

*PEER AND COLLEGE-STUDENT TUTORING
AS REINFORCEMENT IN A TOKEN ECONOMY¹*

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Eighteen second-grade children initially received feedback in the form of nonredeemable tokens for reducing their disruptive classroom behavior. Four types of tutoring were then introduced in a Latin Square Design: noncontingent tutoring from fifth-grade peers, contingent peer tutoring, noncontingent college tutoring, and contingent college tutoring. No significant difference was found in the level of disruptive behavior of those children tutored by fifth-grade peers or college students, but contingent tutoring was significantly effective in reducing disruptive classroom behavior.

DESCRIPTORS: academic behavior, peer tutoring, disruptive behavior, classroom control, education, feedback, peer reinforcement, material reinforcers, primary classroom, token economy, primary school children

Academic deficiency is often associated with disruptive classroom behavior. O'Leary and Drabman (1971) reported the efficacy of token economies in reducing disruptive classroom behavior, but noted less success in achieving gains in academic performance. They suggested that more attention be paid to individualized academic instructional procedures.

Although token programs have typically relied on tangible back-up reinforcers, such as candy or trinkets, cost considerations and problems in program withdrawal (Ferster, 1967; O'Leary and Drabman, 1971) have resulted in increasing emphasis on using reinforcers readily available in the natural environment (Drabman,

Spitalnik, and Spitalnik, 1974; Lovitt, Guppy, and Blattner, 1969; Osborne, 1969; Phillips, Phillips, Fixen, and Wolf, 1971).

The use of peers as an untapped educational resource has received increasing attention in recent years as a function of escalating costs and increased demands for personnel (O'Leary, 1972). Peers have been used to monitor and administer behavioral programs in the classroom, (Surratt, Ulrich, and Hawkins, 1969) in institutional settings with the emotionally disturbed (Drabman, 1973) and the retarded (Drabman and Spitalnik, 1973; Whalen and Henker, 1970), in juvenile rehabilitation programs (Phillips, Bailey, and Wolf, Note 1), and have functioned as speech therapists (Bailey, Timbers, Phillips, and Wolf, 1971). Interestingly, Bronfenbrenner (1970) noted that in the U.S.S.R., the students are divided into small groups within a class. They are responsible for the behavior and performance of all members within that group. If, for example, a student's academic performance falls below the set criteria, his peers actively engage in a tutoring program to increase his academic skills.

In the U.S., the successful utilization of older students to tutor younger peers in academic subjects has resulted in an increasing frequency of

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what Lippert and Lohman (1965) and Johnson and Bailey (1974) have termed "cross-age" tutoring. There have been numerous reports of gains in academic performance by both tutees and tutors. These have included anecdotal and informal reports from educators (Fleming, 1969; Groff, 1967; Harris, 1971) and more formal studies with objective analysis of results (Cloward, 1967; Harris and Sherman, 1973; Johnson and Bailey, 1974).

The present study examined the effects of contingent and noncontingent tutoring and feedback on disruptive classroom behavior and compared the relative effectiveness of fifth-grade tutors and more formally trained college tutors with respect to disruptive classroom behavior and reading performance.

METHOD

Subjects and Setting

A class of 18 second-grade children described by their teacher and school principal as being below grade level academically and disruptive in the classroom served as subjects. Two children were not included in the analysis due to excessive absences. Administration of the Metropolitan Achievement Test (Primary I) indicated that the class as a whole was functioning 1 yr below current grade placement.

Although not designated as a special-education class, the children has been grouped as the "second graders needing the most help". Parental permission was obtained by the school to provide necessary remediation. The children were from lower SES families, residing in and attending school in a rural suburb of a large metropolitan area.

Observation Procedures

Three undergraduates enrolled in a practicum in research methods observed the children in their classroom during regular classroom activities. The observers entered the classroom when school began at 9:00 a.m. each school day. Following initial classroom activities

(Pledge of Allegiance, *etc.*), observation began at 9:15 and continued until 10:15 (rest-room break). The children received reading instruction during this period.

The method of observation was similar to that developed by O'Leary and his associates for monitoring disruptive classroom behavior (O'Leary, Kaufman, Kass, and Drabman, 1970). The observational code consisted of the following operationally defined categories:

1. *Out of chair.* Movement of the child from his chair when not permitted or requested by the teacher. It can only occur when no part of the child's body is touching the chair.
2. *Noise.* Child creating any audible noise, other than vocalization, that is not task-oriented.
3. *Vocalization.* Any unpermitted audible sound emanating from the mouth.
4. *Noncompliance.* Failure to initiate the appropriate response requested by the teacher.
5. *Playing.* Child uses his hands to play with his own or community property when such behavior is incompatible with learning.
6. *Touching.* Child uses his hand or extended object to touch another person's property.
7. *Time off task.* Child does not do assigned task for the entire 20-sec interval.
8. *Orienting.* The turning or orienting of the child when more than 90 degrees from the point of reference (such as the desk, teacher, *etc.*).
9. *Aggression.* The child makes movements toward another person so as to come in contact with him, whether directly or by using a material object as an extension of the hand.

The children were randomly assigned to observers on a daily basis. The observers watched one child for 20 sec and then recorded for 10 sec. None, one, or more categories could be recorded for each interval. After observing a child for 1 min, an observer would begin watching another child. When finished, he would begin his list again. This allowed each child's behavior to be sampled at intervals over the entire

observation period each day and produced a more representative sample of a child's behavior.

The mean number of disruptive behaviors per 20-sec interval was calculated by dividing the total number of disruptive behaviors recorded by the number of intervals observed that day for each child.

Reliability of Observation (Interobserver Agreement)

Observers were trained to use the observational coding system under simulated classroom conditions for approximately 10 weeks preceding the study and were not utilized in the study until their interobserver agreement with a randomly assigned partner was above 65%. Observers continued to meet biweekly during the study for practice and discussion sessions to minimize observer drift. When both observers recorded the same disruptive behavior within a 20-sec interval, a perfect agreement was recorded. The ratio of the number of perfect agreements over the number of agreements plus disagreements served as a percentage measure of reliability. Agreements on intervals of no disruption were not included in the calculations to avoid artificially inflating the measure. Measures of interobserver agreement were taken during 25% of the observation periods over the 48 days of observation. Interobserver agreement ranged from 82% to 100% with a mean of 89% for the study. Only the data from a randomly assigned primary observer were included in the data analysis.

Tutoring Procedures

Four college students and five fifth-grade students served as tutors. The fifth graders were selected by their teachers because of outstanding academic achievement and the desire to be a tutor. Tutors received four 1-hr training sessions over a two-week period in the use of the Sullivan Associates series of programmed readers (Buchanan, 1968). Training consisted of role playing and instruction in the use of verbal reinforcement. They also practised recording correct

and incorrect responses in the Sullivan Readers while engaged in simulated tutoring.

Tutoring was conducted in two 20-min sessions, between 1:00 and 2:15 p.m. each school day, in the school auditorium. Tutor-tutee pairs sat side by side and were spread out to minimize between-pair interference. For the second graders, this time period was an after-lunch recess. Thus, the second graders gave up 20 min of their recess to be tutored, attending either first or second tutoring session on an alternating basis.

The fifth-grade students tutored during the last 45 min of their lunch hour. At the end of the study, they were given an afternoon bowling party in appreciation of their participation. The college students received credit in a research methods course in which they were enrolled.

Experimental Procedures

Design. Following a seven-day baseline phase, Feedback Alone I was introduced in the form of contingent but nonredeemable paper tickets, distributed by the teacher to children who met individually determined criteria. After seven days of Feedback Alone, four types of tutoring were introduced and rotated among the four groups of four subjects each, in a 4×4 Balanced Latin Square Design (Cochran and Cox, 1966). Feedback was continued throughout the study for all groups. Tutoring phases consisted of the following:

Noncontingent Peer Tutoring. The children received tutoring in reading from an assigned fifth grader. A ticket was not required for admission.

Contingent Peer Tutoring. Afternoon tutoring by an assigned fifth grader was contingent on a ticket having been earned that morning.

Noncontingent College Tutoring. This phase was identical with the Noncontingent Peer Tutoring phase, but the children received tutoring from assigned college students. A ticket was not required.

Contingent College Tutoring. As in all the tutoring phases, children in this phase received

feedback tickets following the morning observation period if their level of disruptive behavior for that day did not exceed their individual criteria. Tutoring by a college student was contingent on a child having earned a ticket for that day.

All children were eligible for tutoring every day. Children in the noncontingent phases always received tutoring whether or not they earned a ticket. Children in the contingent phases, however, had to earn a ticket in order to be tutored. When each group had experienced all tutoring phases, tutoring was withdrawn but Feedback was continued for seven additional days. Table 1 shows the order of treatment presentation for each group.

Baseline (seven days). The teacher initially announced to the class that the observers were, "students just like you, who are learning to be teachers. Their teacher will not allow them to talk to us, so I cannot allow you to talk to them". Observers were instructed not to interact with anyone while on the school grounds or in the classroom. The Metropolitan Achievement Test was administered to all children in the afternoon of the third day of this phase.

Feedback Alone I (seven days). The teacher told the class: "Today we are going to begin something new. If you are good in the morning

before rest room break, I will give you a ticket." Following the observation period, after the children left the classroom, observers gave the teacher a ticket for each child who met the criterion that day. The criterion for each child was either a 30% reduction below his baseline level of disruptive classroom behavior or of the entire class's baseline mean level of disruptive classroom behavior, whichever procedure resulted in the lower figure. When they returned to the classroom, the teacher distributed the tickets to the children. The tickets were 5 cm by 7.5 cm pieces of colored construction paper imprinted with two "happy faces", one with a baseball cap to indicate tutoring by a fifth grader when circled and one with a mortar board to indicate tutoring by a college student. There were lines for the child's name and the date. Tickets during this phase were not redeemable and tutoring was not offered.

Tutoring Phases (27 days' total). The children continued to receive tickets in the morning as before. Contingent and noncontingent peer and college tutoring was introduced in the afternoon for all groups, as shown in Table 1. Each child was randomly assigned to a college tutor and to a peer tutor for the duration of the study; only the contingencies changed. During contingent phases, the children were required to

Table 1
Order of Treatment Presentation

| Phase Group | Baseline (7 days) | Feedback Alone I (7 days) | Feedback and Tutoring Phases (27 days) | | | | Feedback Alone II (7 days) |
|-------------|-------------------|---------------------------|--|------------------------|------------------------|------------------------|----------------------------|
| | | | I (6 days) | II (7 days) | III (7 days) | IV (7 days) | |
| I | Baseline | Feedback | Non-contingent Peer | Contingent Peer | Non-contingent College | Contingent College | Feedback |
| II | Baseline | Feedback | Contingent Peer | Non-contingent College | Contingent College | Non-contingent Peer | Feedback |
| III | Baseline | Feedback | Contingent College | Non-contingent Peer | Contingent Peer | Non-contingent College | Feedback |
| IV | Baseline | Feedback | Non-contingent College | Contingent College | Non-contingent Peer | Contingent Peer | Feedback |

present a ticket earned the same morning in order to be tutored.

With the introduction of the tutoring phases and at each new phase, the children were made aware of the new contingencies. In order to accomplish this in a uniform manner, the teacher verbally divided the class into groups. At the beginning of each tutoring phase, the teacher made an announcement such as: "Some fifth graders and some college students will be coming in the afternoon to give you help with your reading. Everyone in Group I can go to get reading help with a fifth grader in the afternoon. Everyone in Group II must earn a ticket in the morning to go to get reading help with a fifth grader. If you are in Group III, you must earn a ticket in the morning to go to get reading help with a college student. If you are in Group IV, you can go to get help with a college student. Remember, everyone must be good in the morning to earn a ticket, but only those in Group II and Group III must have a ticket to get reading help in the afternoon." The teacher illustrated her announcement with a posted chart indicating the students in the respective groups and through the use of moveable cards, showing the contingencies in effect for each group. The teacher periodically reminded the class of the existing contingencies, verbally and by reference to the chart. Thus, the children knew what the contingencies for tutoring were and that they changed, but they were not aware of the sequencing.

Feedback Alone II (seven days). Tutoring was withdrawn during this phase, but as in Feedback Alone I, the children received feedback tickets after morning observation if their level of disruptive classroom behavior did not exceed their individual criterion. Tickets were not redeemable during this phase.

Reading Performance. The Metropolitan Achievement Test (Primary I) was administered during baseline to determine reading placement. A parallel form of the M.A.T. was given on completion of the tutoring phases. In addition, the proportion of correct responses for each

child in the Sullivan Readers was recorded during the tutoring sessions. This was calculated by dividing the number of correct responses by the number of items attempted each session.

RESULTS

Disruptive Behavior

A 4×4 Modified Latin Square Analysis of Variance (Myers, 1966) was performed for the tutoring phases. The mean frequency of disruptive behavior per 20-sec interval for each group during each tutoring phase was used as the dependent measure. In addition, correlated t tests were performed for specific comparisons between treatment phase pairs (*i.e.*, between Feedback I and Baseline). Table 2 contains the mean disruptive behavior for each child during each phase.

A comparison of disruptive classroom behavior during Feedback I and baseline resulted in a nonsignificant $t(15) = 1.32$ ($p > 0.20$), indicating that feedback alone initially was not effective in reducing disruptive behavior. However, a significant $t(15)$ of 2.32 ($p < 0.05$) resulted from a comparison of Baseline to Feedback II, suggesting that feedback may be a promising method of withdrawing token programs.

The Latin Square Analysis resulted in a nonsignificant [$F(3, 6) = 3.55$; $p > 0.05$] group effect and a nonsignificant temporal effect [$F(3, 6) = 0.98$; $p > 0.20$]. This indicated that the groups were not differentially affected by the treatments and disruptive behavior was not differentially affected by the phase (weeks) in which tutoring treatments were presented. In addition, tutoring by fifth graders and college students was equally effective in reducing disruptive behavior [$F(1, 6) = 0.00088$; $p > 0.20$]. A significant $F(1, 6)$ of 7.067 ($p < 0.05$), however, indicated that contingent tutoring was more effective in reducing disruptive behavior than noncontingent tutoring. That is, disruptive behavior was significantly lower when the children were required to present a

Table 2
Mean Disruptive Behavior for Each Phase

| Group | Subj | Baseline | Feedback Alone I | Feedback | | | | Feedback Alone II |
|-------|------|----------|---------------------|-------------------------|----------------------------|----------------------------|-------------------------------|----------------------|
| | | | | Tutoring Phases | | | | |
| | | | | Contin- gent Peer | Noncon- tingent Peer | Contin- gent College | Noncon- tingent College | |
| I | 1 | 0.87 | 0.40 | 0.19 | 0.15 | 0.32 | 0.11 | 0.77 |
| | 2 | 1.54 | 1.27 | 0.86 | 0.88 | 0.73 | 1.20 | 1.30 |
| | 3 | 1.31 | 1.76 | 0.89 | 1.73 | 0.53 | 0.92 | 1.30 |
| | 4 | 1.87 | 1.57 | 1.10 | 1.10 | 1.21 | 1.20 | 1.14 |
| | Mean | 1.40 | 1.25 | 0.76 | 0.97 | 0.70 | 0.86 | 1.13 |
| II | 5 | 1.16 | 1.13 | 0.58 | 1.05 | 1.07 | 0.86 | 0.90 |
| | 6 | 2.62 | 1.40 | 1.02 | 1.23 | 0.99 | 0.81 | 0.98 |
| | 7 | 1.34 | 0.99 | 0.67 | 0.93 | 0.69 | 0.83 | 0.70 |
| | 8 | 0.93 | 0.51 | 0.20 | 0.80 | 0.61 | 0.49 | 0.87 |
| | Mean | 1.51 | 1.00 | 0.62 | 1.00 | 0.84 | 0.75 | 0.86 |
| III | 9 | 1.40 | 0.85 | 0.67 | 0.42 | 0.84 | 0.70 | 0.90 |
| | 10 | 2.37 | 1.62 | 0.76 | 0.50 | 0.53 | 0.76 | 1.10 |
| | 11 | 1.00 | 0.63 | 0.70 | 0.96 | 0.50 | 0.66 | 1.03 |
| | 12 | 0.83 | 1.10 | 0.28 | 0.47 | 0.80 | 0.46 | 0.87 |
| | Mean | 1.40 | 1.05 | 0.60 | 0.59 | 0.67 | 0.65 | 0.98 |
| IV | 13 | 1.33 | 2.02 | 0.54 | 1.33 | 0.55 | 1.54 | 1.90 |
| | 14 | 1.63 | 1.53 | 0.50 | 0.40 | 0.37 | 0.70 | 0.96 |
| | 15 | 0.81 | 1.10 | 0.40 | 0.46 | 0.44 | 0.55 | 0.89 |
| | 16 | 1.03 | 1.43 | 0.66 | 0.77 | 0.67 | 0.47 | 1.10 |
| | Mean | 1.20 | 1.52 | 0.53 | 0.74 | 0.51 | 0.82 | 1.21 |
| Phase | Mean | 1.38 | 1.21 | 0.63 | 0.82 | 0.68 | 0.77 | 1.05 |
| S. D. | | 0.51 | 0.43 | 0.25 | 0.41 | 0.24 | 0.32 | 0.25 |

feedback ticket in order to be tutored. The interaction between type of tutor (college or peer) and contingent or noncontingent delivery of tutoring was not significant [$F(1, 6) = 0.77$; $p > 0.20$].

Since peer and college tutors did not differentially affect disruptive behavior, a contingent tutoring mean was calculated for each child. A correlated t test was performed comparing each child's disruptive behavior during Feedback I with his contingent tutoring mean. A highly significant $t(15)$ of 5.80 ($p < 0.001$) indicated that contingent tutoring was very effective in reducing disruptive behavior. Additionally, a comparison of contingent tutoring with the reversal phase, Feedback II, resulted in a highly significant t of 4.44 ($p < 0.001$).

Reading Performance

To compare the relative effectiveness of peer and college tutors, a correlated t test was performed, using the proportion of correct responses for the respective tutoring sessions as the dependent measure. The proportion of correct responses was calculated by dividing the number of correct responses in the Sullivan Readers by the total number of items attempted per tutoring session. A nonsignificant $t(15)$ of 1.94 ($p > 0.05$) indicated that for peer and college tutors the proportion of correct responses in the Sullivan Readers did not differ. The number of correct responses to peer tutoring was slightly greater (21.91 versus 20.48). For all tutoring phases, the second graders re-

sponded to an average of 21.57 items during a daily tutoring session with 97.34% accuracy.

On the Metropolitan Achievement Test, no significant differences were found for the initial reading level of the four randomly assigned groups ($F(3, 12) = 1.69$; $p > 0.20$).

The second administration of the M.A.T., using a parallel form, resulted in a significant gain in Word Analysis [$t(15) = 2.86$; $p < 0.05$], a subtest that measures skill in decoding. This was accompanied by an average gain of one month on the reading subtest and a contrasting decline of two months in arithmetic performance. The children had received their regular classroom instruction in reading and arithmetic but were tutored only in reading. While the gains on the reading subtest were not statistically significant over the initial administration of the M.A.T. [$t(15) = 1.34$; $p >$

0.05], the significant gains in Word Analysis (and corresponding loss in arithmetic scores) indicate the effectiveness of tutoring. Table 3 presents the results of both administrations of the M.A.T., the proportion of correct responses in the Sullivan Readers, and Tutoring Attendance.

DISCUSSION

The results demonstrate that contingent tutoring can decrease the disruptive behavior of elementary school children. Furthermore, it can be inferred that tutoring was a pleasant situation for these second-grade children, since they gave up part of their after-lunch recess period to attend the tutoring sessions. Thus, this reinforcing consequence was not due to the children's being able to avoid attending an academic class. In fact, children not eligible for tutoring on a par-

Table 3
Reading Performance and Tutoring Attendance. Numbers in parenthesis indicate the total tutoring sessions offered that phase.

| Group | Subj | Metropolitan Achievement Tests (standard scores) | | | | | | Correct Sullivan Responses (%) | | Tutoring Sessions Attended | |
|-----------------------|------|---|------|---------|------|------------|------|--------------------------------|---------|----------------------------|---------|
| | | Word Analysis | | Reading | | Arithmetic | | Peer | College | Peer | College |
| | | Pre | Post | Pre | Post | Pre | Post | | | | |
| I | 1 | 28 | 32 | 26 | 37 | 43 | 35 | 99.7 | 94.3 | 11 | 12 |
| | 2 | 35 | 35 | 36 | 39 | 36 | 48 | 95.6 | 94.0 | 11 | 12 |
| | 3 | 29 | 33 | 33 | 28 | 47 | 37 | 95.0 | 98.0 | 9 | 7 |
| | 4 | 24 | 23 | 28 | 19 | 29 | 26 | 97.6 | 94.7 | 9 | 7 |
| II | 5 | 28 | 28 | 27 | 25 | 36 | 51 | 100.0 | 99.5 | 13 | 10 |
| | 6 | 29 | 33 | 30 | 46 | 60 | 33 | 99.5 | 97.0 | 9 | 10 |
| | 7 | 24 | 34 | 30 | 31 | 27 | 32 | 97.2 | 99.8 | 9 | 14 |
| | 8 | 37 | 35 | 30 | 33 | 51 | 42 | 99.4 | 97.9 | 12 | 11 |
| III | 9 | 26 | 33 | 27 | 39 | 35 | 32 | 97.5 | 100.0 | 12 | 6 |
| | 10 | 22 | 25 | 26 | 34 | 32 | 30 | 99.0 | 98.9 | 10 | 13 |
| | 11 | 28 | 28 | 28 | 34 | 26 | 27 | 91.9 | 89.4 | 7 | 10 |
| | 12 | 38 | 40 | 39 | 31 | 47 | 41 | 99.1 | 99.3 | 13 | 5 |
| IV | 13 | 32 | 34 | 34 | 33 | 39 | 29 | 100.0 | 99.0 | 9 | 10 |
| | 14 | 21 | 42 | 36 | 34 | 36 | 29 | 96.9 | 93.6 | 9 | 11 |
| | 15 | 38 | 41 | 42 | 45 | 43 | 49 | 100.0 | 98.4 | 11 | 11 |
| | 16 | 28 | 34 | 31 | 34 | 30 | 38 | 99.0 | 94.4 | 7 | 12 |
| Mean Grade Equivalent | 29 | 33 | 31 | 34 | 39 | 36 | 97.9 | 96.7 | 10 | 10 | |
| | | 1.2 | 1.4 | 1.4 | 1.5 | 1.7 | 1.5 | | | (14) | (13) |

ticular day, or scheduled for the second tutoring session, quite often came to the tutoring area and had to be escorted back to the playground. Additionally, other children in the school frequently requested to come to tutoring.

Although not as effective as contingent tutoring, noncontingent tutoring also reduced disruptive behavior. There are several possible explanations for this. First, it was possible that some children had trouble remembering which phase their group was in and remained well behaved because that guaranteed tutoring. Second, for some children, feedback alone may have been enough to sustain good behavior in the mornings, since tutoring was automatically received in the afternoon. Finally, it is possible that the appropriate behavior of the children in the contingent groups influenced the children in the noncontingent groups. Drabman and Lahey (1974) showed that improving the behavior of one child in a classroom led to improved behavior of her untreated classmates. Some combination of these possibilities probably accounted for the effectiveness of the noncontingent phases.

Although Drabman and Lahey (1974) found feedback alone to be effective in reducing the disruptive behavior of an individual child in a classroom of better-behaving pupils, in the present study the nonsignificant difference between baseline and Feedback I suggests that feedback alone was not effective in reducing disruptive behavior. Since Feedback I did suppress disruptive behavior, but not significantly below baseline, it is probable that feedback is necessary but not sufficient to reduce the inappropriate behavior of an entire class of disruptive school children. However, feedback may be an effective method of withdrawal from a token program, because the classroom was significantly less disruptive in Feedback II than Baseline I. Perhaps withdrawing from tokens to feedback will prove to be an effective way to promote generalization (Drabman, 1973).

Interestingly, no significant difference was found in disruptive behavior of children receiv-

ing college-student or tutoring by fifth-grade peers. In the present study, tutoring was not contingent for the tutors, but in future studies, perhaps tutoring could be made a behavioral consequence for both the tutees and the tutors (Drabman and Spitalnik, 1973). No significant differences were found between college student and peer tutors for the proportion of correct responses that each child emitted while reading in the Sullivan Readers. This suggests that older peers can provide a large, untapped source of labor for establishing tutoring programs at most schools.

Another measure of the effectiveness of the tutoring program was provided by using parallel forms of the Metropolitan Achievement Test. Significant gains in Word Analysis suggest that tutoring was most effective in improving decoding skills. This is understandable considering the large amount of auditory feedback given during programmed tutoring. The slight gains in overall reading, contrasted with the decline in math skills, further highlight the effectiveness of the tutoring. The teacher did not alter her instructional methods, and the children's behavior was monitored during their normal reading period. This suggests a dual effect in reading gains through both tutoring and decreasing disruptive behavior during the reading period.

The tutoring program did not involve more than 5 min of the teacher's time each day. She was not required to become involved in the program except to make short announcements and to pass out the previously filled-out tickets to those children who earned them each day. In return, her class became very attentive and cooperative during the morning observation period. Although in this study outside observers and supervision were utilized, older peers could function as observers and tutors with minimum adult supervision. Costs for initiating and maintaining such a program are primarily a function of the cost of adult supervision, since tutoring materials already available in the school system can usually be found. The present study involved two supervisory adults for 1 hr each day

for 16 tutors. Although the observers and one-half of the tutors were college students, the use of all peers could probably be adequately supervised within the same time commitment.

Typically, disruptive children are found to be deficient in many academic areas. If a child does not understand a lesson and tends to be disruptive in class, this decreases the probability that he will attend to new lessons. The implications of tutoring, serving both as a learning experience and as a reinforcer for children with academic deficiencies and inappropriate behavior patterns, are enormous. In future, with peer-controlled tutoring programs, schools could reduce disruptive behavior while at the same time helping the children to make academic gains in deficit areas.

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