

THE INTERBEHAVIORIST

A Newsletter of Interbehavioral Psychology

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THE INTERBEHAVIORIST publishes news, information, discussion, journal and book notes, book reviews, comments, and brief articles pertaining to interbehavioral psychology – a contextualistic, integrated-field approach to the natural science of behavior.

The newsletter also publishes professional communications that fall between informal correspondence and colloquia, and formal archival publication. As such, the newsletter supplements contemporary journals dedicated to basic and applied research, to the history and philosophy of the behavioral sciences, and to professional issues in the field. The newsletter strongly encourages submission of notes about current professional activities of its subscribers, news and observations about interbehavioral psychology and related perspectives, comments on journal articles and books of interest, more extended book reviews, and brief articles. All submissions should be sent in duplicate hard copy and a single computer disk copy (any major word processor; any Mac or IBM disk format) to the editor and should conform to the style described in the Publication Manual of the American Psychological Association (3rd edition).

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Call for News

THE INTERBEHAVIORIST publishes news about subscribers' activities and information about others' activities that may be of interest to readers. If you have published an article, chapter, or book with an interbehavioral orientation, or have read one published by someone else, particularly if the source is obscure, please let us know about it.

The Agora

Editorial

At a meeting of interbehaviorists this past summer in Madrid, the possibility of publishing *The Interbehaviorist* in both Spanish and English was discussed. Since that time, the Editorial Board has been consulted and all of their responses to this idea have been favorable. Hence we are going to go ahead with this plan in a somewhat limited manner to start, as of the next issue. Emilio Ribes of the University of Guadalajara, Mexico, has agreed to serve as the Spanish Editor. Manuscripts and other material in Spanish should be submitted directly to him. His address appears on the inside front cover of this issue. Submissions in English should continue to be submitted to Linda Hayes.

At this time, the plan is as follows: Articles and Comments will be published in *either* English or Spanish, with abstracts in *both* languages. Authors will be required to include abstracts with their submissions in these categories. Authors are *not* responsible for the translations of abstracts; however, those who are proficient in both languages are encouraged to provide their own translations. Research Notes and The Agora will be published *only* in the language in which they are submitted unless the *author* provides a translation.

We are very pleased with this development and hope that it will bring together our two collectivities in new and constructive ways.

Linda J. Hayes, English Editor
Emilio Ribes, Spanish Editor

INTERBEHAVIORISTS IN ABA

SPECIAL INTEREST GROUP MEETING

Title: Interbehaviorism SIG Business Meeting
Date: Monday, May 29, 1995
Room: Burnham
Time: 6:30 P.M. - 7:20 P.M.

ABA '95 Program of

Special Interest to Interbehaviorists

The following presentations were selected from the full ABA Program as having potential interest to interbehaviorists on the basis of past contributions by these presenters. We apologize for inadvertently excluding some, and for including others here that may not, in fact, have an interbehavioral character.

Invited Symposium #134 Understanding Behavior Analytic Theory

Saturday, May 27

Conference Theater

2:00 - 3:50 pm

- SAM A. LEIGLAND (Gonzaga University - Spokane, Wa.)

Questions Regarding the Nature of Behavior Analytic Theory.

- PHILIP N. HINELINE (Temple University Psych Dept - Philadelphia, Pa.)

When we Speak of Theorizing.

- LINDA J. HAYES (University of Nevada-Reno)
Going all the Way

Poster Session #157 Experimental Analysis of Behavior (33)

Saturday, May 27

Constitution A

5:00 - 6:30 pm

- MICHAEL CLAYTON, Linda Hayes, Tom Brundige (University of Nevada-Reno)

Inapparent Events in the Generation of Derived Stimulus Relations

Paper Session #212 Behavior and Biology

Sunday, May 28

Conference Theater

9:00-10:50 am

- BRYAND. MIDGLEY, Edward K. Morris (University of Kansas-Lawrence, KS)

B.F. Skinner's Dualism: Nature and Nurture.

- EDWARD K. MORRIS (University of Kansas - Lawrence, KS)

Evolutionary Ontology.

Paper Session #233 Select Topics in the Area of Ethical, Legal, and Social Issues (ELS).

Sunday, May 28

Roosevelt

10:30-11:50 am

- CHARALAMBOS C. CLEANTHOUS (Children's Hospital of Pittsburgh - Pittsburgh, PA), Bryan D. Midgley (University of Kansas - Lawrence, KS)
Questioning Unquestionable Assumptions: Comments on and Extensions of Hubbard and Wald's Exploding the Gene Myth.

Symposium #235 Book Reviews: The Loyal Apposition.

Sunday, May 28

Burnham

10:30-11:50 am

- EDWARD K. MORRIS (University of Kansas - Lawrence, KS)
Review of George Basalla's "The Evolution of Technology."

Symposium #240 The Role of Individual Differences and Competence Analysis

Sunday, May 28

Independence F

10:30-11:50 am

- EMILIO RIBES-INESTA (Universidad de Guadalajara - Guadalajara, Jalisco, Mexico)
Development as a Variation in Behavior: The Meaning of Individual Differences.
- F. HECTOR MARTINEZ-SANCHEZ (Universidad de Guadalajara - Guadalajara, Jalisco, Mexico), Rafael Moreno (Universidad de Sevilla - Sevilla, Spain)
The Acquisition of Basic Competences and the Evolution of Psychological Processes.
- JULIO VARELA (Universidad de Guadalajara - Guadalajara, Jalisco, Mexico)
Psychological Development: The Role of Competence Transfer.

Symposium #255 Book-Length Treatments of Behaviorism: Representations and Responses.

Sunday, May 28

Burnham

1:00-2:50 pm

- WILLIAM M. BAUM (University of New Hampshire - Durham, NH)
Dualism and Private Events in Radical Behaviorism.

Paper Session #283 Contingencies and Reinforcers

Sunday, May 28

Independence F

3:00-3:50 pm

- FLORENTE LOPEZ (Universidad Nacional Autonoma de Mexico-Mexico, DF), Daniel Gomez (Universidad Veracruzana - Veracruz, Mexico)
Parents as Tutors of Their Children: A Sequential Analysis.

Symposium #327 New Thrusts in the Behavior Analysis of Development: Going Where We Haven't Been.

Monday, May 29

Farragut Square

10:00-11:50 am

- Steven C. Hayes (University of Nevada - Reno, NV)
Knowledge of Self.

Poster Session #344 Experimental Analysis of Behavior (22)

Monday, May 29

Constitution A

12:00-1:00 pm

- Linda J. Hayes, Otto H. MacLin, MARKA. ADAMS (University of Nevada - Reno, NV)
Stimulus Functions and Substitutional Equivalence.

Poster Session #346 Developmental Disabilities: Interventions With Adults (64)

Monday, May 29

Constitution A

12:00-1:00 pm

- MARKA. ADAMS, Patrick McCloskey (University of Nevada - Reno, NV), Anthony DiVittorio, Richard LeClerq (Trinity Services - Joliet, IL), Linda J. Hayes (University of Nevada - Reno, NV)
Modifying the Value of Living Spaces Through Response Deprivation.

Symposium #366 Functional Contextualism and Pragmatism: Philosophical Integration in the Science of Behaviorism.

Monday, May 29

Renwick

1:00-2:50 pm

- STEVEN C. HAYES (University of Nevada - Reno, NV)
Functional Contextualism as a Resurgence of the Pragmatic Tradition.

- ELIZABETH V. GIFFORD, Kelly G. Wilson and Steven C. Hayes (University of Nevada - Reno, NV)
Science, Truth and Values.
- ANTHONY BIGLAN (Oregon Research Institute - Eugene, Or)
The Practical Value of Pragmatism.
- RICHARD J. DEGRANDPRE (University of Vermont College of Medicine - Burlington, Vt)
Pragmatism's Role in the Competitive Struggle Between Scientific and Socially-Constructed Knowledge.

Symposium #369 Advances in Functional Assessment: Biological Variables, Generalization of Communication Skills, Functional Assessment by Families.

Monday, May 29

Franklin Square

2:00-3:50 pm

- EDWARD G. CARR, Christopher E. Smith, Theresa A. Giacin, Joe Pancari, Bernadette M. Whelan (State University of New York - Stony Brook, NY)
The Role of Biological Setting Events in the Analysis and Intervention of Severe Problem Behavior.

Invited Address #380 Theory in Behavior Analysis: A Contextualistic Perspective

Monday, May 29

Conference Theater

3:00-3:50 pm

- STEVEN C. HAYES (University of Nevada - Reno, NV)

Symposium #407 What is a Word?

Tuesday, May 30

Burnham

9:00-10:50 am

- Linda J. Hayes, MARK A. SWAIN (University of Nevada - Reno, NV)
Words and Behavioral Function.

Symposium #410 The Use of Complex Direct Observation Research Procedures to Study Social Behavior in School Settings.

Tuesday, May 30

Constitution D

9:00-10:50 am

- MAUREEN A. CONROY, James J. Fox (East Tennessee State University - Johnson City, TN)
Incorporating Setting Events into Direct Observation Measurement Systems.

Panel Discussion #428 How Do We Persuade Linguists and Developmental Psychologists that Language is Learned?

Tuesday, May 30

Independence C

11:00-12:50 pm

- BRIAN MACWHINNEY (Pittsburg, Pa),
- ERNST L. MOERK (California State University - Fresno, Ca),
- JULIE TETEL-ANDRESEN (Duke University),
- PHILIP N. HINELINE (Temple University Psych Dept. - Philadelphia, Pa),
- ROBERT E. SANDERS (SUNY Albany - Albany, NY)

Article

Some Reflections on Kantor, Kantorians, and Kantor's Career

William S. Verplanck
Knoxville, TN

Some Reflections on Kantor, Kantorians, and Kantor's Career

Query: Why have I found Kantor's viewpoint "attractive and inspirational"? Answer: Because it was based on profound and thorough scholarship that, when coupled with Kantor's capacity for critical and original thought, leads to an approach that brings order to our interactions with the world in which we live. It confronts the behavior we observe in ordinary, every day living – our own, as well as that of others. It provides intellectual tools for ordering and evaluating what psychologists do – academic, research, clinical, and otherwise. Grounded in "common-sense" and in behavior that occurs without the contrivance of experimental research and theoretical "special effects," Kantor's interbehaviorism provides the basis for a Linnaean taxonomizing of a Baconian collection of behavioral phenomena. Interbehaviorism points the way to a general psychology that can reunify what is now an absurdly fractionated field of inquiry.

In sum, Kantor's viewpoint enables one to look at the science of psychology with a sharper pair of eyes. It provides a naturalistic and empirical view that (a) summarizes what has been done that will also survive, (b) identifies the discardably faddish, and (c) indicates what needs to be done in the future. His diagrams tell us more than do other people's books. So, reason enough to become a "Kantorian." One wonders, though, why more psychologists have not found Kantor's viewpoint not only attractive, but fundamental for further advance in the psychological sciences.

Query: Why aren't there more of Kantorians? Answer: This cannot be dealt with satisfactorily until we answered another question. The question: How does one come to have, or to arrive at, an interbehavioral view? With this, a third question will have to be partially addressed: Why have

Kantor's ideas remained unknown to everybody else, except, perhaps, as the words of an elderly speaker at a colloquium who went on and on, battling what he called "spooks" – or as a name in a footnote.

"Kantorians" and Fellow-Travelers

Shortly after having heard Karl Pribram tell me that he had read Kantor and has been influenced by him, and then listening to a presentation he gave on metaphors in psychology, I was led to consider four groups (fuzzy sets?) of psychologists who might be termed "interbehavioral" to some degree. There are psychologists:

1. who know and sing all the lyrics in perfect harmony;
2. who know some of the lyrics and can carry the tune, but have to hum a lot;
3. who do not know the words, but can carry the tune, and hum along; and
4. who have heard the melody, recognize it, and like it.

Group 1 and 2 are "Kantorians" – psychologists who identify themselves as interbehaviorists. The members of Group 1 talk and think exclusively in terms of Kantor's writings, and they are inclined to believe that members of Group 2 do not really understand Kantor, that they misuse or misinterpret his concepts. Members of Group 3 might term themselves interbehavioral, but they have not done so explicitly; Roger Barker, for example, might fall in this group.

Members of Group 4 cannot be called "Kantorians," but are reasonably knowledgeable, and have been influenced, if not positively (as by adopting some part of his conceptual system), then negatively (by taking heed of his criticisms of what they have been doing or thinking, and then modifying their activities). Frank Beach might be an example. In the early 1950s, when I saw a good

deal of Frank, he told me how Kantor's (1947) *Problems in Psychological Psychology*, and his own work on the Ford and Beach (1951) book, *Patterns of Sexual Behavior*, led to his discontinuing his "rigorously experimental" program of research on "sexual behavior." (It involved dropping solitarily raised and housed male rats into a box in which was placed a similarly solitarily raised and housed female, brought into oestrus by artificial means.) Quite a few other psychologists fall into this group, but have had no opportunity to acknowledge Kantor's influence by reference.

Becoming a Kantorian

Almost all "Kantorians" (Groups 1 and 2) have been students of Kantor, students of students of Kantor, or close associates of these. For students who encountered Kantor's system "fresh," the affiliation came easily. They learned Kantor's conceptual system from the ground up, and did not have to unlearn so much. Others, who had previously been trained in different conceptual systems and research methodologies had difficulty grasping what Kantor wrote, and learning how to think and work within the framework. The critical factor seems to have been long, first-hand exposure to Kantor's concepts.

To work and to write within the interbehavioral system requires more than book-knowledge. Familiarity with Kantor's difficult writings sufficient enough to paraphrase them on an examination or in a lecture with a degree of accuracy does not give the grasp, the overview, or the aptitudes required for practicing or thinking in interbehavioral terms. It also takes experience in talking and writing about a variety of topics within the interbehavioral community. If you do not begin in such a community, joining one requires that you identify and reexamine the premises on which you (and almost all other academic and experimental psychologists) have been functioning, and doing so using Kantor's concepts. Such self-examination is not easy, and the need for such review is not much recognized. Most psychologists have the notion that psychology is an "experimental" science, carried out in a laboratory with a research methodology borrowed from physics, drilled into them from the first chapter of the first textbook of psychology they studied.

Grasping Kantor's point of view requires lots of talk with others in the interbehavioral community, and lots of practice (a) looking at the world with an unprejudiced, fresh, and naturalistic eye and (b) detecting when you are appealing to an unobservable agent of one sort or another to account for what you observe. You acquire new skills in observing your own and others' behavior, whether in or out of an experiment, as either the "S" or the "E." You learn to catch yourself when one of Kantor's "spooks" slips into your thinking. These include fashionable and scientifically sophisticated spooks such as intervening variables and hypothetical constructs, as well as "processing centers," "minds," and "brains." The study of how the brain functions is both interesting and important, but it is the study of the brain's behavior not of the individual's. Interbehavioral thinking is holistic. As part of the body, the brain *participates* in interbehaving, but does not "explain" or "cause" it.

It is not easy to break away from Humean views of causality and from scientific analysis in terms of single or limited sets of independent and dependent variables, with other variables "held constant." Kantor demands that we consider the whole array of natural events – of observables past and present – that play a role in any descriptive (and hence "explanatory") account of who does what, and when. Furthermore, we must always remember that, as observers, we are part of the event. (Here, Kantor anticipated some physicists.) It is not easy to shed the "analyses" and "scientific methodology" expounded in textbooks.

Thus, participation in a continuing verbal community helps make the break from conventional tacit premises, the axioms of "scientific methodology," and the limited analyses of behavior associated with Cartesian, mechanistic thinking. "Stimuli" cannot be thought of as physical events or energies that are antecedent to responses. "Responses" are not limited to muscle twitches and the like. You need to bypass retinal images, nerve impulses, projection areas – even the electrical brain-field wholes of Gestalt psychology – and start with the world in which we live, a world of tables and chairs, of circles and squares, of speaking sentences, of Roseanne, Beavis, and Butthead, and of leaning forward in your chair, picking up the remote, and then changing channel. You need

to take into account **all** that is going on, as you observe an event, remembering always that observing is part of the event. When you have had the experience of being a member of an interbehavioral community, it shows in your later work, whether or not it is labelled "interbehavioral." Witness the careers and emphasis of Foley, Anastasi, and Humphreys – each of whom spent time at Indiana University.

My Coming to Interbehaviorism

I came to interbehaviorism – to be a Group 2 Kantorian – the hard way. My first graduate work at the University of Virginia was with Geldard and Spence. Geldard led me into sensory psychology and psychophysics; Spence made me a confirmed Hullian. At Brown University, Graham led me deeper into sensory psychology and psychophysics (vision), exposed me to Skinner, pounded deeper into my head the problems of measurement, and grounded me in scientific methodology. Walter Hunter further hammered me into the shape of a confirmed "experimental psychologist," convinced that the retina/brain and the nervous system held all the answers. I had already persuaded myself that Hull had found the true path into that Carnapian unified science.

For me, the stepping stones to interbehavioral views went as follows:

- During World War II, I did field research with real people, real ships, and real problems.
- At Indiana University, when I worked late in the office, Parker Lichtenstein would come by and talk, and I would listen.
- For a year, I worked closely with Kantor, as Assistant to the Acting Department Head, and observed what he did, and how he did it.
- As a non-Skinnerian, but nevertheless a close and good friend of Fred and his family, I undertook the critical analysis of Fred's system (see Verplanck, 1954), for the book, *Modern Learning Theory* (Estes et al., 1954). I identified it as a systematic viewpoint, rather than a theory. This led me to a reexamination of my own views on "scientific method" as laid out in the introduction to that book. This prepared me for a fresh look at Kantor's system.

- My own research on psychophysics was showing that variables other than the physical properties of the stimulus were of major importance in determining the value of a "threshold," and indeed there was no such animal no "the threshold" I realized that the more I learned about *vision* the less I knew about *seeing*.
- I read Kantor's (1947) *Problems of Physiological Psychology*, and worked through its diagrams.
- An extended visit with ethologists led me to a full functional concept of both "stimulus" and "response," and to recognize the indispensability of first-hand observation in uncontrived "naturalistic" or "ecological" contexts.
- In giving a course on Hull's theory, I found myself progressively skeptical of both his theory and of the rationale of putting such a theory together.
- With student participation, I tinkered around with operant methodologies and, in extending them, noted that the behaviors we found were more congruent with Kantor's precepts than with Skinner's narrow views.
- I started work on clarifying vocabulary, sorting out classes of interactions of subject and environment, and trying to take into account the active role of subjects' histories, the environmental context, and the observer in experimental research. This led me to examine in detail the operations carried out in published experiments. I reached the conclusion (to put it crudely) that if you have a theory, you are sure to find a way to confirm it to your satisfaction. Such minor disconfirmation as you may detect can be easily rectified by appeal to "further research" and "theoretical development." If not, you just "leave it lay," and move into a new research area. In sum, the identity of the experimenter too often seemed a more important variable than either the subject or the experimental environment.
- That did it; I had gotten there. I was an interbehaviorist! I had been a slow learner, but then I had a lot to unlearn.

One other Kantorian has had a somewhat similar history: Sid Bijou. Like me, he followed the path from Hull-Spence through Skinner, and

then on to his present view. He and his students now study language in children, using Kantor's vocabulary and conceptual system, rather than Skinner's (1957) *Verbal Behavior* (e.g., Bijou, Chao, & Ghezzi, 1988; Bijou, Umbreit, Ghezzi, & Chao, 1985).

The Kantor-Skinner Relationship: Interbehaviorism and Radical Behaviorism

Query: What about Fred Skinner? Answer: In Skinner's earliest papers, he expounded the functional interbehavioral point of view clearly and cogently. The substrate of interbehaviorism in the Skinnerian system is unmistakable in these papers (e.g., Skinner, 1931, 1935), as it is in *The Behavior of Organisms* (Skinner, 1938). Robert Kantor recognized Skinner's systematic and research compatibility, and brought him to Indiana from the University of Minnesota in 1945 for that reason. Kantor considered Aristotle the first interbehaviorist, himself the second, and Skinner the third.

Kantor had substantial influence on Skinner at Indiana, persuading him, among other things, that "drive" was a "spook," to use one of Kantor's favorite words. But at Indiana, Skinner exhibited the first clear signs of the equivocal way in which he would later use the word "stimulus," shifting back and forth between a physical definition and a functional one (see Verplanck, 1954). He also became hooked on ever more elaborate apparatus, progressively limiting the need to observe behavior directly. The Skinner box gave an illusion of objectivity; it was easy for Skinner to forget that the apparatus he designed and built was an intrinsic part of the behavior recorded by the recorders he designed. (*Query: Is it the pigeon in the Skinner box, or Skinner in the pigeon box?*)

Given the close similarity of Skinner's early writings to Kantor's views, you might expect Skinnerians to become attracted to Kantor. Some were, for example, Nat Schoenfeld, who spent a year at Indiana alongside Kantor and thereafter exhibited his intellectual influence in both work and writing (see, e.g., Schoenfeld, 1969). Through the 1950s and 1960s, there were many other signs of Kantor's acceptability to Skinnerians in the *Journal of the Experimental Analysis of Behavior* and in other Skinnerian writings – much to Skinner's

uneasiness. (Fred did not like to be considered the third anything, including being an interbehaviorist.)

This encouraging trend ended abruptly in 1970, at an invited address Kantor gave to the American Psychological Association's Division 25 for the Experimental Analysis of Behavior (see Kantor, 1970). He spent the first part of his talk remarking favorably on the diligence of Division 25 members in their research, but then went on to criticize them positively, stating his strong regrets for the experimental obsession of Skinnerians with pigeons, rats, hardware, and schedules of reinforcement. He exhorted them to get out in the world and tackle real problems, seeking accounts of and solutions to the problems that occur naturally.

From that time on, Kantor was, as it were, read out of the Party. Skinner himself went out of his way to ignore Kantor and, when he could not, to minimize Kantor's work however he could. Kantor got footnotes, not paragraphs in Fred's writings. Toward the end of his life, Skinner's last effort to remain "first" appeared in a testy (and both sad and funny) letter published in the ABA Newsletter (Skinner, 1988) complaining about the "cuckoos" who were laying their eggs in his nest. He was referring to interbehaviorists who participated, as a Special Interest Group, in the annual meetings of the Association for Behavior Analysis.

But times are now changing. Kantor's "setting factors" are creeping in as "establishing operations." The Cambridge Center for Behavior Science tackles issues such as those Kantor spoke to in 1970. Those Skinnerians who have had a full grasp of Fred's writings prior to approximately 1955 will not find their development into interbehaviorists difficult, although sadly, they will probably be called "neo-Skinnerians."

Un-Kantorians, Anti-Kantorians, and Non-Kantorians

In addition to "Kantorians" (Groups 1 and 2) and the "Kantor-influenced" (Groups 3 and 4), other groups of psychologists may be identified on the basis of their parallel or anti-parallel perspectives with respect to Kantor – or by none at all.

There are, for instance, un-Kantorians: those who have read Kantor, but have been unable (or have not been troubled to try) to use his concepts. There is no way to tell how many of them there are,

that is, to tell how many have read Kantor, but did not take the trouble to think his propositions through.

Then there are anti-Kantorian: those who read and to a degree understand Kantor, but reject or are openly hostile to his proposals. The anti-Kantorians surely include some contemporaries from the 1920s. A former student of one of the latter sat beside me in Kantor-Skinner "meetings" at Indiana, where he muttered under his breath and into my ear in agreement with me – then a doctrinaire logical-positivist-theory-constructing-experimental psychologist – and in disagreement with Kantor. Thereafter, I had the advantage of working first-hand with Kantor, and came to know him as the thorough, conscientious, and sophisticated scholar he was, even though I disagreed with him in toto. My colleague rejected Kantor's concepts so completely, however, that he rejected – even hated – the person himself. I could not tolerate listening to such paeans of contempt, and broke off what had been a close friendship.

Still, I was scientifically outraged by such Kantorisms as his denial of the importance (even existence) of retinal images, and his statements to the effect that "there are no such phenomena as monochromatic light." James J. Gibson caught on much later. Interestingly, a comparable aversion to unwelcome ideas is found in elementary textbooks in relation to Skinner, as well as in Skinnerian books that ignore "cognitive" problems in behavior (e.g., remembering, perceiving).

Finally, there are the non-Kantorians. These are psychologists who never heard of Kantor, but who were or are working along interbehavioral lines, rediscovering interbehavioral concepts. Viewpoints advanced by Kantor seventy years ago, for instance, have reappeared in the guise of contextualism, dialectic psychology, and the like. Among the non-Kantorians, we may now add Paul Schiller who was developing interbehavioral concepts parallel to Kantor's shortly before his untimely death in 1950. Ironically, he was then about to work closely with Skinner at Harvard.

Why So Many Non-Kantorians?

The largest sub-group of non-Kantorians includes just about every psychologist – both then and now. Why have so few people had the oppor-

tunity to study with Kantor, his students, or other interbehaviorists, to examine critically at first-hand his systematic approach? Why did Kantor remain relatively isolated in Indiana? Given the publication and immediate, but short-lived success of Kantor's first books (Kantor, 1924, 1926), why was he not brought back east, into the intellectual power-center of the Ivy League universities, as was, for example, Clark Hull? If Kantor had been brought to those centers and been able to teach their graduate students, the history of psychology would likely have taken a very different course. Certainly, he must have been considered as a possibility for Ivy League appointment, but he was unwelcome, for at least two reasons.

A Disciplinary Reason

First, Kantor was an iconoclast. He taught that almost everything being done in psychological laboratories was misguided and that psychology demanded its own new investigative methods. His views on the research and research methods suitable to psychology were unacceptable to men such as Walter Hunter; even Boring had research publications. The mainstream establishment departments of psychology accepted fully the philosophers' of science cookie-cutter recipes for how to do experimental research, construct theories, and find explanations. They identified themselves with hard scientists, with physicists and chemists in style and in action. The metric of quality – whether of individuals, departments or universities – was the number of research papers published. Universities had succumbed to the strangulation predicted by William James (1912) in "The Ph.D. Octopus."

It was all but impossible for students to complete dissertation requirements under Kantor's direction. Able students of Kantor had to complete their dissertations under the direction of others. With no published experimental research of his own, nor dissertation students publishing research, Kantor was a most unlikely candidate for appointment at any of those universities whose unadmitted motto was "Publish or Perish." (Kantor, we can safely say, was in no way responsible for the kilopiles and macropages of trivialities that pass for dissertations, most of which become published as scientific research.)

A Cultural Reason

The second reason for Kantor's exclusion from the power-structure of psychology, and his isolation from the variety and number of graduate students found in the northeast, is one I might hesitate to put forth, but it must be stated. Most psychologists, including historians of psychology who do not consider the social context of people and events, prefer to overlook this regrettable part of our history.

During World War I, eminent psychologists who developed and worked on the Army Alpha and Beta intelligence test had proved to their satisfaction the intellectual inferiority of, among others, "Eastern Europeans." These mainly Ivy League psychologists, together with labor unions, then played a role in the Congressional enactment of the restrictive and racist 1922 immigration laws. The social and intellectual climate of the times was, in short, more than mildly xenophobic. The Ku Klux Klan ruled state politics in Indiana, and was powerful elsewhere. In universities, xenophobia was more specifically anti-Semitic. Restrictive racist quotas applied, except at the City College of New York and, perhaps, at New York University.

As for Jacob Robert Kantor, he was very Jewish – in name, in origin, and in appearance. Like his positions on causality and research methodology, he was personally alien, too. Moreover, his iconoclasm was likely confirmed to the WASP ascendancy their preexisting suspicions of "Eastern Europeans." Kantor was not alone, of course. As late as the mid-1930s, Isidore Krechevsky had to change his name to David Krech; and the gentile, Harry Israel, had his surname legally changed to Harlow. It is ironic that the dissemination of Kantor's views was limited by anti-semitism, for Kantor himself was a thorough secularist, a card-carrying atheist. Although he acted like the prototypical rabbinical scholar – albeit one who studied people and their behavior, rather than the Talmud – he was an opponent of any theology.

Kantor's brilliance, and the public recognition gained by the publication of *Principles of Psychology* (Kantor, 1924, 1926) were not enough to break through the social walls built around the major graduate universities by the WASP establishment. There was no way on God's Green Earth that, in the 1920s and 1930s, this Jew with iconoclastic

views of psychology as a science could have won an appointment at an Ivy League school. Well, there was S. W. Fernberger at the University of Pennsylvania. And, at Columbia University, Otto Klineberg first broke the barrier, and proceeded to deflate the conclusions of Army Alpha and Beta.

If Kantor had been admissible into the psychological power-structure of the Ivy League, things might have been very different. When talents such as Hunter and Hull emerged from mid-western or other non-northeastern roots, they wound up on Ivy League faculties in fairly short order. But not Kantor. He never had access to those generations of graduate students who, through old-boy networks, have dominated psychological research over the years, either directly or through colonization (as at Stanford, Berkeley, Rochester, and Duke). Indeed, Kantor was fortunate to get to Indiana. That he was appointed and was able to stay attests to his brilliance and promise. I have no doubt that if it had not been for the systematic anti-semitism of the WASP establishment, which did not end until World War II, the number of Kantors today would be greater indeed.

Coda

Robert Kantor was a kind, gentle, and wise man, profound in his scholarship, cogent in his arguments, incisive in his criticism, original in his contributions, seminal in his thinking, worthy of the deepest respect and admiration – and is nationally neglected. Sadly, too, he did not always explicate and emphasize his own unique positive contributions as one wishes he had. When, in retirement, he was asked to teach or speak, he spent time and effort pursuing his war against "spooks," that is, against explanations or descriptions in terms of the supernatural – the mentalistic in any form, shape, or guise.

Toward the end of his life, he told me of his disappointment that his viewpoint had received such limited acceptance. He remained confident, however, that if psychologists kept interacting with their subject matter, they would eventually arrive at the interbehavioral point of view. Some are well on their way to getting there. Like Kantor, I expect they will, but for psychology, this may take a generation or so.

Robert was a quiet man, a humble man, a

gentle man. There is a photo of him taken while lecturing in the University of the South. He looks like a Michelangelo Jehovah, caught in an intense but compassionate moment, a moment when he may be in the very act of deciding whether to conceive/have/become a son. (How is that for hyperbole?)

Author's Note: This manuscript is based on recent queries from and correspondence with Professor John A. Mills (University of Saskatchewan). My answers and other commentary, and the bases on which they were formed, were written to some degree in the context of my own progression to the interbehavioral viewpoint. The author thanks Edward K. Morris for his considerable editorial contributions to this manuscript. Correspondence and requests for reprints should be sent to me at 4605 Chickasaw Road, Knoxville, TN 37919.

References

- Bijou, S. W., Unbreit, J., Ghezzi, P. M., & Chao, C.-C. (1985). Research methodology for language studies: A Kantorian perspective. *Experimental Analysis of Human Behavior Bulletin*, 3, 1-4.
- Bijou, S. W., Chao, C.-C., & Ghezzi, P. M. (1988). Manual of instructions for identifying and analyzing referential interactions II. *The Psychological Record*, 38, 401-414.
- Estes, W. K., Koch, S., MacCorquodale, K., Meehl, P. E., Mueller, C. G., Schoenfeld, W. N. & Verplanck, W. S. (1954). *Modern learning theory*. New York: Appleton-Century-Crofts.
- Ford, C. S., & Beach, F. A. (1951). *behavior*. New York: Harper & Row.
- James, W. (1903). The PhD octopus. *Harvard Monthly*, 36(March), 1-9.
- Kantor, J. R. (1924). *Principles of psychology* (Vol. 1). Chicago: Principia Press.
- Kantor, J. R. (1926). *Principles of psychology* (Vol. 2). Chicago: Principia Press.
- Kantor, J. R. (1947). *Problems of physiological psychology*. Chicago: Principia Press.
- Kantor, J. R. (1970). An analysis of the experimental analysis of behavior (TEAB). *Journal of the Experimental Analysis of Behavior*, 13, 101-108.
- Schoenfeld, N. W. (1969). J. R. Kantor's *Objective psychology of grammar and Psychology and logic: A retrospective appreciation*. *Journal of the Experimental Analysis of Behavior*, 12, 329-347.
- Skinner, B. F. (1931). The concept of the reflex in the description of behavior. *Journal of General Psychology*, 5, 427-458.
- Skinner, B. F. (1935). The generic nature of the concepts of stimulus and response. *Journal of General Psychology*, 12, 40-65.
- Skinner, B. F. (1938). *The behavior of organisms*. Englewood Cliffs, NJ: Prentice-Hall.
- Skinner, B. F. (1957). *Verbal behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Skinner, B. F. (1988). The cuckoos. *The ABA Newsletter*, 11(3), 9.
- Verplanck, W. S. (1954). Burrhus F. Skinner. In W. K. Estes, S. Koch, K. MacCorquodale, P. E. Meehl, C. G. Mueller, W. N. Schoenfeld, & W. S. Verplanck *Modern learning theory* (pp. 267-316). New York: Appleton-Century-Crofts.

Response

Reflections on Verplanck's Reflections About Kantor

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The insights that Verplanck provides on Kantor and Kantorians is intriguing indeed, and he has added new understandings to a problem for which I have long sought an answer: why was Kantor so neglected when his system provided such enormous potential benefits to psychology and when he wrote so prolifically to disseminate it and on such a diversity of topics?

Partly out of a desire to seek answers to this question I began a study of the citations to his work to see if they would offer an answer (Smith, 1981; Smith & Ray, 1981). The data revealed that the positive comments far outnumbered the negative in all categories (e.g., perception, social psychology, language, history). Most importantly, in the case of seventy-nine references to field and setting, fifty-five were positive and the remainder neutral. Not one was negative. What then was the answer?

A few clues emerged from the citations. Out of a total of 526, twenty mentioned the neglect of his work. Of these, ten pointed out his ponderous writing style. No doubt the writing deterred some, but if one considers the enormous difficulty of understanding much of the writings of phenomenological psychology and yet notes the success it has had in Europe and to a lesser extent in the United States, one would have to conclude that writing style is probably a minor factor. Others mentioned Kantor's negativism toward those with whom he disagreed, often at the expense of an explication of his own position, his failure to identify with potential allies, his being far ahead of his time, his lack of an experimental program, and his lack of concentration in one area of psychology in which he might have become renowned. These were, of course, only opinions; and I added my own:

Of far greater probable importance for obscurity [than writing style or diversity of works] is the advanced position of this formulation—its falling outside the familiar dualistic constructs. The lack

of an experimental program is probably also important. American psychology has been almost slavish in following the experimenter, even when the experimental program dealt with trivia and/or unscientific postulation and theory. The latter is well exemplified by Clark Hull's drive reduction theory that dominated much of American psychology for more than a decade and by the current fashion for "information processing" studies. Kantor has been concerned with analyzing basic assumptions and providing a sound system of postulation upon which a scientific psychology can be built; the resulting system provides guidance for experimentation or other data collection procedures and interpretation of that data consistent with scientific postulates. Such establishment of assumptions and consistent conceptualization prior to experimentation, however, has not been the operational mode in the past. (Smith & Ray, 1981, p. 131).

Another attempt to assess Kantor's influence was that of Morris, Higgins, and Bickel (1983). They sent a questionnaire to board members of three behavior analysis journals. The respondents noted four weaknesses: writing style, lack of a research program, failure of the supporters to communicate much beyond themselves, and the unattractiveness of "interbehavioral" as the name of the system. Of these, I suspect that the lack of empirical research is the most important. Had Kantor undertaken such research it would probably have overcome the other handicaps. Verplanck, too, refers to the research problem in his reference to Kantor's insistence "that psychology demanded its own investigative methods" and that this left him out of the mainstream. Kantor did not provide those methods, and only now are some beginning to emerge (e.g., Ray, 1992; Ray & Delprato, 1989; Sharpe, 1992). However, Kantor did not oppose all conventional research: much is cited with approval in the two editions of the *Survey* (Kantor,

1933; Kantor & Smith, 1975). But he did oppose interpreting the results in terms of traditional constructs.

In addition to the research iconoclasm, Verplanck provides a reason that I had previously seen no reference to and had never even conceived of. Chalk up that oversight to my ignorance or naiveté or both. Verplanck's revelation of the anti-semitism in the prestigious universities that shut out all persons who had Jewish backgrounds puts what is probably the final piece into the puzzle, and most likely a big piece at that. Kantor's system that did not include a research program but that did include vigorous criticisms of many of the interpretations of those who were doing research might alone have kept him out of the halls of the mighty; but when we add his Jewish name to that disadvantage, the combination not only kept him out but probably also precluded much serious consideration of his views. When we join to those major factors the minor ones, we can see why he was so deeply buried by mainstream psychology. It is now clearer why only his direct students and associates and a handful of others came to appreciate the brilliant and far-reaching contribution that he had to offer. That misfortune is the misfortune of psychology today.

References

- Kantor, J.R. (1933). *A survey of the science of psychology*. Bloomington, IN: Principia Press.
- Kantor, J.R. (1975). *The science of psychology: An Interbehavioral Survey*. Chicago: Principia Press.
- Morris, E. K., Higgins, S. T., & Bickel, W. K. (1983). Contributions of J. R. Kantor to contemporary behaviorism. In N. E. Smith, P. T. Mountjoy, & D. H. Ruben (Eds.). *Reassessment in psychology: The interbehavioral alternative*. Washington, D. C.: University Press of America.
- Ray, R. D. (1992). Interbehavioral methodology: Lessons from simulation. *Journal of Teaching in Physical Education*, 12, 105-114.
- Ray, R. D. & Delprato, D. J. (1989). Behavioral systems analysis: Methodological strategies and tactics. *Behavioral Science*, 34, 81-127.
- Sharpe, T. & Hawkins, A. (1992). Field systems analysis: Prioritizing patterns in time and context among observable variables. *Quest*, 44, 15-34.
- Smith, N. W. (1981). *Annotated citations to and bibliography of the interbehavioral psychology of J. R. Kantor*. JSAS Catalog of Selected Documents in Psychology, 11(1), 13. (ms. 2198)
- Smith, N. W. & Ray, C. E. (1981). A citation study of the interbehavioral field psychology of J. R. Kantor. *Revista Mexicana de Análisis de la Conducta*, 7, 117-

Article

The Closet Interbehaviorism of Matching Law Theory

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The Closet Interbehaviorism of Matching Law Theory

Behavior analysts have long been involved in discovering what they believe to be the natural laws governing behavior, explaining those laws in terms of mathematical and topographic formulae, and applying those laws in attempts to better describe, predict, and control for therapeutic value particular naturalistic settings. For more than a decade, however, much discussion has been presented concerning the increasing separation among experimental analysts (those primarily involved in 'discovery'), and applied analysts (those primarily involved in 'application') (cf., Marr, 1991; Pierce & Epling, 1980; Rider, 1991).

If we agree that the general goal of behavior analysis is to identify and describe regularities in the interaction of behavior and environment (Nevin, 1984; Skinner, 1953), then it would seem that applied concerns may benefit from experimentally derived mathematical and topographic laws, and experimental analyses may benefit from the data derived from technologically capable applied strategies which have been designed to better incorporate those laws into their therapeutically driven interventions. Though most behavior analysts would agree that the identification and testing of the laws governing behavior are of little value unless they are of use to applied concerns, the primary focus of applied researchers has been on the development of therapeutic intervention strategies, often to the exclusion of recent research and developments in the experimental analysis of behavior. Common argument follows that while many interesting phenomena have been discovered in behavioral laboratories, the interactive complexities of organism, environment, and context

in natural settings when coupled with the operant complexity of the human organism makes the testing and application of laboratory-based laws difficult at best, and is sometimes shrugged off by the applied researcher as an insurmountable challenge.

However, the conceptual world view of interbehaviorism when coupled with the technological developments now available to applicatively drive applied interbehavioral research provide an appealing source for the testing and application of laboratory-based theory in complex and interactive applied settings. Some would argue that the present state of interbehavioral methodology is somewhat idiosyncratic due to (a) its reliance upon the unique non-replicable structure and function of the sequential nature of the behavior $\leftrightarrow$ environment data collected, and (b) the current lack of a robust collection of rules of governance which often results in the subjective manipulation of the observational systems used to describe and analyze particular settings rather than strict adherence to consistent inter and intra-experimental practices (e.g., when observing and coding classroom instruction is instruction simply 'instruction' or is it a hierarchy of separately coded events such as 'verbal, non-verbal modeling, informational, higher order, synthesis'; how do we go about assessing the reliability of recorded sequential transactions, etc., etc.). On the other hand, interbehavioral technology does provide the applied researcher with an enabling tool when endeavoring to more completely describe and analyze the array of behavior $\leftrightarrow$ environment variables which conjointly operate in highly interactive settings. Given the emerging capabilities of interbehavioral methods, there are some appealing experimentally derived behavioral laws from which applied concerns could

benefit if studied interbehaviorally. One area of experimental study that has much potential to bridge the gap between basic and applied literatures is that of matching law, a behavioral phenomena widely supported in the experimental analysis of behavior (Davison & McCarthy, 1988), but not widely tested in applied settings. With a similar interbehavioral emphasis upon context specific organism $\leftrightarrow$ environment interactions or transactions, matching law comprises a formal mathematical representation of those behavior $\leftrightarrow$ environment transactions found in an experimental setting. If more completely tested in applied settings, formal or mathematical representations of behavior (or proposed experimental laws) such as matching law have the potential to increase the effectiveness of applied behavior analytic technologies as this leads to quantifiable prediction of the relationship between the behavior of an organism and the many facilitating and impeding events operating in the organism's environment. Once applicatively tested, the mathematical quantification focus of experimental research would allow a more precise assessment of applied concerns, in turn, facilitating the ability to predict and control various behaviors as specific variables within the quantitative equation are manipulated.

A Brief History of Matching Law Theory

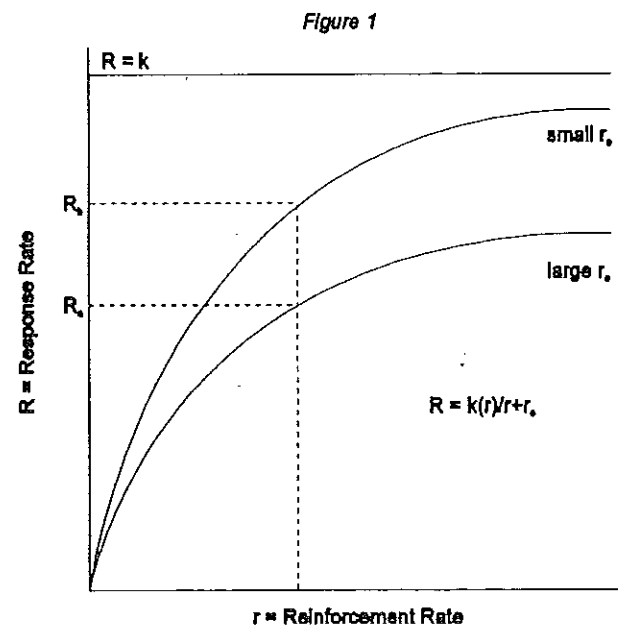
Matching law theory is based largely upon Herrnstein's (1970) proposed quantitative law of effect and related research on single, multiple, and concurrent schedules of reinforcement (e.g., Ferster & Skinner, 1957). Experimental focus has been upon efforts to mathematically describe and contrast the functional relationships among components of multiple schedules and the matching found among responding behaviors and the reinforcing (and indirectly, the inhibiting) factors operating within concurrent schedules (Davison & McCarthy, 1988; McSweeney, Farmer, Dougan, & Whipple, 1986).

Again akin to interbehavioral theory, matching theory states that an individual may exhibit many behaviors at any given time and that the behavior exhibited is a function of obtaining the greatest reinforcing factors over time relative to the total amount of reinforcing factors within the environment at the particular point in time in which the behavior is emitted. For example, the reader of this article may continue reading or quit at any point in

time and engage in another behavior (e.g., write down some notes, call a colleague, or take a nap). Within the confines of matching theory, the behavior of the reader is proportional to the relative amount of reinforcing events obtained for that behavior versus the relative amount of reinforcement available for other behaviors within that unique field of events. Behavior choice is continuous (McDowell, 1989) and dependent upon the complete configuration of enabling and impeding events within the behavior $\leftrightarrow$ environment field in which those behavioral choices are emitted.

Behavioral choices within matching theory are thought to be affected by the relative richness of the reinforcing environment in which the choice is taking place (refer to Figure 1).

For example, the frequency and velocity of behavior in an environment that contains little reinforcement quickly reaches its asymptote (e.g., reading this article in a library in which minimal reinforcement for alternative behaviors exists provides an



environment in which the reader will probably continue to read this article and reading behavior will approach the total amount of behavior the reader could conceivably exhibit). On the other hand, in an environment rich in reinforcing alternatives the rate of behavior approaches the asymptote more slowly

(e.g., reading this article in a bar in which much reinforcement exists for alternative behaviors provides less reinforcement for reading behavior and consequently the behavior of reading will receive less relative reinforcement and tend to approach the total amount of behavior the reader could conceivably exhibit much more slowly).

Herrnstein (1961, 1970) has been primarily responsible for the proposition of an equation which topographically maps behavioral response, not as a function of an absolute rate of reinforcement, but as a function of relative rates of reinforcing conditions over relative response time periods. The initial matching equation proposed was:

$$R_1/R_1+R_2 = r_1/r_1+r_2$$

in which R represents a rate of behavioral responding for a particular behavior and r represents the rate of relative reinforcement obtained for R within a particular behavior-environment field. Herrnstein (1970) further proposed that matching law include alternative responses not under primary experimental or observational control. This was described by the equation:

$$R_1/R_1+R_0 = r_1/r_1+r_0$$

where R_1 represents a response manipulated or controlled by an experimental situation and R_0 represents the rate of all other behavior the individual under observation may exhibit (i.e., $R_0 = R_2 + R_3 + \dots + R_n$ and $r_0 = r_2 + r_3 + \dots + r_n$). Similarly, r_1 represents the rate of reinforcement obtained for R_1 and r_0 represents the rate of reinforcement obtained for R_0 . Assumption at this point was that R_1+R_0 was a relatively constant k describing the total amount of behavior an individual could exhibit. When k is substituted for R_1+R_0 and algebraically manipulated, a hyperbolic equation results commonly termed Herrnstein's hyperbola:

$$R_1 = k(r_1)/r_1+r_0$$

Recent work has demonstrated that k may vary with respect to parameters such as magnitude and immediacy, however, matching law theory remains conceptualized as behavior emission by choice (McDowell, 1986). Recent articulations of the matching law equation have additionally included a time

parameter to topographically map the time an individual spends responding on one alternative reinforcer relative to the time spent responding on other alternatives as a function of the relative rates of reinforcing and inhibiting conditions operating for each alternative (Baum & Rachlin, 1969; Brownstein & Pliskoff, 1968). Including a time parameter, the respective multiple and single alternative matching law equations are:

$$T_1/T_1+T_2+\dots+T_n = r_1/r_1+r_2+\dots+r_n$$

$$T_1 = k(r_1)/r_1+r_0$$

where T is a measure of the duration of time an individual spends engaging in a behavior.

Two deviations from strict matching are accounted for in a mathematical equation termed 'generalized' matching law. This generalized equation is represented as:

$$R_1/R_1+R_2+\dots+R_n = b(r_1/r_1+r_2+\dots+r_n)^a$$

where b represents a bias parameter (e.g., a deviation from strict matching that occurs when the choice between behaviors is not symmetrical such as in the difficulty or complexity of response, or the latency or type of reinforcement; Baum, 1974; Davison & McCarthy, 1988; McDowell, 1989) and a represents a sensitivity parameter (e.g., the individual alternates between responses more or less often than is predicted by strict matching; Baum, 1979, 1982; Wearden, 1983). Time may also be expressed by this equation, most frequently by substituting R (rate of response) with T (time measure of response). When $a = 1$ and $b = 1$ the equation reduces to strict matching, when a is $<$ or $>$ 1 undermatching and overmatching are represented, and when b deviates from 1 the magnitude of bias in either reinforcer or response value is reflected (refer to Allen, 1981; Houston, 1982; and Prelec, 1984 for further discussion of these issues). The logarithmic form of the generalized matching law is:

$$\log R_1/R_1+R_2+\dots+R_n = (a) \log r_1/r_1+r_2+\dots+r_n + \log (b)$$

Hence, matching theory and its mathematical counterpart describe behavior contingencies not as a specific consequence of a specific behavior, but as contextually related to all other behaviors and their

many consequential relationships within the unique field in which they operate (Catania, 1973; White, McLean, & Aldiss, 1986). Akin to interbehavioral field theory, matching law provides at the mathematical level of analysis an appealing molar perspective and a more formal representation of behavior at the molar level. As Delprato (1994, p. 4, $PE = C(k, sf, rf, hi, st, md)$) and other interbehavioral theorists allude, such a mathematical representation is required to more completely and accurately describe, explain, predict, and therefore control complex human interactions in applied settings.

An Education Research Illustration

We conducted a pilot study to begin to examine if the generalized matching law could be useful to the description of student $\leftrightarrow$ teacher interaction in a particular classroom context (reading instruction in a rural 4th grade elementary setting). Our primary objectives were to develop a technologically based procedure to apply matching law to data from interbehaviorally derived classroom observations. It is hoped that efforts such as this one provide impetus for further study of matching law (and any systems oriented mathematical formulae which attempts to represent behavioral transactions) in the context of prediction and control applications, given its documented usefulness in topographically mapping educational environments in more molar fashion.

Table 1 summarizes the interbehaviorally based

observation system used, and Table 2 summarizes the logarithmic ratios derived from the generalized matching law used for data analysis.¹

Though the rigorous experimental analyst may require scrutiny of the specific procedures used to implement a matching law analysis prior to agreement with our findings, review of Table 2 indicates that the generalized matching law accounted for a median 84.7% of the variance in the interaction across the two students and one teacher's behavior. Undermatching was also the norm across the majority of the data, consistent with experimental research on matching law. Student 1 exhibited a negative slope (a value) in two equations interpreted as an inverse relationship between rate of teacher behavior following a particular student behavior and the rate of that student behavior, possibly due to the punishing context of teacher behaviors rather than being reinforcing. Behavioral micro-economics and complementarity of reinforcers provide another explanation for the negative slopes (e.g., Green & Freed, 1993; Hursh, 1978; Iwata & Michael, 1994). Compatible with interbehavioral theory, micro-economics points to the difference in quality of reinforcement that determines the negative slopes. For example, teacher attention may be reinforcing for student 1's behavior, but peer attention may be a more highly valued reinforcer for that same student behavior. In this scenario, teacher attention increases for the student behavior and peer attention decreases with the student behavior not increasing at the rate

Table 1
Interbehavioral Observation System Summary

Task Structure	Student Behavior	Teacher Behavior
o. Opening	1. Reading Aloud (RA)	<i>Teacher Attention</i>
r. Reading	2. Reading Silently (RS)	g. Group (GR)
a. Related Content Activity	3. Writing (WR)	t. Target Student (TS)
c. Closure	4. Listening (LI)	p. Peer Student (PS)
	5. Transition (TR)	n. No Attention (NA)
	6. Waiting (WA)	<i>Specific Teacher Behavior</i>
	7. Verbal Appropriate (VA)	i. Instruction (IN)
	8. Verbal Inappropriate (VI)	l. Listening (LI)
	9. Task Appropriate (TA)	v. Approval (AP)
	0. Task Inappropriate (TI)	d. Disapproval (DI)
		b. Other Talk (OT)
		m. Monitoring (MO)

expected. This is also consistent with indications that no attention from the teacher was reinforcing for some of student 1's behaviors.

Conducting our pilot study was only a first attempt to develop a procedure to describe the confluence of variables operating in a naturalistic classroom setting and test one experimental theory's ability to mathematically represent the multiple behavioral and environmental variables. Interbehavioral

methodology, now that it is well supported by emerging technologies (cf., Sharpe, Hawkins, & Ray, in press), was demonstrated as one avenue to overcoming the methodological complexity of replicating experimental research in highly interactive applied settings.

From our pilot data and other literature we have cited it seems that generalized matching law can serve to help in the mathematical description of interac-

Table 2
Generalized Matching Law Values.

Classroom	Student	Student Behavior	Teacher Behavior	a Value	b Value	% VAF
4th	1	WR/LI	OT/IN	.373	1.369	76.8
		WR/TR	OT/OT	-1.375	5.165	48.7
		WR/WA	OT/MO	.427	2.203	91.6*
		WR/TI	OT/OT	-.334	1.644	20.7
		LI/TR	IN/OT	.612	1.024	64.8
		LI/WA	IN/MO	.594	1.057	58.3
		LI/TI	IN/OT	.370	1.027	96.0
		TR/TI	OT/MO	.639	1.081	72.2
		WA/TI	MO/OT	.509	.651	93.5
	2	RA/LI	LI/LN	1.099	.931	99.7*
		RA/TR	LI/OT	.324	.460	16.0
		RA/TA	LI/MO	.756	.257	100.0**
		WR/LI	MO/IN	.794	1.214	99.8*
		WR/TA	MO/MO	.720	.636	99.9*
		WR/TI	MO/MO	.193	1.278	15.3
		LI/TR	IN/OT	.414	1.226	80.8
		LI/TA	IN/MO	.643	.610	95.1*
		LI/TI	IN/MO	.511	1.537	59.1
		TR/TA	OT/MO	.327	.956	88.5
		TA/TI	MO/MO	.932	1.537	99.9*

Note: * = $p < .05$, ** = $p < .01$. Acronyms are listed in Table 1.

Medians and Ranges of the Generalized Matching Law

Classroom	Student	a Value	b Value	% VAF
4th	1	.427 (-1.375 - .638)	1.081 (.6851 - 5.165)	72.2 (20.7 - 96.0)
	2	.643 (.193 - 1.099)	.956 (.257 - 1.537)	95.1 (15.3 - 100.0)
	1 & 2	.510 (-1.375 - 1.099)	1.069 (.257 - 5.165)	84.7 (15.3 - 100.0)

tion among student behavior and classroom environment in educational settings. If interpreted as successful, a logical next step is to test if by manipulation of one of the variables within the matching equation we may be able to predict the effect of the manipulation on other variables within the equation. Future research may address if this will allow us to predict and control primary and collateral relationships among a 'field' of variables and better construct sophisticated conglomerates of behaviors designed for educational intervention (cf., Shull & Fuqua, 1993). Given the bias and sensitivity parameters contained in the generalized matching equation, greater empirical light should be shed on unique values of behaviors for particular individuals and the unique reinforcing contingencies which act to control those behaviors (cf., Neef, Mace, Shea, & Shade, 1992; Neef, Mace, & Shade, 1993).

Some Closing Thoughts

Matching law seems to be one experimental/mathematical model designed to move the principles and practice of behavior analysis toward a more molar and contextually dependent conceptualization of human behavior. While traditional reinforcement theory has focused primarily on the contiguity between a particular behavior and its immediate consequence, matching law articulates that contiguity is not as important as the correlation between an individual's behavior and the type and amount of consequential feedback received over time within the behavior $\leftrightarrow$ environment field in which that behavior is operating (Baum, 1973). This, when substantiated by more rigorous empirical study similar to the pilot study summarized, should be viewed as theoretically and experimentally supportive of an interbehavioral field conceptualization of operant behavior.

Such efforts are clearly aligned with interbehavioral field thinking and should be pursued in bridging the chasm between theory and practice, or more specifically, the gap between theory derived from the experimental analysis of behavior and efforts at application of effective behavioral principles for therapeutic ends. Regardless of how speciously derived, interbehavioral theory has long carried with it the subjective warrant of experimentally unsupported theory. While many general conceptual models have been proposed (Morris, 1992; Sharpe &

Hawkins, 1992), few attempt to bridge the gap between interbehavioral theory as conceptualized, and full blown mathematical representation (e.g., those which include a specified mathematical relationship capable of prediction and control of any or all of the components of the behavior $\leftrightarrow$ environment field; e.g., Ray & Delprato, 1989; Ray, 1992).

A science of behavior should ideally be concerned not just with the character of particular behaviors, but with behavior as an operative component of the transactional relationships inherent to individual and environment. Even Skinner (cf., Ferster & Skinner, 1957,) alluded to a transactional conceptualization in collaboratively stating that when an individual behaves within an environment in which it lives, it changes the environment and the behaviors of others in ways which then have differential effects on the future behavior of the individual. Matching law, if viewed as a correlational model of transactional effect, provides a plausible method of describing more precisely the interactions operating within a particular interbehavioral field than has been possible with traditional linear $S \rightarrow R \rightarrow C$ laws of effect. In addition, pairing an amenable conceptualization of the principles of behavior (i.e., interbehaviorism) with a more sophisticated and conceptually compatible mathematical model (i.e., generalized matching law) should only serve to enhance the prediction and control functions inherent to applied endeavors – especially in the context of emergent technological means.

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Authors Note: This paper is based on a completed dissertation by the second author which focused on empirical substantiation of matching law theory in public education settings using an interbehavioral field systems data collection technique.

References

- Allen, C. M. (1981). On the exponent in the "generalized" matching equation. *Journal of the Experimental Analysis of Behavior*, 35, 125-127.
- Baum, W. M. (1973). The correlation-based law of effect. *Journal of the Experimental Analysis of Behavior*, 20, 137-153.
- Baum, W. M. (1974). On two types of deviation from the matching law: Bias and undermatching. *Journal of the Experimental Analysis of Behavior*, 22, 231-242.
- Baum, W. M. (1979). Matching, undermatching, and overmatching in studies of choice. *Journal of the Experimental Analysis of Behavior*, 32, 269-281.
- Baum, W. M. (1982). Choice, changeover, and travel. *Journal of the Experimental Analysis of Behavior*, 38, 35-49.
- Baum, W. M., & Rachlin, H. C. (1969). Choice as time allocation. *Journal of the Experimental Analysis of Behavior*, 12, 861-874.
- Brownstein, A. J., & Pliskoff, S. S. (1968). Some effects of relative reinforcement rate and changeover delay in response-independent concurrent schedules of reinforcement. *Journal of the Experimental Analysis of Behavior*, 11, 683-688.
- Catania, A. C. (1973). Self-inhibiting effects of reinforcement. *Journal of the Experimental Analysis of Behavior*, 19, 517-526.
- Davison, M., & McCarthy, D. (1988). *The matching law: A research review*. Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Delprato, D. J. (1994). Interbehavioral psychology: Critical, systematic and integrative approach to clinical services. *The Interbehaviorist*, 22(2), 4-11.
- Ferster, C. B., & Skinner, B. F. (1957). *Schedules of reinforcement*. New York: Appleton-Century-Crofts.
- Green, L., Freed, S. (1993). The substitutability of reinforcers. *Journal of the Experimental Analysis of Behavior*, 60, 141-158.
- Herrnstein, R. J. (1970). On the law of effect. *Journal of the Experimental Analysis of Behavior*, 13, 243-266.
- Houston, A. I. (1982). The case against Allen's generalization of the matching law. *Journal of the Experimental Analysis of Behavior*, 38, 109-111.
- Hursh, S. R. (1978). The economics of daily consumption-controlling food- and water-reinforced responding. *Journal of the Experimental Analysis of Behavior*, 29, 475-491.
- Iwata, B. A., & Michael, J. L. (1994). Applied implications of theory and research on the nature of reinforcement. *Journal of Applied Behavior Analysis*, 27, 183-193.
- Marr, M. J. (1991). The speciation of behavior analysis: The unnatural selection of foxes and hedgehogs. *The Behavior Analyst*, 14, 183-186.
- McDowell, J. J. (1986). On the falsifiability of matching theory. *Journal of the Experimental Analysis of Behavior*, 45, 63-74.
- McDowell, J. J. (1989). Two modern developments in matching theory. *The Behavior Analyst*, 12, 153-166.
- McSweeney, F. K., Farmer, V. A., Dougan, J. D., & Whipple, J. E. (1986). The generalized matching law as a description of multiple-schedule responding. *Journal of the Experimental Analysis of Behavior*, 45, 83-101.
- Morris, E. K. (1992). The aim, progress, and evolution of behavior analysis. *The Behavior Analyst*, 15(1), 3-29.
- Neef, N. A., Mace, F. C., Shea, M. C., & Shade, D. (1992). Effects of reinforcer rate and reinforcer quality on time allocation: Extensions of matching theory to educational settings. *Journal of Applied Behavior Analysis*, 25, 691-700.
- Neef, N. A., Mace, F. C., & Shade, D. (1993). Impulsivity in students with serious emotional disturbance: The interactive effects of reinforcer rate, delay, and quality. *Journal of Applied Behavior Analysis*, 26, 37-52.
- Nevin, J. A. (1984). Quantitative analysis. *Journal of the Experimental Analysis of Behavior*, 42, 421-434.
- Pierce, W. D., & Epling, W. F. (1980). What happened to analysis in applied behavior analysis? *Journal of Applied Behavior Analysis*, 3, 1-9.
- Prelec, D. (1984). The assumptions underlying the generalized matching law. *Journal of the Experimental Analysis of Behavior*, 41, 101-107.
- Ray, R. D., & Delprato, D. J. (1989). Behavioral systems analysis: Methodological strategies and tactics. *Behavioral Science*, 34, 81-127.
- Rider, D. P. (1991). The speciation of behavior analysis. *The Behavior Analyst*, 14, 171-181.
- Sharpe, T. L., & Hawkins, A. (1992). The implications of field systems for teacher education. *Journal of Teaching in Physical Education* [special monograph issue], 12(1), 76-84.
- Sharpe, T. L., Hawkins, A., & Ray, R. (in press). Interbehavioral field systems assessment: Examining its utility in preservice teacher education. *Journal of Behavioral Education*.
- Shull, R. L., & Fuqua, R. W. (1993). The collateral effects of behavioral interventions: Applied implications from JEAB, January 1993. *Journal of Applied Behavior Analysis*, 26, 409-415.
- Skinner, B. F. (1953). *Science and human behavior*. New York: Free Press.
- Weardon, J. H. (1983). Undermatching and overmatching as deviations from the matching law. *Journal of the Experimental Analysis of Behavior*, 40, 332-340.
- White, K. G., McLean, A. P., & Aldiss, M. F. (1986). The context for reinforcement: Modulation of the response-reinforcer relation by concurrently available extraneous reinforcement. *Animal Learning and Behavior*, 14, 398-404.

Background Notes on Kantor's Treatment of Linguistic Behavior

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Background

Kantor's early interest in the psychological aspects of language behavior was evident in his writings in the 1920's (1921, 1922, 1928, 1929). During this period, he published not only a series of journal articles in which he argued for an objective analysis of meaning and language behavior, but also he devoted a chapter to the psychology of language in volume two of his *Principles of Psychology* (1926). Here, he (a) differentiated psychological data from other language-related activities and things, (b) analyzed language action situations, and (c) speculated on the acquisition, development, and classification of linguistic behaviors. Seven years later, in another textbook on general psychology (1933) he published a somewhat revised but less technical account of his systematic approach, and three years after that he published his first volume on language behavior, *An Objective Psychology of Grammar* (1936). Here he emphasized the difference between *actual* linguistic interactions and their *products*. The former was deemed to be the domain of psychology as a natural science; the latter, the bailiwick of general linguistics, including lexicology (semantics and etymology), grammar, and semiotics.

Reviews of an *Objective Psychology of Grammar* by linguists and philosophers were less than enthusiastic, for the book was interpreted as a discourse in negative criticism (see Esteves, 1955; Hess, 1929; Newman, 1953; Velten, 1936). However, an evaluation by an experimental psychologist (Wolfe, 1937) declared the volume to be one of considerable merit, inasmuch as it offered a basis for many of the problems in the study of language and covered the grammatical categories in a consistent theoretical manner. It is interesting to note that long after its publication — 33 years to be exact — another experimental psychologist (Schoenfeld, 1969) wanted psychologists to know that *An objective psychology of grammar* was a "stunning" volume.

Kantor's early writings on language inspired a

series of studies by his Indiana University students (Brions, 1937; Bucklew, 1943; Grace, 1952; Herman, 1951a, 1951b; Pronko, 1945; Ratner, Gawronski, & Rice, 1964; Ratner & Rice, 1963; Rosenberg & Cohen, 1964, 1966; Rosenberg & Curtis, 1954; Wolf, 1958a, 1958b), a comprehensive review of the literature (Pronko, 1946), and an innovative approach to analyzing language behavior in natural settings (Ratner, 1957; Rice & Ratner, 1967).

After *An objective psychology of grammar* (1936), Kantor published only one more paper on language behavior, this on the role of language in logic and science (1938), directing his attention during the next three decades mainly to other psychological "projects." He nevertheless returned to the problems of language behavior in the 1970's in four papers under the authorship of "Observer" (1970, 1971a, 1971b, 1976), reiterating his position that language behavior, which consists of referential and symbolizing behavior, should be distinguished from their products, particularly the structuring of vocal-verbal sounds into phonemes, words, phrases, and sentences. His systematic position appeared once again in another textbook of psychology, *The science of psychology* (Kantor & Smith, 1975), emphasizing here the special character of referential and symbolic behavior. In the same year, in an article in the *Mexican Journal of Behavior Analysis* (1975), Kantor labeled his position "psychological linguistics" despite the fact that "linguistics" was then, and is now, associated with the study of words and word combinations. His next book, *Psychological linguistics* (1977), was for the most part an elaboration of the chapter on language in *The science of psychology* (1975) and the above mentioned article in the *Mexican Journal of Behavior Analysis* (1975). His strategy in this volume was to "...indicate the relations between nonpsychological and psychological linguistic factors by analyzing out each of them from the pool of linguistic events" (pp. 11-12).

Vigorously critical of the whole language field, Kantor argued in his last articles that the confusion between speech and language was due to a lack of

unity in the premises of an authentic objective psychology (1981); that the use of metaphors has had regressive effects on the study of language (Observer, 1983a); and that the concept of meaning in psychology and linguistics is misunderstood because of the continued confusion between events and constructs (Observer, 1983b).

So we see that over a period spanning more than 60 years, Kantor devoted a tremendous amount of effort to making a case for the objective study of the psychological aspects of language behavior. Interestingly enough he began and ended his campaign with a critical and constructive analysis of the concept of meaning (1921;1983).

Psychological Linguistics Origins

We shall review only those highlights of *Psychological linguistics* (1977) which apply to a systematic approach to the study of language in natural settings. But first a comment on the origins of the approach.

According to Kantor, psychological linguistics originated simultaneously with social psychology in the middle of the nineteenth century. While the initial formulations by philosophers and psychologists were entirely mentalistic, later accounts, though still mentalistic, included, thanks to the writings of ethnologists and anthropologists, the functional adjustive character of language. Contributions came also from developmental psychologists who provided normative data on the course of individual language development.

Extant formulations by behavioral psychologists present decided contrasts to the earlier versions in that they are based on objective psychology. Outstanding are *Verbal behavior* by Skinner (1957) and *Psychological linguistics* by Kantor (1977). It is a curious fact of history that Skinner did not refer to Kantor's analysis of language behavior and Kantor did not take into account Skinner's analysis of verbal behavior.

Highlights

Language phenomena, according to psychological linguistics, may be classified into three categories: (a) as authentic psychological language, (b) parapsychological language, and (c) nonpsychological language. Authentic psychological language, which is communicative, interactional, and is intrinsic to the

language event, includes referential language (speaking and hearing, verbal and nonverbal behavior, and writing and signaling); symbolizing behavior (acts of relating signs to other signs or with things); and gestural language. Parapsychological language includes those things or actions that participate in or merely support authentic psychological language: verbal formulae (e.g., "Hi" and "How are you?"), speech derivatives such as transcriptions and potential stimuli for language behavior (e.g., notes for delivering a lecture). Nonpsychological language includes language things in context that are not involved in central language adjustments, namely, signs and signals, textual materials, inscriptions, linguistic systems (French, German, etc.), standard speech, speech description, such as phonetics and grammars, and spoken or written formal lectures.

Psychological language, the focus here, is defined as: The acts of persons as they adjust to other people, objects, and events either through referential interactions, involving verbalizations and/or gestures, writing, or through symbolizing behavior. Referential interactions are analyzed as a person's (the speaker or "referor") coincidental reaction to a listener (the "referee") and a referent (the thing talked about) under specific circumstances, or setting events. When, in a conversation, a listener takes the role of a speaker, he or she responds to what the speaker has said and coincidentally react to a listener (formerly the speaker) and a new referent under the prevailing circumstances. Referential interactions may be narrative, mediative, or a combination of both. In narrative interactions, a speaker's referential behavior is coordinated with a listener's referential behavior which may range from a casual discussion, to a serious interchange about a scientific issue, or a debate on an affair of state. In mediative interactions a speaker's referential behavior is coordinated with a listener's nonreferential behavior (e.g., the listener closes the door at the request of the speaker). A speaker's behavior, and a listener's as well, varies in style in accordance with the dialectical, communal, and cultural practices, which include grammatical structures. The listener may be a person, a surrogate, or the speaker himself or herself (i.e., when a person is both speaker and listener). A referent may be present or absent, concrete or abstract, existent or nonexistent.

Symbolic interactions, the other component of authentic psychological language, refer to a person's reactions to a stimulus that has been made to substi-

tute for something else, either by that person or by someone else. A reaction to a symbol may be simply an orientational reaction with respect to a substitute stimulus (e.g., noticing an exit sign as you enter a theater and take your seat); or an orientational reaction followed by contact with the object or event symbolized (e.g., noticing the exit sign and then leaving the theater through the door under the sign).

Psychological language takes into account what might be called the secondary functions of language behavior, that is, the functions of language behavior other than communicative. This instrumental use of language brings about consequences of special value to the speaker and sometimes to the listener as well. Examples are readily found in the market place, the legal system, the theater, and in the language of oratory, rhetoric, and argument.

Conclusion

Kantor's interest in the psychological aspects of language behavior began in the early 1920's and continued throughout his career. In a way, a summary of his position on language behavior is contained in *Psychological linguistics* (1977):

Psychological linguistics focuses upon the psychological acts or adjustments of organisms as they adapt themselves to their congeners, along with the things which they encounter, either directly by means of vocal utterances and gestures, or indirectly by means of writing and symbolizing behavior (xiii).

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References

- Brions, I.T. (1937). An experimental comparison of two forms of linguistic learning. *The Psychological Record*, 1, 205-214.
- Bucklew, J. (1943). An exploratory study in the psychology of speech perception. *Journal of Experimental Psychology*, 32, 473-494.
- Esteves, N.G. (1955). Review of an objective psychology of grammar. *Word*, 11, 117-122.
- Grace, H.A. (1952). Effects of different degrees of knowledge about an audience on the content of communication. *Journal of Social Psychology*, 34, 111-124.
- Herman, D.T. (1951a). Linguistic behavior: I. Some differentiations in hearer response to verbal stimulation. *Journal of General Psychology*, 44, 199-213.
- Herman, D.T. (1951b). Linguistic behaviors: II. The development of hearer interaction with holophrastic language stimuli. *Journal of General Psychology*, 44, 273-291.
- Hess, M.W. (1929). Kantor's language behavior. *Journal of Philosophy*, 26, 354-356.
- Kantor, J.R. (1921). An objective interpretation of meanings. *American Journal of Psychology*, 32, 231-248.
- Kantor, J.R. (1922). An analysis of language data. *Psychological Review*, 29, 267-309.
- Kantor, J.R. (1926). *Principles of psychology*. Vol. II. New York: Alfred Knopf.
- Kantor, J.R. (1928). Can psychology contribute to the study of linguistics? *Monist*, 26, 630-648.
- Kantor, J.R. (1929). Language as behavior and a symbolism. *Journal of Philosophy*, 26, 150-159.
- Kantor, J.R. (1933). *A survey of the science of psychology*. Bloomington, IN: Principia Press.
- Kantor, J.R. (1936). *An objective psychology of grammar*. Bloomington, IN: Indiana University Publications, Science Series.
- Kantor, J.R. (1938). The role of language in logic and science. *Journal of Philosophy*, 35, 449-463.
- Kantor, J.R. (1975). Psychological linguistics. *Mexican Journal of Behavior Analysis*, 1, 249-268.
- Kantor, J.R. (1977). *Psychological linguistics*. Chicago: Principia Press.
- Kantor, J.R. (1981). Reflections upon speech and language. *Mexican Journal of Behavior Analysis*, 7, 91-106.
- Kantor, J.R. & Smith, N.W. (1975). *The science of psychology: An interbehavioral survey*. Chicago: Principia Press.
- Newman, S. (1953). Review of An objective psychology of grammar. *International Journal of American Linguistics*, 19, 312-313.
- Observer. (1970). Wanted: A better direction for linguistic psychology. *The Psychological Record*, 20, 263-265.
- Observer. (1971a). Comments and queries: Words, words, words. *The Psychological Record*, 21, 269-272.
- Observer. (1971b). Comments and queries: Toward an improved linguistic model for science. *The Psychological Record*, 21, 429-434.
- Observer. (1976). Comments and queries: What meaning means in linguistics. *The Psychological Record*, 26, 441-445.
- Observer. (1983a). Comments and queries: Meanings as events and as constructions in psychology and linguistics. *The Psychological Record*, 33, 433-440.
- Observer. (1983b). Comments and queries: The role of

- tabula metaphors in psychology and in language study. *The Psychological Record*, 33, 279-284.
- Pronko, N.H. (1945). An exploratory investigation of language by means of oscillographic and reaction time techniques. *Journal of Experimental Psychology*, 35, 433-458.
- Pronko, N.H. (1946). Language and psychological linguistics: A review. *Psychological Bulletin*, 43, 189-239.
- Ratner, S.C. (1957). Toward a description of language behavior: I. The speaking action. *The Psychological Record*, 7, 61-64.
- Ratner, S.C., Gawronski, J.J., & Rice, F.E. (1964). The variable of concurrent actions in language of children: Effect of delayed speech feedback. *The Psychological Record*, 14, 47-56.
- Ratner, S.C. & Rice, F.E. (1963). The effect of the listener on the speaking interaction. *The Psychological Record*, 13, 265-268.
- Rice, F.E. & Ratner, S.C. (1967). Toward a description of language behavior: II. The listening action. *The Psychological Record*, 17, 493-502.
- Rosenberg, S. & Cohen, B.D. (1964). Speaker's and listeners' processes in a word-communication task. *Science*, 145, 1201-1203.
- Rosenberg, S. & Cohen, B.D. (1966). Referential processes of speakers and listeners. *Psychological Review*, 73, 208-231.
- Rosenberg, S. & Curtis, J. (1954). The effect of stuttering on the behavior of the listener. *Journal of abnormal and Social Psychology*, 49, 355-361.
- Schoenfeld, W.N. (1969). J.R. Kantor's Objective psychology of grammar and Psychology and logic: A retrospective appreciation. *Journal of the Experimental Analysis of Behavior*, 12, 329-347.
- Skinner, B.F. (1957). *Verbal behavior*. New York: Appleton-Century-Crofts, Inc.
- Velten, H.V. (1936). Review of an objective psychology of grammar. *Language*, 14, 66-68.
- Wolf, I.S. (1958a). Stimulus variables in aphasia: I. Setting conditions. *Journal of the Scientific Laboratories, Denison University*, 44, 203-217.
- Wolf, I.S. (1958b). Stimulus variables in aphasia: II: Stimulus objects. *Journal of the Scientific Laboratories, Denison University*, 44, 218-228.
- Wolfe, D. L. (1937). Review of an objective psychology of grammar. *Psychological Bulletin*, 34, 398-402.

Comments

Notes from the Field

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In their chapter, "Evolution and Differentiation within Behavior Therapy: A Theoretical and Epistemological Review," Fishman and Franks (1992) conclude by describing recent trends in behavior therapy that resonate warmly to an interbehavioral perspective. They note, for instance, the field's increasing interest in philosophical and conceptual issues, citing Hass, Rosenfarb, and Hayes (1987). They see, also, a shift away from a "simplistic stimulus-response model to a nonlinear, multicausal, but methodologically rigorous, perspective" (p.189), citing Goldiamond's (1984) approach to contingency systems and Delprato's (1989) integrative framework.

Perhaps most encouraging of all, they detect a revival of interest in Kantor's (1959) "much neglected" interbehavioral psychology, describing Kantor and his

work as follows:

With the notable exception of behavior therapists in Mexico and certain other areas of Latin America, Kantor has been overlooked or misunderstood despite his lifelong contributions and many publications. Kantor was an outspoken critic of metaphysical dualism. He insisted, perhaps prematurely, that behavioral theory and therapy can be as scientific as the physical sciences. In place of metaphysical dualism, Kantor offered a monistic behavioral field theory with an organismic focus upon mutual and simultaneous interactions between organism and environment. For Kantor, psychology's primary subject matter is the holistic and naturalistic coordination of the entire organism. Thus, there is no artificial and exclusively linear, one-to-one relationship between stimulus and response (see Ruben & Delprato, 1987). (p. 190)

This is nice; however, the chapter is not without faults. It contains errors in historical and conceptual detail, for instance, in stating that Pavlov used a bell as his conditional stimulus, which he rarely did because it was unreliable (see Evans, 1991), and depicting Skinner as a logical positivist, which he was not (see Smith, 1986, pp. 257-297). In addition, the metatheoretical worldview framework within which Fishman and Franks cast contemporary behavior therapy seems a little idiosyncratic to their own views. These points notwithstanding, Fishman and Franks successfully portray the complex interplay of the many historically and currently diverse contributions to what is today "behavior therapy" and they see as its future something imminently interbehavioral.

References

- Delprato, D. J. (1989). Developmental interactionism: An emerging integrative framework for behavior therapy. *Advances in Behavior Research and Therapy*, 9, 173-205.
- Evans, R. B. (1991). Misportraying Pavlov's apparatus. *American Journal of Psychology*, 104, 135-141.
- Fishman, D. B., & Franks, C. M. (1992). Evolution and differentiation within behavior therapy: A theoretical and epistemological review. In D. K. Freedheim (Ed.), *History of psychology* (pp. 159-196). Washington, DC: American Psychological Association.
- Goldiamond, I. (1984). Training parent trainers and ethicists in nonlinear analysis of behavior. In R. F. Dangle & R. A. Polster (Eds.), *Parent training: Foundations of research and practice* (pp. 504-546). New York: Guilford.
- Haas, J. R., Rosenfarb, I. S., & Hayes, S. C. (1987). Back to basics: The formation of a special interest group concerned with the contribution of philosophy, theory, and basic research to behavior therapy. *The Behavior Therapist*, 4, 88.
- Kantor, J. R. (1959). *Interbehavioral psychology*. Chicago: Principia Press.
- Ruben, D. H., & Delprato, D. J. (Eds.). (1987). *New ideas in therapy: Introduction to an interdisciplinary approach*. Westport, CT: Greenwood.
- Smith, L. D. (1986). *Logical positivism and behaviorism: A reassessment of the alliance*. Stanford, CA: Stanford University Press.

Research Notes

At the University of Nevada we have been struggling to develop research from an interbehavioral perspective and have come to realize that the methods we employ are usually indistinguishable from those typical of JEAB and JABA research. What does differ is the nature of the discussion surrounding observed outcomes; and we are beginning to notice an impact of this discussion on the kinds of events selected for study. For example, we are currently conducting research in the vein of response deprivation, as defined by Timberlake and Allison (1974). The response deprivation paradigm is compatible with an interbehavioral approach in its rejection of thing-like reinforcers in favor of more event-like constructions. In addition, we have reconceptualized the response component in this work. We are not investigating schedule effects on localized, replicable responses such as coloring, reading, licking, or solving math problems (Konarski, 1980; Timberlake & Allison, 1974). Rather, we have identified *fields of interaction* as the instrumental and contingent "responses". More specifically, being in one room of a home (a duration measure) is conceptualized as the instrumental response

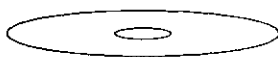
and being in another room is conceptualized as the contingent response, with no attempt to identify more discrete responses or reinforcers in these fields. Our aim is merely to examine the redistribution of participation across settings as a function of manipulating opportunities to participate in a given setting. We think that this focus and this aim are a product of approaching this research from an interbehavioral perspective.

References

- Allison, J., & Timberlake, W. (1974). Instrumental and contingent saccharin licking in rats: response deprivation and reinforcement. *Learning and Motivation*, 5, 231-247.
- Konarski, E. A. Jr., Johnson, M. R., Crowell, C. R., & Whitman, T. L. (1980). Response deprivation and reinforcement in applied settings: a preliminary analysis. *Journal of Applied Behavior Analysis*, 13, 595-609.
- Timberlake, W., & Allison, J. (1974). Response deprivation: an empirical approach to instrumental performance. *Psychological Review*, 81, 146-164.

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