing correlation between % of Responding and % of Reinforcements](https://c1.staticflickr.com/3/2148/2163760529_914e576884_b.jpg)

Figure 3: Proportion of responding to $S_2$ and reinforcers given by $S_1$ for individual subjects; interval 3 = $x$, the last five minutes of parts I and II.
Communication

Communication is the conveying information speech, visuals, signs, exchange of information. Communication represents...

Symbolic Communication Between Two Pigeons
*Columba livia domestic*ca*

Abstract. Through the use of learned symbols, a pigeon accurately communicated information about hidden colors to another pigeon. Each verbal exchange was initiated with a spontaneous request for information. The two pigeons engaged in a sustained and natural conversation without human intervention.

Fig. 2. Typical communication sequence: (A) Jack (left) asks Jill (right) for a color name by depressing the wrong color key. (B) Jill looks through the curtain at the hidden color. (C) Jill selects the symbolic name for the color while Jack watches. (D) Jack rewards Jill with food by depressing the thank you key. (E) Jack selects the correct color as Jill moves toward her reward. (F) Jack is rewarded and fed.
Much Ado About Nothing? Some Comments on B. F. Skinner's Definition of Verbal Behavior

Matthew P. Normand
University of the Pacific

Some have suggested that the definition of verbal behavior offered by B. F. Skinner (1957) fails to capture the essence of language insofar as it is too broad and not functional. In this paper, I argue that the ambiguities of Skinner’s definition are not an indictment of it, and that suggestions to the contrary are problematic because they suffer a critical error of scientific reasoning. Specifically, I argue that (a) no clear definition of verbal behavior is possible because there is no natural distinction between verbal and nonverbal behavior; (b) attempts at an immutable definition are essentialistic; and (c) Skinner’s functional taxonomy of language is in no way affected by the particulars of any definition of verbal behavior.

Key words: essentialism, functional analysis, language, verbal behavior

ON THE ORIGIN AND FUNCTIONS OF THE TERM FUNCTIONAL ANALYSIS

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AND

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In this essay, we note that although Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994) established the standard framework for conducting functional analyses of problem behavior, the term functional analysis was probably first used in behavior analysis by B. F. Skinner in 1948. We also remind readers that a functional analysis is really an experimental analysis, words that were contained in the title of Skinner’s first book, The Behavior of Organisms: An Experimental Analysis (1938). We further describe how Skinner initially applied the concept of functional analysis to an understanding of verbal behavior, and we suggest that the same tactic be applied to the verbal behavior of behavior analysts, in the present case, to the term functional analysis.

Key words: functional analysis, functional relations, experimental analysis, behavior analysis, B. F. Skinner
Much ado…

**Skinner’s analysis…**

- Does not raise any questions or principles other than those already studied in the non-human laboratory.
- Is too broad and includes trivial and irrelevant behavioral episodes.
- Is not a functional definition because it is based on aspects of another organism’s learning history.
- Has failed to generate productive lines of research.

… about nothing

- No clear definition of verbal behavior is possible because there is no distinction between verbal and non-verbal behavior.
- Attempts at an immutable definition are essentialistic.
- Skinner’s functional taxonomy of language is in no way affected by the particulars of any definition of verbal behavior.
- Invoking the behavior of others in categorical definitions is not unique to Skinner’s definition of verbal behavior.
- The validity of an analysis is not judged (solely) by the amount of research that is produced.
“...is reinforced through the mediation of other persons” (p. 2)

“behavior reinforced through the mediation of other persons [who] must be responding in ways which have been conditioned precisely in order to reinforce the behavior of the speaker” (p. 225)

“...is shaped and sustained by a verbal environment—by people who respond to behavior in certain ways because of the practices of the group of which they are members.” (p. 226)
The definition … is so broad as to include virtually all animal operant behavior in traditional behavior analytic research…

(Hayes & Barnes-Holmes, 2004, p. 218)
“The significant interrelations between these terms may be expressed by saying that the community reinforces the response only when it is emitted in the presence of the stimulus. The reinforcement of the response ‘red,’ for example, is contingent upon the presence of a red object. (The contingency need not be invariable.)”

(Skinner, 1945, p. 272)
any attempt to apply the analytic categories described in the book [Verbal Behavior] leads basic behavior analysts inexorably back to what they were already doing in the [animal] laboratory.

(Hayes & Barnes-Holmes, 2004, p. 218)
The definition is … not a functional one in a behavior analytic sense, because it is not based on specific aspects of an individual organism’s history but on aspects of some other organism’s history (namely that of the audience trained to mediate reinforcement to the speaker)…

(Hayes & Barnes-Holmes, 2004, p. 218)

Function

The demonstration that one variable changes as a result of changes in another variable.

There is a functional relation between task difficulty and disruptive behavior.
Function

The demonstration that one variable changes as a result of changes in another variable.

There is a *functional* relation between task difficulty and disruptive behavior.

The consequence that is produced by behavior that maintains (reinforces) the behavior.

*The function of the disruptive behavior is escape.*

A Functional Taxonomy

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>Consequence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mand</strong></td>
<td>Listener plus MO for a specific reinforcer</td>
</tr>
<tr>
<td><strong>Tact</strong></td>
<td>Listener plus verbal stimulus (resembles response)</td>
</tr>
<tr>
<td><strong>Intraverbal</strong></td>
<td>Listener plus verbal stimulus (does not resemble response)</td>
</tr>
</tbody>
</table>
The definition is … not a functional one in a behavior analytic sense, because it is not based on specific aspects of an individual organism’s history but on aspects of some other organism’s history (namely that of the audience trained to mediate reinforcement to the speaker)…

(Hayes & Barnes-Holmes, 2004, p. 218)
Too much ado about nothing.

- No clear definition of verbal behavior is possible because there is no distinction between verbal and non-verbal behavior.
- Attempts at an immutable definition are essentialistic.
- Skinner’s functional taxonomy of language is in no way affected by the particulars of any definition of verbal behavior.
- Invoking the behavior of others in categorical definitions is not unique to Skinner’s definition of verbal behavior.
- The validity of an analysis is not judged (solely) by the amount of research that is produced.

IMPLICATIONS
"I think you should be more explicit here in Step Two."

Meaning?

To grasp the meaning of a thing, an event, or a situation is to see it in its relations to other things: to note how it operates or functions, what consequences follow from it, what causes it, what uses it can be put to.... In the case of the meaning of words, we are aware by watching children and by our own experience in learning French or German that happenings, like sounds, which originally were devoid of significance acquire meaning by use, and that this use always involves a context. (Dewey, 1933, pp. 225-231)
"Meaning is not properly regarded as a property of a response or a situation but rather of the contingencies responsible for both the topography of behavior and the control exerted by stimuli.” (Skinner, 1974, p. 90)

"Meaning, contents, and references are to be found among the determiners, not among the properties, of response.” (Skinner, 1945, p. 271)
The professor suggested that everything that exists is only an illusion. I was disappointed, because my girlfriend is stunning.

Public Accompaniment

Image source: https://c1.staticflickr.com/1/47/148110505_10946213c5_b.jpg
Collateral Response

Common Properties
Lubinski and Thompson (1987)


APPLICATIONS
TOWARD A FUNCTIONAL ANALYSIS OF SELF-INJURY

BRIAN A. IWATA, MICHAEL F. DORSEY, KEITH J. SLIFER,
KENNETH E. BAUMAN, AND GINA S. RICHMAN

THE JOHN F. KENNEDY INSTITUTE AND
THE JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE

This study describes the use of an operant methodology to assess functional relationships between self-injury and specific environmental events. The self-injurious behaviors of nine developmentally disabled subjects were observed during periods of brief, repeated exposure to a series of analogue conditions. Each condition differed along one or more of the following dimensions: (1) play materials (present vs absent), (2) experimenter demands (high vs low), and (3) social attention (absent vs contingent). Results showed a great deal of both between and within-subject variability. However, in six of the nine subjects, higher levels of self-injury were consistently associated with a specific stimulus condition, suggesting that within-subject variability was a function of distinct features of the social and/or physical environment. These data are discussed in light of previously suggested hypotheses for the motivation of self-injury, with particular emphasis on their implications for the selection of suitable treatments.
FUNCTIONAL ANALYSIS OF VERBAL BEHAVIOR: A BRIEF REVIEW

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UNIVERSITY OF THE PACIFIC

A variation of the preintervention functional analysis of problem behavior has recently been extended to identify the function of verbal behavior emitted by children with autism. Recent research suggests that a functional analysis of verbal behavior might be beneficial in evaluating previous instruction and guiding the selection of future educational targets and instructional procedures. The present paper reviews previous literature on the functional analysis of verbal behavior and identifies avenues for future research.

Key words: autism, functional analysis, language, typical development, verbal behavior
### MAND

<table>
<thead>
<tr>
<th>Pre-session</th>
<th>Test</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Object unavailable for 60 min</td>
<td>Object available for 60 min</td>
</tr>
<tr>
<td>Start of session</td>
<td>Object shown to child then placed out of sight. Experimenter in close proximity</td>
<td>Object available throughout session. Experimenter seated on the other side of the room</td>
</tr>
<tr>
<td>Contingent</td>
<td>Brief (20 s) access or a small piece of food</td>
<td>No programmed consequences</td>
</tr>
<tr>
<td>Other</td>
<td>Prompt (“What do you want?”) every 20 s if no response. Item shown every 1 min if no response</td>
<td>Food items replenished throughout session</td>
</tr>
</tbody>
</table>

### TACT

<table>
<thead>
<tr>
<th>Pre-session</th>
<th>Test</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Object available for 60 min</td>
<td>Object available for 60 min</td>
</tr>
<tr>
<td>Start of session</td>
<td>Object available throughout session. Experimenter in close proximity</td>
<td>Object not present. Experimenter seated on the other side of the room</td>
</tr>
<tr>
<td>Contingent</td>
<td>Brief praise (but name of object not used)</td>
<td>No programmed consequences</td>
</tr>
<tr>
<td>Other</td>
<td>Prompt (“What is it?”) every 20 s if no response. Food items replenished throughout session</td>
<td></td>
</tr>
</tbody>
</table>
### INTRA-VERBAL

<table>
<thead>
<tr>
<th></th>
<th>Test</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-session</strong></td>
<td>Object available for 60 min</td>
<td>Object available for 60 min</td>
</tr>
<tr>
<td></td>
<td>Object not present</td>
<td>Object not present</td>
</tr>
<tr>
<td></td>
<td>Experimenter in close proximity</td>
<td>Experimenter in close proximity</td>
</tr>
<tr>
<td></td>
<td>Every 20 s, the therapist delivered relevant phrase that did not contain the vocal response.</td>
<td>Every 20 s, the therapist delivered irrelevant phrase that did not contain the vocal response.</td>
</tr>
<tr>
<td><strong>Start of session</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contingent</strong></td>
<td>Brief praise (but name of object not used)</td>
<td>No programmed consequences</td>
</tr>
</tbody>
</table>

### ECHOIC

<table>
<thead>
<tr>
<th></th>
<th>Test</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-session</strong></td>
<td>Object available for 60 min</td>
<td>Object available for 60 min</td>
</tr>
<tr>
<td></td>
<td>Object not present</td>
<td>Object not present</td>
</tr>
<tr>
<td></td>
<td>Experimenter in close proximity</td>
<td>Experimenter in close proximity</td>
</tr>
<tr>
<td></td>
<td>Every 20 s, the therapist stated the name of the object.</td>
<td>Every 20 s, the therapist seated on the other side of the room</td>
</tr>
<tr>
<td><strong>Start of session</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contingent</strong></td>
<td>Brief praise (but name of object not used)</td>
<td>No programmed consequences</td>
</tr>
</tbody>
</table>
Normand, Severtson, & Beavers. (2008)

APPLICATION IMPLICATIONS?

- Assessment of existing language repertoire
- Evaluation of language acquisition programs
- Basic research
- Translational research

APPLICATION IMPLICATIONS?

• Assessment of existing language repertoire
• Evaluation of language acquisition programs
• Basic research
• Translational research
OTHER IMPLICATIONS?

• Assessment of existing language repertoire
• Evaluation of language acquisition programs
• Basic research
• Translational research
THREE-TERM CONTINGENCY PATTERNS IN MOTHER–CHILD
VERBAL INTERACTIONS DURING FIRST-LANGUAGE ACQUISITION

ERNST L. MOERK

CALIFORNIA STATE UNIVERSITY, FRESNO

Selections from a large longitudinal data set of verbal interactions between a mother and her child are presented. Two sets of three-term contingency sequences that seemed to reflect maternal rewards and corrections were noted. Both the antecedents as well as the immediate consequences of maternal interventions are presented to explore training and learning processes. The observed frequencies of three-step sequences are compared to those expected based upon Markov-chain logic to substantiate the patterning of the interactions. Behavioral conceptualizations of the learning process are supported by these analyses, although their sufficiency is questioned. It is suggested that maternal rewards and corrections should be integrated with perceptual, cognitive, and social learning conceptualizations in a skill-learning approach to explain the complexity of language transmission and acquisition processes.

Key words: three-term contingency, multivariate analysis, language acquisition, reinforcement, imitation, verbal behavior, mother–child interaction

Image source: https://upload.wikimedia.org/wikipedia/commons/2/29/Mother-Child_face_to_face.jpg

![Figure 4](image)

Figure 4: (b) Number of vocalizations produced by infants in each group. The increase in the YC infants' vocalizations may have been due to mothers increasing the amount of interaction generally (e.g., increasing touching, proximity, talking) as a reaction to spending the previous 10 min out of social synchrony with their infants.
cogito ergo sum
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