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This issue marks the end of another year of SIG activities. Please continue your support by sending your 1989 dues at your earliest convenience. See the inside back cover for details.

THE EXPERIMENTAL ANALYSIS OF HUMAN BEHAVIOR BULLETIN

The EAHB Bulletin is published twice yearly, in the Spring and Fall, by the Experimental Analysis of Human Behavior Special Interest Group (EAHB SIG), a group organized under the auspices of the Association for Behavior Analysis (ABA). Articles in the Bulletin represent the views of the authors. They are not intended to represent the approved policies of the SIG or ABA, or the opinions of the membership of the SIG or ABA. The inside back cover has information about joining the SIG and contributing to the Bulletin. Publication costs are paid by the dues of the SIG members and by the Department of Psychology of West Virginia University.

Editors: Philip N. Chase & Michael Perone, West Virginia University

Editorial Assistants: Theodore A. Hoch & Barbara J. Kaminski, West Virginia University

DEADLINE FOR STUDENT PAPER CONTEST EXTENDED TO JUNE 30

The deadline for submitting manuscripts to the SIG's fifth annual awards contest for student authors has been extended to June 30, 1989. The purpose of the contest is to foster student thinking and scholarly writing in the area of the experimental analysis of human behavior. Both undergraduate and graduate students are eligible.

Papers may be either an integrative review of some area of operant research involving the use of human subjects (although it is acceptable to include discussions of other kinds of organisms), or data-based presentations of the same. They may be written from historical, conceptual, theoretical, or empirical perspectives.

Entries will be judged according to their clarity, scholarship, conceptual rigor, and thoroughness by a panel of judges who are active in the experimental analysis of human behavior. Names and affiliations of authors will not be revealed to the judges (i.e., reviews will be "blind.")

There is no set number of awards. Authors of outstanding papers will be given a handsome plaque certifying their accomplishment and invited to present their papers at the 1990 ABA convention. All authors, whether or not they are

selected for an award, will receive at least two written reviews of their papers.

Submissions or inquiries from graduate students should be sent to Barbara Wanchisen, Department of Psychology, Baldwin-Wallace College, Berea, Ohio 44017. Submissions or inquiries from undergraduates should be sent to Anna D. Hatten, Department of Psychology, Averett College, Danville, Virginia 24541.

Papers should (a) be less than 35 double-spaced pages of text (not counting references, tables, or figures); (b) include a 100-200 word abstract suitable for publication in the Bulletin, and (c) be submitted in triplicate.

In addition, submissions must include a letter from the student's major advisor stating: (a) that the paper has been written primarily by the student (although the major professor may have helped the student organize the paper or have made some conceptual or literary contributions); (b) whether the author is a graduate or undergraduate student; and (c) in the case of graduate students, that the student has not completed the requirements for the doctoral degree.

PROCEEDING OF THE 1988 EAHB SIG GROUP POSTER SESSION

The SIG's fifth annual group poster session was held at the Association for Behavior Analysis Convention in Philadelphia on May 29 from 12:30 to 2:00 p.m. Beth Thomas (Auburn University) was Chair. Over 20 posters were on display, representing a wide range of topics within the experimental analysis of human behavior.

Awards for outstanding posters were given for eight presentations:

Michael J. Dougher, David Greenway (University of New Mexico), & Edelgard Wulfert (State University of New York at Albany), "Respondents through the Equivalence Class."

Michael B. Gatch & J. Grayson Osborne (Utah State University), "Class Formation of Contextual Stimuli and Contextual Control of Complex Classes."

David Greenway, Michael J. Dougher (University of New Mexico), & Edelgard Wulfert (State University of New York at Albany), "Transfer of Conditioned Reinforcement through an Equivalence Class."

Cloyd Hyten (University of North Texas) & Philip N. Chase (West Virginia University), "Style Variation in Self-Editing."

Susan Perkins Maryniak & Alan Baron (University of Wisconsin-Milwaukee), "Reaction Times of Older Adults: Stimulus-Response Compatibility."

Renee Michael & Daniel J. Bernstein (University of Nebraska-Lincoln), "Differential Effects of Instructions and Shaping on the Generalization Skills of Children in a Matching-to-Sample Task."

Joseph S. Volpe, George R. King, & A. W. Logue (State University of New York at Stony Brook), "Choice in a Self-

Control Paradigm with Human Subjects: Effects of a Distractor."

A. Michael Wylie, Thomas G. Mattke, Lisa Tuma, William S. Woods, & Michael P. Layng (Mankato State University), "Human Sensitivity to Fixed-Ratio Schedules of Reinforcement: A Signal Detection Analysis."

Following are abstracts of some of the posters. To encourage correspondence, we have included the name of a contact person at the end of each abstract.

ACQUISITION OF REINFORCING FUNCTION
VIA PARTICIPATION
IN AN EQUIVALENCE CLASS

Cathy L. Watkins
Auburn University

Jeanne M. Devany
Appalachian Hall

This study was designed to determine whether a nonreinforcing stimulus that becomes a member of an equivalence class with existing reinforcers will itself acquire a reinforcing function. A nonreinforcing stimulus and two functional reinforcers were identified for six subjects. For each subject, a three member equivalence class was formed using matching-to-sample training. The equivalence class consisted of two identified reinforcers and one nonreinforcing stimulus. Testing was then conducted to determine if the previously nonreinforcing stimulus had acquired a reinforcing function. Transfer of reinforcing function across members of the equivalence class was obtained for four of the six subjects. Contact: Cathy L. Watkins, Department of Educational Foundations, Leadership, and Technology, Auburn University, Auburn, AL 36849.

RESPONDENTS THROUGH THE
EQUIVALENCE CLASS

Michael J. Dougher & David E. Greenway
University of New Mexico

Edelgard Wulfert
State University of New York at Albany

This study examined whether respondent functions conditioned to one member of an equivalence class would transfer to other members of the class. Five subjects were trained via matching-to-sample procedures to form two three-member equivalence classes. One member of each class was then arbitrarily designated as either a conditioned excitatory or conditioned inhibitory stimulus in a simple respondent conditioning paradigm using shock as the US and GSR as the UR. Subsequent to conditioning, other members of the classes were presented and GSR responses were recorded. Results revealed a clear transfer of conditioning in one of the subjects, some evidence in three others, and a failure to transfer in one of the subjects.

Contact: Michael J. Dougher, Department of Psychology, University of New Mexico, Albuquerque, NM 87131.

THE EFFECT OF SELF-TALK ON THE
FORMATION OF EQUIVALENCE CLASSES

Edelgard Wulfert
State University of New York at Albany

David E. Greenway & Michael J. Dougher
University of New Mexico

This study examined differences in the self-talk of subjects who show equivalence after training conditional discriminations, and those who do not. Subjects were instructed to "think out loud" during training and testing. Results showed a close correspondence between matching-to-sample and verbal behavior. Subjects who tacted the relation between stimuli during conditional discrimination training

performed without error on equivalence probes. Those who compounded the stimuli during training did not show equivalence.

Contact: Edelgard Wulfert, Department of Psychology, State University of New York at Albany, Albany, NY 12246.

TRANSFER OF CONDITIONED REINFORCEMENT
THROUGH AN EQUIVALENCE CLASS

David E. Greenway & Michael J. Dougher
University of New Mexico

Edelgard Wulfert
State University of New York at Albany

This study investigated whether a reinforcement function conditioned to one member of an equivalence class will transfer without training to other members of the class. Subjects were taught four interrelated conditional discriminations (A1-B1, A1-C1, A2-B2, A2-C2) via matching-to-sample and were tested for the emergence of two three-member equivalence classes. A conditioned reinforcement function for the B1 and a conditioned punishment function for the B2 was established through a choice procedure. A novel choice task was introduced and responses were consequted with presentations of either C1 or C2. For all subjects, responses that resulted in C1 as a consequence increased while responses that resulted in C2 as a consequence decreased, thus demonstrating a transfer of function.

Contact: David E. Greenway, Department of Psychology, University of New Mexico, Albuquerque, NM 87131.

GENERALIZED INSTRUCTIONAL
CONTROL OF MATCHING-TO-SAMPLE

Barry Lowenkron & Vicki Colvin
California State University-Los Angeles

Under conditions in which a complex behavior was simulated by directly observable component behaviors, four-

year-old children matched comparisons that were smaller, equal, or larger than the sample size--depending on the color of an instructional stimulus. They then generalized the behavior to novel stimuli and, finally, they learned to compensate for missing comparisons by finding the next larger or smaller comparison depending on the state of the instructional stimulus. The traditional form of explanation for behavior at this level of complexity and abstraction, based on cognitive processes, is replaced by a behavioral explanation based on the directly measured components.

Contact: Barry Lowenkron, Department of Psychology, California State University-Los Angeles, Los Angeles, CA 90032.

PROTOCOL ANALYSIS AND SELF INSTRUCTIONS

Kelly Koerner & Michael J. Dougher
University of New Mexico

Edelgard Wulfert
State University of New York at Albany

David E. Greenway
University of New Mexico

This study examined the effects of talking aloud on simple operant performance, and the relation between task related talk and schedule performance. Sixteen students were instructed to talk aloud while they pressed a telegraph key to receive points delivered on a multiple FR 8/DRL 3-s schedule. Schedule performance was compared with a control group of ten subjects working on the same task who received no instructions regarding talking. The talk aloud and control groups did not differ in schedule performance. Phrases from talk aloud transcripts were coded by content as either task related or not task related. The proportion of task related phrases did not differ significantly between those subjects who performed well and those who performed poorly on the multiple schedule.

Contact: Kelly Koerner, Department of Psychology, University of New Mexico, Albuquerque, NM 87131.

REACTION TIMES OF OLDER ADULTS: STIMULUS-RESPONSE COMPATIBILITY

Susan Perkins Maryniak & Alan Baron
University of Wisconsin-Milwaukee

Six younger and six older women (18-26 years vs. 62-76 years) were given extended exposure to a reaction time task. Complexity was manipulated in two ways, both involving stimulus-response compatibility: the stimuli were either spatial or verbal, and the responses were either in the direction indicated by the stimulus or in the opposite direction. For members of both age groups, the verbal stimuli and the reversed task were the more difficult. Older subjects were generally slower than younger subjects. In addition, the reversed task caused much greater slowing in the old subjects than the verbal stimuli. Time limit contingencies substantially reduced latencies of older subjects, and improvements exceeded those of the younger ones. It was concluded that verbal skills are maintained in older subjects better than spatial skills, and that time limits are an effective way to remediate age-related deficits in speeded responding.

Contact: Susan Perkins Maryniak, Department of Psychology, University of Wisconsin-Milwaukee, Milwaukee, WI 53201.

REACTION TIMES OF OLDER AND YOUNGER ADULTS: LASTING EFFECTS OF PRACTICE

Alan Baron, James W. Journey,
& Luis F. Parra
University of Wisconsin-Milwaukee

Two older women (65 and 66 years) responded to the spatial location of a stimulus, either by moving a lever, or by saying the direction into a microphone. Vocal responding was

slower, and latencies increased as a function of the number of response alternatives (1, 2, or 4 directions). Latencies decreased when fast responses were differentially reinforced and these changes were maintained to some extent when the contingencies were removed. Faster responding was maintained when subjects were recalled to the laboratory 4 to 7 months later. A similar pattern of results was observed in two younger women (22 and 23 years). Although there were substantial individual differences in reaction time, they were not correlated with age. In the case of one old-young pair, the older subject's initial inferiority was eliminated by the training procedures. The older subject of the second pair was somewhat faster throughout.

Contact: Alan Baron, Department of Psychology, University of Wisconsin-Milwaukee, Milwaukee, WI 53201.

COMPARISON OF THE EFFECTS
OF SECobarbital AND DIAZEPAM
ON THE ACQUISITION OF
RESPONSE SEQUENCES IN HUMANS

Stephen T. Higgins
University of Vermont

Maxine L. Stitzer
John Hopkins University
School of Medicine

The barbiturates and benzodiazepines both produce "amnesic" effects and disrupt learning. However, the benzodiazepines are purported to produce greater disruption than the barbiturates. In the present study we examined whether the prototypical benzodiazepine diazepam (0, 5, 15, 25 mg) produces greater impairment than the prototypical barbiturate secobarbital (0, 50, 150, 250 mg) in a human learning paradigm. Subjects were four normal adult men. Drug was administered p.o. in a double-blind crossover design with at least 72 hr between sessions. The experimental task was the repeated acquisition of behavioral chains

procedure, which has been used previously to characterize the effects of sedative drugs in humans. The task was performed on a Commodore 64 microcomputer and required that the subjects learn via trial and error to advance a digit located in the center of the video screen from zero through 9 using three keys of a numeric keypad (i.e., a 10-response sequence). Prior to initiating drug testing, subjects were trained on the task until the percent of errors made in learning the sequence and response rates stabilized. Then, each session the task was done predrug and 20, 50, and 100 min postdrug. A new response sequence had to be learned each time the task was done. Secobarbital and diazepam produced quite comparable dose-effect curves. At peak effect both compounds increased percent errors and decreased response rates as an orderly function of dose. The magnitude of effect did not differ across the two compounds. These results indicate that diazepam and secobarbital produce a comparable profile of effects on human learning. Thus, with regard to learning impairment, the liability of using or abusing diazepam versus secobarbital appears to be the same.

Contact: Stephen T. Higgins, Department of Psychiatry, University of Vermont, Burlington, VT 05401.

ACQUISITION AND PERFORMANCE OF
RESPONSE CHAINS IN HUMANS:
EFFECTS OF TRIAZOLAM AND BUSPIRONE

Warren K. Bickel, Stephen T. Higgins,
& John R. Hughes
University of Vermont

An assessment of a drug's abuse liability includes the degree of behavioral impairment it produces. For example, triazolam is reported to produce behavioral impairment to a greater extent than other similar drugs, while buspirone is reported to produce little behavioral impairment. Previous studies, however, have not examined the

effect of these drugs on human learning. In this study, the effects of triazolam (0, 0.25, 0.5, 0.75 mg/70 kg body-weight, p.o.) and buspirone (0, 10, 20, and 30 mg/70 kg body-weight, p.o.) were examined on human learning (acquisition) and performance of response sequences. Subjects were normal adults. The experimental task was the repeated acquisition of behavioral chains procedure composed of two components. In the first component, acquisition, subjects were required to learn via trial and error to advance a digit located in the center of the video screen from zero through 9 using three keys. A new response sequence had to be learned each time the task was done. In the second component, performance, subjects were presented with the same sequence each time the task was done. Triazolam generally produced a dose-related increase in percent errors in the acquisition component, but only increased errors at higher doses in the performance component. Buspirone generally produced an increase in percent errors at the highest dose on acquisition, but generally had minimal effects on performance. Response rates did not show selective effects across the components. Triazolam produced a greater magnitude increase in percent errors than buspirone and consequently appears to have a greater abuse potential.

Contact: Warren K. Bickel, Human Behavioral Pharmacology Laboratory, Departments of Psychiatry and Psychology, University of Vermont, Burlington, VT 05401.

DIVISION OF LABOR BETWEEN DYAD MEMBERS IN A COOPERATIVE SITUATION

Richard J. DeGrandpre & William Buskist
Auburn University

Previous operant research on human social behavior has mainly examined the development of cooperation or the choice to cooperate or compete. In the present study, three experiments examined

division of labor between two persons responding under a single schedule of reinforcement (FR 100). The three experiments addressed response contribution, dominance in responding, and leadership in response initiation and completion. During baseline, dyads earned points by completing the reinforcement schedule. Following baseline, additional contingencies, unspecified to the subjects, were superimposed on the FR 100; earning points was contingent upon completing the schedule requirement while fulfilling the additional criteria. All subjects' responding was effectively shaped by the contingencies where the reinforcement criteria altered the manner in which subjects divided their responding. These results suggest that division of labor between two subjects can be modified and maintained by changes in reinforcement criteria. Contact: Richard J. DeGrandpre, Department of Psychology, Auburn University, Auburn, AL 36849.

PROGRAM DETERMINANTS OF FIXED-RATIO PERFORMANCE BY HUMANS

A. Michael Wylie
Mankato State University

Richard A. Dubanoski
The University of Hawaii at Manoa

Lever pressing performance of four adult humans was examined under the control of large and increasing fixed-ratio schedules of monetary reinforcement. Ratio requirements for reinforcement were differentially increased across subjects following the establishment of stable baseline levels of schedule performance. Responding and, conversely, the disruption of performance (or "ratio strain") were observed to be influenced by the program of schedule increases. Ratio strain occurred when large increases in response requirements were programmed and not when more moderate increases were scheduled. Subjects were able to

sustain responding at ratio sizes considerably larger than those inducing strain when the ratio sizes were increased gradually. Under these conditions, responding persisted even under the largest fixed-ratios examined, suggesting that under the conditions of this experiment the critical feature of strained performance was the history of the schedule increase regimen. Contact: Michael Wylie, Department of Psychology, Box 35, Mankato State University, Mankato, MN 56001.

HUMAN SENSITIVITY TO FIXED-RATIO
SCHEDULES OF REINFORCEMENT:
A SIGNAL DETECTION ANALYSIS

A. Michael Wylie, Thomas G. Mattke,
Lisa Tuma, William S. Woods,
& Michael P. Layng
Mankato State University

Human schedule sensitivity was investigated using the explicit discrimination measures of sensitivity suggested by the theory of signal detection. A randomly alternating mixed fixed-ratio (FR/FR) schedule of reinforcement, one component of which was a FR 75 (designated as the "signal" schedule) was presented on the center key of a three-key apparatus. After subjects completed the fixed-ratio requirement, they "reported" the presence or absence of the FR 75 via a response on one of the remaining two keys. When ratio requirements were disparate between the two alternating FR schedules, subject sensitivity, defined by accuracy of discrimination, was high. Sensitivity decreased when the disparity between FRs decreased, yet sensitive performance was observed even under the following mixed FR/FR conditions: FR 75/70; FR 75/73; & FR 75/74. The present research suggests that humans may be sensitive to schedules of reinforcement even when the requirements for a particular schedule are only subtly different from the requirements of a second schedule. Contact: Michael Wylie, Department of

Psychology, Box 35, Mankato State University, Mankato, MN 56001.

CHOICE IN A SELF-CONTROL
PARADIGM WITH HUMAN SUBJECTS:
EFFECTS OF A DISTRACTOR

Joseph S. Volpe, George R. King,
& A. W. Logue
State University of New York
at Stony Brook

Reliable choice of a smaller, less delayed reinforcer over a larger, more delayed reinforcer (impulsiveness) has been obtained in adult human subjects when points (exchangeable for money) are deducted from a counter independently of the subjects' behavior. One possible reason for this finding is that waiting for larger, more delayed reinforcers (i.e., self-control) is aversive when subjects repeatedly watch points on a counter decrease during the delay period. Previous research has increased self-control using distracting stimuli during delays. The present experiment obtained decreased impulsiveness when a distractor (radio music) was used with the deduction procedure.

Contact: Joseph S. Volpe, Department of Psychology, State University of New York at Stony Brook, Stony Brook, NY 11794-2500.

CHOICE IN A SELF-CONTROL PARADIGM
WITH HUMAN SUBJECTS:
EFFECTS OF ALCOHOL CONSUMPTION

G. R. King, L. Bonvino,
& A. W. Logue
State University of New York
at Stony Brook

Self-control can be defined as the choice of a larger, more delayed reinforcer over a smaller, less delayed reinforcer. The opposite of self-control can be defined as impulsiveness. It has been claimed that alcohol consumption increases impulsiveness, however no study has directly examined

this question. This study examined the effects of alcohol consumption on self-control in intoxicated, moderate drinking, male subjects. Subjects were exposed to a discrete-trials procedure in which they chose between reinforcers of various amounts and delays. There were no significant differences in overall self-control between control and experimental subjects. However, alcohol consumption did influence other aspects of the subjects' behavior.

Contact: George R. King, Department of Psychology, State University of New York at Stony Brook, Stony Brook, NY 11794-2500.

HUMANS' SENSITIVITY TO VARIATION IN REINFORCER AMOUNT: EFFECTS OF THE METHOD OF REINFORCER DELIVERY

George R. King & A. W. Logue
State University of New York
at Stony Brook

Two experiments examined the effects of different methods of delivering reinforcers on human subjects' sensitivity to variation in reinforcer amount and on self-control. In Experiment 1, the monetary value of the points was varied across conditions, while the number of seconds of access to a "consummatory" response remained constant. In Experiment 2, the consummatory response was eliminated and different numbers of points were automatically delivered during the amount period. The results indicated that sensitivity to variation in reinforcer amount, as measured by the exponents of the matching law, in Experiment 2 was significantly less than in Experiment 1. Furthermore, the subjects in Experiment 2 exhibited significantly less self-control than the subjects in Experiment 1 or in previous experiments.

Contact: George R. King, Department of Psychology, State University of New York at Stony Brook, Stony Brook, NY 11794-2500.

CLASS FORMATION OF CONTEXTUAL STIMULI AND CONTEXTUAL CONTROL OF COMPLEX CLASSES

Michael B. Gatch & J. Grayson Osborne
Utah State University

In a three phase experiment, six college students were trained to order six stimuli into groups of three based upon which of two contextual stimuli was present. Two novel stimuli were then related to each contextual stimulus in order to establish classes of contextual stimuli. All subjects demonstrated contextual control of the conditional relations, and all symmetrical and transitive relations were extant. In Phase 2, two contextual three-member classes were formed by training two novel stimuli to both of the contextual stimuli of Phase 1. Existence of symmetry and transitivity was confirmed. In Phase 3, a test was performed to examine whether the new stimuli in the contextual classes would control the conditional relations learned in Phase 1. All subjects demonstrated control by the novel stimuli of the conditional relations of Phase 1.

Contact: J. Grayson Osborne, Department of Psychology, UMC 2810, Utah State University, Logan, UT 84322.

STYLE VARIATION IN SELF-EDITING

Cloyd Hyten
University of North Texas

Philip N. Chase
West Virginia University

An experiment was conducted to examine the relation between editing and style variation under conditions of listener approval and disapproval. Both subjects reacted to disapproval by varying the form of their responses; one varied subtle aspects of his answer style and the other varied gross aspects of her answer style. Only the subtle variations involved substantial on-screen editing. These data suggest

that, although editing can be facilitated by listener disapproval, it may be only one of several possible reactions to such consequence. Varying response topography (answer style) may be a more basic reaction, and this can occur without detectable editing behavior.

Contact: Cloyd Hyten, Center for Behavioral Studies, Box 13438, University of North Texas, Denton, TX 76203.

DIFFERENTIAL EFFECTS OF
INSTRUCTIONS AND SHAPING ON THE
GENERALIZATION SKILLS OF CHILDREN
IN A MATCHING-TO-SAMPLE TASK

Renee Michael & Daniel J. Bernstein
University of Nebraska-Lincoln

This study examined the effects of an extended history of instructions or shaping on sensitivity to changes in matching-to-sample contingencies. Four pre-school children were instructed

about correct matches in this task, while three children were given no instruction about the task or correct matches. Once each child learned four equivalence classes, some of the matching-to-sample contingencies were changed to see how quickly performance adapted to the new stimulus relations. When equivalence classes were changed without notice, those children given instructions on average needed fewer attempts before mastering the new relations than did those children who learned through contingencies. All of the contingency-shaped children did master the changed equivalence classes. While an extended history of instructions produced more rigid behavior when contingencies were changed, the effect was limited. The rule-governed history delayed acquisition, but it did not completely prevent a change in behavior under new contingencies.

Contact: Renee Michael, Department of Psychology, University of Nebraska-Lincoln, Lincoln, NE 68588-0308.

NEW EDITORS FOR EAHB BULLETIN

Carol Pilgrim and Mark Galizio (University of North Carolina at Wilmington) will begin a two-year term as editors of the Bulletin and chairs of the EAHB SIG on January 1, 1989. Material for publication, membership dues, and other correspondence should be sent to:

EAHB Bulletin
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601 South College Road
Wilmington, NC 28403-3297

Carol, who earned her doctoral degree at the University of Florida, has been a member of ABA since 1979. She is interested in both basic and applied questions in the analysis of human behavior. Some of her basic research is concerned with the effects of orienting

instructions on human operant performance, especially as they occur under conditions of contingency change. Carol also is co-investigator on an interdisciplinary project to improve early detection of breast cancer. She is developing and testing discrimination training procedures designed to enhance detection of small breast lumps.

Mark earned his Ph.D. at the University of Wisconsin-Milwaukee, and has been a member of ABA since 1977. He divides his time between human and animal research. Much of his work with animals has been concerned with the effects of drugs on behavior maintained by negative reinforcement. With humans, Mark is best known for his contributions to the analysis of instructional control, but recently he and Carol began collaborating on a series of experiments on stimulus equivalence.

THE IMPACT OF SKINNER'S "VERBAL BEHAVIOR"
ON THE EXPERIMENTAL ANALYSIS OF BEHAVIOR

Barbara J. Kaminski
West Virginia University

In Verbal Behavior, Skinner (1957) extended the basic behavioral principles discovered with laboratory animals to the specialized area of human behavior known as verbal behavior. Skinner considered this "exercise in interpretation" (Skinner, 1957, p. 11) his most important work (Cohen, 1977). Behavior analysts have acknowledged that understanding verbal behavior is essential to understanding human behavior in general (Catania, 1983; Sundberg, 1987), especially because verbal behavior may be the only behavior that is uniquely human (Catania, 1983).

Despite its acknowledged importance, verbal behavior has not been given much attention by behavior analysts of an experimental bent (Day, 1980; Knapp, 1980). An analysis of references to Verbal Behavior from 1957 to 1983 (McPherson, Bonem, Green, & Osborne, 1984) found that only 3.7% of 836 references occurred in articles that investigated one of the functional categories of verbal behavior outlined in the book. Further, only 2.3% of the references occurred in articles that reported empirical investigations of the functional categories.

This paucity of empirical research inspired by the book has often been attributed to a "lack of interest" on the part of researchers (e.g., Day, 1980; Knapp, 1980; Segal, 1977). This, however, is begging the question. Even if researchers have shown a "lack of interest" in subjecting Skinner's interpretation to experimental test, the reason for the lack remains to be explained. The present article examines some variables that have prevented experimental behavior analysts from taking advantage of the framework presented in Verbal Behavior. It is argued that the scientific costs of pursuing verbal behavior research have

been prohibitive. Consequently, contingencies have favored the experimental analysis of animal behavior over verbal behavior.

Human Operant Research

A number of the factors inhibiting empirical analysis of verbal behavior result from verbal behavior being human behavior. Thus, verbal behavior research has encountered the same difficulties as the experimental analysis of human behavior in general. Two interrelated difficulties faced by human operant research can be identified: problems of experimental control and problems of experimental method.

Until recently, the experimental analysis of behavior has emphasized animal behavior (Boakes, 1983; Lowe, 1983; Perone, Galizio, & Baron, 1988). In terms of the degree of control available, the use of animal subjects offers many advantages, including greater control of setting events, extraneous variables, and behavioral history.

Similar control does not seem possible with human subjects. With rare exception (e.g., Bernstein & Ebbesen, 1978), it has not been possible to control the relevant setting events. Further, it has been noted that human subjects enter the laboratory with complex behavioral histories (Baron & Perone, 1982). Typically, those behavioral histories include verbal behavior. It has been suggested (Lowe, 1983) that the subject's verbal behavior alters the way the subject responds to nonverbal contingencies. As a result, different subjects may respond to the same contingencies in different ways.

A further complication arises when one considers that instructions about

the experimental situation must be given to the human subject (Baron & Galizio, 1983). These instructions can interact with the subject's history to affect performance in the experimental situation. Consequently, the question of how instructions affect control by the experimental contingencies has been the focus of much human operant research (for a review, see Baron and Galizio, 1983).

Selection of appropriate instructions, however, is only one of a number of procedural difficulties faced by the human operant researcher. Early research with humans attempted to replicate the procedures used with animals as closely as possible (Davey, 1988), but this sometimes led to performances that deviated from those of animals (e.g., Lowe, Harzem, & Bagshaw, 1978; Weiner, 1969). Experimenters began to question the procedures being used with humans. The list of procedural questions grew, but without agreed-upon answers to such basic questions as what responses to record, what reinforcers to deliver, and how to deliver them. There has also been the question of how long sessions should last and how they should be scheduled (Bernstein, 1988). Efforts to answer to this question have been constrained by ethical considerations which require that an experimenter be on hand during all experimental sessions. Ethical considerations also place constraints on other aspects of procedure. For example, manipulations that have proved potent with animals, such as deprivation and electric shock, are not likely to be used with humans.

A related problem concerns the number of sessions that should be conducted (Perone & Baron, 1982). While research with animals is typically conducted over many sessions, practical considerations often prevent humans from serving as subjects for extended periods of time. Completing all experimental manipulations, then, sometimes requires that exposure to each manipulation be abbreviated. As a result, experimental conditions are sometimes changed after a

small number of sessions, without regard to the stability of the behavior.

The answers to the above questions have not been readily available and, in fact, many remain laboratory lore (Buskist & Johnston, 1988). Further, these problems may have led some researchers to the conclusion that the obstacles to human operant behavior are insurmountable (cf., Perone & Baron, 1982). Human operant researchers have been faced with the possibility of producing fewer finished products than animal researchers, not only because extra time must be devoted to answering methodological questions, but also because the research often is less successful in establishing desired levels of experimental control. Even when control has been achieved, it has been uncertain what would happen to the finished product, as human operant research sometimes has been considered too applied to be published in journals specializing in animal research and as too basic to be published in journals specializing in applied research (Hake, 1982).

Verbal Behavior Research

The lack of experimental control in research using humans is amplified in the study of verbal behavior. The human subject enters the laboratory with a complex and unspecified history with respect to verbal behavior. Further, in Skinner's (1957) conceptualization, most verbal responses are multiply controlled. Thus, in many cases it appears likely that the verbal operant in the experimental situation is controlled, in part, by unspecified variables resulting from the subject's history. Conversely, the experimental variable may control a number of different verbal responses, only one of which may be the response of interest. As a result, the controlling variables in a given experimental situation are unclear. This problem led MacCorquodale (1969, 1970) to question whether studying a verbal response as a function of one variable was possible or

meaningful.

Further, the appropriate methods to use in the study of verbal behavior have been even less clear than in the study of human behavior. As Hayes and Brownstein (1984) have noted, problems in the study of verbal behavior include defining the response, measuring the response, and manipulating the independent variables. For example, a naturally occurring verbal response is not emitted repeatedly within a short period of time. This makes rate of response a poor dependent variable in most studies of verbal behavior (McPherson et al., 1984). Despite this, early research on verbal learning attempted to use something similar to rate (for a review, see Holz & Azrin, 1966). While many of these experiments were able to show that vocal responses increased when followed by some consequence, many others were not able to demonstrate such control (Holz & Azrin, 1966).

Conclusion

The above analysis reveals that there are many scientific costs associated with verbal behavior research. If one then assumes that strong reinforcers are available in the behavior analytic community for engaging in the study of animal behavior, the lack of verbal behavior research is understandable. Engaging in the study of verbal behavior would lead to loss of reinforcers available for alternative forms of research (Hake, 1982) and at the same time would entail significant costs in its own right.

Despite the costs described above, some behavior analysts have conducted successful research on verbal behavior (e.g., Chase, Johnson, & Sulzer-Azaroff, 1985; Lemarre & Holland, 1985; Lee, 1980; Lee & Pegler, 1982). Advances have been made in the methods for the study of human behavior and the study of verbal behavior. Further, exciting new areas of verbal research are emerging. These advances are already changing the consequences available for engaging in

verbal behavior research.

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PHIL'S FUN FACTS

1. Skinner countered arguments for using computerized subjects in place of animals a long time ago. What did he say? Answer (read from right to left): ".ni tar lacinahcem a tup dluoc ew ,hcum os wenk ew fl ...tseb swonk tar eht"
2. What source does Phil often use for new Fun Facts? Answer: .esahC morf elbaliava erawtfos dehsilbupnU .tiusruP laroiivaheB .W ,nomdeR & ,.P ,esahC ,.S ,iralluC
3. Which member of our group received a letter from a bank addressed "Dear Mr. Sig?" Answer: .GIS BHAe mynorca eht rednu tnuocca gnikehc a denepo ohw ,enoreP ekiM

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The Experimental Analysis of Human Behavior Special Interest Group (EAHB SIG) consists of over 100 members of the Association for Behavior Analysis (ABA). The group is organized to facilitate the growth of a multi-faceted experimental literature using human subjects to analyze the relations between behavior and the variables influencing it. The EAHB Bulletin serves the SIG by disseminating information that customarily is not published in the archival journals of behavior analysis.

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