DERIVING RELATIONS FROM THE EXPERIMENTAL ANALYSIS OF BEHAVIOR

MICHAEL F. CATALDO AND JOSEPH V. BRADY

JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE
AND THE KENNEDY KRIEGER INSTITUTE

Reviewing a basic research study in *JEAB* and then trying to relate aspects of the methods and results to applied work appears to involve comparing a sample stimulus to a variety of comparison stimuli. In this instance, the sample stimulus (information in *JEAB*) for the clinician or applied investigator is less familiar and more novel than the comparison stimuli (clinical and applied problems). The task of the applied behavior analyst is to discern from among the comparison stimuli which best matches, is relevant, and shares equivalent relations with the sample. Whether the relational responding anticipated by this series, "Developments in Basic Research and Their Potential Application," will combine with direct contingencies (e.g., Hayes & Hayes, 1993, p. 507) has yet to be demonstrated. But, perhaps, by considering developments in basic research, methods for enhancing both correct matching and contingency contacting can be identified so as to advance the cause of relating basic and applied research.

Three previous articles in this series share some common features. Each has described recent *JEAB* articles in a manner far less technical than the original version. A second common feature is that other articles in this series appear to have a theme. Themes ranged from "Convergence" (Hineline & Wacker, 1993), to "Collateral Effects" (Shull & Fuqua, 1993), to "The Applied Importance of Relational Responding" (Hayes & Hayes, 1993). In this regard we shall be no different. The theme for this article will be "Language Is Behavior" (Catania,

1992). If this statement is true, then basic research findings can be applied to language behavior. And if the goal is to identify potential applications, one mode of language—verbal behavior—has no equal.

Language Is Behavior

The critical role of verbal behavior has been raised in previous articles in this series, despite their different unique themes:

... an adequate account of instruction-based interventions must include the role of verbal behavior. Skinner, of course, delineated functional categories of verbal behavior that are useful for this. . . . Teasing apart the behavior that is attributable to verbally instructed repertoires remains a very difficult but most important challenge, one that is especially worthy of the combined efforts of basic and applied researchers. This, then, allows us to elaborate on the suggestions provided earlier. It may be that applied researchers can identify settings in which the combining of rule-governed and contingency-shaped behavior might be best studied. (Hineline & Wacker, 1993, p. 273)

Behavioral interventions produce collateral effects, but predicting those effects in applied work will be complicated because of verbal and instructional influences. (Shull & Fuqua, 1993, p. 409)

Applied behavior analysts should examine ways that response-produced stimuli might be increased and be more effectively related to desirable outcomes. There may be direct ways to accomplish this, but verbal behavior is probably the primary way this is done in

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Correspondence and reprint requests can be addressed to either author at the Department of Psychiatry, Johns Hopkins University School of Medicine, Baltimore, Maryland 21205.

normal development. (Hayes & Hayes, 1993, p. 510)

Language allows behavior to be guided by descriptions of contingencies in the verbal behavior of others, as well as by direct contact with the contingencies themselves. When verbal behavior is involved, initiated either by someone else through instructions or by one's own private talk, human behavior becomes rule governed rather than contingency shaped. Much human behavior is rule governed rather than contingency shaped. In humans, contingency-shaped performance occurs under circumstances when relevant verbal behavior is absent.

Rule-governed behavior develops early in children, along with many other aspects of language competence. Verbally competent children perform differently in tasks that involve the production of consequences by responding than do nonhuman organisms or children who are not verbally competent. The behavior of children under 2 years of age has been found to be primarily contingency governed, as is the case for nonverbal organisms such as pigeons and rats. Between about 2 and 4 or 5 years of age, performance is transitional, with variable properties related both to contingency-governed and rule-governed behavior. By the age of 5 years, the performances of most children are almost exclusively rule governed (Bentall, Lowe, & Beasty, 1985). Further, the rule-governed behavior of children as young as 5 and 6 years has been shown to be insensitive to consequences, but is readily changed by shaping what the children said about their behavior (Catania, Lowe, & Horne, 1990). This relationship between saying and doing has served as the basis for an applied strategy often called "correspondence training": By first shaping a high degree of correspondence between saying and doing, what a child does can then be modified by shaping what they say about what they are going to do (e.g., Risley & Hart, 1968; Sherman, 1964). Most of the over two dozen or so studies on correspondence training have had important methodological implications and, although using human subjects, are often essentially basic research studies (Baer,

1990). However, the clinical potential is great. For example, lead poisoning from lead-based paint is one of the leading environmentally linked causes of mental retardation. When we were asked to provide a secondary "behavioral"-based prevention strategy to reduce lead poisoning by modifying pica and mouthing behavior of children in houses with lead paint, correspondence training was found to be not only effective but one of the more acceptable procedures (Finney, Russo, & Cataldo, 1982).

Much research on rule-governed behavior has been conducted with adults. For example, research with college students has shown that shaping of verbal reports can be used to produce high and low rates of responding opposite to those typically produced by arranging schedules of consequences (Catania, Matthews, & Shimoff, 1982). The shaping was accompanied by awarding points exchangeable for money for successively closer approximations to target statements about contingencies or performances. This basic research study demonstrated that shaping what people say about their own behavior can be a more effective way to change their behavior than either shaping their behavior directly or telling them what to do. Thus, a therapist may sometimes be more effective by simply shaping what a client says (Truax, 1966).

The Experimental Analysis of Self-Report

In the November 1993 issue of *JEAB*, Critchfield (1993) describes a rather unique approach for investigating not instructions but verbal reports. Among the most noteworthy aspects of Critchfield's paper are (a) a method for studying self-reports of events that have occurred in the past; (b) the notion that accuracy may not be the best measure of self-report behavior; rather, two better indices may be bias (reporting successful responses whether they occurred or not) and discriminability (reporting successful responses only when they occurred); and (c) the fact that research on signal-detection theory may be relevant to understanding the variables that affect self-reporting behavior.

Critchfield's (1993) method employed a delayed match-to-sample task with college students where

two, three, or four sample stimuli were to be compared after a 1-s delay with two, three, or four comparison stimuli. A correct match within 800 ms produced points that could be exchanged for chances in a money drawing. Subjects were then asked to indicate on the computer task, using a "yes" or "no" button, whether they had met the contingency for point gain. A prompt for a self-report occurred immediately after the match attempt and, when scheduled, information about the success of the delayed match-to-sample response immediately followed the self-report. Critchfield found that (a) rates of successful matches were negatively correlated with the number of stimuli, regardless of whether they were samples or comparisons; (b) subjects displayed pronounced biases for reporting successful responses (matches), although this decreased as the actual number of successes became less frequent; (c) self-report discriminability decreased with the number of sample stimuli and increased with the number of comparison stimuli; and (d) biases and discriminability indices revealed effects not evident in self-accuracy scores.

What contributions does this research make to our understanding of language as a behavior, and what are the potential applications? First, it is fascinating to consider that self-reporting behavior is influenced by a variety of variables other than the event reported about and the social pressure (contingencies) favoring one type of report over another. For example, self-reports were more likely to describe successful past behavioral events regardless of whether those events actually occurred. Further, accurate self-reports about successful past behavior can be differentially affected by the stimuli of the event, which in this case involved the number of sample versus comparison stimuli (i.e., discriminability decreased with the number of sample stimuli, whereas it increased with the number of comparison stimuli). Critchfield (1993) concluded that these variables are similar to those involved in signal-detection research and, thus, argues that not only are self-reporting behaviors biased and influenced by the physical properties of the stimulus event, but that research on signal detection would

contribute to our better understanding of self-reporting behavior.

From an applied perspective, one of the more interesting sections of Critchfield's (1993) article was the discussion of the sociocultural influences on self-reports. For example, members of some cultures are more likely to self-report that their behavior is positive and successful than are members of other cultures. This is attributed to the differential social reinforcement contexts of the different cultures. An obvious extension of this research would be to compare the relative strengths of sociocultural versus signal-detection variables in terms of their influence on self-reporting behavior. Research can show that a certain set of variables influence behavior, but the effect may be relatively weak when compared with other variables. For some children with feeding disorders, for example, what could be described as maternal affection in the form of holding improved some aspects of feeding behavior (especially vomiting) (Drescher, Whitehead, Morrill-Corbin, & Cataldo, 1985; Whitehead, Drescher, Morrill-Corbin, & Cataldo, 1985). Although holding the child, particularly during feeding, may produce a clear effect on vomiting, it certainly was not the treatment of choice when compared to the full range of behavioral procedures (Babbitt et al., 1994). Similarly, variables from signal-detection research may influence self-report, but the influence of such variables may be much less powerful than those mediated by the social contingencies of the verbal community.

The most interesting and potentially applied aspect of Critchfield's (1993) article is the method he used to study self-reporting behavior. Extensions of this research could yield exciting and useful findings and consume at least a few careers. The most obvious line of research proceeding from Critchfield's discussion of sociocultural influences would be to introduce differential reinforcement for report bias and contrast this to the strength of the other variables. Also, one could investigate the effects of the length of the interval between a behavioral event and the self-report. For example, do bias and discriminability of self-reports that are differentially reinforced change dramatically if the interval be-

tween the event and the self-report increases while the reinforcement contingency is held constant? How much can accuracy, bias, discriminability, and so on, be altered? What causes the greatest change in these measures? Can we alter variables such that little or no correspondence exists between the report of the event and the actual event? Or, conversely, what variables maximize correspondence?

The most obvious area of applied significance for clinicians is patient report and, in child treatment situations, parental reports. Although applied behavior analysts tend not to rely solely on self-reports as an index of therapeutic progress, many other health professionals do. Information from basic research about the variables that affect self-reporting behavior could be of great importance in both changing reliance on self-report and perhaps even improving the reliability and validity of patient self-report.

For another area of applied significance, we need look no further than our newspapers and news broadcasts. Almost daily, reports of abuse are in the news, and the interval between an individual's self-report of an event and the alleged event often spans many years, with important intervening variables ranging from other news reports, aggressive therapists' questioning, opportunities for lawsuits, and so on. Demonstrating the extent to which self-reports can be influenced by the broad range of variables acting in applied situations could alter both our understanding of self-report behavior and the manner in which society adjudicates cases based upon self-report.

To return for a moment to the Critchfield (1993) study, one obvious objection that can be raised about his paradigm is that it involved not vocal behavior, but button presses. Thus, on the one hand one could argue that what we say may be influenced by a different history than our writing or button-pushing behavior; this would be an interesting area of inquiry in and of itself. But, on the other hand, because language is behavior, variables that influence other aspects of behavior may readily apply to our verbal behavior, vocal or otherwise. With that in mind, let's consider two other articles from *JEAB*, November 1993.

Hen Pecked to a Healthy Life-Style

DeMello, Foster, and Temple (1993) report a study that investigated the effect of increased response requirements on discriminative performances in the domestic hen. Among the more noteworthy aspects of this study are that (a) increasing response requirements to stimuli improves discrimination performance accuracy; (b) this improvement may be caused by increased effort, a reduction in competing stimuli, and increased stimulus duration; and, (c) response requirement provides another nonsensory variable to be taken into account in psychological investigations. DeMello et al.'s method in this experiment involved training hens to make a differential response (left or right pecking) depending on the stimulus presented in a center panel. Stimuli were either gray or "grating." A grating stimulus consisted of a series of lines. Grating stimuli varied in the density of lines from one to ten line spaces (cycles) per millimeter (c/mm). The task involved a sample stimulus presented behind an illuminated center key. When the hen pecked the center key, both the right and left keys were illuminated and a peck on the correct side key produced food. If the gray stimulus appeared in the center, a peck on the right key was correct and produced food; a peck on the left key was correct when a grating stimulus appeared as the sample. However, pecks on side keys were reinforced only if correct *and* if the side keys were illuminated. To illuminate the side keys, the hen had to peck the center sample panel. The requirement to peck the sample stimulus was the means by which DeMello et al. manipulated response requirement. That is, the number of pecks on the center panel required to illuminate the side panels was varied from fixed-ratio (FR) 1 to FR 40 (specifically, 1, 5, 10, 15, 25, and 40).

Using this approach to varying response requirements, DeMello et al. (1993) found that discrimination accuracy increased significantly as the response requirement of the number of pecks to the sample stimulus was increased up to a point. That is, an increase in response requirements from FR 1 to FR 5 to FR 10 resulted in increases in accuracy

at discriminable grating values, but further increases in response requirements above FR 10 did not consistently improve performance.

Certainly almost every educator, parent, and animal trainer is aware of the fact that increasing "attention" to a discriminative stimulus is a tool to enhance learning and performance. Here, DeMello et al. (1993) have demonstrated one method for increasing attention and in so doing suggested which procedural variables (i.e., stimulus competition, duration, and effort) define the construct. These components could be tested as to their absolute and relative relevance and then manipulated to enhance teaching procedures. For example, with the great popularity of computers, and thus computer instruction, teaching software could extend the duration of questions on the monitor before an answer was permitted, or manipulate effort by requiring responses on the screen to the question using the keyboard or mouse (e.g., underlining, blocking, etc.). In oral teaching situations, students could be asked to repeat the question slowly before answering—a tactic often employed in colloquia and scientific presentations both to ensure that we "understand" the question and to provide time to formulate the answer.

Although the most obvious application of DeMello et al.'s (1993) basic study is to formal educational settings, another intriguing relation may be derived. What if the stimuli were not grays or gratings, or classroom materials, but instructions? If our more complex behavioral repertoires are rule governed rather than directly shaped by contingencies, then instructions must be a key to the establishment, maintenance, and modification of these repertoires. If this is the case, then what instructions are to be followed? Our day is filled with a myriad of instructions, most of which we don't follow, but a few of which we do. Does repetition of instructions, in the same or various forms, increase the likelihood of following a specific instruction as opposed to others? Further, would response requirements involving selection of instructions increase compliance with those instructions?

In the past 20 years, the occasional call to us from a government agency soliciting research and

demonstration proposals has never been for trivial problems affecting small numbers of people. Rather, the pressing socially significant questions often involve changing the behavior of large proportions of the population. Behaviors of most interest are related to diet, drug taking (including tobacco use), and sexual practices, to name a few of the "easy" ones. These, by the way, are behaviors neither easily observed nor measured; nor are there convenient and contrastingly powerful consequences that can be immediately delivered contingent upon appropriate competing behaviors. Yet the eventual consequences of not altering unhealthy and dangerous life-styles are all too evident on our streets, in our hospitals, and as high-ticket items contributing to a growing national deficit.

Advertising agencies, and more recently, investigators in the field of public health have used frequently repeated messages in the mass media to effect behavior change in terms of both buying products and modifying life-style. Some of the data are impressive on the degree of behavior change attributed to this essentially "instruction" intervention. For example, one of the most dramatic examples cited is the decrease in male smoking behavior during this decade. How do we explain this in operant terms? And how can we economically study this process? The content of an instruction is certainly important to behavior change. Further, whether the instruction is likely to result in reinforcement is also important. However, is the frequency of the instruction a critical variable? Extensions of DeMello et al.'s (1993) preliminary study might help to answer these questions and thus contribute to the design of effective interventions for problems associated with complex behavioral repertoires.

Make Things as Simple as Possible— But No Simpler (Einstein)

The last article in *JEAB*, November 1993, for discussion here is by Saunders and Spradlin. These investigators addressed a problem of persons with mental retardation who have difficulty acquiring arbitrary matching-to-sample behavior, a form of conditional discrimination. The investigators as-

serted and then demonstrated that this difficulty can be due to deficits in prerequisite component skills. In this case, two simple discriminations are lacking: a successive discrimination between the sample stimuli and a simultaneous discrimination between comparison stimuli. These two components, considered critical by Saunders and Spradlin, were trained in the following manner. The first component sample discrimination was accomplished by training the subject to name each sample stimulus instead of choosing an arbitrary matching comparison stimulus. To use responses in the subjects' repertoires, color names represented each stimulus (red, blue, orange, etc.). A stimulus was presented, the name was prompted, the subject named the stimulus, and reinforcement (a penny and praise) was provided. This continued until subjects could correctly name each sample stimulus. To this was chained the second critical component, choosing an arbitrary matching stimulus. This component was trained by initially presenting the same sample stimulus for all 32 trials that constituted a session. Eventually, as a particular comparison stimulus was consistently reinforced, each subject began to choose that comparison stimulus over the others. This "discrimination" was faded by presenting the same sample stimulus for a block of 16 trials after incorrect arbitrary matches occurred only during the first two trials. When selection errors occurred in the first two trials of each block for two sessions, sessions containing blocks of eight trials were presented, and so forth until the "block" was a single trial. Saunders and Spradlin showed that by training the "necessary" components, performance on conditional discrimination tasks can improve. This study is noteworthy because (a) it shows that persons with mental retardation can acquire this somewhat complex discrimination behavior, (b) the results provide additional information about the nature of the deficits of persons with mental retardation in discrimination and organization of stimuli, and (c) the study reiterates a model often used by behavior analysts in identifying and designing remediation efforts. This third point has considerable significance for a wide variety of applications.

In behavior analysis, deficits are analyzed into their component parts, and if the analysis is correct and each component is taught, then deficits have been shown to be remediated. This general strategy could be extended to analyze and remediate a broad range of complex problems typically attributed to "cognitive deficits." For example, a series of studies similar to that of Saunders and Spradlin (1993) could identify the components basic to performance deficits of children with attention deficit disorders and other forms of learning disabilities. Similarly, aged adults with beginning signs of dementia and Alzheimer's disease could be studied and remedial techniques developed. Even children and young adults with a most fascinating problem recently labeled "executive function disorder" could be similarly studied. In this last example, the individual has considerable difficulty in problem-solving situations that involve organization of information and action to achieve future goals. In nonoperant terms, executive function involves processes that are future oriented and that allow for substantial delay between stimuli and responses—planning and organization. In a more behavioral sense, executive function involves setting goals, self-monitoring progress toward goals, and appreciating when goals are reached (Denckla & Reader, 1993). Executive functions are thought to be controlled by regions of the frontal cortex, which is the last area of the brain to mature. Problems related to elaboration and refinement of this brain region have therefore been implicated in this disorder. Thus, similar to the model by Saunders and Spradlin, basic research should be able to show the discrete performances that characterize the organizational behaviors descriptive of this disorder *and* the methods by which each necessary component performance can be successively trained. With these findings from basic research, clinical intervention studies would logically follow. And the most likely application may again involve verbal behavior. Once the components that constitute the deficit are identified, the stimuli that are used to prompt the necessary remediation behavior may well be verbal instructions. Research on the controlling cue being a verbal an-

tecedent emitted by the subject has been variously described as self-regulation, self-control, and self-instruction (Baer, 1990).

In comparison to the Critchfield (1993) and DeMello et al. (1993) articles, we have much less to say about this last basic research study. The reader interested in training arbitrary match-to-sample behavior is referred to the original text. We have less to say because by choosing the correct components to train, subject performance, as reported by Saunders and Spradlin (1993), appeared to reach criteria effortlessly. Elegantly conceptualized and executed behavioral analyses have a magical quality (i.e., the behavior appears to occur as if by magic).

Differential Consequences for Derived Relational Responding

The basic research enterprise is said to have heuristic value. "Although perhaps not immediately applicable, one never knows when the findings from basic research will alone, or when combined with other findings, be of great relevance," argues the science philosopher. The occasional reader of *JEAB*, struggling through an article, let alone an issue, should achieve some degree of intellectual satisfaction in finally being able to understand "what was really done" after the fifth or sixth reading (a degree of satisfaction somewhat akin to almost completing the Sunday *New York Times* crossword puzzle). But the rationale for this series is that of potential applications. Do applications indeed directly follow from basic research?

For the scientist, practical application and technology certainly are seen to proceed directly from basic research findings. For the engineer, bridges are built and tall buildings erected using tools of physics developed from basic research. Putting a human on the moon resulted from the combination of millions of derived relations from thousands of studies. Yet, a technology developed from basic research can advance to a degree of sophistication where continued reliance on basic research findings is no longer necessary, until the technology's limits are encountered. Then, it is back to the basic re-

search knowledge base, and if that is insufficient, then back to doing additional basic work to extend the knowledge base. But encountering a socially significant problem and then referring to basic research for a solution is a very different behavior from routinely reviewing *JEAB* for potentially useful information. In one situation, the contingency involves relatively weak positive reinforcement; in the second situation, a difficult applied problem creates a stronger contingency, one motivated by escape from the aversive properties of failure.

In terms of measuring and influencing applications, if self-report were the measure, then from the *JEAB* articles reviewed here we should expect that most readers' self-report will likely be biased toward finding more important derived relations than they actually do (Critchfield, 1993). But by repeatedly having readers of *JABA* encounter articles in this series, the increased response requirement ("attention") to the topic could be of benefit (DeMello et al., 1993). Further, each of the articles in the series offers numerous "component analyses" concerning how to derive potential applications from selected basic studies in *JEAB* (Saunders & Spradlin, 1993). But for complex performances, such as discriminating derived relationships, to occur with minimal effort—as if by magic—the critical components for the criterion performance must be identified and properly programmed. In terms of the goal of this series in *JABA*, what are the critical component(s)?

If indeed it is true that "No area of basic behavior-analytic research has more obvious applied importance than the study of derived relations" (Hayes & Hayes, 1993, p. 507), then verbal behavior is the key to application or, if not properly structured, the major barrier. We have suggested here that the goal of this series, indicated by its title, is achievable through derived relational responding. However, like other discrimination performances, relational responding has its limits. In the case of DeMello et al.'s hens, increasing response requirements was effective in enhancing discrimination as long as the stimulus was not too complex (i.e., the density of grating lines was not too great).

We have further suggested here that much of the basic research in *JEAB* could be related to verbal behavior, because much of behavior after 5 years of age is shaped by the verbal description of contingencies. Compliance with instructions depends, however, on two features of the verbal stimulus: (a) It is discriminable for the occasion of reinforcement, and (b) the content makes contact with an existing behavioral repertoire. This series is attempting to show that consideration of basic research in *JEAB* can occasion reinforcement in the form of applications to problems of applied, clinical, and social significance. But applications cannot be derived by clinicians and applied investigators if the content is too effortful to use and does not make contact with their existing verbal repertoires.

Each of the previous articles ended with a general set of suggestions for applied researchers to consider in attempting to derive relations from basic research. We would like to offer a general suggestion as well, but for the developer of basic research findings: If you devote a few sentences in your article to a simple description of the method and findings, your research will be much more likely to make contact with the existing behavioral repertoires of clinicians and applied researchers—repertoires that already are at high strength for finding applied solutions to socially important problems.

REFERENCES

- Babbitt, R. L., Hoch, T. A., Coe, D. A., Cataldo, M. F., Kelly, K. J., & Perman, J. A. (1994). Behavioral assessment and treatment of pediatric feeding disorders: A review and program description. *Journal of Developmental and Behavioral Pediatrics*, 15(4), 278–291.
- Baer, R. A. (1990). Correspondence training: Review and current issues. *Research in Developmental Disabilities*, 11(4), 379–393.
- Bentall, R. P., Lowe, C. F., & Beasty, A. (1985). The role of verbal behavior in human learning: II. Developmental differences. *Journal of the Experimental Analysis of Behavior*, 43, 165–181.
- Catania, A. C. (1992). *Learning*. Englewood Cliffs, NJ: Prentice-Hall.
- Catania, A. C., Lowe, C. F., & Horne, P. (1990). Non-verbal behavior correlated with the shaped verbal behavior of children. *Analysis of Verbal Behavior*, 8, 43–55.
- Catania, A. C., Matthews, B. A., & Shimoff, E. (1982). Instructed versus shaped human verbal behavior: Interactions with nonverbal responding. *Journal of the Experimental Analysis of Behavior*, 38, 233–248.
- Critchfield, T. S. (1993). Signal-detection properties of verbal self-reports. *Journal of the Experimental Analysis of Behavior*, 60, 495–514.
- DeMello, L. R., Foster, M., & Temple, W. (1993). The effect of increased response requirements on discriminative performance of the domestic hen in a visual acuity task. *Journal of the Experimental Analysis of Behavior*, 60, 595–609.
- Denckla, M. B., & Reader, M. J. (1993). Education and psychosocial interventions: Executive dysfunction and its consequences. In R. Kurlan (Ed.), *Handbook of Tourette's syndrome and related tic and behavioral disorders* (pp. 431–451). New York: Marcel Dekker.
- Drescher, V. M., Whitehead, W. E., Morrill-Corbin, E. D., & Cataldo, M. F. (1985). Physiological and subjective reactions to being touched. *Psychophysiology*, 22, 96–100.
- Finney, J. W., Russo, D. C., & Cataldo, M. F. (1982). Reduction of pica in young children with lead poisoning. *Journal of Pediatric Psychology*, 7(2), 197–207.
- Hayes, S. C., & Hayes, L. J. (1993). Applied implications of current *JEAB* research on derived relations and delayed reinforcement. *Journal of Applied Behavior Analysis*, 26, 507–511.
- Hineline, P. N., & Wacker, D. P. (1993). *JEAB*, November '92: What's in it for the *JABA* reader? *Journal of Applied Behavior Analysis*, 26, 269–274.
- Risley, T. R., & Hart, B. (1968). Developing correspondence between the nonverbal and verbal behavior of preschool children. *Journal of Applied Behavior Analysis*, 1, 267–281.
- Saunders, K., & Spradlin, J. (1993). Conditional discrimination in mentally retarded subjects: Programming acquisition and learning set. *Journal of the Experimental Analysis of Behavior*, 60, 571–585.
- Sherman, J. A. (1964). Modification of nonverbal behavior through reinforcement of related verbal behavior. *Child Development*, 35, 717–723.
- Shull, R. L., & Fuqua, R. W. (1993). The collateral effects of behavioral interventions: Applied implications from *JEAB*, January 1993. *Journal of Applied Behavior Analysis*, 26, 409–415.
- Truax, C. B. (1966). Reinforcement and non-reinforcement in Rogerian therapy. *Journal of Abnormal Psychology*, 71, 1–9.
- Whitehead, W. E., Drescher, V. M., Morrill-Corbin, E. D., & Cataldo, M. F. (1985). Rumination syndrome in children treated by increased holding. *Journal of Pediatric Gastroenterology and Nutrition*, 4(4), 550–556.