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The Experimental Analysis of Human Behavior (EAHB) Special Interest Group is organized under the auspices of the Association for Behavior Analysis for the purpose of facilitating the growth of a multi-facited experimental literature that uses human subjects to analyze the relations between behavior and the variables that influence it. The EAHB Bulletin serves the special interests of this group by disseminating useful information that is customarily not published in the field's archival journals.

Contributors are encouraged to submit only those materials for consideration for publication which fall within the guidelines specified above. These materials may include, but are not limited to, research notes, i.e., information about specific procedures, anomalous and negative findings, etc., annotated bibliographies, convention and conference notices, specially prepared course materials, and miscellaneous classified advertisements. All submissions should be addressed to W.F. Buskist, Department of Psychology, Auburn University, Auburn, Alabama, 36849.

Information about joining the EAHB SIG may be found inside the back cover.

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TRIBUTE TO HAROLD WEINER

On March 1 of this year Dr. Harold Weiner, noted EAHB author and advocate, died.

Dr. Weiner was born on March 28, 1932, in Brooklyn, New York. His family lived in Brooklyn throughout his youth. Dr. Weiner attended the City College of New York, receiving his B.A. in Psychology in 1953. He subsequently obtained his M.A. in 1958 and Ph.D. in 1960 from the University of Maryland.

Throughout his career, he held many administrative and professional positions in the Washington, D.C. area. In 1960 he served as Associate Research Scientist and Director at the Behavioral Research Laboratory, American Institute for Research. From 1961 to the time of his death, Dr. Weiner was the Director of Behavior Therapy and Chief of the Behavior Analysis and Therapy Branch at Saint Elizabeth's Hospital. In addition to this post, he served as Clinical Professor of Psychiatry, Department of Psychiatry at the George Washington University Medical School. He also served as Professor of Education at the Institute for Behavioral Research in Silver Spring, Maryland, from 1965 to 1967 and as a Special Consultant and Educator for the Psychiatric Institute in 1975 and 1976. He also maintained a private practice as a psychotherapist from 1972 until his death.

Among the honors and awards which Dr. Weiner received during his distinguished career were memberships of fellow in The American Psychological Association and the American Association for the Advancement of Science. He also received a Citation for inventive contributions of electronic instrumentation in biomedical research (U.S. Department of Commerce, dated December, 1962) and was a recipient of the Superior Service Award and Medal of the Department of Health, Education, and Welfare in 1965.

Among the research manuscripts which Dr. Weiner contributed to EAHB, ten appeared in the Journal of the Experimental Analysis of Behavior and three appeared in The Psychological Record. Dr. Weiner's research was widely cited by his fellow researchers with his manuscripts in JEAB and the Record alone receiving more than 70 citations by colleagues.

Dr. Weiner's work addressed many important and timely issues dealing specifically with analysis of human operant behavior. He pioneered much of the early research involving basic behavior processes in humans (six articles in JEAB prior to 1965). His research expertise and record were greatly valued and will be sorely missed by us all.

RESEARCH NOTES

Verbal Behavior: Is The Human Operant Lab an Ideal Place to Begin?

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Why do human operant research? There seem to be at least three reasons, two weak ones and a strong one. One weak reason is just to see if principles developed with other organisms apply to humans. This is "weak" because unless we have reason to believe the principles won't apply it amounts to a "botanization" approach to behavioral principles. If we have to show every principle with every species just for drill, we'll be wasting a lot of time.

A second weak reason is because humans may at times seem to be convenient subjects. Unfortunately, they are also subjects who have a very complex history. For most uses, we will trade off any convenience with a good deal of noise in our data.

The strong reason is this: because the action of certain behavioral processes are best viewed (or maybe even only viewed) with human subjects. The effect of verbal or symbolic behavior is an outstanding example. If you want to understand verbal behavior, it will be necessary to study humans - at least to discover the precise nature of the behavior that needs explanation.

Why hasn't the human operant laboratory been used extensively to study verbal behavior? One reason may be that

Skinner concentrated on the speaker in the verbal episode. An analysis of the speaker appeared to be demanded, while the action of the listener seemed to be readily interpretable from existing principles, and no additional credibility would accrue to the basic analysis by focusing on the behavior of the listener. In this view, even a pigeon in an operant chamber is "listening" in a sense. An analysis of the listener holds no special appeal.

It is possible, however, to view listening as having more to do with verbal behavior than is reflected in the "listening" behavior of the pigeon. There are several reasons to believe this to be true. The recent literature on the differences between nonhuman and human responding points strongly to the role of instructions, rules, self-rules, and the like as the source: all are verbal operations on the behavior of the listener. It is hard to see how the literature on insensitivity to schedule control in humans can be extrapolated from the types of stimulus control well understood in the animal literature. Control by verbal stimuli on verbal humans appears to require a special analysis.

The literature on equivalence classes suggests that humans may respond to stimulus relations in fundamentally different ways than nonhumans. The concept of equivalence classes seems to clarify why behavior controlled by verbal stimuli (when that stimulus is functional because of its verbal nature) might be more than the kind of stimulus control exerted over nonhuman listeners. Rule-governed behavior is an appropriate term for this type of behavior. A rule is a stimulus. Unlike other stimuli, however, it seems to have acquired its function in part through participation in equivalence classes. Thus, if a dog stops when you say "stop" it is easy to imagine particular histories which might have led to such control. When a human stops because you say "stop" it could either be due to these same types of histories or, most likely, control established indirectly because stop is equivalent to words like "halt" or "desist" and actions like halting, pausing, refraining, and so on. When a stimulus is functioning discriminatively because the stimulus participates in a network of equivalence relations, it is something fundamentally different than direct discriminative control. Viewed in this way, rule-governed behavior is every bit as worthy of special analysis as is the behavior of the speaker.

Once it is seen that rule-governed behavior indeed has important implications for understanding verbal behavior, there are strong reasons to study the behavior of the listener and not just that of the speaker. These occur in four major areas:

1. The breadth and discernability of behavioral classes. While it is easy to classify words and phrases structurally (e.g., into nouns, verbs, and the like) it is extraordinarily difficult to do so functionally. The determination about which class a given verbal output represents can be made only by understanding in detail a person's past history and the current source of control over the response. Unfortunately, these are typically unknown or relatively inaccessible. Since a given verbal operant can take a large or even infinite variety of highly distinct forms, measurement becomes extraordinarily difficult.

Conversely, the behavior of the listener is much more constrained. We can more readily examine whether or not a rule is followed because the rule itself limits the nature of possible rule-following. Similarly, we can examine the effects of rules on well-defined ongoing operant behavior.

2. The measurement of response strength. There is no well-agreed upon method for measuring the strength of individual verbal operants. Response frequency is clearly inadequate. This, of course, was exactly the problem Skinner labored over in Verbal Behavior. Resistance to change seems hopeful, but it has not yet been applied with precision to the behavior of speakers.

With rule-following, measuring response strength presents problems no greater than that experienced in the laboratory generally. In fact, the human operant lab retains considerable expertise in precisely this area. Resistance to change, for example, readily applies to rule-following, as is shown by the literature on schedule insensitivity.

3. The lure of structuralism. One of the most salient characteristics of spoken language is that there is an inherent structuralism it promotes. The speaker produces words, signs or other outputs which can be listened to, transcribed, or recorded. These words and signs are not behavior—they are the by-products of behavior. Because words are said to "mean" certain things based on their form and structure—you understand these very sentences, for example, based solely on form and structure--a concern over behavioral by-products almost automatically leads to structuralistic views of language.

While we can artificially impose a structure on the behavior of the listener, the tendency is not nearly as strong as with the behavior of the speaker. The behavior of the listener has no literal meaning based on the form of behavior, and we would rarely mistake behavioral by-products for behavior itself in the listener. To the contrary, the lack of structure apparently required for literal meaning has tended to mask the relevance of the behavior of the listener to verbal behavior, despite our commitment to a functional approach.

4. Access to manipulable variables. In a given situation a speaker speaks because of a complex history with a multiplicity of variables, and because of a current sensitivity to the same. The subtlety and multiplicity of variables that control the natural emission of verbal behavior makes an experimental analysis extremely difficult.

Conversely, the variables controlling the behavior of the listener are much more available to the researcher and can be elegantly controlled in the human operant laboratory. Rules and instructions can be administered at will by the experimenter. The consequences for following rules can be manipulated in their type (e.g., social, monetary), frequency and probability.

When viewed in this way, the human operant laboratory is critically positioned to do what we have long needed: to develop a strong behavior analytic research strategy which will advance our understanding of verbal behavior. Studying the behavior of the listener seems to be a possible key to that strategy.

Some Implications of Interbehavioral Psychology for the Experimental Analysis of Human Behavior (EAHB)

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J. R. Kantor's interbehavioral psychology is a natural science of behavior that is explicitly contextualistic and field-theoretic in orientation (see Kantor, 1959). Although Kantor's system sents a complementary view to radical behaviorism, and vice versa (Morris, 1982), the implications of inter-behavioral psychology for research in behavior analysis have been overlooked, perhaps for reasons on both sides (Moore, 1984; Morris, in press). Nonetheless, positive and constructive implications do exist, and can be drawn quite readily from a presentation that Kantor made to Division 25 on the Experimental Analysis of Behavior (TEAB) at the 1969 meeting of the American Psan Psychological Association and that was subsequently published in the Journal of the Experimental Analysis of Behavior (Kantor, 1970).

In presenting an analysis of TEAB, Kantor (1970) was both praising and critical. On the one hand, he called TEAB "one of the first adequate scientific formulations of experimental psychology" (p. 102). On the other hand, much of the paper was a cogent critique of TEAB practices. Introducing the issues most generaliy, Kantor (1970) wrote, "An effective science surely demands in addition to sound theory a wide open perspective, that is a profound regard for relevant events" (p. 101). In what follows, some implications of interbehavioral psychology for EAHB are presented by examining what might be meant by having "a profound regard for relevant events" and by "taking a wide open perspective."

Having a Profound Regard for Relevant Events

Having "a profound regard for relevant events" has many implications, but two stand out. First, TEAB could benefit by

focusing more on human behavior as the subject matter of a natural science, rather than relying primarily on (a) the extension of principles derived from research on nonhuman behavior or (b) the interpretation of human behavior on the basis of these principles. This implication, though, is exactly what EAHB is about, and needs no further comment.

Second, EAHB should examine not merely the organism as a whole, but rather human behavior as a whole. The unit of analysis is not just the relationship between responses and stimuli (e.g., button pushing and "points"), but includes the contexts necessary for those interactions — history, setting factors, and the media of contact (see Kantor, 1959). All such factors in the behavioral field are functionally interdependent; no one of them is more important to behavior than any other.

In an EAHB button-pushing-and-points situation, for example, a complete analysis would include consideration of interactional history and setting factors. Interactional history is what imbues stimuli and responses with their functions; in the present example, it imbues "points" with stimulus functions and people with response functions. The organism not only brings a behavioral repertoire to the experimental setting, but also response functions; in an analogous sense, the environment not only brings a stimulus repertoire (or potentiality) to an experimental setting, but also stimulus functions. The importance of the human subject's interactional history is perhaps no better illustrated than by the wide individual differences prevalent in much EAHB research, even in rather restricted conditions. Setting factors are what determine which stimulus and response functions, acquired in the historical context, will occur. The setting function is served through many means, for instance, through schedule of reinforcement, establishing operations, and instructions. These factors may be central to problems of the wide intrasubject variability seen in EAHB research. Neither interactional history nor setting factors can be as well controlled for in EAHB as in TEAB, hence all the more reason to give them explicit attention.

Interestingly, a perusal of the nonhuman TEAB literature shows that research to be moving in the directions Kantor (1970) recommended, especially in the analysis of historical context (e.g., establishing operations and response dependencies). If TEAB with nonhumans is moving in these directions, and if EAHB has anything in common with TEAB, then EAHB might also look to expand its focus. Indeed, EAHB has already begun to do so, as in research on historical causation (e.g., Weiner, 1981), and multiple response analyses (e.g., Bernstein & Ebbeson, 1976; see also Morris, Higgins, & Bickel, 1983, pp. 166-168). Continued expansion of this regard for relevant events should be encouraged.

Taking a Wide Open Perspective

In Kantor's exhortation that TEAB "take a wide open perspective," the implications are not merely that behavior be studied as a whole, but that EAHB might also benefit from a more thorough understanding of behavior in its everyday context. In other words, EAHB must go beyond the generic factors examined in the typical research laboratory (e.g., generic stimulus functions such as reinforcers) to the content and substance of human interactions as described by our natural language of social discourse (see Dietz & Arrington, 1983).

The content and substance of human behavior are not fully captured by the content-free principles of the laboratory. Content-related interactions (e.g., speaking with our tap dance teacher) develop through relevant histories (e.g., the behavior and related contingencies of being asked whether we practiced the day before); their occurrence is facilitated or inhibited by relevant setting factors (e.g., the current aversiveness of having botched up a shuffle-step-shuffle); and they are enabled (or not) through relevant media (e.g., the loud snickering of the other class members). These interactions, and the subtle distinctions between them tacted by our natural language, are also characterized by their specificity. For instance, "reminiscing" about having seen Top Hat and "recalling" the Rogers-Astaire dance sequence to "Isn't This a Lovely Day (To Be Caught in the Rain)" are not just

issues of stimulus control — these behaviors have meaning in the context of everyday life. Moreover, tacting "reminiscing" and "recalling" is not the same as tacting "stimulus control." This sort of reductionism may lead EAHB to overlook an important sense of what it means to be human. Some EAHB research has begun to focus on such substantive issues, as in research on cooperation and competition (see Hake & Olvera, 1978), but EAHB could benefit further by taking an even wider perspective.

The importance of this last implication goes beyond the need to understand the content of human behavior. At issue is also the credibility of a natural science of human behavior. To date, the bulk of the empirical evidence for the radical behavioral view of human behavior comes from EAHB research and applied behavior analyses demonstrating that behavior-environment relationships can be established by selective reinforcement. These demonstrations are not seriously in doubt, but they do not directly establish that the contingencies of reinforcement are the explanation for behavior change in a person's lifetime or for a person's current behavior — this is what is in doubt, especially among nonbehaviorists. Proof for the latter requires descriptive analysis that contingencies operating on everyday behavior play the same role as those that are manipulated in the experimental analysis of behavior. Analogous data of this latter sort constituted the greater part of Darwin's evidence that the contingencies of survival explained phylogenetic change and current speciation; experimental data on selective breeding played but a minor role. The extant descriptive analyses of human behavior come largely from psychologists who are not inclined to a natural science of behavior (e.g., psycholinguists) and whose data are often not interpretable within a natural science framework. Descriptive behavior analyses occasionally occur in the form of naturalistic observations and baseline data published in applied journals and in the work of sympathetic others (e.g., Moerk, 1983), but remains a wide open area of research for EAHB. This argument does not mean that EAHB researchers need to abandon the laboratory, but rather that they consider expanding their concept of what a laboratory can be. Dictionary definitions do not restrict "laboratories" to specialized rooms within academic and research settings. Laboratories are most generally the settings where scientists carry out their research. Human behavior is found in a myriad of settings, any one of which could be a laboratory.

Conclusion

Kantor had been reported to say that Aristotle was the first interbehaviorist, that he himself was the second, and that Skinner was the third (Verplanck, 1983, p. xiv). From that perspective, current EAHB practice should not be seen as the only possible instantiation of a research program derived from a natural science orientation — whether radical behavioral or interbehavioral. Some interbehavioral implications for EAHB may then also be seen as extensions of radical behavioral views — views that are sometimes explicit, sometimes implicit, and sometimes hidden. The value of interbehavioral psychology is that it makes explicit those views that are implicit or hidden, and allows for the derivation of additional implications based on the unique aspects of a contextualistic and field-theoretic orientation. Whatever the source of these implications, EAHB will benefit by having a profound regard for and taking wide-open perspective towards those implications that lead to more effective understanding and practical action.

References

Bernstein, D. J., & Ebbeson, E. B. (1976). Reinforcement and substitution in humans: A multiple response analysis. Journal of the Experimental Analysis Behavior, 30, 243-253.

Dietz, S. M., & Arrington, R. L. (1983). Factors confusing language use in the analysis of behavior. Behaviorism. 11, 117-132.

Delprato, D. J. (in press). Response patterns. In H. W. Reese & L. J. Parrot (Eds.), Advances in behavioral science. Hillsdale, NJ: Lawrence Erlbaum Associates.

Hake, D. F., & Olvera, D. (1978). Cooperation, competition, and related social phenomena. In A. C. Catania &

T. A. Brigham (Eds.), Handbook of applied behavior analysis: Social and instructional processes. New York: Irvington.

Kantor, J. R. (1959). Interbehavioral psychology. Granville, OH: 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.

Moerk, E. L. (1983). A behavioral analysis of controversial topics in first language: Reinforcements, corrections, modeling, input frequencies, and the three-term contingency pattern. Journal of Psycholinguistic Research, 12, 129-155.

Moore, J. (1984). On reciprocal behavioristic concerns. The Interbehaviorst, 13, 10-11.

Morris, E. K. (1982). Some relationships between interbehavioral psychology and radical behaviorism. Behaviorism, 10, 187-216.

Morris, E. K. (in press). Interbehavioral psychology and radical behaviorism: Some similarities and differences. The Behavior Analyst, 8.

Morris, E. K., Higgins, S. T., & Bickel, W. K. (1982). The influence of Kantor's interbehavioral psychology on behavioral analysis. The Behavior Analyst, 5, 158-173.

Verplanck, W. S. (1983). Preface. In N. W. Smith, P. T. Mountjoy, & D. H. Ruben (Eds.), Reassessment in psychology: The interbehavioral alternative (pp. xi-xxv). Washington, DC: University Press of America.

Weiner, H. (1981). Contributions of reinforcement schedule histories to our understanding of drug effects in human subjects. In T. Thompson & C. E. Johnason (Eds.), Behavioral pharmacology of human drug dependence. Rockville, MD: National Institute on Drug Abuse.

Behavioral Stimulation as a Guide to Inner Processes

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For the researcher, perhaps the most salient characteristic of human behavior is the degree to which it is mediated by experimentally unobservable events. The traditional psychologist characterizes these events as mental, and their inaccessibility presents problems for measurement and description. The behavior analyst characterizes these events as behavioral, and inaccessibility presents problems for prediction and control of the overt behaviors they mediate.

One approach to the problem has been to accept inaccessibility as a given, and to attempt to account for behavioral variability in the traditional manner of operant research—by careful analysis of the environment. Unfortunately, this approach seems more and more to lead to the postulation of nonbehavioral events such as rules (e.g., Carter and Werner, 1978).

Simulations of complex behaviors may provide more satisfactory explanations. There are two steps in the technique: initially, forms of the behavior of interest are trained which include overt, observable mediators. Then, the trained forms of the mediating behavior are prevented. The procedure appears to provide a variety of kinds of information.

In the course of training explicit mediators the conditions necessary for their acquisition, and the properties the behavior must possess to function as mediators, are revealed. The product of this training is a laboratory preparation. It is a form of the complex behavior in which many of the workings have been rendered visible for observation and analysis.

Preventing the trained form of behavior tests to see if the originating contingencies have the capacity to produce a class of responses capable of mediating the terminal behavior. There is no reason to assume that this class membership cannot extend to covert, i.e., technically unmeasurable, forms of the behavior. Thus, if the terminal behavior remains when initially trained mediating behaviors are prevented, examination of the training procedure tells something about the origin and properties of a possible type of covert mediator. The result is, at the very least, a simulation of the actual phenomenon

under examination —but one susceptible to explanation in terms of the originating contingencies rather than inferred events.

In recent research to study generalization of delayed matching to sample, non-verbal retardates were trained to represent various shapes with handsigns or pictures, and normal children represented spatial orientations with arrows. The process of training a form of matching to sample with overt mediators capable of sustaining generalization to novel stimuli, revealed how mediating behaviors must be acquired, and the special structure of stimulus control that must be maintained by them for generalization to occur (Lowenkron, 1984).

When the trained forms of mediating behaviors were prevented by removing the pictures or arrows, or by requiring the children to hold things in their hands during the task, the terminal behavior continued. Experimental analysis revealed that other forms of mediating behaviors, as members of the response class acquired during initial training, functioned in the absence of the initially trained forms. Much of what was learned about the overt mediating behaviors could be ascribed to the modified forms that replaced them and extrapolated to fully covert forms.

All this is not to say that the procedure is not without difficulties. Inevitably, there is the question of generality — to what extent do trained forms of the behavior emulate naturally occurring forms? The question is almost certainly susceptible to empirical study. Understanding the properties of trained forms of behavior can only contribute to the analysis of naturally occurring forms.

References

Carter, D.E., & Werner, T.J. (1978). Conditional discrimination learning by pigeons. Journal of the Experimental Analysis of Behavior, 29, 565-601.

Lowenkron, B. (1984). Coding responses and the generalization of matching to sample in children Journal of the Experimental Analysis of Behavior, 42, 1-18.

RESEARCH PROFILES

The following descriptions are provided to inform our readers of the current research of group members. Future issues will describe other research.

CLOYD HYTEN, West Virginia University. I am currently collaborating with Phil Chase in the experimental analysis of verbal behavior. Specifically, I am investigating the process of self-editing through the use of an interactive computer format. In Verbal Behavior, Skinner (1957) analyzed self-editing as behavior which alters the form of a verbal response from a punished form to a reinforceable form which is then released to a listener. According to Skinner, self-editing develops under conditions of listener punishment and is maintained by reductions in punishment or additional reinforcement for released verbal responses which have been edited.

A major problem confronting researchers who wish to investigate this important process is the covert nature of much self-editing. In vocal conversations self-editing is often a private event; in written communication much self-editing is inapparent because of erasure or re-writing. An interactive computer format allows us to retain the social interaction necessary for immediate consequation of verbal responses, while enabling us to automatically record any self-editing performed by the subject on his/her text prior to its release to the experimenter. Experimenter and subject will participate in a "teacher-student" scenario in which the experimenter-teacher will ask the subject-student (via interfaced micro-computers) to answer questions about concepts. The student will be able to produce an answer on the monitor and edit as desired before transmitting it to the teacher. The teacher will reinforce such released responses heavily during baseline, and then begin to punish released responses in a subsequent phase. The teacher's reinforcing and punishing comments will be transmitted to the student's monitor along with an indication of how much money was gained or lost.

Self-editing behavior, such as

backspacing, re-writing or line-deleting prior to release will be automatically recorded on the subject's computer. It is expected that all forms of on-screen editing will be rare during baseline, with exposure to listener punishment in the subsequent phase producing a decline in the frequency of releases as well as the emergence of various forms of self-editing. The interactive computer format allows us to examine a normally covert process by making it public enough to be recorded while retaining its "functionally covert" characteristics (namely, immunity from direct contact with a listener). Additional studies are planned to examine the maintenance of self-editing and subject interactions with multiple listeners.

TOM KELLY, D.R. CHEREK, & JOHN GRABOWSKI, Louisana State University and Veterans Administration Medical Centers. Our primary research interests concern drug effects on human behavior. Three projects, dealing with aggression, nonvocal verbal behavior, and behavioral pharmacotherapeutics, are in various stages of progress.

Epidemiological studies invariably dramatize the catalytic nature of drug use on human aggression. The focus of the first project is the effect of commonly used/abused drugs on human aggressive behavior under controlled conditions. Normal males press buttons to produce points (redeemable for money) on a counter according to an FR 100 reinforcement schedule. Ten responses on a second, concurrently available button ostensibly subtracts a point from a fictitious cohort. Responding to deliver an aversive stimulus (point subtraction) represents our operational measure of aggression. Occasionally throughout the session, points are subtracted from subjects. Cohorts are assigned responsiblility for subtractions. Only during poststudy debriefing is the subject told that point loss was controlled experimentally. Investigations of drug effects proceed along two dimensions. First, the quantitative effects of drugs on aggressive responding are measured using this baseline. Previous studies by Cherek and colleagues have determined that caffeine and nicotine, administered to recreational users, decrease aggressive responding at doses that increase point maintained responding whereas alcohol increases aggressive behavior at doses which have little effect on point-maintained responding. Studies with amphetamine, diazepam, and diazepam-ethanol interactions are in progress. A second dimension of this project determines the behavioral effects of ethanol and amphetamine in the presence of differential environmental factors which either set the occasion for or maintain aggressive responding. For example, drug effects are being monitored on aggressive responding either engendered by various densities of point subtraction or maintained by various lengths of time-out from further subtractions. The purpose of these studies is to isolate potential behavioral mechanisms through which drugs affect human aggression.

As Stephen Higgins (1984) pointed out in the last issue of this newsletter, drug-induced changes in social behavior purportedly contribute to the development and maintenance of human drug-seeking behavior. With the exception of the efforts of Higgins, Stitzer and colleagues at Key Medical Center, Johns Hopkins University (formerly Baltimore City Hospitals), drug effects on social behavior have received little attention. We are currently investigating the variables which control exchange of information (tacts) between normal human volunteers. Subjects respond (button press) to earn points (later exchangeable for money) or pass information to a partner working in a separate room. Our aim is to isolate units of nonvocal behavior through manipulation of social reinforcement (the generalized conditioned reinforcer, "thank you") and concurrent schedules of point availability. This information should prove useful in subsequent examination of behavioral mechanisms of drug effects on social/verbal baselines.

A third area of interest concerns the behavior assessment of pharmacotherapy in psychiatric patients. A clinical behavioral pharmacology research unit is developing in the psychiatric ward at the Louisiana State University Medical Center. The primary focus will be examination of the behavioral

changes of depressed patients during the first several weeks of hospitalization and pharmacotherapy. Blood levels of therapeutic agents and putative transmitter metabolites will be examined along with a range of objective and subjective self-report (e.g., POMS) behavioral measures.

A.W. LOGUE, State University of New York at Stony Brook. In the past my research has focused on self-control in pigeons. For laboratory purposes we define self-control as choice of a larger, more-delayed reinforcer over a smaller, less-delayed reinforcer. Impulsiveness is defined as choice of the smaller, less-delayed reinforcer. My co-workers and I have examined several different factors that can affect self-control in pigeons, including events during the delays, pre- versus postreinforcer delays, deprivation, and specific training procedures. We developed a mathematical model that was able to describe individual differences in self-control.

More recently the laboratory has been attempting to extend this research to human subjects. We have been able to show that adult humans usually choose the larger, more-delayed reinforcer, given that this choice maximizes total reinforcement received during the session. This behavior is in sharp contrast to that of pigeons, which are usually impulsive. The human subjects report using counting and timing behaviors in order to determine which choices will maximize total received reinforcement.

In addition to continuing to explore adult humans' choices between reinforcers of varying sizes and delays, we are now beginning to explore these types of choices in children. Eventually we hope to investigate the role of verbal behavior in self-control of humans of different ages.

The major purpose of our recent research is to assess the adequacy of various mathematical models of choice in describing humans' choices between reinforcers of varying sizes and delays. In this way the research attempts to add to previous knowledge regarding quantitative descriptions of choice. In addition, since most clinical problems are self-control problems, a quantitative analysis of self-control in humans may eventually be of practical use.

GARY F. MEUNIER, Ball State University. We have been studying schedule controlled responding of profoundly retarded, non-verbal adult males. Subjects are seated in a small cubicle and movements of a bat-handle toggle switch, which is mounted on a board at the front of the cubicle, are automatically recorded. We first studied simple fixed-ratio behavior at several ratio sizes and then switched to fixed-interval behavior. Interestingly, although switch responding was not under control of the ratio schedule parameters, entries and exits from the cubicle were. That is, as ratio requirements increased there was no systematic effect on either pre-ratio pausing or response rates but attempts to escape from the contingencies by leaving the cubicle did increase. When subjects were switched to fixed-interval schedules their behavior remained similar to that which had been produced under the ratio schedules. These data would seem to have some importance for theories which argue that the discrepancy between operant responding of normal adult humans and infra-humans is due to the fact that human behavior is under the control of verbally constructed rules. Although these subjects were clearly not able to verbalize contingencies, their behavior was much more "human" than "animal".

W. DAVID PIERCE & W. FRANK EPLING Centre for Experimental Sociology, The University of Alberta. We have been collaborating on research for approximately 8 years. We are currently investigating: a) motivational interactions of operant behavior, b) activity-based anorexia and c) response independent reinforcement and Herrnstein's hyperbolic equation. The motivational interaction of operant behavior concerns the relationship between eating and running and is a spin-off of our previous research on an activity type of anorexia (Epling, Pierce and Stefan, 1983). The general idea is that deprivation-satiation operations applied to eating alter the reinforcement effectiveness of running. Also, similar operations applied to running change the reinforcement efficacy of eating. We are

testing these ideas with rats who can bar press for either the opportunity to run (on a wheel) or for food reinforcement. We manipulate the deprivation status of the organism with respect to one operant (running or eating) and test the amount of bar pressing sustained by the other (Premack, 1962) using an incrementing fixed-ratio procedure.

Our research on activity-based anorexia is continuing and we are now involved with the conditions which will prevent the onset of the disorder or ameliorate it once the process has started. While I can not outline the research and behavior analysis here, the general effect is that rats will engage in excessive running when their food is restricted to a single meal presentation (i.e. a diet). The excessive running suppresses eating or food intake and this leads to a decline in body-weight that further augments the exercise. As extreme levels of running occur the intake is further reduced and the rat dies of starvation. We are investigating how the scheduling of exercise and food prevents or stops this process. There is increasing correlational evidence that this kind of activity anorexia extends to some human anorexias. We are planning an interdisciplinary study of the changes in human food intake and body-weight that a standard running program produces. This study will combine the talents of behavior analysts, medical researchers and physical education experts.

The final project concerning response-independent reinforcement and the quantitative law of effect is based upon an animal experiment by Rachlin and Baum (1972). The idea is to have four human subjects respond on a panel for points later exchangeabled for money. A standard VI 60-s schedule operates on the white-lighted response manipulandum. Completion of the schedule requirement turns off the white light on this button and lights a yellow button situated under a mechanical counter. A single "consumatory" response on the yellow button (FR1) produces a point and again activates the initial response button. When stable baselines are established, we will superimpose a VT 30 s schedule of points on the VI 60 s schedule and again obtain stable response rates. The complete design is an ABAB reversal, counterbalanced for order of presentation. In order to reduce confounding, we shall shape the putton press and not provide any instructions about responding, the contingencies or the free points. According, to the quantitative law of effect, response rates should decrease with the addition of free points. This is because the free points constitute an alternative source of reinforcement and proportional reinforcement on the white response button is less. On the other hand, previous research that we conducted with Dr. Sheila Greer, suggested that response rates often increased with additional reinforcement, which is contrary to the predictions by Herrnstein's equation. The present study attempts to introduce more control and design features that will allow for stronger conclusions than our previous findings.

BEHAVIOR ANALYSIS PROGRAMS

The following descriptions are provided to inform students and other interested persons of the specific emphases, outstanding features and research facilities of particular graduate programs associated with the experimental analysis of human behavior.

University of Kansas

Three groups of investigators in the Department of Human Development at the University of Kansas offer research opportunities in the experimental analysis of human behavior. They maintain separate laboratories, but share in the same research support provided by the Department, and by the Bureau of Child Research through a CORE grant (Center for Research in Mental Retardation Aspects of Human Development, NICHHD). The three groups are supervised by Edward K. Morris, by Judith M. LeBlanc and Barbara C. Etzel, and by Joseph E. Spradlin. The research programs are described below.

Ed Morris's group is pursuing research in the areas of instructional control, behavioral contrast, and the temporal

structure of behavior. Lisa Johnson has been continuing research begun by Steve Higgins on the effects of instructions to subjects to respond on a response-dependent schedule when, in actuality, a response-independent schedule is in effect. Findings to date seem to establish the generality of instructional control across response-independent schedules, hence extending the experimental analysis of "superstitition" via social transmission. Jim Todd and Steve Larsen are conducting studies analyzing the temporal structure of behavior not specified by programmed contingencies. In research on relatively unconstrained behavior, subjects are exposed to an experimental situation, analogous to an extinction-induced aggression paradigm with nonhumans, in which periods of non-contingent reinforcement are alternated with periods of extinction. Current data indicate that the temporal pattern of behavior with a punching bag is similar to that of extinction-induced aggression with nonhumans. In other research on the patterning of a more finite number of sequences for moving a light across a matrix, Todd and Larsen have also been examining the effects of reinforcing a class of potentially correct response sequences, in a series, over two levers. Current findings indicate that response rates are relatively stable and that response topographies generally fall into identifiable patterns, but with large individual differences across subjects. Finally, Larsen and Johnson are conducting research that examines the temporal robustness of behavioral contrast. In their studies, contrast is examined both through the typical within-sessions procedures and by separating the components of the multiple schedule so that they alternate across days, rather than within a single session.

Judith LeBlanc and Barbara Etzel's group conducts research in two separate human experimental laboratories and share an applied preschool laboratory classroom. One human experimental laboratory, directed by Professor LeBlanc, emphasizes instructional control in academic learning; visual and auditory control and error analyses related to the development of educational microcomputer software; observational learning; and stimulus equivalence procedures. The other laboratory, directed by Professor Etzel, emphasizes stimulus control in reduction of errors; visual, auditory, and conditional discrimination learning; cross-modality research; and stimulus control hierarchies. Both laboratories are equipped with microcomputer-assisted stimulus presentation and data processing units, as well as with closed circuit television facilities. In addition to working within these two laboratories, students engage in or consult with others on research conducted in the Diagnostic Learning Classroom that is a part of the Department of Human Development Child Development Laboratory. This classroom laboratory is supervised by Mary H. Aangeenbrug, with Professors Etzel and LeBlanc serving as the research consultants. The classroom is an applied environment in which results from the more basic research projects can be further analyzed.

Joe Spradlin's group conducts research on the development of stimulus classes in laboratory and natural settings at the K.U. University Affiliated Facility in Parsons, Kansas. As in related research by Sidman and his colleagues, this research has demonstrated that preschool children, retarded adolescents, and normal adults can be taught stimulus classes of previously unrelated stimuli through match-to-sample procedures. If subjects are then taught new functions for some of the members of the class, those functions are also often demonstrated for the remaining stimuli of the class not involved in training. In addition to the basic laboratory studies, research has also demonstrated the utility of these stimulus class approaches for teaching class labels, prearithmetic skills, and sign language. Currently, Spradlin, Richard Saunders, and Nancy Schussler are collaborating in laboratory studies to determine optimal procedures for establishing stimulus classes with normal and retarded adolescents and adults. Spradlin, Saunders, and Muriel Saunders are collaborating in teaching severely retarded children such natural stimulus classes as "disposable" and "nondisposable" in classroom contexts.

The M.A. and Ph.D. program in the

Department of Human Development operate according to a Junior Colleague model that encourages close student-faculty interactions and the development in individualized professional skills. Further descriptions of the graduate program and applications are available from the **Admissions Secretary, Department of Human Development, University of Kansas, Lawrence, KS, 66045.**

West Virginia University

The Behavior Analysis program at West Virginia University offers a rare opportunity to pursue a Ph.D. in a strong behavior analytic community where organizational, developmental, clinical, and experimental psychologists approach their studies from a behavioristic viewpoint. The program is one of four in the Department of Psychology offering doctoral-level training (the others are Life-Span Developmental, Child Clinical, and Adult Clinical). There is also a strong behaviorally-oriented Professional Masters degree program in clinical psychology. There are 80 graduate students, 200 undergraduate majors, and 25 full-time faculty in the department.

The goal of the Behavior Analysis program is to produce psychologists who can function in either an academic or an applied setting. We accomplish this by providing training in basic research and theory, conceptual issues, and applications of behavioral principles. We adhere to a Junior Colleague model of training. Students are actively involved in research projects during their first year, and they continue to collaborate with faculty and other students on projects throughout their graduate careers. Emphasis in the applied area is on nonclinical applications such as organizational behavior management, systems analysis, and instructional innovation. The curriculum integrates the basic, conceptual, and applied areas of behavior analysis, and requires students to actively participate in each area. However, students may specialize in either a basic or applied area by selecting elective courses and research activities. Examples of required courses are Organizational Behavior Management, Applied Behavior Analysis, Reinforcement and Punishment, Stimulus Control and Memory, Behavior Theory and Philosophy, and Human Behavior.

The full-time faculty in the Behavior Analysis program are:

Philip N. Chase. Verbal learning (e.g., conceptual behavior, functional classifications of verbal behavior, instructed vs. contingency-shaped behavior); individualized instruction/training (e.g., computer-assisted instruction, employee training systems); and applied research methods.

Kennon A. Lattal. Response-reinforcer relationships and response maintenance; animal psychophysics; punishment; circadian rhythms and behavior; reinforcement theory; and general conceptual issues in the analysis of operant behavior.

B. Kent Parker. Stimulus control; memory; complex sequential learning in animals; research design; and applied behavior analysis.

Michael Perone. Basic processes in the operant behavior of humans (acquisition, speed of response, conditioned reinforcement) and non-humans (escape, avoidance, schedule control); research methodology; laboratory applications of microcomputers; and radical behaviorism.

James N. Shafer. Complex visual discriminations in nonhuman animals, including the learning of natural concepts in pigeons.

Other faculty directly involved in the Behavior Analysis program are:

William K. Redmon. Applied behavior analysis, behavioral contracting, community assessment of mental health needs.

Hayne Reese. Learning and retention in children, life-span research methodology, philosophy of science.

Edward J. Callahan. Behavioral medicine, human sexuality, addictive behaviors, behavioral assessment.

All students begin the program in late August. Completed applications, including Graduate Record Examination scores, three letters of recommendation, and transcripts, must be received by the Department of Psychology by **February 1.** Applicants are automatically considered for financial support, and it is the Department's policy to support all graduate students for at

least four years. Present graduate teaching assistant stipends are $4131 per 9 months for pre-M.A. students, and $4599 per 9 months for post-M.A. students. In addition, tuition and fees are waived. Other sources of financial support for students include applied practica and research assistantships.

Interested persons should contact the **Department of Psychology, West Virginia University, P.O. Box 6040, Morgantown, WV, 26506-6040.** The telephone number is **304-293-2001.**

SPECIALIZED BIBLIOGRAPHIES

Verbal Behavior Research

Dudley J. Terrell
Auburn University

Since the publication of Skinner's Verbal Behavior in 1957, many articles, books and essays have appeared on the same subject. Although most popular among these publications is the continued discussion of conceptual and theoretical analyses of verbal behavior, the following references have been selected for their emphasis on empirical research.

Azrin, N.H., Holz, W., Ulrich, R., & Goldiamond, I. (1961). The control of the content of conversation through reinforcement. Journal of the Experimental Analysis of Behavior, 4, 25-30.

Baer, D.M., & Sherman, J.A. (1964). Reinforcement control of generalized imitation in young children. Journal of Experimental Child Psychology, 1, 37-49.

Boe, R., & Winokur, S. (1978). A procedure for studying echoic control in verbal behavior. Journal of the Experimental Analysis of Behavior, 30, 213-217.

Braam, S.J., & Poling, A. (1983). Development of intraverbal behavior in mentally retarded individuals through transfer of stimulus control procedures: Classification of verbal responses. Applied Research in Mental Retardation, 4, 279-302.

Brigham, T.A., & Sherman, J.A. (1968). An experimental analysis of verbal imitation in preschool children. Journal of Applied Behavior Analysis, 1, 151-158.

Cohen, B.D., Kalish, H.I., Thurston, J.R., & Cohen, E. (1954). Experimental manipulation of verbal behavior. Journal of Experimental Psychology, 47, 106-110.

David, K.H. (1972). Generalization of operant conditioning of verbal output in three-man discussion groups. Journal of Social Psychology, 87, 243-249.

Davison, M.C., & Kirkwood, B.J. (1968). Response cost and the control of verbal behavior under free-operant avoidance schedules. Journal of the Experimental Analysis of Behavior, 11, 173-176.

Greenspoon, J. (1955). The reinforcing effect of two spoken sounds on the frequency of two responses. American Journal of Psychology, 68, 409-416.

Kapostins, E.E. (1963). The effects of drl schedules on some characteristics of word utterance. Journal of the Experimental Analysis of Behavior, 6, 281-290.

Lane, H. (1960). Temporal and intensive properties of human vocal responding under a schedule of reinforcement. Journal of the Experimental Analysis of Behavior, 3, 183-192.

Lane, H. (1964). Differential reinforcement of vocal duration. Journal of the Experimental Analysis of Behavior, 7, 107-115.

Lane, H.L., & Shinkman, P.G. (1963). Methods and findings in an analysis of a vocal operant. Journal of the Experimental Analysis of Behavior, 6, 179-188.

Lee, V.L. (1981). Prepositional phrases spoken and heard. Journal of the Experimental Analysis of Behavior, 35, 227-242.

Levin, G., & Shapiro, D. (1962). The operant conditioning of conversation. Journal of the Experimental Analysis of Behavior, 5, 309-316.

McLeish, J., & Martin, J. (1975). Verbal behavior: A review and experimental analysis. Journal of General Psychology, 93, 3-66.

McNair, D.M. (1957). Reinforcement of verbal behavior. Journal of Experimental Psychology, 53, 40-46.

Rosenfeld, H.M., & Baer, D.M. (1970). Unbiased and unnoticed verbal conditioning: The double agent robot procedure. Journal of the Experimental Analysis of Behavior, 14, 99-107.

Shearn, D., Sprague, R., & Rosenzweig, S. (1961). A method for the analysis and control of speech rate. Journal of the Experimental Analysis of Behavior, 4, 197-201.

ANNOUNCEMENTS

SOUTHEASTERN ASSOCIATION FOR BEHAVIOR ANALYSIS
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ASSOCIATION FOR BEHAVIOR ANALYSIS: INTERNATIONAL

It is a pleasure to announce the formation of the Southeastern Association for Behavior Analysis (SEABA). SEABA will be a regional affiliate of the Association for Behavior Analysis (ABA). Membership requirements for SEABA are the same as those for ABA. If you are already a member of ABA, you may become a member of SEABA by writing to the address below. If you are not a member of ABA and wish to become a member of SEABA, please request application materials by writing to the address below.

The first annual meeting of SEABA will be held November 15-17, Thursday evening through Saturday noon. The meeting will take place at The Landmark Hotel in Myrtle Beach, South Carolina. Reservations may be made by contacting the Landmark directly. The Toll Free number is **800-845-0658.** Please indicate that you are attending SEABA.

A major focus of the inaugural meeting will be with organizational matters. A set of By-Laws has been submitted to ABA for preliminary approval and will be put forward for additional consideration by attenders of the meeting. Officers and members of the Board of Directors will be elected at the first business meeting. These individuals will provide leadership for the next year with more lead time available for planning next years meeting activities.

The major purpose of SEABA is to provide the structure to support an annual meeting in the Fall. This meeting will complement the Spring meeting of ABA. The SEABA meetings will cover the broad range of topics associated with Behavior Analysis found at the ABA meetings. A strong SEABA will provide the opportunity for a second yearly major meeting with a strong behavioral orientation.

Mailing address is **SEABA, Department of Psychology, University of North Carolina at Greensboro, Greensboro, NC, 27412.**

CALL FOR GRADUATE STUDENT REVIEW PAPERS

The Experimental Analysis of Human Behavior Special Interest Group will sponsor its first annual awards contest for graduate student authors. The purpose of the contest is to foster graduate student thinking and scholarly writing in the area of the experimental analysis of human behavior.

Papers must be an integrative review of some area of operant research involving human subjects, although it is acceptable to include discussions of the behavior of other organisms. Papers may be written from a historical, conceptual, theoretical, or empirical perspective. Papers will be judged according to their clarity, scholarship, conceptual rigor and thoroughness by a panel of experimental analysts who are established in this area. Names and affiliations of authors will not be revealed to members of the review panel.

Authors of particularly outstanding papers will be awarded certificates of merit and receive invitations to present their papers at the 1985 ABA convention in Columbus. There will not be a set number of awards or a "first prize." Each author, whether or not they are awarded a certificate of merit, will receive a detailed, written review of their paper.

Submission materials must include three copies of the review paper and a letter from the student's major advisor stating that 1) at the time of submission,

the student has not completed the requirements for the doctoral degree and 2) the paper has been written primarily by the student submitting the paper (although the major professor may help the student organize the paper as well as make conceptual and literary contributions).

Inquiries and/or submission materials should be sent to **William Buskist, Psychology Department, Auburn University, AL, 36849.** The submission deadline is **31 December 1984.**

LATE CALL FOR EAHB SIG POSTERS

The ABA late deadline for submission of poster materials for presentation at the 1985 ABA Convention is 8 March 1985. If you wish to present a poster at the EAHB SIG Poster Session and have not yet sent us your materials, please send **your name, affiliation and poster title (no abstract required)** before **2 March 1985** to **Barbara Wanchisen, Psychology Department, Weiss Hall, Temple University, Philadelphia, PA 19122.**

ERRATA

The first sentence of the fourth paragraph in Barry Lowenkron's research profile (page 4, EAHB BULLETIN, Volume 2, Number 1) should read as follows: While explanations of cognitive processes expressed in terms of the environmental contingencies so explored are not exhaustive, in the sense that some other set of contingencies may produce the same complex behavior, a number of benefits are expected to arise from the research.