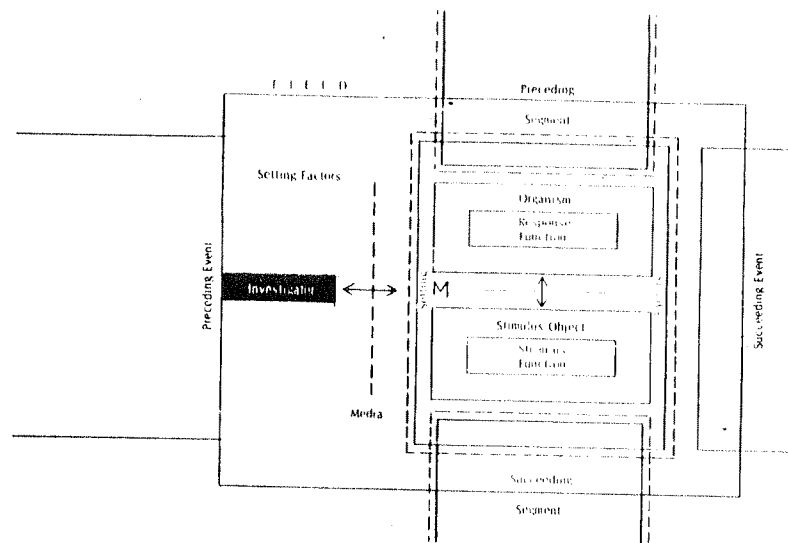


THE I n t e r b e h a v i o r i s t



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First, both of these traditional conceptions of motivation [Habit x Drive and Expectancy x Value Theories] lead us to consider behavior in terms of discrete behavioral episodes that can be conceived in terms of $S \rightarrow O \rightarrow R$, that is, stimulus situation \rightarrow organism \rightarrow reaction to stimulus situation. Second, both are stimulus-bound theories of motivation. They encourage us to think of the immediate stimulus situation to which the organism is exposed as the cause of the tendencies to act in certain ways . . . as contrasted with the traditional image of separate episodes, . . . behavior, now conceived as a continuous stream, characterized by change from one activity to another even in a constant environment, is influenced by characteristics of particular persons . . . and characteristics of the immediate environment.

J. W. Atkinson and D. Birch, 1978.
Introduction to Motivation (2nd ed.).
Van Nostrand. p. 17, 26.

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The Agora

This issue's cover quote is intended to engender interest in a truly revolutionary new text on motivation, Atkinson and Birch's *Introduction to Motivation* (2nd Edition). As can be seen in the excerpt from the introductory chapter, Atkinson and Birch replace several traditional premises about the nature of behavior and the organism-environment relationship with new premises having a distinctly interbehavioral flavor, and the remainder of their book is a highly specific elaboration of the dramatic (and potentially testable) implications of the new premises for the conceptual analysis of human motivation. The book is a daring revision of Atkinson's classic introductory text (1964), and while the revised edition is probably less appropriate than the original (and than other texts on motivation) for the undergraduate of average ability, its scholarliness and clarity make it an excellent choice for an advanced undergraduate seminar or for a graduate course concerning theories of motivation. Although Kantorian interbehaviorism is not referenced, the book is a testimonial to the enormous potential impact of interbehavioral assumptions upon scientific psychology, and I give it my highest recommendation.

* * *

As indicated in the credits, Associate Editor Donna Cone has begun a new job within the Department of Mental Health, Retardation and Hospitals, State of Rhode Island. Her new title is that of Assistant Director for Program Standards, Planning, and Evaluation. She writes that "It's a much less strife-ridden assignment, much more in keeping with my background, and much more fun."

* * *

The *Interbehaviorist* will continue under the same editorship (and associate editorship) for Volume 9, 1979. Enclosed with this last issue of Volume 8 is a subscription form: please return it promptly, as the first issue of the new volume is scheduled to appear in early April. The (regretted) increase in subscription rate is in deference to inflation.

* * *

This issue's feature is a paper by Edward K. Morris, University of Kansas. His interest is in articulating with greater specificity the relationships between the psychologies of Kantor and Skinner in order to "promote a useful interchange between interbehaviorists and behaviorists."

* * *

Edward K. Morris

University of Kansas

J. R. Kantor and B. F. Skinner approach psychology with similar natural science assumptions, yet their perspectives rarely are related to one another in a constructive manner. In this paper, some relationships between the approaches are discussed in an attempt to promote a useful interchange. First, the interbehavioral field and the three-term contingency are described according to their points of correspondence; special attention is given to the concepts of stimulus and response function. Second, points of disagreement on the issue of complexity in human interactions and on the concept of causality are outlined, and resolutions suggested. It is concluded that the two psychologies can be related constructively.

Much is to be admired in the works of J. R. Kantor and B. F. Skinner and in their proposals for a natural science of psychology (e.g., Kantor, 1924, 1925, 1938, 1959, 1971; Skinner, 1938, 1953, 1966, 1969, 1974). The proponents of one approach, however, sometimes fail to view constructively or understand completely the aims and methods of the other. This paper will note briefly some points of correspondence between the two approaches and suggest some other points upon which there is potential agreement. Some of these relationships have been described elsewhere (e.g., Bijou & Baer, 1978; Fuller, 1973), but a more explicit delineation is needed in order to promote further interchange, and eventually a more encompassing and practical analysis of behavior than that which emerges from either approach alone. This paper will also describe, and suggest resolutions for, the apparent points of disagreement between Kantor and Skinner on the issue of complexity in human interactions and on the issue of causality. The present analysis is incomplete, but perhaps it will stimulate further efforts to merge the two views.

POINTS OF CORRESPONDENCE

In this section, Kantor's conceptual unit, the interbehavioral field, will be described and its elements discussed in order: the organism, the stimulus, setting factors, media, and the reactional biography. An analysis of Skinner's conceptual unit, the three-term contingency, will be integrated with Kantor's as we proceed.

I am indebted to Sidney W. Bijou, Parker E. Lichtenstein, and Irvin S. Wolf for contributing so much to my thinking through the years; they are not, of course, responsible for any of this paper's shortcomings. Also, I would like to thank my students -- Jane Atwater, Bob Sharkey, and Greg Wagner -- and the editor of this newsletter for their perspicacious comments on earlier versions of the manuscript. Reprint requests should be sent to the author, Department of Human Development, Haworth Hall, Lawrence, Kansas 66045.

¹Bijou and Baer (1978) add Kantor's concept of setting factor to Skinner's three-term contingency, thus yielding a conceptual unit called a four-term contingency.

The organism. Kantor suggests that the organism may be described on three different levels: first by its organismic equipment; second, by its response forms; and third, by its response functions. The organismic equipment refers to the biological entity that defines the organism. It is synonymous with what Skinner would call the response equipment of the organism. Kantor goes on to describe the organismic equipment in terms of the phylogenetic and ontogenetic contributions made to it; that is, in terms of what has been imparted to it by evolution and maturation. In general, he has attended more closely to biological variables than has Skinner (see Kantor, 1947). Skinner never intended to dismiss biological factors from his system (Skinner, 1974, 1975), but most behaviorists have focused so intensely on the environment in their analysis of behavior that they have courted misinterpretation on this issue.

The second level on which the organism may be described is in terms of its response forms. Response forms are the neuromuscular patterns of behavior, described by their physical topography or structure. All psychological activity has a form or topography that may be described (or potentially described) by physical measurements. An analogous term for response form in Skinner's system would be response instance. A formal or structural analysis of behavior covers the broad range of all possible interactions, from relatively discrete units (instances), such as a bar press or a spoken sentence, to more lengthy and complex sequences, such as a description of the course of development.

Kantor and Skinner agree that response forms or instances are of obvious importance in the analysis of behavior, but both would argue that formal analyses must not be confused with functional analyses. While formal (or structural) and functional analyses of behavior are not incompatible, and while both may be necessary for a full understanding of behavior (Catania, 1973; Richelle, 1976), and for proper remediation of behavior (Wetherby & Morris, 1979), Kantor and Skinner would state that a formal or structural analysis does not on its own promote an understanding of psychological functioning.

The third level of analysis is that of response function, in which behavior is described in terms of its "meaning" within an interactional field. When we describe what an individual is doing psychologically, we are describing the individual's response functions. Response functions are the "whys" of or reasons for behavior. When we say that a child is crying (response form) in order to obtain food, we are describing the function of that behavior.

In the analysis of response functions, two sets of interrelationships should be noted. First, response functions cannot be defined without taking into account all the other elements of the interbehavioral field; response functions are defined by their relationship to the other elements, especially stimulus functions, and not on the basis of response forms removed from the context of the other functioning elements. Second, a multiplicity of form-function relationships may be described. One response form may have different response functions for different individuals or for the same individual at different times (i.e., in different interbehavioral fields). For instance, in the example presented previously, a child's cry (response form) may occur because he or she is hungry, tired, or seeking attention (response functions). Also, one response function can be served by a wide variety of response forms. Children may seek teacher attention (response function) by acting up in class or by working studiously (response forms) depending on the other variables in the interbehavioral field.

Skinner has proposed a concept for the analysis of behavior that is similar to Kantor's, but instead of speaking of response functions, Skinner speaks of response classes (Skinner, 1935). A response class is defined by a set of response instances that are held together by their specific functional relationship to stimulus contingencies. Instances of behavior come in a near infinite variety; no two are likely to be identical. But when a group of instances is functionally related to a particular set of contingencies (i.e., when they reserve the same function), then that group is called a response class. A response class is maintained by a relationship or contingency between the response instances and the stimulus conditions that control the defining and non-defining properties of that class of behavior. For example, a child's single request for assistance is a response instance, but requesting assistance comes in many different forms which, as a group, define a response class.

While valuable conceptually, Kantor's concept of response function and Skinner's concept of response class pose a problem for sorting out the almost infinite number of substantive, content-related functions or classes that may exist in the world. Skinner has another approach to response functions and classes, however, that allows one to organize them so that they may be dealt with in a more practical manner. He has organized behavior into two functional categories: responses that function as respondents and responses that function as operants (Skinner, 1953). Some responses function as respondents in that they are controlled by antecedent eliciting stimuli; other responses function as operants in that they are controlled by consequent reinforcing stimuli and accompanying discriminative conditions. Respondents and operants, then, are defined in relation to their respective controlling conditions, and may be thought of as two broad categories of response functions.

The stimulus. Corresponding to the three levels of analysis for the organism are three similar levels of analysis for the stimulus with which the organism interacts, the first level of which is what Kantor labels the stimulus object. The stimulus object, like the response equipment, is analyzed in terms of both its phylogenetic history (i.e., the ways in which it came to exist) and its ontogenetic history (i.e., what has become of the object since it was created). In general, behavior scientists have paid little attention to this level of analysis. Skinner has no comparable term and does not address the concept directly.

The second level of analysis is that of stimulus form; this refers to the physical description of the stimulus according to its topography or structure. All stimuli have forms that may be described (or potentially described) by physical measurement. An analogous term for stimulus form in Skinner's system might be stimulus instance. A formal or structural analysis of stimuli covers the broad range of all objects in our world, from relatively discrete units (instances) such as food pellets and the word "good", to more complex categories such as a landscape and the complex behavior of other organisms. As with response forms, both Kantor and Skinner would agree that stimulus forms or instances obviously are important in the analysis of the world around us, but both would also argue that formal analyses of stimuli cannot provide a sufficient basis for understanding how they function. Kantor and Skinner would hold that a formal or structural analysis of a stimulus does not promote much understanding of its function, in spite of the assertions of some psychologists that behaviorists have failed to appreciate the form-function distinction (e.g., Randura, 1977; Bowers, 1973).

The third level of analysis is that of stimulus function. Not only may stimuli be described by their physical properties, but they also may be described in terms

of their functions or "meanings" within an interactional field (see Lichtenstein, 1970). When we describe how a stimulus affects an organism's interaction with it, we are describing the stimulus's function. If we say that a stick with a flat blade attached to one end (stimulus form) is being used as a toy shovel in a sandbox, then we are describing a stimulus function for that object.

As in the case of response functions, two sets of relationships should be noted. First, a stimulus function cannot be defined without taking into account the other elements of the interbehavioral field; stimulus functions are defined by their relationship to the other elements, especially response functions, and not on the basis of their forms alone, removed from the context of the other functioning elements. Second, a multiplicity of form-function relationships may be described. One stimulus form may have different functions for different individuals or for the same individual at different times (i.e., in different interbehavioral fields). For instance, in the example presented previously, the stick with the flat blade on the end (stimulus form) may be used by a child as a shovel for digging, as a weapon for attacking those who intrude into the sandbox area, or as a spoon for a mudpie luncheon (stimulus functions). Also, one stimulus function can be served by a wide variety of stimulus forms. Digging implements (stimulus function) may come in many different forms, such as shovels, pieces of bark, or flat stones.

Skinner has a concept similar to Kantor's stimulus function -- that of stimulus class (Skinner, 1935). A stimulus class is defined by a set of stimulus instances that are held together by their specific functional relationship to behavior. Instances of stimuli come in a near infinite variety, but when a group of instances is functionally related to a particular set of responses (i.e., when they serve the same function), then that group is called a stimulus class. A stimulus class is maintained by a relationship or contingency between the stimulus instances and the responses that control the defining and non-defining properties of that class of stimuli. For example, a particular toy shovel is an instance of a class of shoveling implements, but other stimuli that similarly move sand about a sandbox will serve the same function. All these instances constitute a stimulus class of sand-moving instruments. That class of implements will be maintained by the relationship of its instances to the behavior of shoveling.

Kantor's concept of stimulus function and Skinner's of stimulus class represent valuable conceptual approaches to the analysis of the relationship of environment to behavior. However, these concepts, like those of response function and response class, pose some problems because of the nearly infinite number of substantive, content-related functions or classes that may exist among objects in our world. Again, Skinner proposes a practical organizing scheme. We may define functions or classes of stimuli in terms of their effects on behavior, that is, in terms of their eliciting, discriminative, and reinforcing functions (Skinner, 1953). Many stimuli may serve any or a combination of these functions, and almost any stimulus function can have numerous associated forms.² These three categories of stimuli are defined functionally by the two categories of response functions with which they interact -- respondents in the case of eliciting stimuli and operants in the case of discriminative and reinforcing stimuli.

²These two relationships hold within the limits of the organismic equipment; see Seligman and Ilagar (1972) and Shettleworth (1972).

The media. Kantor's concept of the medium of stimulation refers to the means by which contact is made between the organism and stimulus. The medium is not a property of an object itself, but is a stimulus condition under which interactions occur (or are "enabled": Kantor, 1970). For example, a child may contact a cookie through the visual medium of a dark cupboard, or may turn on a light in the hallway to enable him or her to see better what kind of cookie it is, and perhaps to enable different kinds of interactions with it, such as keeping it or selecting another. Unfortunately, turning on the light in the hallway also enables a parent to observe the forbidden act. Changes in the medium can affect the interaction of an organism with a stimulus object, even though the organism and the object remain formally the same. Skinner's system has no analogous conceptual element. The media would probably be analyzed in terms of supplementary stimulus control within an interaction.

Setting factors. Setting factors or events are the contextual conditions that surround the organism-environment interactions and that influence the functional properties of the stimulus and response forms. Setting factors are not the stimuli with which an organism interacts directly, but are the contexts of those interactions. These factors may be internal organismic conditions (e.g., fatigue and illness), external environmental conditions (e.g., classrooms and play yards), or the interaction of the external and internal conditions (e.g., emotional states). The important feature of setting events is that they have a strong influence over the functional properties of the interacting stimuli and responses. For example, tickling a child who is alert, active, and awake may evoke laughter, but stimulating the child in the same way when he or she is tired or ill may evoke crying. Or, roughhousing between children will lead to very different consequences depending on whether the children are in the classroom or in the play yard.

Psychologists with a Skinnerian perspective have not readily adopted the concept of setting factors, though their system does not discount the effects of such variables. The closest Skinner comes to an independent setting event concept is probably when he describes the habituation operations that affect respondent interactions and the satiation-deprivation operations that affect operant interactions. As for setting events related more obviously to the general environmental context, the preference of many Skinnerians is to speak in terms of stimuli that function as supplementary eliciting, discriminative (especially conditional), and reinforcing events, and not of a special class or category of stimuli.

The reactional biography. The reactional biography or interbehavioral history is the organism's history of past interactions. This history is critical in that it imparts to the stimulus and response forms their functions. Stimuli and responses acquire their functions as the result of their interbehavioral histories. Similar Skinnerian terminology would be conditioning or reinforcement history, though the latter would be too narrow in that it eliminates consideration of respondent interactions. Through an organism's conditioning history, stimuli acquire eliciting, discriminative, and reinforcing functions with respect to respondent and operant behavior. Or, alternatively, stimulus and response classes become mutually defined.

Concluding comments. Kantor's interbehavioral postulates allow for a complete and objective analysis of organism-environment interactions. Many experimental and applied behavior analysts could profit from an understanding of Kantor.

For some, however, Kantor's system is unwieldy because in the application of his concepts -- especially the stimulus and response functions -- there is no intermediate step between the broad classes he differentiates and specific examples from everyday life. Skinner's experimental analysis of behavior, however, provides an intermediate level of analysis for stimulus and response functions that is a useful adjunct to Kantor's approach. Skinner's response function categories of operants and respondents and his stimulus function categories of eliciting, discriminative, and reinforcing stimuli allow a slicing of the interbehavioral pie into specific, content-free units of investigation which have proved extremely valuable in both basic and applied behavior analysis. Once analyzed in basic behavioral research, operants and respondents, and eliciting, discriminative, and reinforcing stimuli can be interrelated with the substantive activities of everyday life. Or, in applied behavioral research, one can analyze everyday behavioral and environmental events in terms of respondent and operant behavior, and in terms of eliciting, discriminative, and reinforcing functions, respectively. Skinnerians, however, are wont to be narrow on occasion (Bijou, 1979). Sensitivity on their part to Kantor's broader perspective might prove an excellent remedy. In sum, a wedding of the two approaches has much to offer proponents of either system.

POINTS OF DISPARITY

Two points of disagreement between Kantor's and Skinner's perspectives deserve special attention. One is an unnecessary conflict over the issue of complexity. The second pertains to causality and the different ways in which it may be approached.

Complexity. Kantor (1970; see also Farrington, 1971) has criticized Skinnerians for failing to analyze the complexity of human behavior. He has said that they devote too much effort to the analysis of simple conditioning phenomena and too little effort to the analysis of such interactions as perceiving, remembering, and thinking. But the behavior analyst would object. Complexity may be conceived of in two legitimate but different ways that should not be confused.³ One type of complexity is related to basic behavioral principles or processes and a second to the outcomes of those processes as they operate in everyday organism-environment interactions.

Despite assertions to the contrary, the basic behavioral principles are not simple. Volumes upon volumes of journals and texts attest to their complexity and to the behavior scientist's difficulty in understanding them. Skinnerians, for the most part, concentrate their work and energy in this area. Behavioral content is also complex. Given the myriad biological and environmental conditions in which stimulus and response functions develop, interbehavioral interactions take on a tremendous number of substantive, content-related form-function relationships. These relationships are complex and they need to be studied. This is the type of complexity on which Kantor focuses. An analogy might be drawn to the work of the research physicist and the meteorologist. Both are dealing with complexity, but in two different ways -- one in terms of the basic principles or processes of physics and the other in terms of the real world outcomes of those processes. For psychologists, important work remains to be accomplished in both areas, but the two should not be confused with one another. Indeed, exploration of the complexity of behavioral processes and behavioral outcomes must proceed hand in hand if a truly effective psychological system is to be developed.

³I am indebted to David Rider for his discussions with me on this point.

Causality. The second issue requires more attention than can be provided here, but it will be touched on briefly. The issue is that of causality. In Kantor's organismic model, there is no temporal separation of cause and effect; a stimulus function and response function interact dynamically in a field as part of a unitary event (Smith, 1973). An organismic, field system does not allow for a "billiard ball" conception of causality (Lichtenstein, 1970). Skinner, however, does speak in terms of temporally ordered functional relationships between antecedent and consequent events. This mechanistic cause-and-effect model serves a useful stipulative rule or pragmatic device for the conduct of science.⁴ The mechanistic approach may have its limitations as we gain a more sophisticated perspective on behavior, but psychology probably has not yet proceeded far enough to require a more sophisticated conception of causality. Billiard ball models will remain sufficient -- even if they are incomplete -- for some time. Certainly, the Newtonian mechanistic model of physics sufficed for many years before Einstein revolutionized our perspectives; and even today the Newtonian model remains adequate for most of what physicists do.

Organismic and mechanistic models or world views (Pepper, 1942) have received much attention in developmental psychology of late (e.g., Lerner, 1976; Overton, & Reese, 1973; Reese & Overton, 1970). Unfortunately, the organismic model has become aligned solely with mentalistic, cognitive assumptions about behavioral development (Fuller, 1973), and is clearly favored in these comparisons; the mechanistic model has become aligned with behaviorisms of various sorts, and is dismissed as misguided, or grossly limited at best. It is important to point out, however, that a mechanistic model may be either cognitive (e.g., information processing and computer analogies) or behavioral (Skinner) and that an organismic model also may be cognitive (e.g., Piaget) or behavioral (e.g., Kantor). Present world view analyses fail to appreciate this point. An organismic model need not come with mentalistic baggage (Kantor, 1923). Who would want that on a honeymoon? An organismic model can ascribe to natural science assumptions and yet be behavioral.

Mentalism aside, analyses of the different world views are in general agreement that the basic metatheoretical assumptions of the mechanistic and organismic approaches are incompatible in fundamental ways, never to be reconciled by any eclecticism (Pepper, 1942). But there is one way in which the two world views may be combined. One may adopt organismic assumptions, yet do everyday science following mechanistic reasoning. We may use the science of physics as an example: everyday physics may be accomplished with mechanistic assumptions, despite the conceptual advantages of relativity theory. Perhaps the relationship between Skinner and Kantor can be viewed in the same way: everyday psychology can be accomplished with mechanistic reasoning even though Kantor's organismic approach might be the better model. Kantor's and Skinner's psychologies are not incompatible; rather, they provide different degrees of analytic completeness.

Much is to be said for the wedding of Kantorian and Skinnerian psychologies, even though -- as is the case in many weddings -- neither set of parents will be totally satisfied. Certainly, points of disagreement remain (Lichtenstein, 1973). But if the proponents of each perspective will look more closely at

⁴Skinner's behaviorism may or may not be mechanistic depending on one's definition of mechanistic. For example, operant interactions do not display mechanical cause-and-effect relationships in the same sense that S-R respondent interactions do. See Ringen (1976) for further elaboration on this point.

what is good in the other, the resulting union may bear children who are unusually effective as behavior scientists.

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