COMMENTS ON FUNCTIONAL ANALYSIS PROCEDURES FOR SCHOOL-BASED BEHAVIOR PROBLEMS

ALAN REPP

NORTHERN ILLINOIS UNIVERSITY

Functional analysis procedures were developed in the 1980s in an effort to determine whether clinicians could identify the function of behavior problems like self-injury and aggression. More recently, several groups of researchers have been attempting to extend that procedure to classroom environments. The following commentary reflects my viewpoint of this transition.

DESCRIPTORS: functional assessment, hypothesis-based interventions, analogue assessments, problem behavior

The last decade has been an exciting one for those of us interested in the treatment of behavior problems. We have witnessed the emergence of a technology for treating these behaviors that has moved from the traditional approach of selecting interventions from a textbook list (e.g., time-out, overcorrection, differential reinforcement of other behavior) to one that is based directly on the function of the problem behavior for an individual (and which, therefore, is more idiographic). This emergence has, of course, been based on the development of functional assessment.

From my perspective, that technology has become available to us because of three sets of publications. The first was Carr's (1977) review of research on self-injurious behavior (SIB), in which he proposed three hypotheses for the controlling conditions of SIB (positive reinforcement, negative reinforcement, and self-stimulation). For some, these hypotheses represented a statement about functional analysis (i.e., the relationship between dependent and independent variables), and they have since applauded this "return" to a focus on functional analysis. However, that view misses the point. Every experimental paper published in *JABA* has been an exercise in functional analysis in its attempt to relate dependent variables to independent variables. That analysis, though, was made after in-

tervention had been instituted within an experimental paradigm. In essence, the experimenter could be seen as having "stepped in" at the end of the baseline phase, choosing and implementing an intervention to determine whether a functional relationship would exist. Carr was pointing us in the opposite direction, temporally speaking. He was directing our attention to the first day of baseline, suggesting that we ask (prior to intervention) why a particular behavior existed (i.e., whether a functional relationship has already existed). This, of course, is a far more difficult question to answer.

The methodology for answering that question evolved through two sets of analogue assessments. One was a series by Carr and his associates (e.g., Carr & Newsom, 1985; Carr, Newsom, & Binkoff, 1980) in which they exposed students to analogues of conditions found in their normal environments in order to determine whether the negative reinforcement paradigm was in effect. These studies were conducted in true experimental fashion, contrasting the presence and absence of experimental variables, and they demonstrated the relationship between demands and behaviors like tantrums, aggression, and self-injury.

A comprehensive assessment was simultaneously being developed by Iwata and his associates (e.g., Iwata, Dorsey, Slifer, Bauman, & Richman, 1982; Iwata, Pace, Kalsher, Cowdery, & Cataldo, 1990), one that tested all three of Carr's hypotheses for each subject. This development was important for several reasons, not the least of which were that (a) it tested the three hypotheses proposed by Carr

Address correspondence and reprint requests to the author at the Department of Educational Psychology, Counseling, and Special Education, Northern Illinois University, DeKalb, Illinois 60115.

(1977) in a single assessment, (b) it was a relatively standardized approach, and (c) it was transportable and could therefore undergo tests of systematic replication (which it has passed exceedingly well).

A third set of studies influential to this field was being published by several researchers interested in school-based problem behaviors. In some cases, these groups conducted analogue assessments; in other cases, they assessed directly in the natural environment. The important point for those of us interested in school populations is that these studies showed that instructional variables could be directly related to the occurrence of problem behavior. Some of these variables included presenting students a choice of tasks (e.g., Dyer, Dunlap, & Winterling, 1990), varying the tasks presented (e.g., Winterling, Dunlap, & O'Neill, 1987), increasing the pace of instruction (e.g., West & Sloane, 1986), embedding low-probability demands in a series of high-probability demands (e.g., Horner, Day, Sprague, O'Brien, & Heathfield, 1991), and reducing task difficulty (e.g., Weeks & Gaylord-Ross, 1981).

These three sets of publications left those of us interested in school-based problems with the following results: (a) three general hypotheses seemed to account for most environmentally based problem behaviors, (b) several instructional variables were demonstrated to be salient and fit within these three hypotheses, and (c) experimental assessment procedures were available that could address these hypotheses. The last of these posed a problem for those working in some schools because administrators often were unwilling to allow experimental assessments that explicitly set the occasion for high rates of problem behaviors. Whereas the same rate of behavior in the natural environment did not make these administrators particularly uneasy (although they certainly wanted the behaviors reduced), the idea of intentionally occasioning high rates did. The problem for us, then, was to adapt the analogue procedure to classroom use.

Several developments allowed this transition. One was the emergence of the scatterplot, which was a graph that related behavior to time (Touchette, MacDonald, & Langer, 1985). Another was an effort to show that data relevant to all three hy-

potheses could be gathered under naturalistic conditions in classrooms and that the resulting variables could be manipulated (Repp, Felce, & Barton, 1988). However, although Repp et al. were successful in changing behavior, our basis for selecting a given intervention was not systematic (there was some narrative recording, but too much clinical judgment). The problem then became the one solved by Carr and Iwata in their analogue assessments: how to institute a standardized and replicable method of assessment that addresses all three hypotheses. A system was developed recently that seems to meet these requirements (O'Neill, Horner, Albin, Storey, & Sprague, 1990), and I have found it to be the most useful approach for conducting functional assessments in classroom environments (e.g., Karsh, Repp, Dahlquist, & Munk, 1994; Sprague & Horner, 1992). The procedure generally involves three phases: (a) hypothesis development, in which data from interviews and direct observation are combined, without any manipulations having been performed, to develop an hypothesis; (b) hypothesis confirmation, in which formal baseline data are collected and contingency tables are formally or informally developed to confirm or deny the hypotheses; and (c) hypothesis testing, in which an intervention based on the hypothesis is tested, thus affirming or denying the predictive validity of the first two phases. Several researchers have shown that this approach can lead to the development of effective interventions for behavior problems in schools (e.g., Karsh et al., 1994).

Where are we now? By building on the work of Carr, Iwata, and their colleagues, various groups (e.g., Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991; Lalli, Browder, Mace, & Brown, 1993) have been able to show the value of functional assessment procedures through extensive systematic replication (Sidman, 1960). The question now becomes: Where do we go from here?

Of course, there can be many answers to that question, but two areas of study seem particularly relevant. One is the analysis of setting events (Repp & Karsh, 1990). To date, most studies have analyzed and manipulated immediate antecedents to and consequences of behavior. However, some an-

tecedents are correlated with high rates of behavior at one time and low rates at another. In such cases, setting events may be operative (defined as "events that change the probability of occurrence of a three-term contingency without differentially altering reinforcer probability," Kennedy & Itkonen, 1993, p. 321). Analyses of setting events should lead to a more thorough understanding of problem behavior, and may produce an additional level of analysis for functional assessment procedures. A second important area of study is further analysis of dependent variables by considering the effects of intervention on response classes. Sprague and Horner (1992), for example, showed that when only one member of a response class was blocked, other problem behaviors increased. When, however, a functionally equivalent behavior was taught, all problem behaviors in the response class decreased. With work in these and other areas, we should be able to look forward to continued replication and further extension of a very powerful technology—functional assessment.

REFERENCES

- Carr, E. G. (1977). The motivation of self-injurious behavior: A review of some hypotheses. *Psychological Bulletin*, 84, 800–816.
- Carr, E. G., & Newsom, C. (1985). Demand-related tantrums. *Behavior Modification*, 9, 403–426.
- Carr, E. G., Newsom, C. D., & Binkoff, J. A. (1980). Escape as a factor in the aggressive behavior of two retarded children. *Journal of Applied Behavior Analysis*, 13, 101–117.
- Dunlap, G., Kern-Dunlap, L., Clarke, S., & Robbins, F. R. (1991). Functional assessment, curricular revision, and severe behavior problems. *Journal of Applied Behavior Analysis*, 24, 387–397.
- Dyer, K., Dunlap, G., & Winterling, V. (1990). Effects of choice making on the serious problem behaviors of students with severe handicaps. *Journal of Applied Behavior Analysis*, 23, 515–524.
- Horner, R. H., Day, M., Sprague, J. R., O'Brien, M., & Heathfield, L. T. (1991). Interspersed requests: A non-aversive procedure for reducing aggression and self-injury during instruction. *Journal of Applied Behavior Analysis*, 24, 265–278.
- Iwata, B., Dorsey, M., Slifer, K., Bauman, K., & Richman, G. (1982). Toward a functional analysis of self-injury. *Analysis and Intervention in Developmental Disabilities*, 2, 3–20.
- Iwata, B., Pace, G., Kalsher, M., Cowdery, G., & Cataldo, M. (1990). Experimental analysis and extinction of self-injurious escape behavior. *Journal of Applied Behavior Analysis*, 23, 11–27.
- Karsh, K. G., Repp, A. C., Dahlquist, C. M., & Munk, D. (1994). *In vivo functional assessment and multielement intervention for problem behaviors of students with disabilities in classroom settings*. Manuscript submitted for publication.
- Kennedy, C. H., & Itkonen, T. (1993). Effects of setting events on the problem behavior of students with severe disabilities. *Journal of Applied Behavior Analysis*, 26, 321–327.
- Lalli, J. S., Browder, D. M., Mace, F. C., & Brown, D. K. (1993). Teacher use of descriptive analysis data to implement interventions to decrease students' problem behaviors. *Journal of Applied Behavior Analysis*, 26, 227–238.
- O'Neill, R. E., Horner, R. H., Albin, R. W., Storey, K., & Sprague, J. R. (1990). *Functional analysis of problem behavior: A practical assessment guide*. Sycamore, IL: Sycamore.
- Repp, A. C., Felce, D., & Barton, L. E. (1988). Basing the treatment of stereotypic and self-abusive behaviors on hypotheses of their causes. *Journal of Applied Behavior Analysis*, 21, 281–290.
- Repp, A. C., & Karsh, K. G. (1990). A taxonomic approach to the nonaversive treatment of maladaptive behavior of persons with developmental disabilities. In A. C. Repp & N. N. Singh (Eds.), *Perspectives on the use of nonaversive and aversive interventions for persons with developmental disabilities* (pp. 331–347). Sycamore, IL: Sycamore.
- Sidman, M. (1960). *Tactics of scientific research: Evaluating experimental data in psychology*. Boston: Authors Cooperative, Inc.
- Sprague, J. R., & Horner, R. H. (1992). Covariation within functional response classes: Implications for treatment of severe problem behavior. *Journal of Applied Behavior Analysis*, 25, 735–745.
- Touchette, P. E., MacDonald, R. F., & Langer, S. N. (1985). A scatterplot for identifying stimulus control of problem behavior. *Journal of Applied Behavior Analysis*, 18, 343–351.
- Weeks, M., & Gaylord-Ross, R. (1981). Task difficulty and aberrant behavior in severely handicapped students. *Journal of Applied Behavior Analysis*, 14, 449–463.
- West, R. P., & Sloane, H. N. (1986). Teacher presentation rate and point delivery rate. *Behavior Modification*, 10, 267–286.
- Winterling, V., Dunlap, G., & O'Neill, R. E. (1987). The influence of task variation on the aberrant behaviors of autistic students. *Education and Treatment of Children*, 10, 105–119.

Received March 3, 1994

Initial editorial decision March 6, 1994

Revisions received March 9, 1994; March 18, 1994

Final acceptance March 18, 1994

Action Editor, Brian A. Iwata