

SKETCH OF J. R. KANTOR'S PSYCHOLOGICAL INTERBEHAVIORAL FIELD THEORY

Dennis J. Delprato

Eastern Michigan University

Noel W. Smith

State University of New York at Plattsburgh

We provide a sketch of J. R. Kantor's (1959, 1971) psychological interbehavioral field (IBF) theory by identifying 9 essential points and briefly discussing each. The main emphasis of this sketch is on the foundation of Kantor's thinking, the IBF. Suggestions for further study are provided.

Keywords: interbehavioral psychology, interactional history, psychological events, interdependent events, interbehaviorism, J. R. Kantor, field theory, theory

We provide a sketch of J. R. Kantor's (1959, 1971) psychological interbehavioral field (IBF) theory in the following nine major points and the accompanying discussion of each. This article emphasizes the foundation of Kantor's thinking, the IBF. The final section entitled "Further Study" identifies several resources that amplify our sketch.

1. Psychological IBF theory applies the most recently evolved scientific thinking to psychology.

Kantor's (1946, 1963, 1969) analysis of the history of science agreed with Einstein and Infeld (1938) and Dewey and Bentley (1949) that field theory represented the third stage of science. Scientists first regarded natural events as acting under self-contained (internal) powers. As Dewey and Bentley put it, up to the time of Galileo, the learned view was "that there exist things which completely, inherently, and hence necessarily, possess Being; that these continue eternally in action (movement) under their own power—continue, indeed in some particular action essential to them in which they are engaged" (p. 110). In the second stage of science, thinkers retained the notion of internal powers and accounted for natural phenomena in terms of forces acting between unalterable objects. Familiar standbys of classical science evolved in the second stage: the world-machine, mechanism,

Correspondence concerning this article should be addressed to Dennis J. Delprato, Department of Psychology, Eastern Michigan University, Ypsilanti, MI 48197. E-mail: ddelprato@emich.edu

materialism, causal determinism, and reductionism. However, by the middle of the twentieth century, physical scientists no longer compared the world to a machine. Einstein and Infeld and others (see Frank, 1955) proposed that the transition from classical mechanics (e.g., Newton's gravitational laws) to Maxwell's differential equations of the electromagnetic field marked a critical development in the evolution of new thinking in physics. Heinrich Hertz prominently argued that physical knowledge was attained not from reductions to mechanical laws but via derivations from laws of the electromagnetic field (Frank, 1955). In this thinking, there are no material actors; the equations do not "connect the happenings *here* with the conditions *there*" (Einstein & Infeld, pp. 152-153). Maxwell introduced the field construct, according to which *here* or *now* are not connected to conditions *there* or *then*. Although the mechanical theorist attempted "to describe the action of two charges only by concepts referring directly to the two charges, . . . in the new field theory it is the description of the field between the two charges, and not the charges themselves, which is essential for an understanding of their action" (Einstein & Infeld, p. 157). Today's physical scientists do not adopt a cause-effect outlook (e.g., Feigl, 1953; Holton, 1973). Instead, the field alternative to the terms *cause* and *effect* of ordinary language "is the entire *set* of conditions [an event-field]" (Feigl, p. 410), and this set represents the cause of an event.

2. IBF theory does not use simplistic direct analogies between psychological events and physical fields.

Kantor considered a scientific field as a "locus of interaction of the factors in an event" (1936, p. 155) and argued that scientific description always has such a field character because no event can be described in fewer than two variables acting simultaneously, that is, all knowledge claims are statements of relations between at least two interdependent variables. This is the essential radical departure from previous thinking that physicists first captured with the field construct, which carried with it the exclusion of hypothetical explanatory internal factors (Kantor, 1941). The fact that psychological events are at the same time physical ones does not, however, imply that the former are adequately described and explained by way of physical analogies. Kantor (1936) used the then-prevalent gestalt field theory as an example of shortcomings in using physical fields as analogies in psychological science. Thus, one should expect to find the IBF to have a character distinctive from that of any other science.

3. Kantor's IBF is not a version of Pepper's contextualism.

Marr (1993) painted Kantor's field theory as a "vague contextualism" and implied that the framework is of no use in psychological science. Marr was referring to Kantor's field theory as a form of Pepper's (1942) version of contextualism according to presentations by Morris (e.g., 1988, 1993) and Hayes, Hayes, and Reese (1988). Unfortunately, we have been unable to locate a single article commingling Kantor's field perspective and Pepper's contextualism that links Kantor's views with what Pepper considers "the most plausible theory of the nature of the world as far as physical evidence goes" (p. 214), that is, *consolidated mechanism* based on the root metaphor of the electromagnetic field (Delprato, 1993). Instead, Morris and Hayes et al. offer contextualism as an alternative to mechanism in the form of what Pepper

calls *discrete mechanism*, with a lever as the root metaphor. In brief, we (a) take Marr as correctly rejecting so-called field theory as a form of Pepperian contextualism; (b) emphatically dissociate Kantorian field theory from what Malone, Armento, and Epps (2003) described as “flaky” contextualism sometimes found in attempts to tie Kantor’s thinking to that of Pepperian contextualism; (c) find Kantorian field theory to be linked to Pepperian consolidated mechanism, that is, modern field theory; and (d) maintain a role for context and even contextualism in our analyses and thinking, but context as setting factors and contextualism as represented by contextual interactionists (Smith, 1973).

4. Scientific identification of an IBF is based on specific observations of particular events, not constructs; thus, in the most rudimentary way, the IBF is nothing more than interrelated spatiotemporal things or processes.

This point highlights three important concepts: events, constructs, and specificity. The reference to events emphasizes that the IBF is an event and, more precisely, a set of multiple events or factors. Events are happenings in the world of space-time. Events are always the *sine qua non* of any science, and it is events that serve as the ultimate criteria of the adequacy of knowledge claims. IBF theory draws a firm line between events and constructive activity of observers, or knowers, which provides knowledge in the form of descriptions and interpretations, that is, constructs. Given that every event is unique, scientific activity always begins with observed specifics in the form of particular events. Once an event has occurred, it can never again occur and is lost apart from the outcome of an observer’s constructive activity such as a recorded number or code (e.g., “smiled”), a written narrative, tracings on paper, a video recording, or, perhaps, an account subject to the vagaries of the conditions of remembering.

5. The starting point for analyzing an IBF is the interdependent actions (responses) of a behaver and stimulating object (stimulus).

Interbehaviorism begins an investigation with the observed events of an interaction between a responding organism and its stimulating object, not as a stimulus that the response depends on, with the stimulus standing independent, but as an interdependence of the two. When we are stimulated we are responding, and when we are responding it is to something, a stimulus object. This interdependence stands in stark contrast to the standard assumption in experimental psychology that a stimulus is independent and that a response is dependent on it, or that there is an antecedent event and a consequence. As such, IBF theory takes stimulus and response as always factors in any psychological event. However, the stimulus-response relation is not one of classic cause → effect, stimulus → response. Rather, the interdependent relation is represented as stimulus ↔ response. Against positions denying that stimulus or response are psychological primitives, Kantor (1969) pointed out that even psychologists with the most mentalistic and introspectionist leanings study “the reactions [responses] of certain persons, called subjects, to certain things, called stimulus objects” (p. 301).

6. Stimulus and response in IBF analyses are functions.

Further observation reveals that the stimulus has different properties in different situations, and different responses can occur to the same stimulus. These are the stimulus functions and the response functions, respectively. For example, a sheet of paper can stimulate one to (a) jot down a memo when one is thinking of something to be noted or (b) wad it up to help start a fire when a fire is needed. Similarly, the paper can be said to have the response functions of writing on it or wadding it for a fire. The difference between stimulus function and response function is only a matter of emphasizing either the stimulating properties or the responding properties. Thus, the interdependence and reciprocal relationship of stimulus and response and their stimulus and response functions are evident. This reciprocal action can be symbolized as $R_{\text{func}} \leftrightarrow S_{\text{func}}$. An important advantage of recognizing the functional nature of the response and stimulus is that this obviates treating the stimulus as physical energy that either (a) directly evokes a response or (b) causes the organism to produce a mental sensation of the object. Neither mechanism nor mentalism finds a place in the interbehavioral system. They are superfluous as well as antithetical.

7. Behavers' actions (response systems) are usually complex.

The stimulus and response functions are the end point of an entire complex response system, for any interaction consists of at least two and usually three or more constituent response systems or phases, that is, $S \leftrightarrow$ Response system (attending \rightarrow perceiving \rightarrow consummation). First, attending permits the behavior to actualize a stimulus object as such out of a myriad of possible stimuli, and, second, the behavior perceives its function. With the completion of the actualizing and perceiving phases, one can then complete the interaction (consummatory phase of the response system). One actualizes the paper, perceives its function as tinder for a fire, and then ignites it. Or one could complete the interaction by perceiving that the paper is available for igniting and go no further with it, in which case the interaction ends with two response phases.

8. The IBF always includes contact medium, setting, and interbehavioral history.

According to interbehavioral theory, the fundamental psychological event always is a multicomponent affair, a field of interdependent factors. To this point, we have identified stimuli, stimuli as functions, responses, responses as functions, and three constituents of the action units that comprise response: attending, perceiving, and (often) the final consummatory act. Another component of the IBF is the medium of contact, which permits an interaction of a behavior with a stimulus object. In this way, interbehavioral thinking does not confuse the object perceived, or known, with the means for perceiving. Few, for example, would confuse object-seen with one means for seeing, the retina. Yet, traditional dogma encourages us to think that visually perceiving an object occurs indirectly via stimuli in the form of light rays. That is, we know objects visually only by way of the physical stimulation of light rays that must be transformed through neural and/or psychic transduction processes into representations or appearances of objects. The result is the received

double-world view of outside (physical) and inside (mental). In contrast to double-world proposals, the interbehavioral distinction between stimulus contacted or perceived and medium of contact (e.g., light, air, and chemical reactions for seeing, hearing, and tasting and smelling, respectively) permits a monistic position of one world, the lived world of space-time.

$S \leftrightarrow$ Response system (attending \rightarrow perceiving \rightarrow consummation) made possible via contact medium does not occur in a vacuum. Interbehavioral theory recognizes that factors in addition to medium of contact are not captured by $S \leftrightarrow R$ or by $S_{\text{func}} \leftrightarrow R_{\text{func}}$ and are integrated participants in the psychological event. All interactions occur in some kind of context called the setting. The paper is perceived as tinder for a fire when a room is cold and as a surface to write on when one wishes to make a note. Thus, the setting and the stimulus and response functions are interdependent. Recognition of the role of concrete setting factors obviates the postulation of such abstractions as drives and motives. The setting or context in which $S \leftrightarrow R$ interactions occur consists of numerous factors that analysts ignore at the risk of performing incomplete analyses. Some setting factors (or events) are organismic ones that inhere in the behavior, such as conditions of organic health, nutritional condition, measurable levels of bodily functioning, emotional state, and ongoing tasks such as writing a note. Other setting factors are found in the surrounding conditions, ranging over levels of social, educational, political, religious, vocational, familial, meteorological, and temperature of surrounds. Those who say they are "morning people," for example, are suggesting that time of day is an important setting factor for their interbehavior.

There is another field component that, like contact medium and setting factors, operates concurrently with all other participants of the IBF. Also entering into the complex of the organism's behavior is the life history, called *interactional* or *interbehavioral* history. Before a paper can be perceived as tinder, one must have learned about this possibility at some time or be able to infer it from other knowledge one has acquired: Paper is made from wood and wood is flammable; therefore, paper must also be flammable. It is via a history of previous interactions with stimuli that $R_{\text{func}} \leftrightarrow S_{\text{func}}$ evolves. For example, classical conditioning interactions have outcomes involving the transfer of stimulus function from one stimulus to another, such that a stimulus previously functioning as something to simply orient to or reach for might come to function as something against which to defend oneself (aversive conditioning). In brief, the IBF is an outcome of learning or developmental interactions that occur on a moment-by-moment basis. As Einstein and Infeld (1938) put it, "the field *here* and *now* depends on the field in the *immediate neighborhood* at a time *just past*" (p. 153).

9. To sum up, the IBF is multiplex.

The previous discussion indicates that the IBF is a multiplex of interdependent events and is antithetical to a putative, mechanistic input-stimulus and output-response model or to the mentalism of a psychological brain, with an executive sitting in the head interpreting the external world and directing actions. The multiplex field comprises the psychological events and is irreducible to biology or to simple mechanisms. As in any complex event in nature, in order to study it, it becomes necessary to abstract components from the whole, but they must always be put back into their interactional

whole. The role of the brain, for example, can be legitimately studied for its participatory role in all interactions. As a necessary condition for these interactions, it must not be confused with sufficient conditions for them. Only the total field, with all the factors sketched above, comprises sufficiency or causality for the interaction, not any one single component. Finally, it is important to note that in many areas of contemporary science, one finds the term *system* used to refer to irreducible sets of interdependent elements, that is, fields.

Further Study

We suggest several resources to readers who seek additional information on Kantor's thinking. *Interbehavioral Psychology* (Kantor, 1959) is possibly Kantor's most cited book. However, it may not be the best introduction to his approach. Most readers might be better prepared for this work after study of certain other material. *The Aim and Progress of Psychology and Other Sciences* (Kantor, 1971) contains a selection of 36 of Kantor's papers with brief introductory comments. Some idea of the breadth of the author's work is revealed in a partial listing of the original sources of the articles: *American Anthropologist*, *American Journal of Psychology*, *American Journal of Sociology*, *American Scientist*, *Character and Personality*, *Journal of Abnormal and Social Psychology*, *Journal of Philosophy*, *The Monist*, *Psychological Bulletin*, *Psychological Review*, and *Psychological Record*. This collection is one of the best places for the reader to begin a study of modern integrated-field thinking as applied to psychological science. Study of this work does tend to leave the reader with the impression that Kantor's is a truly general theory of behavior. *The Science of Psychology: An Interbehavioral Survey* (Kantor & Smith, 1975) is a revision of Kantor's introductory textbook that appeared in the 1930s. *Psychology from the Standpoint of an Interbehaviorist* (Pronko, 1980) is a full-length introductory psychology textbook. The author does an excellent job of using examples to illustrate interbehavioral principles. Smith (2006) provides exclusive coverage of the IBF in a chapter of the same name in *Modern Perspectives on J. R. Kantor and Interbehaviorism*.

Study Questions

1. Have scientists always taken a field perspective?
2. How does the field theorist approach "cause" and "effect"?
3. Pepper proposed that there were two versions of mechanism. What were they? How is Kantor's IBF not a form of Pepperian contextualism?
4. Distinguish between events and constructs.
5. Identify the starting point for analyzing an IBF.
6. How is Kantor's psychology not a stimulus-response approach? How is his psychology a stimulus-response theory?
7. Give examples of stimulus function and response function, and give an example of how an apple can participate in different $R_{\text{func}} \leftrightarrow S_{\text{func}}$ interactions.

8. Identify three successive stages of the response complex or system we discussed.
9. What is the role of contact medium in psychological events?
10. How might being ill function as a setting factor on a particular occasion?
11. Einstein and Infeld's (1938) proposal that "the field *here* and *now* depends on the field in the *immediate neighborhood* at a time *just past*" (pp. 152-153) is captured by which interbehavioral construct?
12. If interbehaviorism neither ignores brain nor places psychological events in brain, how is brain viewed?
13. We may not find the term *field* used in certain areas of science today, but what term is often used instead to refer to the same outlook?

References

- DELPRATO, D. J. (1993). Behavior analysis and S. C. Pepper's other mechanism. *The Behavior Analyst, 16*, 51-53.
- DEWEY, J., & BENTLEY, A. F. (1949). *Knowing and the known*. Boston: Beacon Press.
- EINSTEIN, A., & INFELD, L. (1938). *The evolution of physics*. New York: Simon & Schuster.
- FEIGL, H. (1953). Notes on causality. In H. Feigl & M. Brodbeck (Eds.), *Readings in the philosophy of science* (pp. 408-418). New York: Appleton-Century-Crofts.
- FRANK, P. (1955). Foundations of physics. In O. Neurath, R. Carnap, & C. Morris (Eds.), *Foundations of the unity of science* (Vol. 1, pp. 423-504). Chicago: University of Chicago Press.
- HAYES, S. C., HAYES, L. J., & REESE, H. W. (1988). Finding the philosophical core: A review of Stephen C. Pepper's *World hypotheses: A study in evidence*. *Journal of the Experimental Analysis of Behavior, 50*, 97-111.
- HOLTON, G. (1973). *Introduction to concepts and theories in physical science* (2nd ed.). Reading, MA: Addison-Wesley.
- KANTOR, J. R. (1936). Concerning physical analogies in psychology. *American Journal of Psychology, 48*, 153-164.
- KANTOR, J. R. (1941). Current trends in psychological theory. *Psychological Bulletin, 38*, 29-65.
- KANTOR, J. R. (1946). The aim and progress of psychology. *American Scientist, 34*, 251-263.
- KANTOR, J. R. (1959). *Interbehavioral psychology* (2nd ed.). Granville, OH: Principia Press.
- KANTOR, J. R. (1963). *The scientific evolution of psychology* (Vol. 1). Chicago: Principia Press.
- KANTOR, J. R. (1969). *The scientific evolution of psychology* (Vol. 2). Chicago: Principia Press.
- KANTOR, J. R. (1971). *The aim and progress of psychology and other sciences*. Chicago: Principia Press.
- KANTOR, J. R., & SMITH, N. W. (1975). *The science of psychology: An interbehavioral survey*. Chicago: Principia Press.
- MALONE, J. C., ARMENTO, M. E. A., & EPPS, S. T. (2003). What color is the sky on your planet? A review of *Investigations in Behavioral Epistemology*. *Behavior and Philosophy, 31*, 47-61.

- MARR, M. J. (1993). Contextualistic mechanism or mechanistic contextualism? The straw machine as tar baby. *The Behavior Analyst, 16*, 59-65.
- MORRIS, E. K. (1988). Contextualism: The world view of behavior analysis. *Journal of Experimental Child Psychology, 46*, 289-323.
- MORRIS, E. K. (1993). Behavior analysis and mechanism: One is not the other. *The Behavior Analyst, 16*, 25-43.
- PEPPER, S. C. (1942). *World hypotheses: A study in evidence*. Berkeley, CA: University of California Press.
- PRONKO, N. H. (1980). *Psychology from the standpoint of an interbehaviorist*. Monterey, CA: Brooks/Cole.
- SMITH, N. W. (1973). Contextual interactionists: A symposium. *Psychological Record, 23*, 281-282.
- SMITH, N. W. (2006). The interbehavioral field. In B. D. Midgley & E. K. Morris (Eds.), *Modern perspectives on J. R. Kantor and interbehaviorism* (pp. 87-110). Reno, NV: Context Press.