Review of Educational Research
Summer, 1979, Vol. 49, No. 3, Pp. 436–458

Home-based Reinforcement of School Behavior: A Review and Analysis

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Home-based reinforcement of school behavior is proving to be an efficient method for motivating behavioral change. It has been used successfully with children in group homes, with children in special classes, and with entire mainstream and special classrooms. Twenty-four studies are reviewed with particular attention given to types of consequences employed and methods of gaining parental involvement. Consumable reinforcers, earned privileges, verbal praise, and response costs were all effectively administered by parents who were informed of their children's performance via daily or weekly school notes. Parents were instructed in their role in several ways, including group and individual conferences as well as simple letters sent home. A wide range of behaviors and academic problems were remedied rapidly and with a modicum of response costs to counselors, teachers, and parents. Implications for further research are considered.

It has been demonstrated frequently and incontrovertibly that classroom behavior can be controlled by teachers who are trained in the use of differential reinforcement and token economies (O'Leary & Becker, 1967; Walker & Buckley, 1972). Teachers have learned to use behavioral principles to increase their effectiveness in dealing with problematic behavior in mainstream classes (Barrish, Sanders, & Wolf, 1969; Hall, Panyan, Rabon, & Broden, 1968; Thomas, Becker, & Armstrong, 1968), in special classes (Axelrod, 1970–1971; Koegel & Rincover, 1974), in institutional settings (Cohen & Filipczak, 1971; Meichenbaum, Bowers, & Ross, 1968), with individual children in their classes (Hall, Lund, & Jackson, 1968; Madsen, Becker, & Thomas, 1968), and in an entire school (Boegli & Wasik, 1978). However, it seems that the training effects were frequently not maintained, and teacher reinforcement levels and student performance returned to base line without additional contingency management (Brown, Montgomery, & Barclay, 1969; Walker & Buckley, 1972). Resistance by teachers to even a minimum of involvement with behavioral programs has also been reported (Coleman, 1973; Packard, 1970; Patterson, 1974; Patterson, Cobb, & Ray, 1972).

Patterson (1971) has stated, "Because most of the teachers with whom we worked had a deep antipathy towards the whole idea of behavior modification, the emphasis has been to develop an approach which requires low response cost on the part of the teacher" (p. 151). The acceptance of new programs by teachers often seems to be determined by the short term response costs, which have become associated with the notions of additional study, extra training, data collection, and classroom restructuring, rather than the greater long-term gains for the students and the teacher of a

positive, well-managed classroom. Although student teachers now in training may be getting an increased exposure to behavior-management techniques, this does not begin to mitigate the problems that currently exist. In this day of large classrooms and increasing mainstreaming, most teachers have more than a few difficult children in their 'nonproblem' group. New programs that do not require great behavioral changes from the teacher, but which provide significant changes for children, need to be implemented to provide additional aid for teachers and children.

Report cards are presently used in the majority of schools to help motivate students to demonstrate appropriate behavior and to learn. They are usually sent home from two to six times a year and they report on a variety of student behaviors. Report cards utilize wide varieties of criteria for evaluating and methods for symbolizing the huge quantities of behavior that a child has shown during grading periods (e.g., Mann, O'Dell, Parsons, & Walbert, 1966). For some children this 'feedback,' in addition to other factors, seems to result in the provision of sufficient motivation for the maintenance of good classroom performance.

However, there are many children for whom this feedback does not result in the kind of consequences required to support successful classroom learning. This is not surprising in view of the extremely long intervals between the behavior and the feedback, and in view of the experimental evidence of the limited reinforcement value of feedback about school performance or of any consequences that naturally ensue from it (Edlund, 1969; Karraker, 1972; Sluyter & Hawkins, 1972). It is for these children that different parameters of the reporting system need to be tailored.

Programs that utilize home-based reinforcement of school behavior are based on the premise that the feedback from report cards can be of more assistance to children, teachers, and parents than it now is. In such programs, notes are sent home frequently, usually daily at first, and they report on the child's performance on certain prespecified, or target, behaviors. The frequent feedback helps the parents and child to monitor how the child is doing and provides the parents with information that they use to systematically reward performances that meet the criteria. In some programs, performances that do not meet the criteria are systematically sanctioned. Many of these programs have now been implemented and have been shown to be remarkably successful. Although the basic systems are quite similar, the relevant parameters of the system have been varied. In some cases, the effects of this variation have been examined experimentally.

One parameter that has been manipulated, and whose manipulation has resulted in improved school performance, is the frequency with which the feedback is given. In some studies 'school notes' have been sent home daily (Bailey, Wolf, & Phillips, 1970; Cantrell, Cantrell, Huddleston, & Woolridge, 1969; Sluyter & Hawkins, 1972). In other studies, the daily notes have been faded to a weekly and biweekly event (Coleman, 1973; McKenzie, Clark, Wolf, Kothera, & Benson 1968; Schumaker, Hovell, & Sherman, in press; Thorne, Tharp, & Wetzel, 1967). Other intervals remain to be tested with different populations.

Another important variable that has been altered is the extent of differential feedback that school notes provide. In some cases, only a dichotomous occurrence-nonoccurrence scoring system was used, (Blackmore, Rich, Means, & Nally, 1976; Edlund, 1969; Karraker, 1972; Todd, Scott, Bostow, & Alexander, 1976), while others differentiated across several academic periods and levels of performance (Lahey,

Gendrich, Gendrich, Schnelle, Gant, & McNee, 1977; McKenzie et al., 1968; Thoresen, Thoresen, Klein, Wilbur, Becker-Haven, & Haven, 1977).

A relatively unexamined aspect of the standard report card system concerns what parents do with the feedback that has been provided them. Consultants for home-based reinforcement systems have instructed parents to deliver contingent consequences in a multiplicity of ways. Some programs have emphasized only positive consequences for good notes (Karraker, 1972; Lahey et al., 1977; Sluyter & Hawkins, 1972; Budd & Leibowitz, Note 1), while others have encouraged differential reinforcement (Ayllon, Garber, & Pisor, 1975; McKenzie et al., 1968; Stedman, 1976; Todd et al., 1976). The rewards and sanctions to be used have been spelled out very explicitly (Edlund, 1969; McKenzie et al., 1968; Schumaker et al., in press), and have also been left largely up to the parents (Ayllon et al., 1975; Karraker, 1972).

It is quite evident that home-based reinforcement programs are being used (cf. Brown, 1972; Homme, Csanyi, Gonzales, & Reches, 1969; Stuart, 1971a; Hops, Beickel, & Walker, Note 2), although their use is generally not being emphasized or examined. Several reports mention them obliquely, but do not go very far with either their description or analysis (e.g. Ayllon, Smith, & Rogers, 1970; Coloroso, 1976; Martin, Buckholder, Rosenthal, Tharp, & Thorne, 1968; Patterson, 1971, 1974; Rinn & Markle, 1977; Stuart, 1971b; Tharp & Wetzel, 1969). Dickerson, Spellman, Larsen, and Tyler (1973) report that a home-based reinforcement of a school behavioral system had been in use for 4 years, and that 1,000 children, from ages 5 to 15, had been placed on the program at one time or another. The authors state that the program was helpful, but no data are given. Enough experimental work has now been reported to merit a review and appraisal.

Home-based Reinforcement in Group Homes

One of the earliest reports of the use of daily school notes came from Achievement Place, a group home for predelinquent boys (Bailey et al., 1970). The authors point out that it is sometimes more feasible for parents to control reinforcers than it is for teachers. This was especially true in their study because the 'parents' were in fact teaching-parents who were trained to operate a token economy. The adolescent residents brought notes to school daily and their teacher evaluated them on two criteria: the following of school rules and study behavior. A simple yes-no criterion was used by the classroom teachers. The availability of privileges at home (e.g. TV, snacks, bedtime) was contingent on returning the card after school each day with all yeses. During the first phase of the experiment the teacher was instructed to give yeses noncontingently. School behavior still improved markedly. Upon the withdrawal of the school-note procedure, performance returned to base-line levels. This indicated that the classroom behavior had been under school note control. Reinstatement of the noncontingent school note resulted in a subsequent improvement of the youth's behavior. This improvement declined dramatically over time. The teacher was then instructed to mark the note either yes or no, contingent on the child's behavior. The first no that the teacher sent home, resulting in the loss of privileges and one extra work period back at Achievement Place, was followed by a significant increase in rule following and study behavior. This work demonstrates that it was not the feedback itself, but rather its use in the determination of differential consequences that was responsible for the behavioral change. In the next phase of

the experiment, the daily school notes were faded and were brought only on Tuesday and Friday. Points were accumulated and all points could be lost for a single no. Under the fading condition, the variability of behavior increased, but appropriate behavior fell insignificantly from 90% to 87%.

The authors make note of some important issues that bear consideration by users of home-based reinforcement systems. The first is that the classroom teacher must be able, and willing, to differentiate appropriate from inappropriate behavior and to deliver the feedback in a nonaversive way. Secondly, they point out that this system is aimed at motivational deficits and that it is vital that the skills the child possesses be consonant with the level of difficulty of the materials that he or she is expected to use.

A study by Kirigin, Phillips, Timbers, Fixsen, and Wolf (Note 3) underscores this concern. The authors found that two girls in a group home, who had primarily motivational deficits, demonstrated significant improvement with the aid of a home-based reinforcement program. A third girl, who had a substantial skills deficit, showed no gains until tutoring was added to the program to increase her academic proficiencies.

Another family-style group home that uses a school note program is Learning House (Thoresen et al., 1977; Tobey & Thoresen, 1976). In the case study by Tobey and Thoresen a yes-no criterion was used and four target behaviors were evaluated each day by the child's public school teacher. At present, a more comprehensive note, with seven target behaviors and four categories for evaluating the extent to which the child met the target behaviors is used. It is the child's responsibility, as it is in the majority of studies reported, to hand each teacher his or her note and to accept the marked note without comment. Privileges are awarded at Learning House for good behavior, and check marks that indicate poor performance are followed up by the teaching-parents with school contact.

Although notes are brought home daily by the children throughout their stay at Learning House, a fading procedure is used after the child's school behavior has stabilized at a sufficient level. After stabilization, the children begin to self-rate their school performance. Privileges are then contingent on the overall rating as well as on the degree to which the child's rating matches the teaching-parents evaluation. This procedure was developed in order to increase the child's self-observation, self-evaluation, and self-reinforcement skills, and to ultimately obviate the need for the school-note system.

When the children leave Learning House and return to their original public schools they continue using the daily school notes. A family consultant assists in the use of the program with the goal of establishing systematic parent-school contact and parental consequation of the notes. The long-term objective is to generate a system that will maintain the child's improved school behavior, that will be less formal but no less effective, and that will survive the consultant's imminent withdrawal.

Thoresen et al. (1977) consider the school note to be serving several important functions. The first is that it helps the classroom teacher to evaluate the child on the categories that the teacher feels are important. It also helps the teacher to evaluate the child on current performance in those categories, rather than on remembered or reputed performance. The note also directly involves the parent with the school and thereby increases the likelihood that appropriate and inappropriate behaviors will be

attended to when they are still at low frequency and amplitude and timely contingencies can then be initiated in order to accelerate or decelerate the noted behaviors (p. 32). At the present time, no systematic evaluation of the effectiveness of the school note program or the self-rating program has been made.

Harris, Finrock, Giles, Hart, and Tsosie (1975) demonstrated the effects of performance contingencies on the assignment completion behavior of five institutionalized Native American teenage boys who were residents of a half-way house. The boys earned a small monetary reward for attending school and also earned 300 points (toward home privileges) per assignment completion. They were fined 100 points for each assignment completion failure. A control group composed of all other youths in the boys' classes (n = 279) completed 65% of their assignments during the 4-week base line and 62% during the second 4-week period. The experimental group of delinquent boys completed only 37% during base line, but they completed an average of 77% during the point-contingent experimental phase. Individual gains ranged from 16 to 66 percentage points. Semester grades rose concommitantly from .86 (D−) to 2.0 (C).

Home-based reinforcement programs have been very effectively employed in group homes. This is in part attributable to the ability of the group-home 'parents' to control the contingencies and to closely monitor the program. For children whose behavior has resulted in their institutionalization, this degree of control may initially be necessary. For children with milder problems, less structured home-based reinforcement programs may be equally successful.

Home-based Reinforcement in the Natural Environment

School-note systems have also been used and examined in more open settings. School counselors, teachers, and parents, without the benefits of previous training, have been successfully instructed in their use. Experimental work has been done to examine the most effective means of producing the desired behavioral changes. The major thrust of these investigations has been concerned with finding the optimum methods for gaining parent involvement, and with determining the most beneficial contingencies and consequences.

Parental Involvement

A variety of paths have been followed in pursuit of an efficient and effective means of gaining parental involvement. Karraker (1972) took a close look at the effectiveness of three methods for training parents in the use of a home-based reinforcement system. The children involved were 16 second-graders who were not performing up to expectation, but who were in no other remedial programs. The parents of five children were instructed in two 1-hour conferences with the consultant. A second group of six sets of parents had only one 15-minute conference, while the remaining parents were mailed a 1-page instruction sheet. All parents were given instructions that emphasized consistency, the immediate presentation of the reward after the delivery of a deserving note, and the pairing of the reward that they gave with verbal praise. They were instructed to reward notes with happy faces on them and to make no comment if the school note had a frown face or if the child did not bring one home. Teachers were to give happy faces if the child increased or maintained the percentage of correct responses made on daily tests and if the child also completed his or her work.

Karraker (1972) found that parent instruction methods were not predictive of the amount of behavior change that the children demonstrated. Academic performance improved markedly under all conditions. It was shown, however, that during the no-note reversal stage, the children whose parents had been in the 2-hour training group maintained their gains better than did the children whose parents were instructed by the other methods. Karraker also included a phase in his design during which the children brought the daily school notes home, but received no tangible consequences. Their scores during this phase did rise above base line, but insignificantly so. The results in this study are somewhat beclouded by the failure of one of the three involved teachers to maintain the program throughout the experiment. This important study deserves replication.

Edlund (1969) used a daily school note for a special education classroom at the elementary school level. The notes had categories for behavior and assignment completion and employed a yes-no criterion. The arrangements were made during four to six conferences with parents, teachers, and the consultant. The conferences were both individual and group. A very specific procedure was presented for parents to use in translating the school notes into privileges or extra homework time. An ABCBC design was used in which the A was base line, B was school notes without consequences, and C was school notes with positive and negative consequences. Appropriate behavior and assignment completion increased insignificantly from 60% to 63% during B1, and from 63% to 90% during C1. Performance dropped to 63% during the return to condition B. After the reinstitution of C and the return to a high level of responding, a fading procedure was begun. When the child had between 20 and 60 perfect days in series, the school notes were stopped. Occassional tangible reinforcers were used during this time. No data are given for this fading procedure, and no follow-up is reported, but apparently the fading was successful. Edlund's program demonstrates significant behavior change in a relatively short time (usually the changes were seen in about one week) with little parent training and a simple instrument for teachers' use.

Edlund (1969) reports that this procedure was used effectively with children from kindergarten age to high school age, with emotionally disturbed children, and with children who were mentally retarded. It was also used with children from different cultural groups such as Mexican-Americans. He reports, "A random canvassing of the teachers and parents indicated that both groups found the program easy to understand and carry out and much less time-consuming than any of their former approaches to the problem. Most teachers reported that prior to the initiation of the program the children who demonstrated academic and/or behavioral problems had required almost constant surveillance" (p. 126).

A study by Lahey et al. (1977) contributes corroborating evidence to the proposition that home-based reinforcement programs can be effective with a minimum of parental instruction. Twenty-five public school kindergarteners were involved in this multiple-base line experiment. Preprinted notes that provided for evaluation of several behaviors, including the target behavior of improved resting, were sent home daily. Parents were instructed by letter to praise the presence of checks in the yes boxes, and to ignore their absence. Teachers reported spending 10 to 15 minutes a day filling out the notes and were rewarded by significant improvements in the target behavior. Spurred by the success of the experimental program, five other teachers in the school decided to adopt the program. Unfortunately, no follow-up was reported with regard to the experimental classroom or its five offspring.

A questionnaire, which was somewhat biased in favor of positive responses, indicated that parents preferred daily school notes over both weekly notes and the standard report cards traditionally sent home every fifth week. The attempt by Lahey and his co-workers (1977) to tap parental attitudes toward home-based reinforcement programs is creditable. A better understanding of parental responses to such systems may result in improved system design.

Budd and Leibowitz (Note 1) also instituted an extremely effective intervention program with a minimum of parent contact or instruction. They used a home-based reinforcement system with six 4- and 5-year-olds. These children had manifested severe behavioral problems in preschool and kindergarten. Two had attempted kindergarten before but had been dismissed because of aggression and noncompliance.

The work was done during a summer school session. The structured activities of the school day were divided into approximately 12 periods. Periods lasted from 4 to 8 minutes. A child earned a brightly colored sticker for each period during which she or he had met the criteria for the target behavior. If the child earned 8 of 12 stickers, she or he gained the opportunity to exchange the token card at home for prespecified privileges such as snacks, swimming, or having a friend over. The home reinforcements were arranged in a single parent-teacher conference, and the program was later explained to the child in a joint parent-teacher-child meeting.

In the procedure that was used, three target behaviors were tracked across multiple base lines. The first was 'off-area' (out of seat, off the mat during group time, or off the rug during rest time). During 8 days of base line the children were off-area 39% of the time. With the advent of the home-based reinforcement program, time spent off-area fell to 7%. After 6 days of that condition, the criterion for a sticker was extended to include 'aggression' (a motor attack on another person). The base line for aggression was 14 incidents per child per hour. Under the new condition, a child could earn a sticker if that child was in the right area and was not aggressive during each period. The mean rate of aggression fell to 2 incidents per child per hour. This change occurred in 10 days. Negative statements fell modestly at this time. When 'negative statements' (derogatory, profane, or threatening verbalizations) were added to the criterion they fell to 2 incidents per hour (the base line was 26 incidents per hour per child). The changes were accomplished in just 32 sessions!

Budd and Leibowitz (Note 1) asked that the parents record whether or not they had delivered reinforcement to their child, and to return the information with the school note each day. Records indicated that in 98% of the cases, the parents provided privileges when the children earned them and withheld them when they did not. No checks were made on the parents' reports, but they did have a high correspondence with the informal comments of the children.

Follow-up indicated that three of the six children were progressing well in school with no additional special help. The other three children showed lower rates of appropriate behavior, but were still in their normal classes. For two of the children, simplified home-based procedures were initiated in their mainstream classes. One responded quite well; the other did not. The program was not recommenced for the third child because the teacher did not deem it necessary. A 1-year follow-up is currently in progress.

McKenzie et al. (1968) used weekly school notes and monthly group parent

conferences to set up a home based reinforcement program with 10 preadolescent boys who were diagnosed as having learning disabilities. Weekly school notes were cashed in for allowances according to a standard scale that paid $ .10 per A, $ .05 per B, $ .01 per C, and cost $ .10 for every incomplete assignment. The children earned from $ .70 to $3.50 per week. Parents were told how to keep the economy from getting inflated by banking gifts from relatives, controlling outside earnings, and by expecting the child to pay for personal consumables like movies and candy. Even when they faded the payday to once every 2 weeks, the children's gains were maintained, as demonstrated by an overall increase in attending to reading work from a base-line level of 68% to 86% during fading. A reversal procedure was not used due to risks for the children.

(The use of money as a backup reinforcer is common to the majority of these home-based reinforcement studies. It is a very natural reinforcer because allowance day is often a well-established part of the parent-child interaction in the home. Making the allowance contingent does not require the addition of much extra effort or skill on the parents' part. It also allows the child the opportunity to buckle down and earn a little extra money if the need arises.)

Imber, Imber, and Rothstein (Note 4) used home-based reinforcement to help three second-graders improve their aggregate seatwork completion percentages from a base line of 47% to a final of 85%. Parental involvement was secured through parent-teacher telephone contact and with a written explanation of the school note. Parents were instructed to give immediate, lavish, and sincere praise if the child brought home a praise note, to praise the child again in front of the family and neighbors, and to post the praise notes in a conspicuous place. Each morning they were to remind the child of the pleasure that praise notes brought. No punishment was to be used.

The authors report that the children who participated in this study were not selected on the basis of demonstrated parental interest, and that there was no assurance that the parents would follow through on the teacher's instruction. Imber et al. (Note 4) report that "there was certainly some variation with which the parents implemented the recommendations of the teacher, although informal questioning of the subjects revealed that there was rather consistent cooperation among the parents" (p. 12).

Todd et al. (1976) sought to motivate parental support by using school suspension as a response cost for inept parental cooperation. If the child's report card ratings fell below the criterion level on three consecutive days, the child was to be suspended from school. This was conceived of as an inconvenience penalty for the parents, who both held daytime jobs. The student did fall below the criterion for two consecutive days, on two occasions, but never for a third day. The hypothesis of Todd et al., that the inconvenience penalty was functionally responsible for the child's improved third day performance, deserves experimental verification.

Hickey, Imber, and Ruggierro (Note 5) looked at whether or not school-home programs actually increased parent-teacher communication. Base-line data were collected on the behavior of five children and on the amount of contact that parents initiated toward school personnel. The children's arithmetic scores improved significantly (the results are reported later in this paper) with the institution of the home-based reinforcement system. No instances of parent-initiated contact were recorded

during the base line, but 20 such contacts were observed during the parent-involvement stage. Among those were several calls to the principal praising the program.

It is apparent that parents can learn to administer home-based reinforcement with a modicum of instruction. Home visits and time-consuming parent educational programs are not necessary for successful behavioral change when this system is used.

Teacher Involvement

Todd et al. (1976) found that the teacher's evaluation of the child's performance had a high correspondence with the evaluations of a trained observer. In their experiment, the teacher was provided with 5 hours of training in pinpointing and recording appropriate and inappropriate behavior. During classtime the observer recorded at 10-second intervals, while the teacher simultaneously used variable 6- and 10-minute intervals. Teacher-rater agreement was found to be quite high when the child's behavior was predominately appropriate or inappropriate. Correspondence was lowest when the student's appropriate behavior was 40 to 60%.

In two experimental settings, the observer also recorded the teacher's responses to appropriate and inappropriate behavior and found that the advent of the system resulted in no significant changes from base-line levels. It was also shown that there was no systematic variation between the teacher's responses and the boys' behavior. This has important implications in view of the findings that teachers often provide more attention to disruptive behaviors than to appropriate ones (Thomas, Presland, Grant, & Glynn, 1978; White, 1975) and that this attention may serve to reinforce the inappropriate behavior (Madsen, Becker, Thomas, Koser, & Plager, 1972; O'Leary & Becker, 1967). Home-based reinforcement may act to supercede the deleterious effects of contingent teacher attention for inappropriate behavior. Replication of this study should be done utilizing a longer base-line period in order to evaluate the effects of teacher attention on a student's behavior prior to and during, the use of the home-based system.

Clark (1972) also examined the relationship between teacher reinforcement and student behavior under multiple base-line and home-based reinforcement treatment conditions. A 10-second interval observational system was used to measure the percentage of time in which one or more adolescents violated a rule in their junior-senior high school special education classes. The teachers' rates of praise and punishment were also monitored.

With the implementation of a home-based reinforcement system the percentage of time that children were involved in rule violations was reduced. Talking out fell from 74% of the time to 20% after 5 days of treatment, despite the fact that the teachers' levels of reinforcement remained approximately constant under the base-line and treatment conditions for each class. In the afternoon art class, the teacher delivered reinforcement during 42% of the intervals. During the treatment condition, the teacher delivered reinforcement during 44% of the intervals. In the morning class, the percentages were 38% and 39% for the base line and treatment conditions respectively. Caution should be exercised in generalizing the results of this study beyond special education settings. The rates of reinforcement were significantly higher than those observed in mainstream classes (Thomas et al. 1978; White, 1975). It is possible that the reinforcement rates were nearly at their peak before the

implementation of the home-based system. This would be less likely to be the case in a mainstream class, and therefore teacher reinforcement rates could show greater interdependence with exposure to home-based reinforcement programs.

Types of Home Consequation

Schumaker et al. (in press) took a systematic look at the relative importance of parental praise in contrast to contingent privileges for three seventh-grade boys whose parents volunteered for the program. The boys were called disruptive, truant, and tardy, and reportedly did no homework or classwork. Privileges and praise were made contingent on daily test grades, classwork, and school conduct for the boys involved. School grades rose significantly above the base line and above a matched control group. In a second experiment, an ABCB design was used in which A signified the no-note condition, B signified a school note with contingent praise only, and under condition C both privileges and praise were contingent on a good school note. Although the youths showed some initial improvement in B1 and some apparent maintenance of gains in B2, the behavior was more variable than it was during condition C and was regressing toward the base line. Contingent privileges did result in a significant improvement in the boys' performance. Schumaker et al. (in press) note that subsequent to this experiment, additional subjects have used the program without contingent privileges and although most have shown some initial improvement, their performances have also declined over time.

In the third part of their study, they examined whether or not school personnel could supervise such a program with the aid of a manual, but without consultation. The results showed that counselors were able to effect an increase in one child's GPA from 1.07 to 2.16. Counselors estimated that they spent about 1 hour per week per child, and reportedly liked the program. The manual used by school personnel has since been made available to the public (Schumaker, Hovell, & Sherman, 1977). The program includes a fading procedure which begins by shortening the form and proceeds by sending the notes home two times a week, then weekly, and finally fading them completely. It is pointed out that most students have had to repeat steps, and that some remain on the fading ladder.

The fading procedure works in two ways. The first is to move the student to a stricter point requirement for earning privileges. Initially, 60% of possible points must be earned to gain daily privileges. After 10 consecutive days above that criterion, the level is moved to 75% and finally to 90%. At this time a shortened card is used with fewer and more general rating categories. The criterion is lowered to 80%. When daily privileges are earned for 15 straight days a semiweekly card is instituted. If two consecutive cards fall below the 80% level, the student is returned to the daily card. When six consecutive cards (3 weeks) that earn basic privileges are brought home, a weekly card is introduced. Finally, a merit system is commenced with only quarterly and semester grade reports. This phase is designed to include frequent reinforcement of performance without a card system.

Sluyter and Hawkins (1972) also found that daily school notes without contingent consequences did not motivate significant behavioral change. A child-feedback phase in which the teacher filled out the daily note and merely showed it to the child did not promote academic improvement in two underachievers. However, the addition of parental reinforcement (material and privileges) for good notes was effective in

significantly increasing the targeted mathematics and spelling scores. In working with a third child who was described as disruptive, the child-feedback phase was supplemented by an additional parent-feedback phase in which the child brought a note home for the parents to see. The parents had not been instructed about consequation at this point. Attending behavior, which was the target, increased somewhat during these two phases, but not significantly. With the addition of contingent reinforcement for good notes (one-half hour later bedtime for one note, and a model car for three notes) attending increased significantly ($p < .02$). At the same time, talking out in class dropped in frequency of occurrence from 28% of the observed intervals at base line to 4% of the intervals at the termination of the experiment.

The authors point out that one possible advantage of the long delay between the behavior and the evaluation (in this case notes were given at the end of school) is that other appropriate behaviors that occurred in the interim (e.g. not talking out) were adventitiously reinforced. The procedure of reinforcing at day's end is different from that used by Thoresen et al. (1977) and Blackmore et al. (1976), in which evaluations were made after each class period. Different time intervals between the behavior and the feedback should be compared on their merits. Sluyter and Hawkins (1972) note that the results cast doubts upon the efficacy of sending report cards home without instructions to parents about what to do with the feedback (p. 23).

Hawkins, Sluyter and Smith (1972) report that the general technique of daily feedback to parents and consequation at home has become a regular procedure utilized throughout the School Adjustment Program, a public school program for severely emotionally disturbed children in the Kalamazoo Unified School District (p. 117).

For some children, feedback and praise are not a sufficient motivator of behavioral change. For others, it seems to motivate initial change but not its maintenance. However, there is also evidence that feedback and social reinforcers can be effective initiators and sustainers of improved behavior. In one of the most streamlined uses of home-based reinforcement, Dougherty and Dougherty (1977) ran a successful program with minimal parent contact and minimal reinforcement. Their work was done with an entire class of 15 fourth-graders in a private school. None of the children exhibited serious behavioral problems and the classroom teacher did not have overall management difficulties. The target behaviors were homework completion and talking out during group discussion.

A multiple-base-line design was used and all observation and recording were done by the teacher. Parents were instructed in their role by a short letter that stressed the need to review the card each day, to emphasize the good ratings first, and to then discuss ways of bringing up lower ratings. After a 10-day base line was taken and it was found that homework was completed 65.3% of the time, the school-note program was commenced. The percentage of homework completion rose to 83% during the next 12 days, and remained at that level for the rest of the study (a total of 70 days). After 22 days, talk-out scores were added to the daily school notes. Talk-outs dropped from a base-line level of 13.5 per hour to 2.3 per hour within a few days. On the 34th day, school notes were made a weekly event, but levels of homework completion and talk-outs remained stable.

Two hours of total consultation time were expended. The teacher reported that the

time required to run the program was so minimal and the effects so beneficial that she planned to continue using it in the absence of outside consultation. Dougherty and Dougherty commented that, "given these results, it is suggested that this intervention procedure should be at least a first step in classroom management, avoiding until necessary more complicated intervention strategies such as intensive teacher training, token economies, etc." (p. 194).

Hickey et al. (Note 5) also reported the successful use of a home-based reinforcement system that employed only positive verbal reinforcement as consequences. A multiple-base-line design demonstrated the control of the procedure over the target behavior of independent reading work. The subjects were five fourth-graders with academic and behavioral problems. After the base line, children were praised for the appropriate behavior that they had been showing, and informed that they could expect to get a praise note each time that they did 80% of their independent seat work correctly. The length of this phase was varied for each child. After from 10 to 20 days of this condition, parents were involved. They were instructed by handwritten notes to give social praise (as outlined above in Hickey et al. [Note 5]). There were individual differences in the children's reactivity to this program, but they all showed considerable progress. Aggregate data demonstrated that arithmetic criteria were met 63% of the time during base line; 78% during the preparental involvement condition; and 90% during the home-based reinforcement condition. The authors reported a "halo effect," as performance improvements were also observed in other subjects and with other teachers.

Kroth, Whelan, and Stables (1970) demonstrated that daily school notes backed up with verbal parental praise could be effective in motivating improved behavior in three of five junior high school pupils. The report cards rated the children on a total of eight academic and behavioral areas (e.g. number of pages read and peer interaction). Some ratings were on a 1–10 scale while others reflected the amount of piece work done or the percentage correct.

After a 4-week base line, parent-teacher conferences were held. Parents were instructed in behavioral principles and in recording and graphing methods. They were requested to select at least two categories to discuss with their child in a positive way each day. They were expected to graph performance on all eight categories each day.

Aggregate data showed a 26% increase in performance over the base line in the selected categories, and an 8% drop in the nonselected categories. The increases were significant ($p < .031$), and the decreases were not ($p = .125$). There is some evidence of a behavioral contrast effect. The adolescent subjects responded quite variably to the verbal praise. Two students were virtually unaffected by the procedure. While it should not be surprising that the value of reinforcement would be different for different individuals, it is noteworthy that even some difficult teenagers have maintained their responsiveness to effectively administered feedback and praise.

Fairchild (1976), a school psychologist, reports a case study in which home-based reinforcement was used with impressive results. A second-grade boy was rewarded at home with a bubble gum card for every 20 pages that he had read at school, and a bonus card for each additional 5 pages. Base line (19.5 days) showed him to be reading an average of 3 pages a day. During the period of contingency application (93.5 days), he averaged 22 pages a day. The home reinforcers were terminated at

this time, but reading report cards were still sent home daily. Social reinforcers reportedly maintained reading for the following week. The number of pages read daily during the week following termination of home reinforcement were 50, 50, 63, 83, and 93. This high rate may be evidence of an extinction burst. Unfortunately, no data were given after that. However, the boy did finish the school year near the top of his class in total number of pages read. The AB design used in this study leaves it open to many interpretations, but the magnitude of the demonstrated change is still titillating. The findings lend credence to the notion that powerful reinforcers may be required to initiate behavioral change, but that less powerful reinforcers may be sufficient for its maintenance.

Bristol (1976) used home-based reinforcement as an important component of a program designed to help an 8-year-old boy (Andy) control his fighting at school. She found that the award of very modest contingent home and classroom privileges, and no consumable reinforcers or response costs, resulted in significant decreases in his excessively aggressive school behavior.

The arrangements were set up in a teacher-parent-counselor conference that included Andy and that culminated in the signing of contracts for both school and home rewards for improved deportment. Both contracts were for increased privileges. Andy earned teacher signatures for not fighting during three difficult transition periods at school (before school, at noon, and after school). Andy received 15 minutes extra bedtime when he brought home three signatures. At school, he earned privileges (e.g. being the line leader) when he had gathered 15 signatures.

An ABAB design was used. During one week of base line (which the teacher reported as a good week) Andy fought during 9 of the 15 possible transition periods. During the 10 weeks that the contracts were in effect (B1) Andy fought during 2 of 150 possible opportunities. During 3 weeks of reversal, Andy fought during 43 of 45 periods. For the first 3 weeks of the return to contract usage, the teacher did not follow the program directions and did not give Andy his card (she kept it at her desk and marked it instead). Andy fought during 27 of the 45 possible transition times under this impromptu system. During the remaining 3 weeks of the program, when the teacher again followed the original instructions, Andy did not fight at all.

The counselor spent 10 hours in this intervention; the classroom teacher spent about 6 minutes a day; and Andy's mother spent from 3 to 5 minutes a day. Andy's teacher and his mother both reported that they had previously been spending more time than that reprimanding him each day. Andy reportedly improved his relationship with his peers and his status in the class as a result of the changes in his behavior.

Adjunctive Home-based Reinforcement

Home-based reinforcement can be a particularly useful assistant to ongoing classroom incentive systems. For cases in which skills deficits compound motivational deficits, home reinforcement would not be indicated as the singular mode of intervention. Instead, it would be best employed as an adjunct to in-class programs. As reported below, when major behavioral disorders occur, single site and home-motivational systems may both be necessary for the inducement of change.

Coleman (1973) describes a comprehensive piece of work in which the experimenter began by working in the classroom with a recalcitrant 11-year-old boy. At first, the boy earned token rewards for appropriate behavior. The tokens were cashed in

with little delay. After reversal demonstrated that the boy's school behavior was under contingency control, the tokens became points which were distributed and cashed in with increasing delays. The child's work period was then extended from 15 minutes to 90 minutes, and finally for the entire day. At this point, the child was switched to a response cost system (he started each day with a fixed number of points and lost them for inappropriate behavior), and the classroom teacher took over the program. The child's grandmother was then contacted and requested to make the boy's allowance contingent on his weekly point earnings. The boy's improved classroom behavior was maintained.

This study demonstrates the fading of behavioral control procedures across time intervals and mediators, with no fading of gains. None of the mediators had previous behavioral modification experience and as the author points out, "In the beginning this study had neither support nor encouragement from the school administration, teacher, or parents (p. 75).

Another innovative use of the school note, in conjunction with other behavior-modification procedures, was employed by Blackmore et al. (1976) in a summer program for "chronically maladaptive" preadolescents. In this program, school behavior was evaluated by the teachers, recorded on daily school notes, and the notes cashed in at home for privileges and for money. Home behavior was recorded by parents and rewarded by the backpacking activity staff with camping privileges. The parents were given six group sessions to help them to set up behavior modification programs at home in addition to teaching them how to translate their children's points into privileges. The criterion level for reinforcement was manipulated throughout. Initially, only good mathematics behavior was required, and then six of seven good marks covering several behaviors had to be earned. One of those marks had to be work completion. At this point, the target behavior had improved considerably and a no-note withdrawal stage was used. Behavior fell well below base-line levels at this time. In the final phase, all possible checks were required to earn privileges, and behavior returned to a level that was significantly above the base line. During this phase, reinforcement quantities were reduced. School notes were introduced in the regular fall classroom, and a 3-month follow-up showed that the subjects were on task 83% of the time, which equalled their peers, and bettered their base line performance by 19%.

The teaching staff in this project was careful to keep the attention that they gave to pupils below 8% and to use "inconsistent praise and nagging" in order to simulate natural classroom conditions and to promote generalization. Although the variable of teacher effects was controlled somewhat in this way, independent variables were changed coincidentally in the study, and it is not possible to attribute the boys' later success solely to the use of home-based reinforcement of their school performance. What is noteworthy is the imaginative use of the most powerful reinforcers available, even if they were not to be found in the same setting as the behaviors that they reinforced.

Ayllon et al. (1975) obtained impressive results using home-based reinforcement with an entire class of black third-graders who were extremely disruptive and who were achieving about a year below grade level. A school-based token economy, with rewards for reading one page, and for 15 minutes of good behavior, was not able to reduce the level of disruptiveness which was occurring in 95% of the observed 10-second intervals. Conferences were then called and the parents, children, teacher,

principal, and experimenter discussed the use of the daily school notes in a 2-hour session. Parents were instructed to provide positive consequences for their child if he or she brought home a letter of good behavior, and to provide negative sanctions if he or she did not. An ABAB design demonstrated that letters contingent on classroom conduct were more effective than noncontingent letters, and the overall level of disruption was reduced to 0%. During this time the token economy remained in effect. The school note facet of the experiment covered only 24 days, which demonstrates its power as well as the need for follow-up.

Just as Ayllon et al. (1975) combined behavioral procedures in order to effect the desired change, Cohen, Keyworth, Kleiner, and Libert (1971) also needed to make many adjustments in their school-note program. Their work was with two difficult aggressive adolescents and their parents. Parent conferences were limited to 15 minutes per week for the first child and about 15 minutes total face-to-face contact for the second. Daily notes were used to reinforce task completion and attendance, and to penalize suspension from school. In addition, weekend privileges could be earned with "good Friday" letters. Target behaviors were ultimately increased, but not before six different 2-week contracts were tried. Only when appropriate incentives were finally located, and access to competing outside reinforcers eliminated, were the significant changes shown.

Use by School Counselors

Blaker and Bennet (1970) describe the use of three different kinds of reporting and reward systems by a school counselor. In this study, the backup reinforcers were obtained during weekly meetings with the school psychologist. In the first procedure, two problem children were paired with model classmates of their choosing and the points that the target children earned were cashed in weekly for treats for themselves and their partners. A second procedure involved the use of a response cost system in which the children were given slips of colored paper at the beginning of each week and the teacher impassionedly confiscated one for each instance of misbehavior. The remaining slips were cashed in at the week's end. This method reportedly inspired friendly competition among classmates and was a well-appreciated alternative to scolding for the teacher. The third system involved a card with squares that were checked for appropriate behavior. When the card was full the child could cash it in. Although Blake and Bennett (1970) did not provide data, they did report improvement and present some interesting strategies that could be readily adapted to a home-based system.

MacDonald, Gallimore, and MacDonald (1970) used school notes to report attending behavior for school-phobic and chronic nonattending adolescents. The youths were instructed to have their daily school note filled out at school. After-school privileges were delivered contingently by mediators (often parents, but in one case a pool hall operator). In their large study (N = 35), students were randomly assigned to a contact counselor or a contingency counselor who used daily school notes. The contingency system was set up with a 90-minute telephone call between the contingency counselor and the mediator, and was maintained with weekly telephone contact. Three times as much parent contact was made by the contact counselor as was made by the "contingency" counselors. Despite this, the contingency programs resulted in significantly improved attendance while the contact counseling

did not. MacDonald et al. (1970) were careful to point out that there was no evidence of changes in achievement level or classroom behavior despite the significantly increased attendance levels.

Thorne et al. (1967) employed home-based reinforcement to help an adolescent who was on the verge of being expelled from school because of truancy. Claire, a 16-year-old, was reportedly also ready to run away because of conflict with her mother. This had resulted in the withdrawal of Clair's allowance, telephone, and dating privileges. A home-based reinforcement system was instituted at that point. Telephone privileges and weekend dates were made contingent on Claire's attending school all day. The school attendance officer gave Claire a note at the end of the day signifying that she had attended all her classes. Each day that she brought a note home she earned telephone privileges, and if she earned four of five notes during the week, she was granted one weekend date night. Five out of five notes was good for the second weekend night out. Telephone privileges were noncontingent on the weekend. The mother reportedly thought the plan 'childish' and was quite pessimistic.

Claire began attending school regularly from the outset. After one month, a fading procedure was instituted and she received notes only on Wednesday and Friday. Each perfect note earned her a weekend night out. Telephone privileges were taken off contingency. After 7 weeks, the notes were stopped entirely. During the base line (46 days), Clair was truant 65% of the school days. During the three months of the project, she was illegally absent only twice (6.6%). In Claire's case, her relationship with her mother did not improve, but her grades did.

Discussion

It is quite clear how far the examination of home-based reinforcement of school behavior has yet to come. It is the hope of the author that it is now equally obvious how deserving it is of further scrutiny. The procedure has been shown to be effective in special education settings as well as in mainstream classes, and with children from kindergarten through high school. Its applicability to regular large classrooms is particularly noteworthy in view of the findings of Cowen, Zax, Izzo, and Trost (1966) that up to 37% of the representative sample of first-graders they evaluated "already manifested moderate to severe maladjustment" (p. 381). After following these cases for three years it was found that they "had suffered serious impairment in their academic, achievement, and adjustment behavior and appeared to be rutted on a globally down hill course" (p. 386). It is not reasonable to expect that all these children will be able to have access to special instruction or be provided with the high-powered incentive systems of classroom token economies. Home-based reinforcement of school behavior may provide a significant boost to children with special needs in the mainstream. As Karraker (1972) points out, parents control more reinforcers than teachers, but teachers control access to the information about the child's performance (p. 173). The child too often falls down the resultant crack.

In pointing out the limitations of standard report cards Giannangelo (1974) writes "that the reporter of letter grades can never be certain whether appropriate credit is being given to growth and achievement by the youngster. Most current reporting systems give both parents and children vague feelings of pleasure and shame" (p. 410). In fact, Sarason (1971) found that the use of interim report cards, without home-based reinforcement, had a negative overall effect on the grades of children in

two sample seventh grades. In the sample grades, approximately one-half of the boys and one-third of the girls received interim reports indicating that their grade was a D or an F. Although there was little room to get lower grades, 38% of the grades did go down, 12% went up, and 50% did not change (p. 79). Although the AB design used was weak, there was certainly no evidence that the commonly used interim report cards had a positive effect on grades. The experimental evidence from the above studies would suggest that unstructured feedback alone is generally not effective in improving children's behavior and that these "vague feelings of pleasure and shame" may actually be the extent of the contribution that report cards usually make.

Facilitating The Usage Of Home-based Reinforcement

An increased usage of home-based reinforcement programs could be facilitated by clearing up some of the false assumptions about parents that seem to predominate. One assumption may be something like: If we, as trained educators and counselors, cannot structure the school situation in order to get the children to perform at school, then we cannot expect their untrained parents to structure the home environment in order to help change their children's school behavior. The fallacy here is (as shown by Bernal, Delfini, North, & Kreutzer, 1976; Wahler, 1969; Walker, Hops, & Johnson, 1975) that school behavior and home behavior can have very distinct properties, and that behavior observed in one setting is not necessarily predictive of behavior in a second setting. It is very possible, in fact, that parents have already found a way of structuring the child's home environment that is quite effective in promoting appropriate behavior.

A second assumption centers around the expectation that the parents of unmotivated, low-performing children are likely to be unmotivated, low performers as well, and to be unable to follow instructions without careful monitoring. It should now be apparent that very brief and simple instructions can be sufficient prompts for parents and that they can implement highly structured, as well as unstructured, programs and effect significant changes in school behavior (Dougherty & Dougherty, 1977; Karraker, 1972; MacDonald et al., 1970; McKenzie et al., 1968; Budd & Leibowitz, Note 1).

Fears about the proverbial punitiveness of parents of problem children may also be a contributor to the failure of many educators to assist themselves by taking advantage of parental support. These fears should be quelled somewhat by the reports of the ability of parents to locate and present positive reinforcement with a minimum of instruction (e.g. Ayllon et al., 1975; Dougherty & Dougherty, 1977; Schumaker et al., in press; Todd et al., 1976; Budd & Leibowitz, Note 1). These studies deserve replication with closer examination of the relative amounts of usage made of positive and negative consequences, and with attention paid to the possibility of a drift towards the negative over time (as has been reported in institutional settings [Basset & Blanchard, 1977]). This should also be looked at by using the child's evaluation of the procedure as an indicator of its relative positiveness (cf. Jesness, 1975).

At least two well-conceived, data-based guides for the use of home-based reinforcement are now available. Schumaker et al. (1975) have developed a manual with a programmed instruction text, mastery tests, very detailed instructions, and the

necessary forms for parents and consultants. Hops et al. (Note 2) use home-based reinforcement as an integral part of the CLASS program for acting-out children. Hops et al., and Schumaker et al., include examples of praise statements and home rewards in their manuals. Counselors who are initiating parental involvement via letter could consider including similar lists with their instructions. Fairchild (1976) has contributed a good discussion of the merits of a home-based system and useful suggestions for its implementation.

Vital to the development of home-based reinforcement procedures is their appeal to the schools, especially to the teachers. It is important, therefore, that reports of the use of these programs be more detailed with regard to the amount of teacher and counselor time that they require. Lahey et al.'s report (1977) of the spontaneous adoption of such a program by five teachers in one school implies that the potential market is there if the product is packaged effectively. This should best include the reporting of pertinent measures of the response costs involved in using home-based reinforcement, as well as more subjective reports of the attractiveness of these programs to teachers who have tried them.

The studies demonstrate unequivocably that school behavior can come under the control of home-based reinforcement contingencies. The use of the ABA design indicates that the withdrawal of the home-based reinforcement system results in a return to low base-line levels of appropriate behavior. The inference could be made that home-based reinforcement is not truly a minimum intervention, but that it might necessarily become a permanent fixture and ultimately a burden to teacher and family. For some children, this may indeed be the case. The need for an adjunctive motivational system may never end. However, there is substantial evidence that appropriate behavior can be maintained after the reduction or withdrawal of the home-based program if proper fading procedures are utilized. Coleman (1973), McKenzie et al. (1968), Dougherty and Dougherty (1977), and Edlund (1969) demonstrated that daily notes could be faded to bimonthly occurrences without performance loss. Schumaker et al. (in press), Thorne et al. (1967), and Fairchild (1976) showed that the program could be completely phased out without reversal of the student's gains. It is not apparent from the literature how long a home-based reinforcement system can be operated before it degrades, but it is evident that significant changes can be effected before this occurs.

The reasons why fading of home-based reinforcement systems is possible are not obvious. Perhaps the system acts to strengthen the child's pairing of verbal praise with concrete backup reinforcers; and although teachers apparently do not change the rate of approval, the perceived significance of the approval may change. It is also possible that a side effect of the program is an increase in the use of contingent reinforcement by parents for both school and home behaviors. This would mean that the system was faded on a formal basis, but that it continued to function informally. The merit of these hypotheses deserves experimental determination.

Future Directions

A wide range of methods used to involve parents was described in the reports. Contact was made in groups, individually, via telephone, and through the mails. More needs to be known about these methods, and their strengths and weaknesses with different populations of parents. For those situations in which school resources

simply do not provide for contact with individual parents, it is important to determine what form of letter to be taken home, with what degree of specificity, would be most efficacious. It is clear that no procedure is likely to result in changes for all children. As the study by Cohen et al. (1971) demonstrates, even professionals may need to sample many consequences before they find an effective combination.

Although the study of school-home contingencies has some unique properties, it fits solidly into the mainstream of work done in learning theory, with token economies, and with contracting. The experimental findings that have come from single-site studies are likely to be an important source of information for the development of school-home systems. The relative effectiveness of response cost, reinforcement alone, and of concurrent schedules should be looked at. More work with variable interval fading procedures also seems merited. The analysis of these parameters is in the service of the quest for the "minimax" solution to the school behavioral problem. The minimax state is one in which the minimum effort results in the maximum behavioral change (Cantrell et al., 1969). Delineation of the minimum frequency that school notes need to be sent; the fewest discriminations that need to be made by the teacher; the simplest and cheapest reinforcement systems; the lowest level of demands on parents' and teachers' time; and the earliest and shortest fading procedures that are effective, should result in the highest probability that daily school-note programs can succeed, proliferate, and endure.

Despite the desirability of further scrutiny of the parameters of home-based reinforcement procedures, the wide-scale application of this system need wait no longer. A sufficient number of descriptive studies are now available to provide potential users with a variety of workable options. School counselors, social workers, family therapists, and classroom teachers can now be field testing this well-documented procedure and they, by so doing, can be aiding the development of this model and of their charges.

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