

Two Types of Behavior Management Programs and Their Effects upon Student Achievement

Geoffrey G. Hett
University of Victoria

This report summarizes the outcome of treatment programs for boys exhibiting problems subsumed under the label "nonattending." Twenty-seven children referred by their teachers were randomly assigned to two treatment conditions and a control condition. Treatment for one group consisted of training the teachers to alter the nonattending behaviors of the problem child. Treatment for the second group was also conducted within the classroom, but by an experimenter as well as the teacher. Direct observations were made in the classroom before, during, and after intervention. The data showed a significant difference between means at posttreatment between the group conducted by the experimenter and the control group. Follow-up indicated a loss of part of the desired effect for this group, while the teacher group maintained the gains achieved. There were no significant differences between groups on achievement scores.

Cet article fait état des résultats des programmes de réadaptation mis en place pour les élèves difficiles que l'on qualifie généralement de "dissipés." Vingt-sept élèves de quotient intellectuel normal ont été choisis par les titulaires de leur classe et répartis au hasard entre deux situations de traitement et une situation témoin. Pour l'un et l'autre groupe, le traitement a consisté à développer chez les élèves un esprit d'attention à l'endroit du maître et un esprit d'application dans les travaux scolaires. Pour l'un des groupes, le traitement a été donné en classe par un spécialiste avec la coopération de l'enseignant, et pour l'autre groupe il a consisté à former des enseignants, ensemble et isolément, en vue d'accroître l'esprit d'application chez les élèves dissipés. On a procédé à des observations directes en classe tant avant que pendant et après l'intervention. Les données recueillies ont fait apparaître une nette différence dans les moyennes, après le traitement, entre le groupe dirigé par le spécialiste et le groupe témoin. Par la suite, on a constaté dans ce groupe une diminution de l'effet recherché tandis que, dans le groupe confié aux enseignants seuls, l'amélioration s'est maintenue. Il n'y a pas eu de différence significative d'un groupe à l'autre dans les résultats obtenus par les élèves.

Current research suggests that children who engage in high rates of nonattending behavior miss many of the learning experiences and academic skills which normally accrue to the attending child. Cobb (1969), for example, found attending behavior to be an important correlate of arithmetic achievement for fourth-grade children. Stallings and Koskowitz (1974) discovered that among more than 100 significant correlations between classroom activities and student achievement, the highest correlations were obtained for the length of time students attend and reading and arithmetic achievement. Bloom (1976) reports consistent positive correlations between student attention and achievement gains.

Recent studies also indicate that there are a set of effective strategies for improving attending behavior in classroom settings. Teacher attention and extinction are among the strategies employed (Marlowe, Madsen, Bowen, Reardon, & Logue, 1978; Breyer & Allen, 1975; Hall, Fox, Willard, Goldsmith, Emerson, Owen, Davis, & Porcia, 1971; Hall, Lund, & Jackson, 1968). When token reinforcement is added to these procedures, further improvement is noted (Marlowe et al., 1978; Breyer & Allen, 1975). Time-out procedures are frequently used concurrently with these strategies to reduce specific nonattending behavior (Walker, Madson, & Buckley, 1969; Wahler, 1968; Bijou, Birnbrauer, Kidder, & Tague, 1967).

Currently researchers are investigating varying approaches for effectively implementing behavior management strategies into classroom settings. Borg (1975) found that teachers who enrolled in a 30-hour course in classroom management significantly increased their students' work involvement in recitation and seatwork situations. Greenwood, Hops, and Walker (1977) cite the effectiveness of a program for academic survival skills (PASS) for increasing the attending behaviors of school children. Marlowe's et al. (1978) study suggests that counsellors serving as consultants to classroom teachers provide an effective means for improving student attending behavior.

Relatively little, however, has been done to compare the effects of training teachers during group and individual sessions with the more popular approach of having an experimenter intervene directly in the classroom. The purpose of the present study was to compare the efficacy of these two approaches for implementing management strategies into regular classroom settings. Their immediate and long range effects for increasing and maintaining the attending behavior of non-attending pupils are investigated. In addition, the effects that increased attention has upon the reading, arithmetic, and spelling performance of the subjects are examined.

METHOD

Subjects and Setting

Children of normal IQ enrolled in regular second, third, and fourth grade public school classrooms were the subjects of investigation. As a preliminary step, second, third, and fourth grade teachers in a particular school district were asked to refer one pupil from their classrooms who manifested a high rate of nonattending behavior. Behavior observations were made on these pupils using coding procedures devised by Cobb and Rey (1970). Attending behavior was then calculated for each pupil by combining all code categories judged on an a priori basis to be appropriate to the classroom setting. The categories selected are defined by Cobb and Rey (1970) as:

CO Complies. Pupil does what the teacher requests.

TT + Appropriate talk with teacher. Pupil talks to the teacher about his academic work.

VO Volunteers. Pupil indicates, by using appropriate methods, that he wants to make an academic contribution.

IT Initiation to teacher. Pupil seeks assistance from the teacher in solving a problem.

AT Attending. Pupil indicates by his behavior that he is doing what is appropriate for the academic situation.

The 27 children finally selected for the study were those who demonstrated the lowest rates of these attending behaviors. All 27 pupils to exhibit the lowest rates of attending were boys. Each pupil was assigned at random to one of three experimental conditions: (a) direct intervention group, (b) teacher-training group, and (c) control group. Each group comprised nine pupils from each of the three grade levels.

Observation Procedure

Six independent observers recorded time samples of attending and non-attending behavior for all pupils across baseline, treatment, post-treatment, and follow-up phases. Data from six 18-minute independent observations were gathered on each pupil during each experimental phase, except for the follow-up which included five observation sessions on each pupil.

In an attempt to minimize observation measurement error, the observers were trained together until an interobserver reliability of .80 was reached. The degree of observer agreement was determined by calculating the number of experimental conditions: (1) direct intervention group, (2) teacher-training group, and (3) control group.

The underlying assumption of this investigation was that the classroom milieu normally provides little reinforcement for the attending behaviors of the nonattending child. It was also believed that only by changing the child's classroom environment could a behavioral repertoire compatible with learning be established and maintained. In an attempt to develop an effective program, provision was made to reduce any social consequences for nonattending behavior and to increase the recognition of attending behavior by involving the classroom teacher, the peer group, and for subjects in Group 1, an intervening experimenter.

Group 1: Direct Intervention

Nine undergraduate students, each working directly within one of the experimental classrooms, developed the intervention programs based on the following outline. As these students varied in their knowledge of the intervention procedures, weekly planning sessions were held by the students and writer throughout the within-treatment phase.

Phase 1. The intervention program was explained in part to each of the subjects and their classmates. The emphasis here was that special events such as prizes, field trips, and recreational activities could be earned by each subject for attending and that these would be shared with his entire class.

A workbox (Patterson, 1965) was then placed on each subject's desk and token reinforcement was dispensed on a variable interval schedule for attending behaviors. This phase of the program was continued for two weeks (five morning sessions), with training sessions being approximately 10 to 30 minutes in duration. During each session the schedule was gradually increased from 10 to 30 seconds. At the end of each session the subject was allowed to exchange the points earned for one of the special events.

Phase 2. During this two-week phase, experimenters visited each classroom for six morning sessions. The training sessions were gradually increased from 35 to 60 minutes in length. The variable-interval schedule was similarly increased from 35 to 60 seconds. Thus, Phase 2 commenced with a 35-minute training session and a variable-interval schedule of 35 seconds. It terminated with a 60-minute session and an interval schedule of 60 seconds.

Throughout Phase 1 and Phase 2, points, used as tangible reinforcers, were paired with social reinforcers which took the form of praise and encouragement. No aversive controls were used. Failure to attend was simply not reinforced.

Phase 3. During the third two weeks, a workcard was substituted for the workbox. Each subject was informed that points earned for attending behaviors would continue to qualify for special events. The workcard was chosen as a manageable method for the classroom teacher to continue the reinforcement program.

Each card listed such task-oriented words as "working quietly," "remaining seated," "complying," and "completing tasks." Points for these attending behaviors were administered on a variable interval schedule which allowed each subject to earn a maximum of 30 to 40 minutes of time each day for these special events. Each point awarded was exchanged for one minute of time.

During week two of this phase, the experimenters visited the classrooms three mornings each week for 60-minute periods. On the days when the experimenters did not visit, the classroom teacher carried on with the program independently.

"Time-out" procedures were also introduced during this phase of treatment. Specific disruptive behaviors engaged in by each subject were identified by his teacher. When the subject exhibited such behavior he was placed behind a portable partition which isolated him from his classmates for a five-minute period. The use of the time-out procedure was

not limited to the subjects themselves, but was used with all pupils in each experimental classroom.

Phase 4. During the final two-week period the workcard was removed and the points earned for attending behavior was recorded on the chalkboard. To earn points each subject had to complete progressively longer assignments and to attend for longer periods. The procedures of exchanging each point for one minute of time and having the entire class share in the special events were continued.

At the end of the two-month period, teachers were encouraged to withdraw the token procedures by relating the token reinforcers to progressively longer periods of attending. In addition, the interval between dispensing the tokens and the subject receiving the special events was lengthened. Instead of having tokens exchanged for the back-up reinforcers on a daily basis, tokens were exchanged for the special events every second, third, or fourth day. Finally, the interval was increased to a week. The length of time to eliminate the token system was left to the discretion of the teacher in consultation with the individual experimenters.

Posttreatment. Following the treatment period each experimenter made eight additional classroom visits. These visits were conducted weekly and were designed to reinforce the teacher for maintaining the program. At varying intervals during these two months, each teacher was also given information from the observation data about the improvement made by her pupil.

Follow-up. Observation data continued to be collected for two months following the posttreatment period. However, no classroom visits were made by the experimenters during this period and no further consultation was provided to the teacher.

Group 2: Teacher Training

The program for this group of subjects consisted of the teachers themselves developing and using operant-based procedures in their classrooms. Training sessions were provided for these teachers to assist them with procedures for strengthening behaviors and concurrently weakening non-attending classroom behavior.

The training program began with the writer meeting the subjects' teachers in seminar. The total training program consisted of three one-and-one-half hour meetings followed by brief weekly meetings or telephone conversations.

The first session stressed the basic difference between operant and personality theories. It was emphasized how teachers, when interacting with their pupils, play an important role in shaping and maintaining classroom behaviors. Reinforcement and extinction procedures were then discussed in detail. Research in support of these procedures was reviewed.

In developing this presentation further, in Session 2, the following topics were discussed: token economies, contingency programs, and "time-out" procedures. Again, research demonstrating the efficacy of the token economy and time-out procedures was reviewed.

The third and final seminar resulted in a general discussion and summary of the key classroom strategies discussed in previous sessions. The emphasis here was on the teachers' task of "tailoring" their programs to meet the needs of the individual subjects. During this session each teacher designed and presented her intervention program to the group.

Following the seminar session, five weekly meetings were held with individual teachers. The purpose of these meetings was to ensure the implementation of the program in each of the experimental classrooms and to assist each teacher with problems which she may have encountered. Following this two-month period, four bi-monthly meetings were held with each teacher. The purpose of these remaining sessions was to ensure program maintenance. The succeeding two months comprised a period of follow-up with no further consultation provided to the teachers.

Group 3: Control Group

Each subject in this group was removed from the classroom each week while the intervention programs with Group 1 and 2 were conducted. During these absences, the child was engaged in nondirective discussions.

TREATMENT EFFECTS

The mean proportions of attending during baseline, within-treatment, posttreatment and follow-up for each group are presented in Figure 1.

A two-way analysis of variance with repeated measure on one factor (Winer, 1962, p. 302) was done on attending behavior across baseline, posttreatment and follow-up. This indicates a significant gain in attending for all groups across time and also a significant interaction effect. Thus the null hypothesis concerning the differences between groups is rejected ($p < .025$ level). Results are shown in Table 1.

The differences between groups during baseline, posttreatment and follow-up were compared (Kirk, 1968, p. 263). A significant difference between means was obtained at posttreatment between the direct intervention and the control group ($F = 3.621$, $df = 1/24$, p between .05 and .10).

In addition, attending across baseline, posttreatment, and follow-up for each group were similarly analyzed. The direct intervention group showed a significant increase in attending from baseline to posttreatment ($F = 26.75$, $df = 1/48$, $p < .01$) and from baseline to follow-up ($F = 6.38$, $df = 1/48$, $p < .05$). This group also showed significant decrease in attending from posttreatment to follow-up ($F = 7.00$, $df = 1/48$, $p < .05$), indicating a loss of part of the desired effect. For the teacher training group

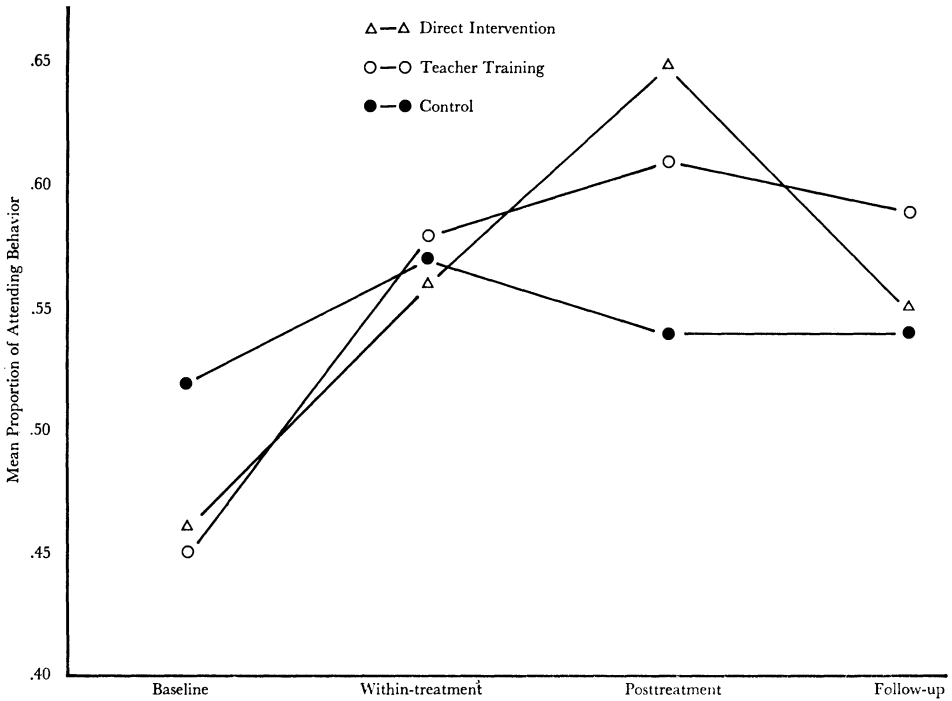


FIGURE 1

Mean Proportion of Attending Behavior (CO + VO + IT + AT + TT+) at Baseline, Within-Treatment, Posttreatment, and Follow-Up for Experimental (DI and TT) and Control Ss.

a significant difference between baseline and posttreatment ($F=20.55$, $df=1/48$, $p<.01$) and from baseline to follow-up ($F=16.85$, $df=1/48$, $p<.01$) was obtained. Further analysis showed no significant difference between posttreatment and follow-up. Thus, attending behaviors seemed to be maintained during follow-up. In contrast, the control group showed no significant difference between baseline, posttreatment, or follow-up.

The analysis of variance with repeated measures (Winer, 1962, p. 302) was used for the statistical analysis of achievement data. There were significant gains in achievement for all groups during the course of this study. However, none of the differences between groups, nor interaction effects, were statistically significant. Thus the null hypothesis could not be rejected.

DISCUSSION

This study supports recent research by Greenwood et al. (1977), Hops and Walker (1976), and Cobb and Hops (1973) which demonstrate the

TABLE 1
*Summary Table: Analysis of Variance with
 Repeated Measures for Proportion of
 Attending (CO + VO + IT + AT + TT+)
 at Baseline Posttreatment and
 Follow-up for Experimental
 and Control Ss*

<i>Source of Variance</i>	<i>SS</i>	<i>DF</i>	<i>MS</i>	<i>F</i>
Between Subjects				
Groups	0.007	2	0.004	0.14
Error	0.629	24	0.026	
Within Subjects				
Trials	0.245	2	0.123	21.85**
Interaction	0.074	4	0.018	3.29*
Error	0.269	48	0.006	

* $p < .025$

** $p < .01$

efficacy of contingency management procedures for increasing attending behavior in regular classroom settings. It appears that teachers are able to learn these procedures during seminar sessions and effectively implement them in their classrooms. This approach has distinct advantages. One advantage is that the educational psychologist is able to work with groups of teachers rather than with individual children, resulting in an economy of his time. This approach also seems to result in a better maintenance of the desired effect than does a direct intervention approach by an outside authority. It is hypothesized that for Group 1, the loss of part of the desired effect was due to teachers placing the responsibility for changing the subject's behavior directly with the experimenter. The teachers in Group 2, however, immediately assumed the responsibility for changing the classroom behavior of their pupils.

The effects that attending behavior has upon the academic achievement of school children has yet to be resolved. Greenwood et al. (1977), Walker and Hops (1976), and Cobb and Hops (1973) obtained positive results on achievement scores when attending behavior was improved. Hay, Hay, and Nelson (1977) and Ferritor, Buckholdt, Hamblin, and Smith (1972), however, failed to demonstrate that increases in attending behavior result in concurrent increases in achievement. Greenwood et al. (1979) argue that such differences are probably due to differences in achievement measures used. The Hay et al. (1977) and Ferritor et al. (1972) studies use criterion-reference measures. The studies

obtaining positive achievement results used standardized achievement tests. This argument, however, doesn't hold for the present study as standardized achievement tests were used and yet differences in attending did not result in differences in achievement cores.

To assume that achievement increases as attending increases may be erroneous. Attending may be necessary, but not sufficient to produce learning (McDonald & Elius, 1976). It seems that future research should continue to explore effective means for helping teachers increase and maintain attending, but in addition and concurrently, explore instructional strategies which will ensure increases in achievement for individual children.

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Geoffrey G. Hett is an Assistant Professor in the Department of Psychological Foundations at the University of Victoria, Victoria, British Columbia V8W 2Y2.