

THE INTERBEHAVIORIST

A Newsletter of Interbehavioral Psychology

Volume 21

1993-94

Number 2

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THE INTERBEHAVIORIST

A Newsletter of
Interbehavioral Psychology
ISSN 8755-612X

Linda J. Hayes, Editor
Department of Psychology
University of Nevada
Reno, Nevada 89557, U.S.A.
702-784-1137

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).

Subscription Information

Student Subscriptions (USA).....	\$7.00
Regular Subscriptions (USA).....	10.00
Foreign (Non-USA) Subscriptions.....	12.00
Institutional Subscriptions.....	15.00
Back Volumes 1-18.....	12.00

THE INTERBEHAVIORIST is published as a public service by CONTEXT PRESS, Box 50172, Reno, NV 89513. CONTEXT PRESS publishes books of interest to contextualists and interactionists. Write for brochures on the books available.

Editorial Linda J. Hayes

The Behavior Analysis Program at the University of Nevada, Reno has hired Duane Lord, a graduate student in the program, as a production manager for **THE INTERBEHAVIORIST**. This move will make it possible for us to distribute **THE INTERBEHAVIORIST** as planned, and to do the work necessary to help us overcome our declining numbers of subscriptions and low submission rates. We are grateful to the Behavior Analysis Program for this contribution to the future of interbehaviorism; and we are very pleased to be able to serve our subscribers better as a result.

The next issue is planned for distribution in May, 1994. The deadline for submission of materials for that issue is April 1, 1994. We encourage you to think of **THE INTERBEHAVIORIST** as a outlet for talks you have given, ideas, comments, book reviews, works in progress, research notes, as well as more substantive or finished works. We also encourage responses to comments and articles published in **THE INTERBEHAVIORIST**. And if you have any suggestions as to how we might reach a larger audience, we look forward to hearing from you. Please join us at the Interbehaviorists in ABA Special Interest Group Meeting at the upcoming ABA convention in Atlanta to talk about these and other issues.

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

Conference Announcements

The Kantor Institute

There will be an Interbehavioral conference as part of the activities of the J. R. Kantor Institute. This conference will be held in Madrid, Spain. The dates are July 13, 14, & 15, 1994. If you would like more information on this conference please call Linda Hayes at (702) 784-1137.

Association for Behavior Analysis

The 1994 ABA convention will be held at the Atlanta Hilton and Towers in Georgia. We hope to see a strong representation of interbehaviorists at this years meeting. For further information about registration and hotel accommodations, contact: Sherry Chamberlain, ABA, Wood Hall, Western Michigan University, Kalamazoo, MI 49008.

International Conference on Advances in Management

The Second Biennial International Conference on *Advances in Management* will be held at Marlborough Inn, 1316-33 Street Northeast, Calgary, Alberta T2A 6B6, CANADA (Phone: 403-248-8888; Fax: 403-248-0749) on June 17-20, 1994. The Distinguished Speakers for the conference are: Professors Edwin M. Epstein, University of California at Berkeley; Robert T. Golembiewski, University of Georgia; Edwin A. Locke, University of Maryland; and Craig C. Lundberg, Cornell University.

Requests for further information should be addressed to the Conference President Dr. Afzal Rahim, 3109 Copperfield Ct., Bowling Green, KY 42104, USA; Phone/Fax 502-782-2601.

Book Announcements

A new book entitled *Interbehavioral Psychology* has been published by the University of Guadalajara Press, 1993. This book is printed in Spanish and will be of interest to those seeking reading on Interbehavioral psychology. The authors are Emilio Ribes Inesta, Francisco Lopez Valadez, and Linda J. Hayes. This book is also expected to be

printed in English by Context Press in 1994. The 1994 English edition will be authored by Emilio Ribes Inesta, Linda J. Hayes, Patrick Ghezzi, and Francisco Lopez Valadez.

Sidney W. Bijou and Patrick M. Ghezzi have published an *Outline of J. R. Kantor's Psychological Linguistics*. The outline covers Kantor's book, point by point, and clarifies difficult material. It is ideal for classroom use, but also serves as a kind of "Cliff Notes for Kantor" for anyone wanting to understand Kantor's approach. The book is available from Context Press (see ad on last page).

J. R. Kantor's Publications

With the recent death of Helene J. Kantor the inventory of Principia books authored by J. R. Kantor has been moved to the University of Akron archives. For now, you may call John A. Popplestone [(216) 972-7285] at the University of Akron, if you would like to order any of J. R. Kantor's books.

Interbehaviorists at UNR

We are happy to acknowledge that both Patrick Ghezzi and Sidney Bijou have made their way to our department at the University of Nevada.

Patrick has been teaching both undergraduate and graduate classes. He has also initiated contracts to consult in local school districts which have proven to be excellent training opportunities for our graduate students. We are very happy to have Patrick with us.

Sidney Bijou has been helping with the school consultations and is also serving as a mentor to all of us. Sid has been an excellent addition to our program, he inspires both students and faculty alike. We are grateful to Sid for his services.

Missing Persons

We have received a number of our newsletters "returned to sender" with no forwarding address. Your help in locating these individuals is appreciated:

Melissa Cooper, Louise Kent-Udolf, John Lyons, Katy Maloney, Peter Morgan, Tim Murphy, Timothy B. Sinnott, Paul Stewart, Linda Talmoge, Lynn Tubbs

Article

Interbehavioral Psychology: Outstanding in the Field or Out Standing in Its Field

Edward K. Morris

University of Kansas

I am honored to speak with you this morning about the place of interbehavioral psychology in the organizational structure of the behavioral psychologies more generally. Art, though, may have selected a wrong person, for I am not, as Kantor might have put it, a "pristine" interbehaviorist. I defer to my colleague, Dennis Delprato, for a truly interbehavioral perspective on the matters before us (see Delprato, 1979, 1990a).

I am not pristine because my interests are in integrating radical behaviorism, interbehavioral psychology, and related views into a more effective science, technology, and epistemology (Morris, 1982, 1984, 1988a; Morris, Higgins, & Bickel, 1982). Integration, though, can be dangerous because for an interbehaviorist to value radical behaviorism, and vice versa, is sometimes to be, not once, but twice a heretic (Morris, 1988b). As I have noted elsewhere, we live sometimes in a dogma eat dogma world

Problems

Let me begin by suggesting that behavioral psychology's organizational problems are actually behavioral problems. Cast that way, we can address an apparent problem in the sociology of science as a problem in the behavior of scientists. The organization as host, as it were (cf. Baer, 1976).

The Behavior Analysts' Problem

Skinner's 1988 ABA Newsletter article, "The Cuckoos," sets the occasion for my remarks, for it was there that he chastised the interbehaviorists for being members of the Association for Behavior Analysis (ABA) and Division 25 of the American Psychological Association (APA). Since its publication, "The Cuckoos" has been viewed, by some, as a serious intellectual and organizational threat to interbehavioral psychology. But is "The Cuckoos" really a problem? No, Skinner's writing it was, perhaps. But is Skinner responsible for that? No, his behavior is just as lawful and orderly as is any other organism's. The problem is in controlling variables that lie elsewhere.

Why would Skinner write "The Cuckoos"? He told us why, in part, via his criticisms, but let me offer some background. Before "The Cuckoos" was published, Skinner read it to me while I was on sabbatical in Cambridge. He also told me it was not for publication, only for circulation among colleagues, though some of them were urging him to go public. He was irked at the criticisms of radical behaviorism published and presented in behavior-analytic forums (e.g., Kantor, 1970). What he especially emphasized to me, though, was his displeasure over the harsh tone of those criticisms (e.g., Parrott, 1983). "The Cuckoos," then, was partly a side-effect of aversive control, and should have come as no surprise.

Having written "The Cuckoos" for private circulation, why would Skinner then publish it? Others undoubtedly know more about this than I but I speculate that one proximal cause was the Fall, 1988 issue of Behavior Analysis, the Division 25 journal, which contained a special section on "The Psychology of J. R. Kantor," dedicated to the centennial of Kantor's birth. Not all of this material was celebratory, however. Again, some of it was harsh in criticism of behavior analysis, misunderstanding it as well (e.g., Roca, 1988; cf. Marr, 1984). That it was published in the journal of an organization established for the experimental analysis of behavior must have greatly aggrieved Skinner (but see Moore, 1983-1984). Counter-control quite naturally ensued.

The Interbehaviorists' Problems

I was editor of the newsletter, The Interbehaviorist, when "The Cuckoos" was published, and received concerned inquiries about what problems might ensue. My first concern, though was for Skinner: Someone I like and respect had been, I thought, a little ungracious in public. That, alone, hurt. Second, I did not see "The Cuckoos" as a scientific or an organizational problem, for it seems not to apply to interbehavioral psychology, but to some of the behavior of some interbehaviorists. Let me address some of the issues raised in "The Cuckoos."

Skinner (1988) asked: "Why have interbehaviorists joined and why do they remain members of the Association for Behavior Analysis and Division 25 of the American Psychological Association?" (p. 9). An answer: Because these organizations promote a natural science of behavior, just as does interbehavioral psychology. That interbehaviorists join is a compliment, not a complaint.

Skinner (1988): "Those organizations were founded to promote the experimental analysis of behavior and the use of its principles in solving problems" (p. 9). A reply: True, but those organizations also promote conceptual analyses of behavior, such as those offered by radical behaviorism. Interbehavioral psychology is, to date, also largely a conceptual and interpretive undertaking--as Skinner's work has been for the past 30 years--and naturally finds a home in organizations that share many of its perspectives (see Moore, 1984; Morris, 1982, 1984).

Skinner (1988): "Interbehaviorists criticize the validity of [behavior] analysis and its applications. But one does not join the Darwin Society and use its journals and meetings to promote creationism" (p. 9). A reply: Creationists, of course, do not join the Darwin Society, any more than out-and-out cognitivists join ABA or Division 25 to promote mentalism. Neo-Darwinians, though, do join the Darwin Society and, in extending and elaborating on Darwin's views, they advance the field of evolutionary biology. Interbehaviorists join ABA and Division 25 out of similar interest and concern, seeking to advance the science.

Skinner (1988): "Why do they not have an association of their own to hold meetings and publish journals? In other words, why have they not built a nest of their own to lay their eggs in?" A reply: The interbehaviorists are too few to support an association or a journal. AABT has about 4000 members, ABA 2000, and Division 25 1000, whereas The Interbehaviorist has only about 100 subscribers. The first behavior analysts, though, were also once too few, and so they belonged to APA Division 3 for Experimental Psychology. When they eventually increased in number, they formed an independent division and published their own journals. Thus, even if we organized something like Art's suggestion for an over-arching "Society for Behavioral Psychology" (Staats, 1989), the problems faced by the interbehaviorists would be no different than they are

now--interbehaviorists would remain simply too few.

Conclusion

Yes, then, ABA and Division 25 are behavior-analytic organizations. They were established as such in the first place, and we should not expect them to be otherwise. Even so, have behavior analysts constrained any interbehavioral activities? Is it that interbehaviorists cannot join ABA or Division 25? Or cannot present papers at ABA or Division 25 meetings? Or cannot past editors and the editor-elect of *The Behavior Analyst*--myself, Sigrid Glenn, and Jay Moore--are interbehavioral in persuasion, or subscribe to or publish in *The Interbehaviorists*, and if Division 25's past and current journal/newsletter editors--Linda Hayes and myself--are interbehaviorists, pristinely or not, then interbehaviorists cannot take "The Cuckoos" as indicative of any limiting features in behavioral psychology's current organizational structure. "The Cuckoos" is not the cause or correlative of any difficulties, but rather a consequence of interactions among individuals holding different views on behaviorism as a natural science of psychology.

Interbehavioral Solutions

Given these lack of constraints on interbehavioral activities, I see no necessity for changing any organizational structures at this time. Given that still other means for representing interbehavioral interests are available, further complaints about any impediments may be more a function of restricted acumen, energy, and imagination than opportunity. AABT and ABA, for instance have a special interest group (SIG) structure that allows interbehaviorists to form their own internal groups and to sponsor convention symposia, which they have done.

As for the ABA symposia, two are usually offered each year. One is explicitly interbehavioral and offers "introduction to" material (e.g. Hayes, 1990; Chiasson, 1989; Midgley, 1988). It targets ABA members who are curious about interbehavioral psychology, but who are uninterested in criticisms of behavior analysis, especially when presented in a sometimes foreign tongue. The second symposium targets advanced topics, but keeps "interbehaviorism" out of its title (see Bijou & Morris, 1989; Delprato, 1990b). Importantly, these symposia invite well-known behavior analysts to serve as discussants (e.g., Baer, 1990; Pennypacker, 1989). Not only

does this increase session attendance, but it also requires the behavior analyst to engage in interbehaviorism deeply and seriously, the consequence being that at least one behavior analyst's repertoire might be altered. Interbehaviorists ought not always be discussants on their own symposia – behavioral scientists of other persuasions should also be invited (see, e.g., Reese, 1990).

If the interbehaviorists offer behavior analysis something useful, then their ABA SIG will grow in size and their newsletter will become a journal. Neither is disallowed by behavioral psychology's organizational structure. Unfortunately, neither is the possibility that we may soon have as many behaviorisms as there are behaviorists, which is not a very pretty sight.

For instance, in addition to the behaviorisms represented this morning (i.e., interbehavioral psychology, Kantor, 1959, 1981; radical behaviorism, Skinner, 1953, 1974; paradigmatic behaviorism, Burns, 1988; Eifer & Evans, 1990; Staats, 1981, 1986, 1987), we can point to "praxics" (Epstein, 1984, 1985, 1987; contra. Barry, 1986; Deitz, 1986; Gaydos, 1986; Leigland, 1985; Malagodi & Branch, 1985) and "behaviorology" (Comunidad Los Horcones, 1986; Fraley & Vargas, 1986; Fraley, 1987; Vargas, 1987; contra. Barry, 1986). Also not represented are emergent behaviorism (Killeen, 1984), social learning theory (e.g., Bandura, 1977), and cognitive behaviorism (e.g., Meichenbaum, 1977). We need to be careful, though, in aligning with some of these behaviorism, for some of them are no behaviorism at all. Indeed, if radical behaviorists are really concerned about the pernicious effects outsiders may have on ABA, then they should be aghast that the cognitive behaviorists make up almost 10% of the ABA membership (Survey Results, 1989, p. 19). That their interbehavioral colleagues comprise but 3.6% of the membership should be an organizational irrelevancy.

Conclusion

In conclusion, those behaviorisms that are behaviorism need to avoid cloistering themselves from and critically abusing each other. As for the criticism, its sometimes trident tone has an unhealthy religious fervor to it, as though the truth had been revealed to one group and not the others – the others being but dissenting religious sects. Although many behaviorisms may dissent over particulars, they share more than is worth the consequences of sectarian animosity. As I have noted elsewhere (Morris, 1988a), that

they share so much should be the basis for some "sects" – that's S-E-C-T-S – some "sects" appeal, as well as some "sects" education. We ought to be putting our "sectual" energy to better use.

As for the cloistering, one consequence of organizational isolation is the inbreeding that produces anomalies and sterile monsters, if any breeding at all. The related conceptual systems may then grown narrow, inflexible, and nonadaptive. With that, they become less able to draw strength from and assimilate related perspectives or accommodate what might be valid criticisms of their own programs. They simply stop evolving. The organizational isolation of interbehaviorism, radical behaviorism, and paradigmatic behaviorism may have just those effects.

In the end, there will be but one science of behavior, just as there is essentially one physics, one chemistry, and one biology. Unfortunately, the allure that our behaviorism will be the behaviorism fragments us, forcing us to compete with one another – pre-paradigmatic science, red in tooth and claw. The duplication of effort and resources this produces decreased our collective ability to establish and promote a science of behavior and its application. It also diminishes our collective force both within the profession and the discipline of psychology, as well as within the culture at large (Staats, 1983). Indeed, if behaviorists cannot take each other seriously, why should anyone else?

Our long-term interests are best served, I think, by altruistically enhancing our inclusive fitness. Only by accommodating and assimilating our behavioral diversity scientifically and professionally – but not eclectically – can we insure our survival. Art's asking us to consider these issues seems a maximally adaptive thing to do.

Footnote

1. Item #7 on the ABA Membership Survey (Survey Results, 1989, p. 19) asked "What one conceptual orientation best describes your position?" Of the 560 respondents, these were the answers:

Behavioral	264 (47.1%)
Radical Behavioral	180 (32.1%)
Cognitive Behavioral	56 (10.0%)
Interbehavioral	20 (3.6%)
Behaviorological	15 (2.7%)
Cognitive	4 (0.7%)
Other	18 (3.2%)
NA	7 (1.3%)

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Author Note

I thank Art Staats for inviting an earlier version of this paper (Morris, 1989), and Bryan D. Midgley and James T. Todd for their perspicacious comments on it and still other versions. Reprint requests should be sent to the author at the Department of Human Development, 4001 Dole Human Development Center, University of Kansas, Lawrence, KS 66045-2133.

Paper presented in A. W. Staats (Chair), *ABA/AABT/Division 25: Do They Adequately Represent Behaviorism, Maximize Behaviorism's Strengths and Development?* Syposium conducted at the meeting of the Association for Behavior analysis, Nashville, TN, May 30, 1990.

SQAB

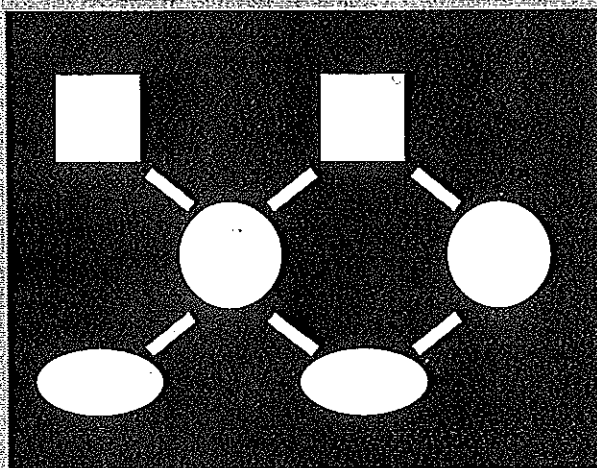
17th Annual Meeting: Atlanta, Georgia May 26-27, 1994

The Society for the Quantitative Analyses of Behavior (SQAB) is holding its annual meeting in conjunction with the Association for Behavior Analysis (ABA) rather than at Harvard. This year's meeting will be held at the Atlanta Hilton beginning May 26th the day before ABA. Presentations will be given by K. Cheng, M. Davidson, E. Fantino, G. Fetterman, R. Grace, R. Kessel, P. Killeen, A. Logue, J. Mazur, J. Nevin, H. Rachlin, J. Richards, W. Roberts, R. Shull, C. Shimp, J. Staddon, and J. Wixted. Topics will include analyses and models of: choice, discrimination, timing, steady-state, and transitional behavior.

For membership, registration or information contact:

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Article

A Return to the Space \leftrightarrow Time Continuum: Empirical Notes From Teacher Educators

Tom Sharpe

University of Nebraska-Lincoln

Andrew Hawkins

West Virginia University

It has long been challenging for educational researchers to describe and analyze in concert the complex, rapidly occurring, array of behavioral and setting events operating in live instructional settings (Dawe, 1984; Eisner, 1983; Gage, 1978, 1984; Jackson, 1968). In a theoretically post-positivist era, current methodological debate often centers around the ability of particular tactics to capture "private" events, correlating such ability with tactical viability (cf., Heward & Cooper, 1992). Specific to educational research, the current zeitgeist of constructivist and qualitative assessment approaches purport to succeed in the private event arena, however are criticized for their inherent subjectivity and lack of validated measures (Salomon, 1991). On the other hand, quantitative and behavior analytic instruments are often viewed as either: (a) too time consuming an undertaking in naturalistic settings, or (b) lacking in their ability to fully capture teacher \leftrightarrow pupil interactions due to what has been termed a simplification by isolation technique (Iran-Nejad, McKeachie, & Berliner, D., 1990).

Behaviorally oriented literature may, however, be argued as an exception to Lloyd's (1992, p. 333) perspective that "one can discern too few rational and thoughtful observations" in the midst of current educational reform. Behavior analytic measurement of the processes emitted in instructional settings facilitate: (a) a common terminological language across teacher educator and student, intern, or practicing teacher that may be translated into well defined instructional procedures; (b) the formulation of a viable metric in determining relative improvement from teaching trial to teaching trial, and (c) teacher education program substantiation of the observable characteristics of its final products.

Our empirical efforts in this area have been first driven by Heward and Cooper's (1992, p. 358) perspective that a "scientific approach [with all of its attendant assumptions] to produce an effective and reliable technology of education" is warranted regarding teacher education. Second, our work is predicated on Leary's (taken from Wilson, 1986, pp. 36-38) "game" analogy regarding group interaction. Akin to the interbehavioral position of post Einstein physics, organismic interaction described objectively and relativistically must include neuro-muscular interaction (behavior) and the larger defining rules of the game (ecological and historical events). A seven dimensional game model was derived in which the researcher must ask the following questions for complete mapping of the experimental territory:

1. What are the defined roles of the players (history)?
2. What is the language of the game and the semantic/linguistic world view implied (history)?
3. What are the goals of the game and the purpose served (history)?
4. What are the rules of the game accepted by all players (context)?
5. What are the recommended strategies for success (context)?
6. What is the ongoing character of space \leftrightarrow time location (setting)?
7. What are the characteristic movements and behaviors in space \leftrightarrow time (behavior)?

Similar to the transactional conception of organismic interaction which interbehavioral theory espouses, Leary emphasized that: (a) specification of where organisms are in space \leftrightarrow time, and (b) definition of the observable signals exchanged, are both necessary to complete understanding of psychological events.

In this light, an interbehavioral field systems tactical approach is viewed as an amenable educational research and instructional assessment tool, given: (a) its suitability with the largely behavioral character of the teaching<->learning process, and (b) its technological capability of more completely capturing the nature of the instructional process than traditional paper and pencil recording methods which constrain the evaluator to a more limited number of variables tracked (see Sharpe & Hawkins, 1993; Sharpe, Hawkins, & Ray, submitted).

Instruction as a System

In defining an interbehavioral field systems approach to educational phenomena, we rely primarily on methodological interpretation of Kantor's (cf., 1922, 1959, 1969) conceptual contributions, and Ray and Delprato's (1989) tactical interpretation thereof. In summary, the term interbehavior is used to emphasize the interaction among organisms in teaching<->learning environments, field speaks to an attempt to take into account the interaction among teacher and student behavior and the instructional setting factors within which they operate, and system is used to emphasize the dynamic and reciprocal interaction of these many operative elements in space<->time.

Altman and Rogoff (1987, p. 24) provide the following definition of the instructional setting in supporting the "goodness-of-fit" between interbehavioral research tactics and educational phenomena:

"... the [instructional] whole is composed of inseparable aspects that simultaneously and conjointly define the whole... a spatial and temporal confluence of people, settings, and activities that constitutes a complex organized unit... these aspects, that is, person and context, coexist jointly and define one another and contribute to the meaning and nature of... the [instructional] event."

If one compares the scientific evolution of biology, physics, and psychology toward field systems contextualism as presented by Morris (1992, Table 3, p. 21), with the above characterization of classroom settings, it is apparent that an interbehavioral field systems methodology is compatible with the character of typical educational settings.

To illustrate, if evaluating the teaching of a middle school movement education class, taking into account isolated teacher behaviors (e.g., instruction, observation, management, etc.), even when

coupled with a dimension of student behavior (such as subject matter engagement or on-task), does not provide a complete structural mapping of the situation. One must also provide information concerning: (a) the sequential nature of teacher and student behaviors (e.g., instruction->observation->task engagement->feedback; rule->example->rule; structure->solicit->respond->evaluate; etc.), (b) the situational features of the lesson (e.g., IPI, large group, materials used, etc.), and (c) the space<->time relationships among teacher stimulus and student response packages and the larger lesson ecology. Characterization of instruction across curriculum areas and instructional settings may also require differing behavioral terminology, as the Bloom taxonomy for example may capture effective social studies teaching but not be necessary to the typical movement education classroom. Herein lies interbehavioral field systems' tactical utility in providing a technological tool which may objectively evaluate instructional interactions in differential context, with a space and time based metric primary to description and analysis endeavors.

Empirical Examples

Familiarizing researchers with current empirical applications has generally been a productive avenue in encouraging use of alternative means of scrutinizing experimental phenomena. Our notes additionally render an inclusionary stance in relating what we feel to be forms of interbehavioral (as conceptualized) field systems research and training applications. It is our perspective that those who take an exclusionary perspective to their work within a larger profession or culture run the danger of extinction within their lifetime. On the other hand, an inclusionary stance should better ensure that a particular world view survives beyond the generation which spawned it. Currently, behavioral systems efforts exhibit a wide and diverse authorship which has fostered many linguistic characterizations. In this regard, some of the emerging work by systems researchers who choose the term of ecobehavior (as well as other characterizations) are included.

Most interbehavioral work in education may be traced to the precision intervention conceptual framework of Greenwood, Carta, Arreaga-Mayer, & Rager, (1991). A generic describe and analyze strategy is typically used which first inductively derives structural mapping schemes, and second analyzes time dependent relationships contained within from a

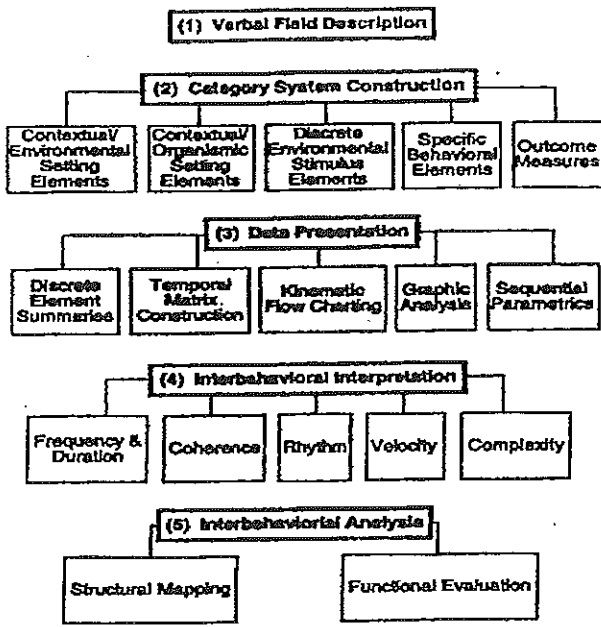


Figure 1

probabilistic stance. Application to a diverse set of settings and circumstances is therefore possible, highlighting the unique characteristics of each. Figure 1 provides a schematic of a general tactical protocol.

Evaluation

Ongoing teacher evaluation work in our practicum based teacher certification programs provide a first example of fruitful application of interbehavioral methods. We are currently implementing a teacher assessment procedure based largely upon the generic category system in Table 1 (derived from effective instructional behavior identification in the literature, and associated empirical work with teachers of variable experience and expertise, teaching various subject matters in different settings) and the related tactical guide (Figure 1), in providing descriptive and prescriptive information to student, intern, and inservice teachers in portfolio fashion.

As the Figure 2 example demonstrates, findings indicate that complex preservice teacher stimulus packages may be changed in the recommended directions over time, based upon: (a) an interbehavioral technology's ability to describe and analyze temporal data in applied settings, and (b) consequent teacher evaluator ability to provide detailed goals for instructional improvement based upon systems oriented data (see Sharpe & Hawkins, 1993; Hawkins, Sharpe, & Ray, in press; Sharpe & Hawkins, submitted; for a detailed implementation description inclusive of

Table 1

BEST Categories, Descriptions, Codes, and Examples

Categories	Number of Codes	Description	Examples of Codes
Ecological: Setting	8	Service delivery setting	Regular class, resource room, partitioned, gymnasium
Content	10	Subject matter content	Science, math, english, physical education
Content Stage	3	Temporal status of lesson	Introduction, lesson body, review
Materials	6	Physical resources	Task cards, pupil folders, workbooks
Pupil Grouping	3	Physical arrangements	Large group, small group, individual
Method of Instruction	6	Stimulus method to occasion responding	Command style, task teaching, questioning, peer teaching, self instructional, cooperative
Teacher: Behavior	22	Teacher's behavior relative to student	Observation, verbal instruction, interpersonal, managerial
Focus	3	How behavior is directed	Individual student, general class, non-student
Position	5	Relative proximity to target student	Central, peripheral, proximate, distant, out of room
Student: Academic	5	Active response	Task appropriate, Task engaged, motor, cognitive, verbal
On-Task	5	Organizational responses	Transition, absorption, waiting, supportive, instruction of peers
Off-Task	3	Academically competing responses	Active disruption, self-stimulation, passive
Historical: Teacher Definition	11	Organismic history of setting impact	Educational certification, years and type of experience
Student Definition	17	Organismic history of setting impact	Age, cultural background, SES, achievement, and discipline

teacher<->student temporal data).

Data which substantiates the interbehavioral evaluation system's ability to effect complex tempo-

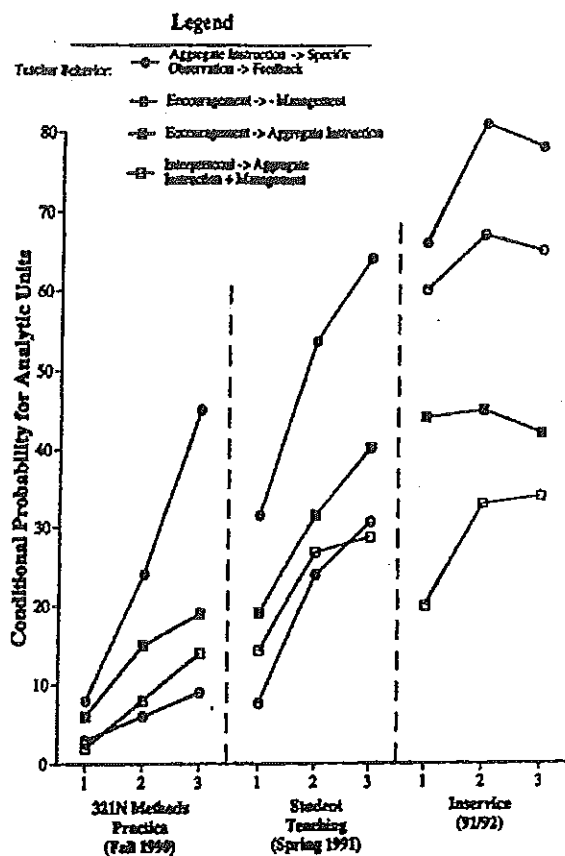


Figure 2

rally based behavior change in undergraduate trainees in applied contexts, is viewed as quite salient in light of teacher education's longstanding challenge of maintaining recommended instructional practices in their certified charges post preservice education experiences. Such long term empirical substantiation of the interbehavioral assessment protocol provides impetus for further experimentation with behaviorally oriented instructional evaluation techniques which include a systems character.

Applied Research

As we have stated, the above teacher education/evaluation application example is largely based upon behavioral systems research designed to discover the most salient relationships among stimulus and response classes in situational context. Much of this recently emerging work has come forth under the terms ecobehavior analysis, which adds to behavior analysis the assessment of situational or contextual factors (e.g., classroom physical arrangements, instructional materials, etc.), and field systems analysis, which adds probabilistic analyses of temporally based behavioral interactions (e.g., structure→solicit→re-

spond→evaluate). Though their full importance and eventual additions to education are yet to be realized, current contributions include: (a) the development and validation of specific classroom instructional procedures, (b) the development of a number of approaches to the reduction of challenging behaviors, (c) an improved understanding of the components of effective instruction in context, and (d) a better understanding of how the quality and character of instructional implementation functions as a mediating variable for student outcomes (refer to Greenwood, Carta, & Atwater, 1991 for a complete literature review).

From this type of work, precision intervention techniques have been developed and proven to be beneficial to particular educational settings (e.g., Kamps, Leonard, Dugan, Boland, & Greenwood, 1991). Related research examples include the structural description of educational phenomena in context (Carr & Durand, 1991), setting specific interventions (Patterson, 1974; 1982), behavior↔ecology analyses (Carta, Greenwood, & Robinson, 1987; Greenwood, Delquadri, & Hall, 1984, 1989), and expert↔novice teacher comparisons in context (Sharpe & Hawkins, 1992).

Consistent findings from this research avenue in school settings include the importance of, and means to: (a) accelerating students' academic responding, and (b) increasing time allocated for active student engagement in academic responses. Systemic interventions which alter instructional behavior and classroom contexts to determine relative gains in academic responding and related achievement indicators show great promise for educational improvement. Though only summary has been provided for select empirical applications, emerging systems tactics (e.g., Frick, 1990; Greenwood, Carta, Arreaga-Mayer, & Rager, 1991; Ray & Delprato, 1989; Sharpe & Hawkins, 1992) should serve to help educational researchers determine the effects of particular instructional processes for specific instructional settings, subject matters, and learner profiles.

Simulation and Theory Testing

Often greater rewards flow to quick and clever followers than to brilliant and original inventors, however, without the inventors we followers would be without original impetus. This statement is particularly salient with respect to both the simulation work of Roger Ray (1992) as applied to educational

concerns, and to the testing of basic science principles such as Matching Law in applied educational settings.

It is with emerging instructional simulation applications that a test for the fidelity of the interbehavioral instructional maps made is provided. It is also in the simulation area that most research and development applications remain yet to be discovered. With technologically enhanced data file reproduction used in concert with videodisc copies of the actual instructional episodes from which the data files were made, applications such as: (a) tests of instructional episode reproduction accuracy, (b) preservice, novice inservice, and expert instruction comparisons and related scaffolding, and (c) laboratory based practice teaching simulation inclusive of decision making and predictive functions, may be realized (refer to Berliner, 1992; and Ray, 1992 for greater depth of discussion in this area). Computer driven forums for teacher aspirants to learn and practice their skills without the inherent challenges of pupil accountability when in front of an actual classroom is an appealing concept to teacher education. Providing student and intern teachers with an introductory means to instructional practice without the detrimental effects of poor practice with live students may have the propensity to dramatically improve teacher education efforts. In addition, striving toward a more complete view of the simulated relationships among operative variables in particular instructional settings, when endeavored in concert with advancing technologies, should only serve to facilitate greater pedagogical understanding. If pursued, a more effective science of teacher education should naturally evolve, inclusive of enhanced intern teacher instruction and assessment applications.

Another appealing application which has remained largely unrealized, is that of basic theory testing in applied educational settings through interbehavioral methodologies. The study of laboratory science principles in applied settings via strategies which can more completely track the complex stimulus and response classes (and the rate and character of emitting and responding behaviors) related to a particular theory, has been an ongoing challenge to those interested in behavioral phenomena (see The Behavior Analyst, 1991). It seems to us that a systems oriented describe and analyze procedure may shed greater light on the traditional search

and validate challenges related to the transcription of "basic" behavioral processes to "human" settings. Shriver, Kramer, and Sharpe (submitted) provide one appealing example in validating Matching Law Theory in educational settings via interbehavioral methodology.

Methodology

Operating on our view that a primary means to improving the current state of public education lies in improving the day-to-day effectiveness of the individual teacher, development of technologies which enable concurrent evaluation of behavioral and context variables within particular instructional episodes should demonstrate great promise. The ongoing methodological question is thus one of, 'how should such a rich setting be evaluated, given emerging technologies which may be of help?'

Many advances related to technological application are currently emerging, overcoming the skeptic's concern of, 'is conducting interbehavioral research worth the increased effort and expense in terms of the yield in new knowledge?' Cost of hardware is rapidly diminishing. Software applications are rapidly becoming more efficient, with capabilities designed for individual implementation on-site in applied settings. Current software packages allow for complex overlapping event collection (via virtual keyboarding) and immediate screen or hard copy analysis (e.g., discrete event summaries, graphic representation, and descriptive and "Z" score temporal analyses based upon Bakeman & Gottman (1986), and Gottman & Roy's (1990) sequential analysis illustrations). Notation programs are available for recording atypical characteristics of existing events, or inductively recording additional and/or overlapping events as they become manifest. Logically specified pattern in time event searches are now possible using preceding event, succeeding event, origination event, and length of chain parameters. Lag time specifications may also be generated in a pattern in time search (a time parameter between the onset of a central event and the onset of others), particularly useful if multiple ongoing events obscure a temporal cluster of interest. Many data collection and analysis applications are now contained on disk and may be driven by laptop hardware. Compatibility, and the ability for time-stamped hook-up, with video technology is also available (see Sharpe, Hawkins, & Wood, in press; or contact the primary author for tactical

examples of all mentioned applications). The enhanced complexity of data collection and immediate availability of analysis results is viewed as a distinct advantage to the favorable arguing of interbehavioral research.

Though inductive systems methodologies, and advancing technologies, are currently being implemented in efforts to gain greater understanding of psychological phenomena, scientific protocol is still scarce with regard to: (a) category system construction, and (b) interrater reliability issues regarding temporal data (Wruble & Ray, 1992). Questions concerning parsimony versus complexity of inductively derived category systems, the danger of infinite regress versus accurate field representation as systems become more complex, and statistically viable methods of assessing temporally based interrater accuracy, still need to be addressed in facilitating the scientific maturation of interbehavioral methodology. Experimenting with rules of governance related to these issues remains largely uncharted at present.

The current methodological challenge lies not only in continuing with the task of trying to describe and assess the instructional process, but also in recognizing and experimenting with new tools available for accomplishing the task. As we come to greater understanding of the many attendant variables of the instructional process, we should also focus empirical efforts on the technology available to well research that process.

Summary

Though empirical applications of interbehavioral methods are beginning to emerge in educational research, much remains as yet unknown about the primary functional relationships of instructional expertise in context. What remains, however, is that experimental models which attempt to discern the behavioral processes which maximize instructional potential in context for particular students, are the models which hold greatest promise for direct educational improvement (Metzler, 1992).

Inherent in efforts toward a scientific technology of teacher education via interbehavioral methods, lies the propensity for a better means of providing student and intern teachers with: (a) the ability to describe and better understand what exactly should be done in particular instructional settings, (b) the means of ensuring contextual understanding across instructional settings, (c) what to look for in student behavior and in the evaluation of their own teaching

behavior, and (d) how to initiate behavior change with future instructional attempts. Related to further methodological/technological exploration, areas which should significantly impact teacher education are: (a) more capable recording instruments designed for use in naturalistic instructional settings which bring us to greater understanding of the primary components of instructional expertise, and (b) more sensitive data analyses which focus upon temporally based behavioral interactions.

What hopefully endures is the view that a systems oriented categorical approach to empirical work provides a vehicle for a more complete representation of the phenomena of interest. Therefore, conceptual systems and related technologies which facilitate the implementation of interbehavioral approaches to educational research will hopefully flourish in coming to greater understanding of just what teacher, student, and ecological categories are most strongly related to student learning in context and, hence, should be prioritized for preservice teacher education.

Prior to recommendations of adopting better advertising techniques with regard to interbehavioral methods, one must first agree that answers to what is as yet unknown about instructional settings may require exploration of alternative research and evaluation practices. As a final thought, if we are to accept the premise that "laws" contained in traditional research models are only "generalizations" based on experience, then concepts which do not fit these traditional models should not be rejected a priori. They should be given careful scrutiny, as clues that might lead us to better models tomorrow. The position which rejects this view and claims to know with certitude which "laws" are absolute brings one full circle historically to Plato's absolutism. Absolute laws in the Platonic sense cannot be known scientifically, as even Plato himself realized. They can only be "known" by acts of faith based on traditional model outcomes. From both empirical and existential perspectives, no one knows at a certain point in time if we have any absolute laws in our intellectual common market. All that we know is that we have some models which seem to work better in accurately characterizing the world about us than some of the older models which the scientific community has shelved. Only time, and tentative experimentation with new models and their attendant technologies, will provide answers regarding the ultimate utility of new models.

It is our hope that continued experimentation with temporally based systems analyses of stimulus and response classes in context, and data-based simulation of particular settings may provide greater understanding of why teachers are more or less effective given a particular set of circumstances, and why particular students respond in a particular way in particular contexts within the ongoing instructional process. Even in the mainstream of behavior analysis it is now apparent that it is not always enough to attempt to establish that one particular variable causes change in another in isolated fashion in gaining a better "understanding" of applied settings (Morris, 1992). By addressing applied interests through alternative search and validate tactics, many of the yet unknown educational variables primary to optimal instruction may come to light.

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Notes

The Ontological Dilemma in System Building

Debra W. Fredericks

University of Nevada

All philosophical systems include fundamental assumptions regarding the existence of the world. In other words, whether or not it is believed that there exists something outside of our study of it participates in all interbehaviors of scientists, philosophers, theologians, and layman alike. For scientists, clearly stating the basic ontological (and epistemological) beliefs underlying their system is necessary for the development of a cohesive system. J. R. Kantor always conscientiously elucidates his underlying assumptions. In *Psychology and Logic* (1945), he considers the building of logical systems on the basis of two theses; specificity theorem and interbehavioral theorem. The basic ontological and epistemological assumptions underlying these theses are defined and analyzed, thereby contributing to the cohesiveness of his philosophical system as a whole.

According to Kantor, logical interbehavior is a system building activity, e.g., "an enterprise for organizing, arranging, and ordering things for particular purposes" (Kantor, 1945, p. 293). Those "things" which are organized, arranged, and ordered are the products of the logician's direct or indirect interaction with natural events. Sometimes the logician interacts directly with events and other times with the products of their, or other's, direct or indirect interactions with events. The implication is that "... even though logical systems can be built of detached responses . . . the system builder is always located in an interbehavioral field" (Kantor, 1945, p. 164). Although Kantor states that he is unwilling to deal with "ultrametaphysical" (1945, p. 161) ontological questions, e.g. interbehavioral psychology simply assumes the existence of organisms and objects, I think he deals with this issue by making traditional ontological concerns a non-question.

The traditional ontological dilemma "concerns the relationship between logical work and products and actual things and events" (Kantor, 1945, p.

161). In other words, do stimulus objects exist distinct from logician's responses to them? This results in a dichotomization of thoughts, sentences, or forms (products of logical interbehavior) and existing things (stimulus objects). Kantor states that this dichotomy problem is resolved by "taking strict account of the field in which the logician is operating and especially the particular kinds of stimulus objects he is handling" (1945, p. 162). Herein is how Kantor makes the ontological dilemma a non-question; he allows for systems to be built using concepts or constructions without regard to whether or not these concepts or constructions directly correspond to existing events. The important issue is in regard to "system building procedures. . . (and). . . the specific conditions under which the construction takes place" (Kantor, 1945, p. 169) instead of the existence of things. In other words, logic is inherently ontological; the logician exists in an interbehavioral field and the products are derived from this existence.

This is not to say that Kantor accepts the possibility of the nonexistence of things. By focusing upon specific interactions and, particularly, the kinds of stimulus objects participating in these interactions, it can be determined whether or not the "construction is completely unjustified by the event" (Kantor, 1945, p. 165); such of which occurs in dualistic, metaphysical system building. To clarify, constructions are not determined to be unjustified on the basis of whether or not it is an abstraction, but on the basis of the interaction with products of which the abstraction, itself, is a product. In contrast, nonexistence is traditionally confused with "abstraction products as materials" (p. 163) but Kantor (1945) argues that all products, even products derived from natural events are abstractions.

In addition to ontological concerns of whether or not things exist outside of our interaction with them is the epistemological question of how we come to have knowledge of the world. Traditional epistemology is "centered in such questions as how to achieve certainty, how to integrate appearances with underlying

reality" (Kantor, 1959, p. 25). The ontological logician's verification of correspondence between real events and our knowledge of the events results from spurious confusion between the events themselves and our description of them. According to Kantor (1959), the products of our interaction with stimuli and those stimuli are of the same spatiotemporal (naturalistic) framework, including knowing action. Knowing is an orientative behavior, e.g., we assume an intellectual attitude, or develop an idea about something (Kantor & Smith, 1975). In regard to the traditional treatment of knowing, the ontological logician overlooks two important points relevant to system building. First, system building is an activity of logicians operating in an interbehavioral field; the materials, as such, derived from interbehavior (Kantor, 1945, p. 164). The linguistic reference to an event may function both as a product or stimulus object in system building. By establishing the validity of our knowledge of events on the basis of our referential interaction is to overlook the field within these products were derived and confuse the event with its description.

Secondly, events themselves cannot validate the system of constructions built upon the products of

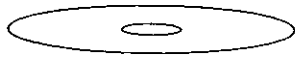
our interactions with those events. Kantor (1945) states "neither a reaction to things nor a description of that interaction exists antecedently to the interaction" (p. 165). In other words, our "knowledge" of things is not something inhered in the events themselves. Knowledge is a type of interaction with things;

it is, itself, a type of product of that interaction. Within the context of system building, logic is, therefore, not a product of interaction with "items" of knowledge. Traditionally, assumptions are based upon a metaphysical doctrine that logic deals with absolute reality. From an interbehavioral perspective, our knowing responses are a type of logical interbehavior which participates in the operations of system building.

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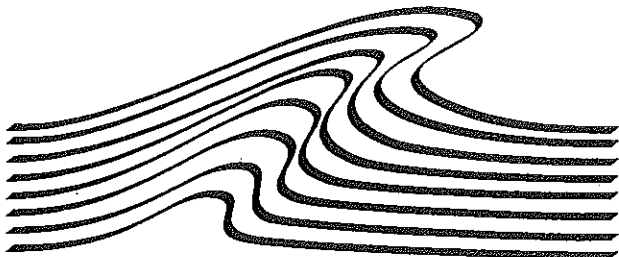
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