FOCUS ON EXCEPTIONAL CHILDREN

PSYCHOEDUCATIONAL TECHNOLOGY: CRITERIA FOR EVALUATION AND CONTROL IN SPECIAL EDUCATION

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BEHAVIOR REINFORCEMENT IN THE CLASSROOM

Psychoeducational technology, the fusion of reinforcer systems and programming techniques in educational settings, is now a major force shaping the lives of all children. Advances in materials production, programming, information storage and retrieval, evaluation, computer assisted instruction and operant behavior management have revolutionized instructional methods and provided visions of an educational Eldorado. In discussing trends in the education of handicapped children, Martin (1972) has commented, "Despite the frequent frustrations with the use of educational technology today, it is impossible to disregard its impact on allowing instruction to become more individualized in the future" (p. 521). Behavior modification and academic programming techniques offer the special educator an opportunity to humanize the child. As Wallace and Kauffman (1973) have noted, "Technical mastery allows the practitioner to give form and substance to human values" (p. 3).

Nevertheless, the uncontrolled development of psychoeducational technology cannot be viewed without alarm. It appears that *every* technological advancement harbors potential not only for human benefit but also for destruction. For example, the technology which provided life-saving oxygen for premature infants also produced many cases of retrolental fibroplasia. The highly successful marketing campaigns of tobacco companies, made possible only by technological advances in communications, are now known to be counterproductive to human health. Noise, exhaust emissions and accidental death and injury, once the complaints of persons thought to be shortsighted dolts, are now matters of grave concern to scientists surveying the results of uncontrolled transportation technology. Psychotechnology has been applied humanely to the therapeutic process but inhumanely to the processes of deceptive advertising, political coercion and psychological warfare.

The good and evil consequences of technology, and the need to monitor and control its development, have been recognized belatedly by psychologists and educators. Schwitzgebel (1970) has urged specific applications of social technology to the solution of persistent human problems. Miller (1970) has noted the impact of technology on our quality of life and suggested a code of priorities for the assessment of psychotechnology.

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Finn (1969) has called for humanistic control of educational technology as it is applied to the evaluation of federal programs.

Special educators occupy a unique position among producers and consumers of psychoeducational technology by virtue of their concern for exceptional individuals who require special environmental adaptations for maximum learning. It is through special education that many technological developments find their way into the educational mainstream, and it is in special education settings that psychoeducational technology faces its greatest challenge. It follows that special educators have unequalled opportunity to evaluate the benefits and hazards of technological progress in education.

Simplicity

A primary criterion for assessment and control of psychoeducational technology is simplicity. Less complicated technological solutions are always preferable to those that are more complex, provided that the desired effect is obtainable by the simpler means (for an example of simplified technology, see Kauffman, Cullinan, Scranton, & Wallace, 1972). Simplicity is superordinate to the code of priorities for the assessment of psychotechnology suggested by Miller (1970), i.e., simpler technology is more intelligible, available and distributable to the layman and,

consequently, is often of greater social relevance. Furthermore, simpler technology is not as easily used to deceive either the child or his caretakers or to excuse its user from accountability. Because simpler technology is less dependent upon the development of other related technologies, it possesses greater reliability and does not foster the illusion that escalation of technological development is the *only* solution to human problems. For these reasons, parsimonious technological solutions are less likely to endanger the physical, mental and social well-being of children.

When faced with a teaching problem needing a technological solution, the special educator must always ask, "Is this reinforcement system, teaching program, etc., the simplest possible solution to the problem which this child and his environment present?" For example, there exists among behavior modification technicians considerable controversy concerning the most appropriate techniques for observing and recording behavior (Lovitt, 1970; Johnston, 1970). A system incorporating specially designed logarithmic paper on which behavioral rates are plotted (cf., Bradfield, 1970) involves a more complex recording system than the plotting of behavioral rates on standard arithmetic graph paper. The criterion for evaluation must be desirable changes in the behavior of children and their caretakers. Unless use of the more complex behavior-recording technology is shown to produce significantly greater positive change in the appropriate behaviors of children and adults, it may be misleading or irrelevant for parents and teachers of exceptional children.

Ethical Implications

The application of technological developments which are not parsimonious and, consequently, are misleading or irrelevant raises questions of ethics. Krasner (1969) and Staats (1970) have argued that one's conception of human behavior determines the nature of his interaction with other persons and suggested that psychoeducational technology is not and cannot be value-free. The exhilaration and awesome responsibility which accompany the use of powerful technological tools to modify human behavior have been described by Tharp and Wetzel (1969). "The behavior engineer finds himself on the cutting edge —exciting, frightening, vital—of carving a new, self-conscious ethic of socialization" (p. 212).

The paradoxical nature of the "control *vs* freedom" issue has been discussed in such microscopic detail (Krasner, 1969; Muchmore, 1971; Ullmann, 1969; Tharp &

Wetzel, 1969) that further comment borders on irrationality. The real and pressing ethical questions involving psychoeducational technology are related to the use of specific techniques under specified circumstances. Situation-specific value questions are often difficult to resolve, and they may require courageous individual action. *Every teacher must have the courage to assume individual responsibility for the consequences and ethical implications of his intervention in the lives of children and to insist upon the professionally ethical conduct of his colleagues.* In describing the dilemmas faced by behavior analysts, Tharp and Wetzel (1969) stated, "Our own ethical resolution was a simple one: we declined to participate in any program of behavior modification which did not meet our own ethical and moral standards, no matter who or what system was represented" (p. 212).

Survival Value

The ethical implications of psychoeducational technology are highlighted by the technology's relevance to and compatibility with the world in which the child lives, i.e., the survival value of what and how the child is taught. It probably is unethical to teach children skills which do not increase their ability to function happily, autonomously, productively and creatively in the environment in which they live. For example, it may be possible, with the astute application of behavior modification technology, to shape flawless beam-walking behavior in a child considered to have a perceptual-motor disability. However, flawless beam-walking behavior itself is neither a locomotor skill greatly valued by many proponents of perceptual-motor training nor a behavior likely to be of functional value in the child's natural environment unless, perhaps, the child becomes a construction worker whose flawless performance of this skill is required to avoid a terminal plunge from a great height. The issue involved is clearly one of setting priorities for the child's learning.

To be of maximum survival value, psychoeducational technology must produce behavioral change which generalizes from one environment to another, from one response class to another and from one period of time to another. "Desirable behavior should be manifest in all environments, should expand in detail and scope, and should endure" (Baer & Wolf, 1970, p. 319). Such generalization is likely to occur if the technology induces the child to enter an on-going system or "community" of reinforcement (Baer & Wolf, 1970) or if appropriate use of the technology itself becomes generalized among the child's caretakers. Consequently, special educators must

place a high priority on the development of technology which is compatible with the child's natural environment.

Ultimately, survival as a fully human, self-actualized individual depends upon the acquisition of self-management skills. Developers of psychoeducational technology have stressed the necessity of developing self-control behaviors in children (Haring, 1968; Homme, 1970), and recent efforts have been made to use behavior management technology to increase the freedom and responsibility of children in school (Salzberg, 1972). *The special education teacher must continue to ask, "Are the content and methods of my instruction producing changes which promote the child's survival and autonomy in his natural environment?"*

Psychodegradability

A technological application may have survival value but be unethical or undesirable because it is not psychodegradable. Psychodegradability refers to the problem of contamination of the human environment by the residual effects of educational methodology. Probably it is unethical to use technology which does not quickly "decompose" or allow the child to return to his natural habitat no longer dependent upon or adversely affected by it. Application of inappropriate technological devices in education may increase the demand for new technology in an upward-spiraling and costly trend not unlike the environmental crisis produced by the creation of excessive physical wastes which are not biodegradable. For example, the use of cigarettes or other addictive reinforcers may have the unfortunate effect of necessitating the application of additional technological devices to remove a harmful residual habit or remedy a chronic physical illness. The use of food as a reinforcer for an obese child may encourage undesirable eating habits and further damage the child's physical and emotional health.

Tharp and Wetzel (1969) have discussed the frequent necessity for using extrinsic reinforcers which do not occur naturally in the environment of the child. In such cases it is essential that the "synthetic" reinforcers be degradable or transferable to reinforcers which are available and appropriate in the natural environment of the child. They have observed that

> a response and its consequences are imbedded in the social network in which the individual is enmeshed. Sometimes a reinforcer, effective for one behavior, is inappropriate because its use upsets other behavioral systems. . . . Many cautions have been issued about this potential effect, most of which are not based on any evidence. However, the matter

must be given the closest consideration and the careless establishment of contingencies always avoided. [pp. 209-210]

It is important to note that experimental evidence of the interaction of reinforcer systems does exist. Reinforcers may be "adjunctive" in that their reinforcing properties are controlled, at least in part, by other reinforcer systems (Whaley & Malott, 1971), and the modification of one member of a response class may produce changes in other member behaviors (Sajuaj, Twardosz, & Burke, 1972). Thus, concern for the effects of psychoeducational technology on the ecology of the child's behavior is justified.

The concept of psychodegradability is relevant not only to reinforcer systems but to the design of research in which technological developments are tested. It is probably unethical to conduct research with children in which the undesirable results of reversal, nontreatment control or other experimental conditions are not quickly degradable to beneficial effects.

The special educator must ask, "Is the child left free of any harmful residual effect of the teaching or research methodology?" When a child is taught basic reading skills, there is no question of the survival value of what is being taught. If his reading behavior is reinforced with tokens which are redeemable for access to other academic and play activities, the shift to natural environmental consequences can be made successfully and with a minimum of effort except, perhaps, in very unusual cases. Any harmful residual effect of such an application of psychoeducational technology is likely to be a result of the teacher's lack of knowledge or concern for appropriate use of the technology rather than a fault of the technology itself.

Long-Term Effects

Survival value and psychodegradability may be adequately evaluated only over extended periods of time. Thus, a final criterion for evaluation and control of psychoeducational technology should be long-term effects. Unfortunately, short-term gains seem to have become the exclusive controlling consequences for educational methodology (Locke, 1971). Programs which can produce earlier acquisition, faster production and greater consumption of academic responses tend to be evaluated more favorably and to be considered more accountable, regardless of the triviality of the behavior which was learned or the methods used to obtain the performance (Cass, 1971).

Questions regarding the long-term effects of advances in psychoeducational technology are sometimes viewed with disdain or ignored. However, Staats (1970) has noted the need for longitudinal research.

I am suggesting that a prime dimension for the extension of the learning approach to behavior modification is in the extension of the *time* the behavior problem—child or adult, normal or abnormal—is dealt with. . . . The major part of behavior modification is still stalled on this dimension. [p. 19]

The special educator must ask questions concerning the probable effects of his teaching on the child 5, 10 or 20 years in the future and design research to find the answers. If this is not done, a headlong plunge into irrelevancies, rejection of a technology with beneficial effects which increase greatly with time, or development of a technology which has significant but long-delayed ill effects may be the unavoidable consequence. Fortunately, follow-up studies of exceptional children to whom psychoeducational technology has been applied are now being reported, and the results are encouraging (Lovaas, Koegel, Simmons, & Long, 1973; Nedelman & Sulzbacher, 1972).

FUTURE DIRECTIONS

The future seems brighter because of the potential benefits of technological progress in special education. But the view that all *will be* well because all *is* well is shortsighted and dangerous. Only by trying to determine for certain where we are going can we be assured that the process of getting there will continue to be rewarding.

It may be prudent to recognize that desirable technological progress alone does not guarantee improvement of the human condition. Some of our most pressing social problems do not demand new technology for their solution. The problem of hunger in America, for example, is not one which requires additional technological developments in food production, preservation or distribution. It is now a matter which can be resolved only by human concern and reordered priorities. It is enticing but delusional to believe that the flowering of psychoeducational technology alone will usher in a new era of intellectual achievement and interpersonal harmony. Technology must be bridled by humanistic goals if its promise for the future is to be kept.

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TEACHER ATTENTION TO APPROPRIATE AND INAPPROPRIATE CLASSROOM BEHAVIOR: AN INDIVIDUAL CASE STUDY

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A number of recent studies have demonstrated teacher attention, approval and praise to be effective reinforcers in increasing child behavior in the classroom setting (Becker, Madsen, Arnold & Thomas, 1967; Hall, Lund & Jackson, 1968; Madsen, Becker & Thomas, 1968; O'Leary, Becker, Evans & Saudargas, 1969). Several studies have provided evidence that teacher disapproval, criticism and negative attention may also have reinforcing effects upon child behavior. A study by Lovaas, Freitag, Kinder, Rubenstein, Schaeffer and Simmons (1964) indicates that teacher attention, whether positive or negative, may be reinforcing. Studies by Madsen, Becker, Thomas, Koser and Plager (1968) and Thomas, Becker and Armstrong (1968) suggest that the teacher's use of disapproval, critical comments and warnings can actually strengthen the behaviors to which they are applied.

Experimental subjects in the above studies usually exhibited high rates of deviant classroom behavior. Systematic intervention procedures involved varying the teacher's behavior so as to produce changes in child behavior. In these studies, the teacher with experimenter supervision, produces behavior change by substantially increasing the frequency and quality of social reinforcement for appropriate behavior. These studies have provided evidence that teacher attention may be instrumental in maintaining appropriate as well as inappropriate classroom behavior.

There is very little normative data available on the frequency with which classroom teachers attend to either appropriate or inappropriate child behavior. An additional question of interest is the amount of time teachers attend to the behavior of deviant versus nondeviant children in the same classroom. Also of interest is the ratio of teacher attention to the appropriate as well as inappropriate classroom behavior of deviant and nondeviant children.

The present study recorded the frequency with which a regular classroom teacher attended to the appropriate as well as inappropriate behavior of deviant and nondeviant children enrolled in her classroom. Specific objectives of the study were (1) to determine the proportion of overall teacher attention given to deviant versus nondeviant

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children, (2) to measure the amount of time the teacher attended to appropriate versus inappropriate classroom behavior of deviant and nondeviant children.

SETTING AND SUBJECTS

The setting for the study was a fifth grade classroom in a local elementary school. The classroom teacher was a university graduate with 3 years of reported successful teaching experience. Thirty-one children were enrolled in her classroom during the study.

The mean intelligence quotient for the class, as measured by the CTMM, was 101 with a standard deviation of 12. Individual scores ranged from 76 to 131. The mean achievement score on the California Achievement Test was grade level 5.1 with a standard deviation of 1.2. Achievement scores ranged from 2.7 to 7.6. The average chronological age for the class was 131 months with a standard deviation of 5.7 and a range from 124 to 147. Although there was considerable individual variation on the measures used, the class, as a whole, approximated age and grade level norms in academic achievement and intelligence quotient.

Subject Selection

The teacher was asked to complete the *Walker Problem Behavior Identification Checklist* (Walker, 1970) for each child in her class. Higher scores on the instrument indicate deviant behavior and lower scores indicate less deviant behavior. All 31 children were ranked from most deviant to least deviant based on their checklist scores.

The 5 most deviant children and the 5 least deviant children, according to checklist score, were selected for further observation and subsequent screening. Behavioral observation data were then used to select the 3 most deviant and the 3 least deviant subjects from this group.

These children served as experimental subjects throughout the remainder of the study. The classroom teacher was informed that the experimenters were conducting an observation study. However, she was not informed about the nature of the study nor which subjects were being observed until the study was concluded.

Observation and Recording

Observation of child behavior. Child behavior as well as teacher behavior was recorded in this study. Behavioral observation data were used in the process of screening and selecting deviant and nondeviant subjects at the beginning of the study. Observations of the deviant and nondeviant

subjects' behavior were also recorded for the duration of the study.

A behavioral observation form (Ray, Shaw & Patterson, 1968) was used to record the classroom behavior of subjects in this study. The observation form provides a method of characterizing school situations for a child so as to facilitate understanding the determinants and consequences of his behavior. The 13 response codes on the form are divided into 7 inappropriate and 6 appropriate categories. Figure 1 contains definitions of the behavior categories in the observation form.

The form also contains codes for the classroom setting, the social consequences of child behavior and the social agent supplying the consequence. During each 6-minute observation session, the activities of the classroom setting are coded as group, individual, transition or recess. The social consequences of child behavior are coded as no response, attention, praise, compliance, disapproval, noncompliance and physical (+ or -). The social agent supplying the consequence is coded as teacher, peer or observer.

The observation form is set up as a grid. Each horizontal line in the grid defines a 15-second interval. The 6-minute grid is further subdivided into 2-minute sections for observer convenience in reading the behavior codes. Using an observation clipboard, set for 15-second intervals, the observer moves down one grid line each time he receives a signal from the clipboard. During each 15-second interval, the observer records both the behavior of the subject and the social consequences of his behavior by placing the appropriate consequence and agent notation(s) in the space beneath the appropriate behavior code. More than one behavior category can be coded during a single 15-second interval; however, once coded, the same category cannot be recoded during the 15 second interval.

Two observers, graduate students in special education, were assigned to record child behaviors on a daily basis for the duration of the study. Observations were taken between 9 a.m. and 12 noon each day. Class activities during this period consisted of reading, language arts and mathematics. This instructional bloc was approximately evenly divided between group and individual activities. Group work consisted of the teacher lecturing, explaining assignments, giving instructions or holding group discussion sessions. Periods for individual work usually followed group activities. Observations were randomly taken across this 3-hour bloc throughout the study so as to sample all academic areas and class activities. Observers used a sampling without replacement procedure in taking observations. One subject was randomly selected for observation

Figure 1

Classroom Behaviors—Description of Codes

NY (noisy): Coded whenever the subject (S) is talking loudly, yelling or making other deliberate, inappropriate noise (such as banging books or scraping chair back and forth) which is actually or potentially disruptive to others.

AG (aggression): Actual or attempted physical abuse of another, e.g., John hits Bill or John starts to hit Bill and is stopped by the teacher. This included pushing, shoving, threatening, bossy.

NA (not attending): S is not attending to his work or to a lesson being taught, etc.—may be looking out the window, watching the observer or other children, drawing when he is supposed to be watching teacher demonstrate arithmetic, leaning down to tie his shoe, turning his chair.

PI (peer initiation): Peer talks to, pokes or in some way tries for attention of S.

IP (initiation to peer): S talks to or in some way tries for attention of peer.

MO (movement around room): Coded whenever S is moving around room (other than times when entire group is moving, as in transition periods). Observer need not try to decide whether each movement is appropriate or inappropriate; that question is better decided by comparing rate of movement across subjects.

IW (inappropriate task): Work on task not assigned or specified by teacher for that time.

NO (appropriate group behavior or normative behavior): Coded whenever the S's behavior is task-directed activity which is appropriate for that time and situation. Included would be listening to the teacher explain a lesson, painting during an art class, singing with others during music, lining up with the rest of the class to go out for recess, etc. The observer should take care not to include any behavior which might be more appropriately characterized as recitation.

WK (work): A child may be engaged in appropriate group activity but not working, e.g., observe a movie. Work means at desk on *academic projects*. Must work on teacher-assigned task. Record when engaged in reading, writing, arithmetic, basic skills.

RE (recites): Coded whenever S recites, answers a teacher's questions, reads out loud, gives a speech or performs before the class.

VO (volunteers): Coded whenever S raises his hand or in some other manner indicates a desire to recite or do whatever else the teacher may have asked for (e.g. someone to pick up papers); may be either in a class discussion or in a small group.

TI (teacher initiation): Coded when the teacher "calls on" the S or comes to his desk or activity area to speak to him; this interaction must be initiated by the teacher and not be a response to an initiation by the subject.

IT (initiation to teacher): Coded when the S indicates that he wants some attention from the teacher; he may raise his hand, speak or go to her. This behavior is differentiated from "volunteer" in that the subject's initiation to the teacher is not in conjunction with class discussion, group study or reciting.

and not observed again until the remaining 5 subjects had been selected and observed. Approximately 12 minutes of observation data or six 2-minute observation sessions were taken daily on each subject during the study.

Observation of teacher behavior. The authors recorded interaction data between the teacher and the 6 experimental subjects between 9 a.m. and 12 noon for each day of a 2-week period. Each interaction between the teacher and any of the 6 subjects was timed with a stopwatch and recorded on a data sheet. The subject's behavior immediately prior to the interaction was coded as either appropriate or inappropriate. The authors coded whether the child continued the same activity or initiated a new activity immediately following termination of the interaction. If the subject changed his behavior within 15 seconds following the interaction, the authors coded initiation of a new activity. If the behavior did not change within this period, continuation of the same activity was coded.

The subject's behavior was again coded as appropriate or inappropriate following the interaction with the teacher. Each interaction was also coded as to whether it was a result of the child initiating to the teacher or a result of the teacher's independent initiation to the child.

Reliability

Approximately 1 month prior to the beginning of the study, the 2 observers were given the coding manual for the observation form developed by Ray, et al (1968). The observers memorized the operational definitions for the response codes and familiarized themselves with the grid system, social agent and consequence codes. The observers were initially trained in an experimental classroom setting for behaviorally disordered children. Observer training was supervised by a graduate research assistant experienced in using the observation form in both the experimental and regular class setting. Observations were taken on subjects in the experimental classroom through one-way glass from an adjoining room. The observers were thus free to discuss differences in behavioral coding among themselves and with the training observer in the process of establishing reliability.

Inter-rater reliabilities were calculated by a percent agreement method in which number of agreements was divided by the total number of time intervals. Agreements were defined as 2 observers coding the same consequence and agent events under the appropriate behavior category in a given 15-second interval. Each observer was required to reach a criterion of .80 agreement with the training observer. The observers were then required to achieve the same criterion with one another. The observers then entered the regular classroom and re-established their reliability in this setting, according to the same criterion, prior to the beginning of systematic observation. Inter-rater reliabilities during the experimental class training sessions averaged .87 and ranged from .50 to 1.00. Inter-rater reliabilities during the training sessions in the regular class setting averaged .90 and ranged from .62 to 1.00.

The observation data collected by the 2 observers was used as a basis for validating the author's recordings of teacher-child interactions. Each time an interaction occurred, it was recorded by the authors as described earlier. The interaction was also recorded simultaneously by the observers. The subject's behavior prior to, during and following the interaction was coded as were the consequences supplied to the subject's behavior during the interactions.

During the study, each specific teacher-child interaction coded by the authors was also coded by the observers on the child behavior observation form. There was complete agreement on the two sets of recordings as to whether an interaction occurred and on whether it was initiated by the subject or the teacher.

RESULTS

Fifth grade subjects in the original standardization sample for the *Walker Problem Behavior Identification Checklist* (Walker, 1970) received an average score of 8.72. In contrast, the 3 deviant subjects selected for this study received an average score of 18 on the checklist while the nondeviant subjects received an average score of 1.

Rates of appropriate and inappropriate classroom behavior were computed for each subject from the observation data. During the study, the deviant subjects' rate of appropriate behavior averaged .44 per minute while their inappropriate behavior rate averaged .39 per minute. In contrast, the nondeviant subjects' rates of appropriate and inappropriate behavior were respectively .59 and .21.

There were 144 separate interactions between the teacher and the 6 subjects during the 2-week observation period. Seventy of the 144 interactions were a result of the child initiating to the teacher and 74 were a result of the teacher's independent initiation to the child.

The distribution of these interactions and the resulting teacher attention was quite unequal among the 6 subjects. For example, of the 74 interactions resulting from the

teacher's initiation to the subjects, 57 (or 77 percent) involved the 3 deviant subjects and 17 (or 23 percent) involved the 3 nondeviant subjects. For the deviant subjects, 51 of the 57 interactions (89 percent) were a result of the teacher attending to their inappropriate behavior. For the nondeviant subjects, 14 of the 17 interactions (82 percent) were a result of the teacher attending to their appropriate behavior. The actual frequencies of teacher attention to the appropriate and inappropriate behavior of individual subjects is presented in Table 1.

Table 1

Frequency of Interactions in Which Teacher Attention Was Given to Appropriate Versus Inappropriate Behavior for Individual Subjects

		Appropriate Behavior	Inappropriate Behavior
Deviant Ss	1	1	31
	2	4	11
	3	1	9
Nondeviant Ss	4	5	2
	5	5	1
	6	4	0

Inspection of Table 1 reveals there was a much higher frequency of interactions involving deviant subjects than nondeviant subjects. For the deviant subjects, there were nearly 9 times as many interactions involving teacher attention to inappropriate behavior as there were interactions involving teacher attention to appropriate behavior. In contrast, for the nondeviant subjects, there were approximately 5 times as many interactions involving teacher attention to appropriate behavior as there were interactions involving teacher attention to inappropriate behavior.

Across all subjects, the probability was .94 that interactions in which teacher attention was dispensed for appropriate behavior would be followed by appropriate behavior (in the post-interaction 15-second interval). Conversely, the probability was .58 that interactions in which teacher attention was dispensed for inappropriate behavior would be followed by inappropriate behavior. Thus, less than 50 percent of the time was the teacher's attention to inappropriate behavior effective in terminating or changing that behavior.

This held true for both deviant and nondeviant subjects. By subject classification, the probability was .59 for deviant subjects that the teacher's attention to inappropriate behavior would be followed by inappropriate behavior. For nondeviant subjects, the probability was .57. These probabilities suggest that the subjects in this study were negatively reinforcing the teacher's attempts at terminating their inappropriate behavior on an intermittent basis. That is, they sometimes reinforce the teacher immediately by terminating the inappropriate behavior. At other times, they would persist in the inappropriate behavior through several attempts by the teacher to terminate it.

DISCUSSION

The teacher-child interaction data indicate that the inappropriate behavior of the 3 deviant subjects was being maintained on a very dense schedule of teacher attention. In contrast, teacher attention to the appropriate behavior of the same subjects was relatively infrequent.

The imbalance in teacher attention to the appropriate versus inappropriate behavior of the deviant subjects is consistent with results of a prior study by Walker, Fiegenbaum and Hops (1971). In that study, 5 subjects exhibiting acting-out behavior in the classroom were selected for treatment in an experimental class setting. Pre-treatment observation data were collected on each subject over a 2-week baseline period. The subjects were enrolled in 5 different classrooms. As a group, they received teacher praise for appropriate behavior an average of 3 times per hour. Conversely, they averaged 45 teacher disapprovals to their inappropriate behavior during the same period.

In the above study, as in the present study, teacher attention to the deviant subjects' inappropriate behavior was designed to terminate that behavior. During these interactions, the teacher's verbal behavior was characterized by such comments as "sit down," "be quiet," "get back to work," "how many times have I told you to sit down," "stop talking," and so forth. Positive teacher attention or praise was never directed to inappropriate behavior in either of these studies.

Although the overall frequency of teacher attention was much lower for the nondeviant subjects, the imbalance in teacher attention to their appropriate versus inappropriate

behavior was similar to that for the deviant subjects (89 percent to 11 percent—deviant Ss; 82 percent to 18 percent—nondeviant Ss). However, the behavior class to which teacher attention was directed was reversed for the 2 groups of subjects. For example, 89 percent of the teacher attention given to the deviant subjects was directed to their inappropriate behavior. In contrast, 82 percent of the teacher attention given to the nondeviant subjects was directed to their appropriate behavior.

In addition, teacher attention to the nondeviant subjects' appropriate behavior was consistently positive and was characterized by such comments as "nice work," "you're doing well," "good," etc. This held true for the deviant as well as nondeviant subjects. While teacher attention to inappropriate behavior was devoted to terminating that behavior, teacher attention to appropriate behavior was devoted to increasing its frequency. This also held true for both deviant and nondeviant subjects.

Although teacher attention covaried with the amount of appropriate and inappropriate behavior produced by the deviant and nondeviant subjects, this study did not establish cause and effect relationships between these two variables. However, there are studies which have demonstrated that teacher attention can be used to increase both appropriate and inappropriate classroom behavior. For example, studies by Becker, Madsen, Arnold and Thomas (1967), Hall, Lund and Jackson (1968), and Thomas, Becker and Armstrong (1968) have shown that an increased frequency of teacher attention to study behavior increases that behavior while a decrease in teacher attention is associated with a reduction in study behavior. A study by Madsen, Becker, Thomas, Koser and Plager (1968) demonstrated that out-of-seat frequency was increased by the teacher's use of "sit down" commands. The frequency was reduced when the teacher decreased her use of these commands. Thus, teacher attention, whether positive or negative, appears to have reinforcing properties which may be instrumental in maintaining both appropriate and inappropriate classroom behavior.

The relationship between the deviant subjects' inappropriate behavior and the teacher's efforts at consequating that behavior can be related to the reciprocity-coercion hypothesis developed by Patterson and Reid (1969). This hypothesis holds that coercive demands (mands) which are highly aversive are applied to a reinforcement dispenser (adult). The social interaction is usually terminated when the adult yields to the coercive manding. In this process, the behavior of the reinforcement dispenser is maintained through negative reinforcement (termination of the aversive manding); and the child's coercive manding is maintained through positive reinforcement (adult yielding to mands).

This process characterizes the teacher's interactions with the 3 deviant subjects. For example, the subjects would terminate the aversive mand (disruptive or deviant classroom behavior) only after 1 or more attempts by the teacher at consequating the inappropriate behavior. These attempts were almost exclusively verbal and included such comments as "sit down," "get to work," "I told you to be quiet," "stop disrupting the class." It is somewhat ironic that the attention dispensed by the teacher in consequating the subjects' inappropriate behavior appeared to be instrumental in maintaining it.

Moreover, the high frequency of teacher attention to the deviant subjects' inappropriate behavior appeared to be related to the intermittency with which they reinforced her by terminating their inappropriate behavior. The nondeviant subjects would usually terminate their inappropriate behavior on the first or second consequation attempt. However, the deviant subjects sometimes would not terminate the aversive behavior until the fourth, fifth, or even sixth attempt by the teacher to get them to do so. At other times, they would terminate the inappropriate behavior on the first or second attempt. Thus, it appeared the teacher's consequating behavior was partly under the control of a schedule furnished by the deviant subjects. The inappropriate behavior of the deviant subjects appeared to be maintained at a high rate by the teacher attention generated by this schedule.

The results of this study need to be cross-validated upon a large group of classroom teachers before they can be applied to teachers in general. If the results are replicated, they would suggest that classroom teachers respond to the behavior of deviant and nondeviant children in a very different fashion. The reasons for this are intriguing. If reinforcement schedules which are controlled and mediated by the deviant subjects account for this effect, then it would be interesting to know what the parameters of these schedules are. It would also be interesting to know how the inappropriate behavior of the deviant subjects develops and becomes strengthened while appropriate behavior is developed and strengthened for nondeviant subjects.

The teacher in this study appeared to be reasonably competent. She had 3 years of reported successful teaching, and her teaching lessons were usually well organized and clearly presented. There were several children in her class who were extremely difficult to manage, and she accepted this as a natural part of teaching. If she is representative of the average teacher, it would appear that

teachers could benefit from training in behavior management techniques. Systematic training programs could reduce the deviant child's rate of inappropriate behavior while freeing the teacher to devote more of her time to instruction.

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CLASSROOM FORUM

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PROBLEM 27

I teach in a special education school that is not served by a speech correctionist. We have several children who display defective speech, resulting in frustration and sometimes rejection by their peers. Is it possible for classroom teachers, untrained in diagnosis and treatment, to help children overcome these problems?

You will show good judgment if you refuse to accept primary responsibility for the correction of seriously defective speech. Children with such problems need the assistance of a speech correctionist. Therefore, your first goal may be to initiate action to get one! You may also need to tap available community resources such as physicians, audiologists and psychologists. The importance of organic or psychological factors should not be overlooked.

Classroom teachers can *help* children overcome some speech problems by developing certain skills.

Providing a Good Model

Although a small percentage of children need speech correction, almost *all* students need speech improvement. Because children tend to imitate the diction, voice and manner of communication of their teachers, you have a powerful influence on their speech. Be certain that your own speech and voice is worthy of imitation. For example, careless or substandard articulation will be imitated by children. (It may also interfere with a child's ability to concentrate on what is being said.)

Listening

Most teachers are skillful at picking out those students who need speech help. You need to develop a discerning ear for identifying the specific articulatory and vocal errors

your children are making. Provide your children with interesting experiences to talk about; and when they do, *listen*. Look at them and listen attentively as if nothing else matters at that moment.

Physical Environment

Provide a physical setting that promotes speaking and fosters listening skills. An attractive, comfortable room with materials that stimulate is important. It is equally important to provide an atmosphere free from noisy distractions that may interfere with auditory discrimination.

Fostering Human Relations

When you show acceptance of the child with a handicap (whether it be speech, physical, intellectual or emotional), the child and his classmates are likely to adopt the same attitude. Control your feelings of sympathy. Provide a setting that invites oral communication and foster good human relationships among your children.

All readers are invited to submit questions to the *Classroom Forum* column. Answers to selected questions will be published in the September, 1973, through May, 1974 issues. Send your questions to the Editorial Offices, *Focus on Exceptional Children* 6635 East Villanova Place, Denver, Colorado 80222.