

*PROMOTING PRINCIPALS' MANAGERIAL INVOLVEMENT IN
INSTRUCTIONAL IMPROVEMENT*

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Studies of school leadership suggest that visiting classrooms, emphasizing achievement and training, and supporting teachers are important indicators of the effectiveness of school principals. The utility of a behavior-analytic program to support the enhancement of these behaviors in 2 school principals and the impact of their involvement upon teachers' and students' performances in three classes were examined in two experiments, one at an elementary school and another at a secondary school. Treatment conditions consisted of helping the principal or teacher to schedule his or her time and to use goal setting, feedback, and praise. A withdrawal design (Experiment 1) and a multiple baseline across classrooms (Experiment 2) showed that the principal's and teacher's rates of praise, feedback, and goal setting increased during the intervention, and were associated with improvements in the academic performance of the students. In the future, school psychologists might analyze the impact of involving themselves in supporting the principal's involvement in improving students' and teachers' performances or in playing a similar leadership role themselves.

DESCRIPTORS: performance management, feedback, public education, school principals, teacher behavior, academic skills

Exploring practical, cost-efficient behavioral methods for involving school principals directly in the educational process may contribute substantially to educational improvement, because principals are assumed to have the potential for influencing the effectiveness of their schools. This contention is supported largely by correlational research from the field of educational administration that attempts to describe the role of the principal in producing effective schools (Edmonds, 1979; Rutherford, 1985; Venezky & Winfield, 1980). These studies have concluded that principals of successful schools are strong instructional leaders, in that they involve staff in planning for school improvement, arrange programs to develop specific teacher skills, and participate in careful assessment

of achievement. The data also suggest that such principals emphasize achievement, provide an orderly atmosphere, evaluate student progress, support teachers, coordinate instructional programs, and show their presence and visibility in classrooms and hallways (Blumberg & Greenfield, 1980; Leithwood & Montgomery, 1982; Little, 1982; Rosenblum & Jastrab, 1980; Snyder, 1983).

Unlike correlational studies, experimental analyses would permit the function of variations in the conditions of any of those variables to be investigated over time. Such strategies ultimately should reveal both optimal performances for principals and methods for promoting those practices. To date, however, relatively few behavior-analytic studies have been conducted on this topic (e.g., Brown, Copeland, & Hall, 1972, 1986; Copeland, Brown, Axelrod, & Hall, 1972; Copeland, Brown, & Hall, 1974; Maher, 1981; Nau, Van Houten, & O'Neil, 1981; Souweine, Sulzer-Azaroff, & Frederickson, 1977). Brown et al. (1986) investigated the active involvement of principals in promoting students' learning of multiplication tables. The experimenters

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arranged for teachers to test the student-subjects repeatedly and for other students to grade the papers. The principals posted group and individual feedback and played an arithmetic game with the children in groups, or in some cases, individually. During the game, students' accuracy increased substantially, and their standardized achievement test scores were higher than those of other students from comparable schools.

The findings showed that principals' involvement in the instructional process can influence student achievement. The principal in the latter study, however, invested approximately 12 hr in its implementation. Many principals might be unable to subtract time from their busy schedules to prepare tests and charts and play games with the students. Nor are natural contingencies supportive of their continued efforts in that direction. Reinforcement value, in the form of evidence of improved student performance and teachers' enhanced satisfaction, would tend to diminish through delay, whereas other more potent contingencies are generally absent. Indeed, Hopkins (1987) reported that after training principals to maintain teachers' skills, "the principals did not reliably continue doing what we trained them to do" (p. 341). In a related descriptive study, Peterson (1977) found that principals were observed to spend as little as 5% of their time in classrooms and less than 6% of their time planning and coordinating curriculum and instruction, again suggesting inadequate reinforcement for those activities. Thus, the principals' involvement with teachers and students in the classroom probably needs more opportune contingency arrangements if significant change is to occur.

Based on the growing body of research findings from the organizational behavior management literature (e.g., C. Johnson, Redmon, & Mawhinney, 1994), one strategy for increasing principals' involvement with students is to emphasize their managerial roles. This might involve teaching the leader to set challenging but achievable goals, such as setting aside short blocks of time to visit classrooms, seeking out and monitoring improvement in student and teacher performance (e.g., items mastered or skills practiced, respectively), and obtaining feed-

back and reinforcement from their supervisors (i.e., school superintendents) or themselves. If self-reinforcement is to be elected, though, some form of external support probably would be helpful, because as Hayes et al. (1985) have concluded, "It has not been shown that a self-reinforcement procedure that is relatively devoid of external variables will work as well as external reinforcement or indeed will work at all" (p. 201).

The purposes of the present study were to demonstrate (a) the feasibility of arranging a set of contingencies to support the principals' and teachers' ongoing involvement in the performance management program and (b) the functional relation between the principals' and teachers' use of goal setting, feedback, and praise with students and changes in the students' academic performance.

EXPERIMENT 1

METHOD

Subjects and Setting

An elementary school with a student population of 437 served as the experimental setting. The school contained 19 third- through fifth-grade classes, and students generally performed above the state average on standardized tests. The primary subject was a principal, 50 years of age, with a doctorate in education. She had been in her current position for 3 years. Of her 24 years of experience as an educator, 9 were spent as an elementary school administrator and the remainder as a teacher of Grades 4 through 6. She expressed her willingness to participate in a program designed to enhance her leadership efficiency and effectiveness.

The class in which the study took place consisted of a teacher with 16 years experience and 21 students, 10 boys and 11 girls ranging in age from 8.5 to 9.5 years. The 4 girls and 3 boys who served as subjects were selected because they had failed to learn multiplication tables, which the teacher had assigned as homework for several months. Many weeks before the study, the teacher had abandoned efforts to encourage the children to learn the tables. All continued to have difficulty, primarily with the

six, seven, and eight tables. The teacher, student-subjects, and principal agreed that the 7 students would spend the first 5 min of the 25-min afternoon recess on the math activities described below. A wall chart was posted that contained the names of all students in the class and their daily quiz scores. Other than conducting class as usual and viewing the wall chart displaying the students' performance on their daily quizzes, the teacher was not directly involved in the intervention.

Target Behaviors and Observational Procedures

Data were collected by three undergraduate research assistants who were selected from a pool of applicants interested in participating in an applied research program in education. They received three academic credits for their participation. None were informed of the specific nature of the treatment variables or of phase changes until the end of the study.

Principal's performance. Of prime concern was the principal's regular implementation of the planned goal setting, feedback, and reinforcement procedures. Three times a week, she entered the classroom following afternoon recess. Upon her entrance, data recording began. Using a 30-s partial-interval time sampling procedure, observers recorded the presence or absence of the principal's use of positive verbal and nonverbal consequences and goal setting within each interval. *Verbal praise* was defined as any positive statement to a student indicating approval or admiration for math performance. This category also included specific feedback on good performance. *Positive nonverbal consequences* were defined as gestures of approval of the accomplishment such as smiles, pats, nods, and handshakes. *Goal setting* was defined as statements specifying what the students were to learn or do, such as the percentage correct or the table they would try to master next time.

Students' performance. Quizzes consisted of different randomized combinations of 20 single-digit multiplication problems from either the six, seven, or eight tables, depending on each individual student's current level of mastery of the tables. Pre-

and postassessment measures included randomized combinations of the three tables. The quizzes were very similar to materials the teacher had used regularly for arithmetic drills. Three times a week, during the first 5 min of the second recess period, the research assistants administered, orally or in writing, a 20-item quiz covering the multiplication table that each student was assigned.

A follow-up assessment was conducted on two separate occasions during the afternoon recess of the 2nd and 3rd weeks following the conclusion of the study to determine how well the students retained their skills. Quizzes that consisted of a randomized combination of single-digit multiplication facts from the six, seven, and eight tables (similar to the form used throughout the study) were administered.

Observer Training

Observers practiced partial-interval time sampling using the data sheets to score instances of the target behaviors from videotapes prepared by the experimenter and episodes of a popular television program. Ambiguities in definitions were discussed and clarified, and practice continued until indices of agreement (agreements divided by agreements plus disagreements and multiplied by 100%) reached 85% on three successive occasions. Then observers continued to practice by measuring principal and teacher behaviors for several weeks prior to the formal baseline phase. Once percentages of agreement reached consistently acceptable levels above 85%, regular data recording began.

Interobserver Agreement

Indices of agreement on principal performance were calculated on eight occasions, approximately a week apart. Data collected by the two observers were compared for the presence or absence of each category of behavior on an interval-by-interval basis. Although the observers were cued simultaneously by the same audiotape, each observer's earphone cord was long enough (2 m) to permit them to sit far enough apart to maintain independence of scoring. Resultant percentages of overall agreement ranged from 84% to 100%, with a mean

of 95%. Agreement was 100% for goal setting, 97% for nonverbal positive consequences (range, 94% to 100%), and 88% for verbal positive consequences (range, 84% to 88%). The weekly agreement checks of student quiz performance yielded an agreement of 100%.

Experimental Design

A withdrawal design was used to demonstrate the principal's responsiveness to the package of instructions, feedback, and approval. Following three baseline observation sessions, the experimenter conducted a training session for the principal (see below). This was followed by an intervention phase of four sessions, a three-session return to baseline, and four sessions of the intervention.

Procedures

As she had done previously in the year, the teacher asked the 7 students to work on their multiplication tables at home. Beginning with the baseline phase, three times a week, for the first 5 min of the afternoon recess, the research assistants administered and graded the quizzes and posted the results on the wall chart immediately after recess. As students demonstrated mastery of a given table by scoring 100% on the quiz covering that table, they progressed to another table. For instance, Students 2 and 5 progressed through the six, seven, and eight tables during the study; the others only needed to master the seven and eight tables. By happenstance, because Students 1 and 5 had scored 20 correct of 20 items on the last day of Intervention 1, they began the second baseline with a new table. Consequently, their scores on that day probably were influenced by both factors.

Baseline. To control for any effects derived from her extra attention, the principal began scheduled visits to the class three times a week just after recess. She then examined the wall chart, gathered the group of 7 students, and commented in general on the subjects' progress in math. In the second baseline, the principal was asked to continue her visits but to refrain from giving the subjects any performance feedback or praise and not to set goals. During their frequent informal chats about the

program, the principal and the experimenter briefly discussed her and the students' performance and her own schedule.

Training the principal. Using excerpts from the Sulzer-Azaroff and Mayer (1986, 1991) and Daniels (1989) texts, during three sessions of about a half hour in length each, the experimenter taught the principal the main guidelines for effective goal setting, feedback, and reinforcement. Key points were (a) setting challenging yet achievable goals by breaking down tasks into components that can be accomplished in a brief period of time; (b) recording progress, viewing it regularly for feedback; and (c) providing positive verbal and nonverbal feedback as soon as possible following the accomplishment. To practice applying those concepts to her own circumstances, the principal recorded her own activities for several days. She divided the day into 20-min time blocks and noted the activity in which she was engaged. She then set up daily schedules for herself, assigning tasks (handling correspondence, visiting classrooms, etc.) to 20-min time blocks. When the scheduled activity was accomplished, she would be able to check off the item. The experimenter and principal then discussed ways to apply the concepts with the students (e.g., for goal setting, asking the students how many more multiplication facts they felt they could memorize for the next quiz and guiding them to identify just a few additional facts). Other examples included praising, signaling approbation, and other forms of feedback based on posted progress.

The experimenter then asked the principal to continue to visit the class, but also to provide the student-subjects with feedback and positive consequences for any progress they showed in memorizing their multiplication tables and to set goals with them. Immediately following each visit, the experimenter praised the principal's deserving performance and provided her with specific feedback.

RESULTS

Principal's Performance

The principal visited the class as scheduled three times a week. Data are presented as percentage of intervals, because the number of 30-s time blocks

during which the principal remained in the classroom varied, ranging from 10 to 15 min each visit. During the initial baseline, the principal set goals in an average of 17% of the intervals, delivered nonverbal positive consequences in 13% of the intervals, and praised in 5% of the intervals (Figure 1). During the first intervention phase, the principal continued her visits as requested. Her levels of goal setting and nonverbal and verbal positive consequences rose to means of 71.3%, 57%, and 53.5%, respectively. As requested, the principal decreased her levels in each category during the return to baseline, although not to the levels of the initial baseline. Means of 40%, 49%, and 52.7% were displayed for goal setting, nonverbal feedback, and verbal praise, respectively. During reinstatement of the intervention, mean levels for the three classes of behavior were 83.8%, 82%, and 88%, respectively.

Students' Performance

After having failed to master the assigned multiplication facts over the prior 3 months, during baseline each of the students began to make slow but steady progress, increasing the number of problems they solved, with a mean gain of 1.84 facts memorized per day (see Figure 2). During the intervention, all students continued to improve, generally at a rate more rapid than during baseline. All mastered the first table they were assigned by the end of this phase and some began work on a second. The mean number of new facts the group learned was 10.26 (mean per day = 2.57). During the return to baseline, improvement, in general, almost leveled off and the group mean dropped. Students assigned new tables during this phase showed only minor progress, and the average gain for the group during the 3-day withdrawal was only 1.25 (mean per day = 0.42). With the reinstatement of the intervention, the students' performance again accelerated. Six of the 7 students achieved mastery scores of 100% on their second assigned table, and 1 mastered a third table during this phase, for a group average gain of 2.1 per day. By the end of the intervention, 5 students had succeeded in achieving 100% on all multiplication

tables, and the other 2 were rapidly approaching that level. No student scored less than 85% during the two follow-up assessments, and 4 achieved 100% on two occasions. Clearly, the students had mastered nearly all their multiplication facts.

DISCUSSION

Consonant with the findings of Maher (1981) and Brown et al. (1986), educational leaders can modify their activities to affect student performance directly. This experiment demonstrated that given assistance in scheduling convenient times during her weekly routine to visit the classroom, a rationale for and instructions in the best way to deliver feedback and praise, and ongoing informal feedback, a willing principal was able to make regular brief visits to a group of students to deliver positive consequences contingent upon their accomplishments in arithmetic and to set goals with them. The efficacy of that involvement was shown by the students' marked increase in memorizing their multiplication facts. In general, the students progressed more rapidly during the intervention than during baseline. It should be noted, however, that the data for Students 1 and 5 probably were further depressed during the second baseline because they began new tables coincidental with the initiation of that phase.

An interesting aspect of the results was the fact that during the return to baseline, the principal did, although to a lesser extent, continue to visit the classroom and deliver positive consequences and set goals, despite a request to the contrary from the experimenter. This suggests that some natural reinforcing events had begun to control her visits (perhaps the visible evidence of the students' progress or their positive social reactions to her presence). Presumably some sort of "reinforcement trap" was activated. Anecdotally, the principal reported setting more goals for herself and her staff and providing more praise and feedback than she had before the study. On inquiry a few years later, the principal said she had continued to use many of the performance management skills and spent more time in classrooms than she did before the study.

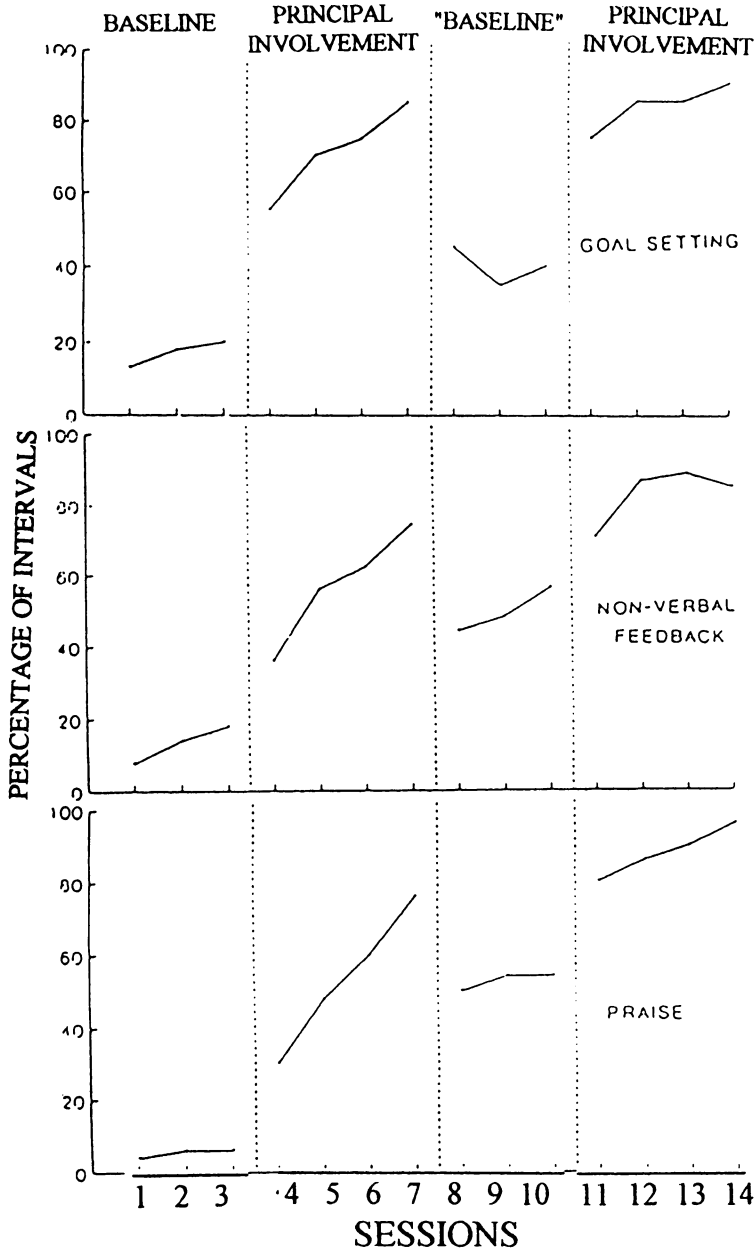


Figure 1. Percentage of intervals during which the principal set goals and gave nonverbal positive feedback and praise during baseline, intervention, withdrawal, and the reintroduction of the intervention.

EXPERIMENT 2

Although the principal in the first experiment was able to schedule regular visits to the classroom in her weekly routine, investing similar amounts of time in all the classrooms in the school would not

be feasible. A more cost-efficient approach might be (a) to train principals in the types of skills mentioned, (b) to demonstrate their effectiveness in applying those skills, and (c) to train the principal to train the teachers in the school to apply those skills. Eventually, then, the principal's main func-

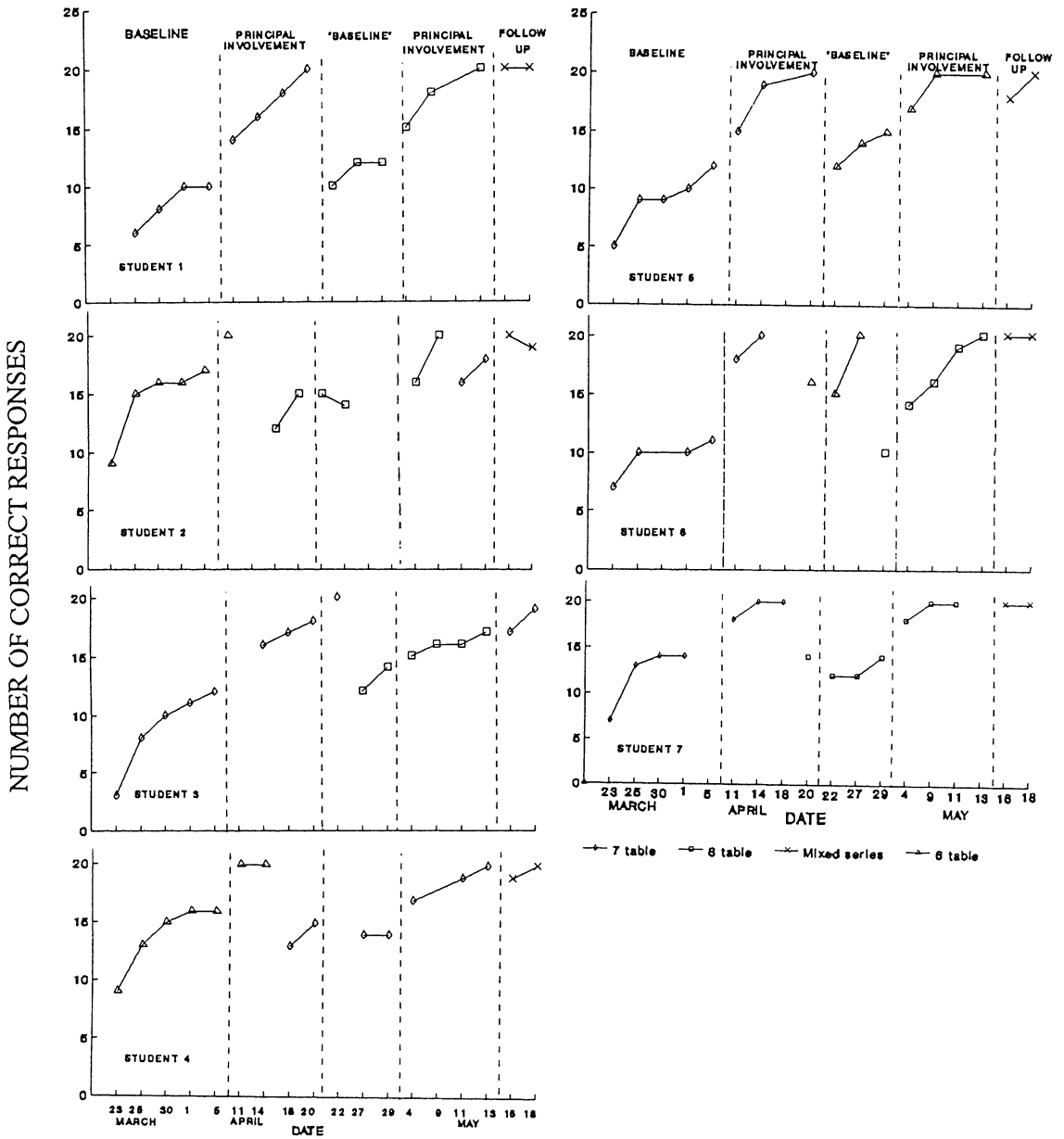


Figure 2. Number of problems students solved correctly (of a set of 20) during each day of the study. Lines are disconnected for absences and shifts from one table to another. The six table is depicted by a triangle, the seven by a diamond, and the eight by a square. The X indicates quizzes containing 20 problems selected randomly from each of those three tables.

tion could shift to a more practical one, that of managing the system. The specific purposes of the second experiment, then, were to determine whether a principal, taught to manage his time schedule and trained in the use of goal setting and positive consequences with students, might (a) demonstrate

the skills to a teacher, (b) show her the relation between goal setting plus positive consequences and the number of pages students reported reading, and (c) use goal setting, positive feedback, and positive consequences to promote the teacher's continuing use of the methods.

METHOD

Setting and Subjects

A middle school served as the research site. The school contained 513 seventh- and eighth-grade students distributed among 21 classes. Two of the classes, composed of 6 students each, were the remedial reading groups involved in this study. A key instructional objective for both groups was to increase the amount of material students read silently and understood.

The school principal, a 50-year-old male, had been a science teacher for 25 years and had been in his present position for 2 years. He held a master's degree and had completed an extensive number of credits toward a doctoral degree. The remedial reading teacher, a 51-year-old female with 24 years of experience, held a master's degree and had been teaching reading and writing in the school for 18 years.

Each of two remedial reading groups, fifth-period and seventh-period classes, ran an hour long and contained 6 students who ranged in age from 13 to 15 years. One female and 5 males were in one group, and 3 males and 3 females were in the other.

Observations

Teacher's performance. The main dependent variables of interest in this experiment were the teacher's use of feedback, positive consequences, and goal setting. The teacher's behavior was recorded during each 25-min observation period for 14 days in the fifth-period class and 16 days in the seventh-period class. The same methods of observer training and data collection used for the principal in the first experiment were applied with the teacher in this study. A second observer recorded one of the three dependent variables throughout the session on 16 occasions (three times for goal setting, eight for nonverbal feedback, and five for praise). Based on the formula of agreements divided by agreements plus disagreements and multiplied by 100%, mean interobserver scores were 100% for goal setting, 89.9% for nonverbal feedback, and

88.5% for praise, with an overall range of 71% to 100%.

Pages read. To assess the impact of the teacher's behavior on students' performance, the number of pages students recorded having read silently and over which they were able to answer questions correctly was measured daily. The students themselves recorded the number of pages they read, and the teacher posted those data on a chart mounted on the classroom wall. The teacher was asked to observe the students as they read silently, to note the pages they were reading, and to listen to the answers to the questions posed by their peers. She was also requested to monitor and praise accuracy of self-recording, because external surveillance has been found to increase the reliability of such recording (Kazdin, 1974). To satisfy the teacher that students had actually read the number of pages they reported reading, at the end of each session the teacher asked each student questions related to the content (especially the last part) of the material. Examples were, "What do you think happened to ___ on page X?" or "Give a summary of the last two pages you read." The teacher reported that in essentially all cases, the students' answers were correct.

On task. The proportion of time students remained on task during silent reading was assessed using the PLA-check method (Risley & Cataldo, 1973). The method operates by using momentary time sampling to scan the group in a fixed sequence and count the total number of students on task at the end of the interval. Dual observers recorded these data twice weekly in the first group and three times a week in the second, over a span of 8 weeks (minus days for vacations and special events). Because on-task data rarely varied (it ranged from 98% to 100% of the intervals), agreement indices (based on the smaller total count of students on task over the larger total) were essentially perfect.

Experimental Design

The influence of the principal's use of performance management on the teacher's behavior was analyzed experimentally by means of an across-classroom multiple baseline design. In a sense, this

second experiment constituted a systematic replication of the first, because as the basic aspects of principal involvement and goal setting, feedback, and reinforcement among students were held constant while other aspects varied. Variations included the principal shifting the management of the intervention to the teacher, and shifting the recording of progress to the students. Beyond the value derived by demonstrating the reliability of the functional relation through the direct replications inherent in multiple baseline or withdrawal designs, systematic replications reveal the generality of findings (Johnston & Pennypacker, 1993; Sidman, 1960).

Procedures

At the beginning of the study, the experimenter and teacher developed a method students could use to record their preparedness for class and the number of pages they had read silently. Self-recording forms were set up in the format of a table that included a row for each day of the week and columns for the following items: on time to class; have pen or pencil, book, folder; and number of pages read. The decision to use self-recording forms was based on several studies in which the effects of self-recording on classroom behavior and academic performance were measured (Ballard & Glynn, 1975; Broden, Hall, & Mirts, 1971; Fixsen, Phillips, & Wolf, 1972; Glynn, Thomas, & Shee, 1973). In those studies, it was suggested that self-recording procedures would be most effective if they were used in conjunction with established reinforcement techniques, such as teacher praise. This method was implemented immediately after the teacher explained it to her students. The form's simplicity allowed the students to quickly learn how to use the self-recording procedure and thereafter to complete it routinely each day.

Students were asked to read material of their choice silently for 15 min, while the teacher did paperwork and made herself available to assist students on request. As mentioned above, at the end of 15 min, first the student partners and then the

teacher asked each reader questions about the material.

Baselines

At least weekly, baseline measures of teacher behavior were collected in both classes (for four sessions in the first class and seven in the second). After being instructed in how to self-record, at the end of each silent reading period, students began to mark down the number of pages they had read (for 10 days in Class 1 and 15 days in Class 2). Simultaneously, observers recorded the students' on-task behavior.

Modeling by the Principal

After training in time scheduling and goal setting for himself, the principal was taught to set goals and give feedback and praise to students. As in Experiment 1, the experimenter asked him to implement these skills in the remedial reading classes. This also served as a model for the teacher, when the principal was later asked to train the teacher to apply those same skills in the classroom. Beginning on the 11th day of self-recording in the first class (and after recording the teacher's performance for four sessions) and the 16th day of self-recording in the second class (after seven teacher sessions), the principal began to stop by each classroom daily, check the records, and give praise and feedback to the students, as appropriate, about the number of pages they recorded having read. He also asked them how many pages they thought they could read the next time, challenging them to commit to accomplishing a little more (but not too much for them to achieve).

Implementation by the Teacher

Between self-recording Days 20 and 21, the principal explained to the teacher the value of increasing her rates of praise and positive nonverbal feedback and how to assist the students to set challenging yet achievable goals. On Day 21, the principal showed the teacher the data and commented on her higher rates of applying those management skills. Subsequently, the principal began

to diminish the regularity with which he visited the classes to approximately every other day. In the interim, the teacher took full responsibility for applying the intervention. (No follow-up data were collected, because the intervention continued until the end of the academic year.)

RESULTS

Teacher's Performance

Data on the teacher's use of verbal praise, nonverbal positive feedback, and goal setting are presented in Figure 3. Percentages, rather than number, of intervals are displayed because length of observational sessions varied slightly. In each class, as soon as the principal began intervening with the students, the teacher started to apply similar managerial skills. Her rates increased even further after the principal began to train and supervise her. Phase means for each class are as follows: In the fifth-period class, her verbal praise rose from 6.2% during baseline to 28% and 34.5% during the next two phases, respectively; nonverbal positive feedback rose from 22% to 37.5% to 43.3%; goal setting rose from 0.5% to 11% to 18.3%. In the seventh-period class, verbal praise rose from 12% to 59% to 73% across each of the phases; nonverbal positive feedback rose from 18% to 42% to 51.1%; and goal setting rose from 2.9% to 24% to 30.8%.

Students' Performance

Students remained on task essentially all the time during all phases and consistently answered the teacher's questions correctly. During baseline, students in the first class averaged 4.13 pages per 15 min; those in the second class averaged 6.75 pages per 15 min. During the intervention phases, the average increased by a mean of 5.5 pages for the first class and 7.6 pages for the second. At an individual level, all students substantially increased the number of pages they recorded as having read (Figure 4). The *t*-test values of the change scores were significant ($p < .05$) for 11 of the 12 students.

DISCUSSION

Again, the principal did follow through by visiting the classrooms regularly. The feasibility of

involvement by the principal in instructional improvement was demonstrated, and data showed the impact of that involvement on student progress. In this case, the principal was able to train the students' teacher (by means of modeling, specific feedback, and praise) to assume the managerial functions of setting goals and supplying feedback, nonverbal positive consequences, and verbal praise. After the teacher began using the targeted management methods, several students (e.g., Students 2 and 4 in the fifth-period class and Students 3 and 6 in the seventh-period class) accelerated their rates of progress even further over the previous phase. Perhaps the teacher controlled more reinforcers for those children.

Conclusions about the value of the intervention as a way of increasing the students' reading skills, however, need to be tempered on the basis of several factors. First, the number of words per page and difficulty of the vocabulary were not controlled from day to day. Perhaps some students were selecting less challenging material. Second, although efforts were made to enhance the reliability of students self-reports, those results could have been biased. Future researchers are advised to use more objective achievement measures and to standardize difficulty levels of reading selections to control for these potential confounding influences. Interestingly, though, the teacher and principal both reported that the students scored "considerably higher" on their standardized reading achievement tests than those from previous years. (Unfortunately, specific data are not available.) Third, these remedial reading classes contained only 6 students. Perhaps the small class size made it easier for the teacher to implement the procedures than might have been the case in larger classes. Replications of the procedures should be attempted with classes containing a greater number of students.

Informal observations in the teacher's classrooms the following year indicated that she continued to post the records of students' reading rates, and she reported continuing the management package with many of her remedial reading classes. Currently, the principal reports visiting classes more often and continuing to apply many of the performance management skills he had acquired during the study.

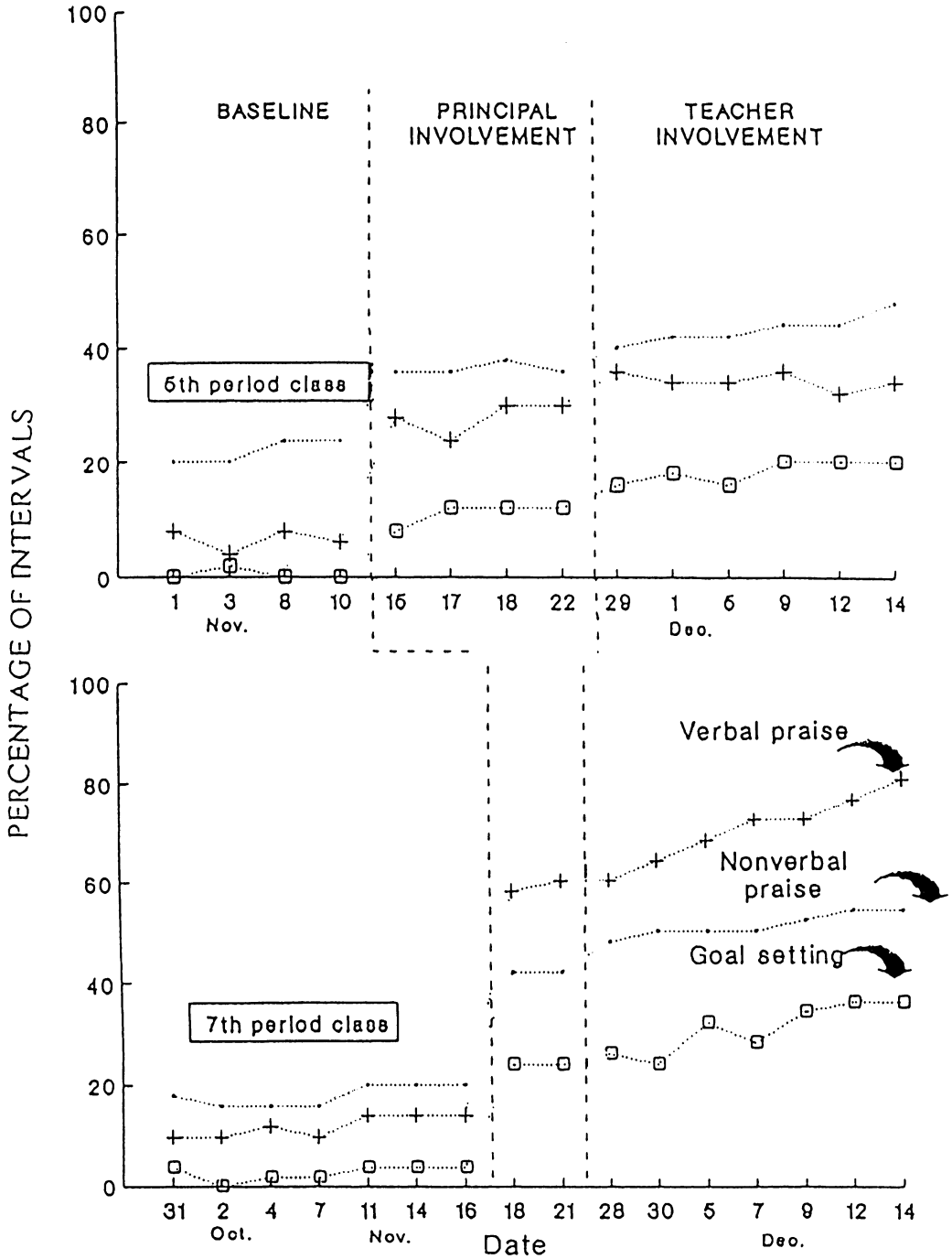


Figure 3. Percentage of intervals during which the teacher used goal setting, nonverbal positive feedback, and verbal praise during the fifth-period class (upper panel) and the seventh-period class (lower panel). Note that the displayed data were collected on the days when her performance was observed and that the numbers of observational sessions do not correspond with "days" in Figure 4, because students reported the pages they read daily, but the teacher was not observed each day. The dashed lines correspond to the introduction of the interventions: Days 11 and 21 in the fifth-period class and Days 16 and 21 in Figure 4.

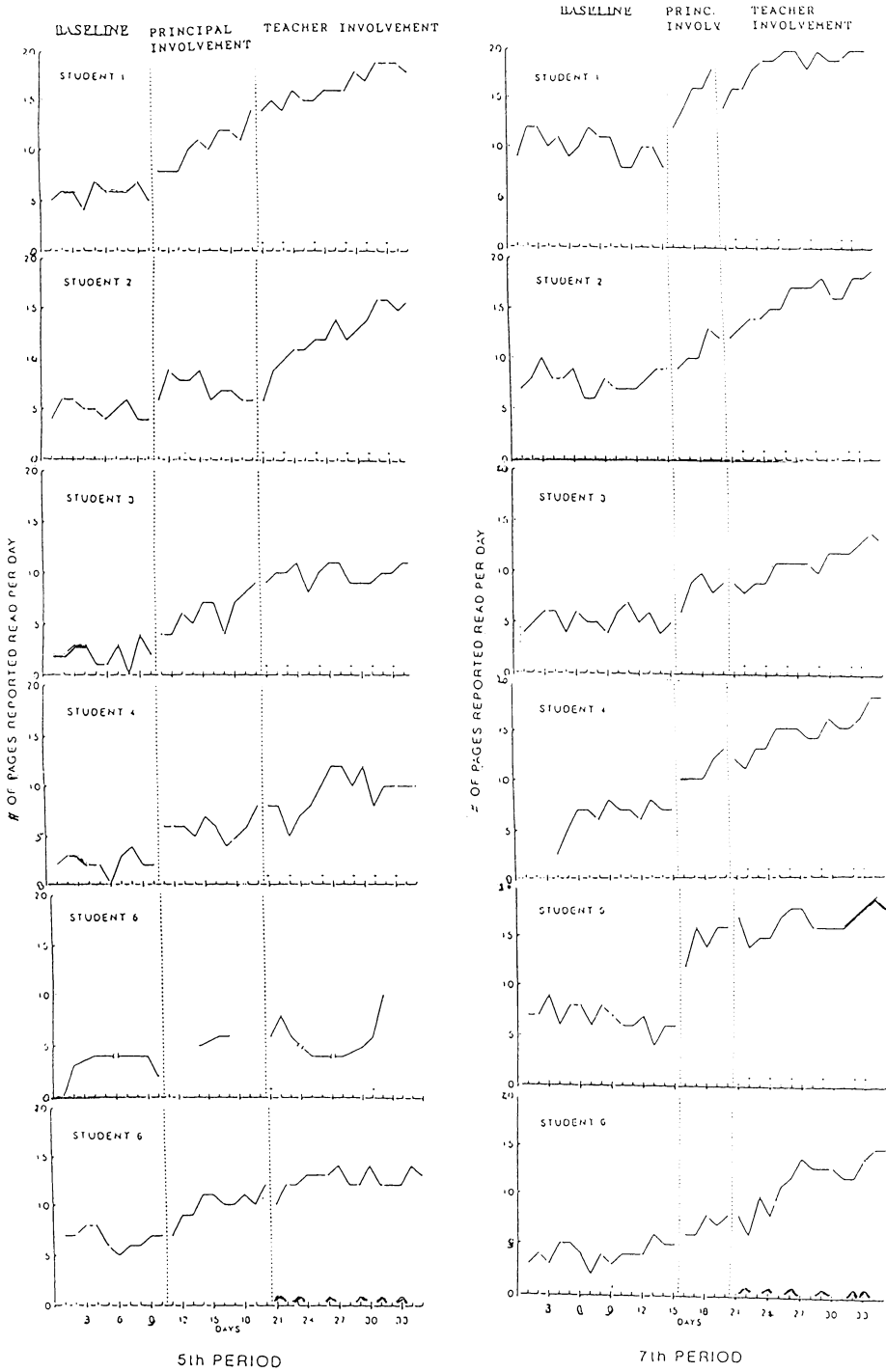


Figure 4. Number of pages students recorded having read and over which they could correctly answer questions during baseline and Interventions 1 and 2. Marks above the x axes indicate days on which the principal visited the classroom.

GENERAL DISCUSSION

In this set of experiments, training and support in the use of techniques for managing performance by planning and scheduling challenging but achievable goals and using verbal and nonverbal positive feedback appeared to have worked successfully for the principals, a teacher, and the students. Both principals faithfully conducted their visits, the teacher consistently applied the skills, and once the intervention was put in place, the students accomplished more than they had previously. Nevertheless, limitations to the generality of these findings must be recognized. Both the principals and teachers expressed their clear willingness to participate. How would the procedures have worked among less enthusiastic participants? How essential was it to involve an external person (the experimenter) in training the principal? Could that job have been done just as effectively by an individual within the organization? Did the fact that the experimenter had a history of being a school administrator himself exert any special influence? Would the impact on student learning have been as great or greater had tasks and measures been different? Only further research can answer those questions.

Despite just a small investment of time and effort, the school principals in the present set of systematic replications appeared to have both direct and indirect (via the classroom teacher) influences on enhancing student achievement. The impact was shown across two different principals and schools, three grade levels, and two types of subject matter. The studies also replicate the findings depicting the value of the principal's involvement achieved by Brown et al. (1972, 1986), Nau et al. (1981), and Souweine et al. (1977). As Sidman (1960) has argued, replications of this sort extend the generality of the findings.

One possible explanation for the power of the principal's influence is that the position tends to be prestigious. In addition, principals usually control numerous reinforcers for teachers and students, including class assignments and schedules, materials and supplies, special activities, and others. Those factors would tend to imbue the actions of the

principal with special conditioned reinforcing properties.

Might school psychologists and other personnel who occupy positions of leadership in the schools be able to produce similar results? Although that question remains to be investigated, the concept is a promising one. In the course of their regular duties, these personnel often visit and pass by classrooms. Were they to assess the impact of scheduling just a few minutes extra to check on students' progress, set goals with them, give them feedback and praise their progress, they might find the results surprisingly rewarding. In addition, depending upon their relationships with the individuals, school psychologists also might offer to serve as performance management trainers and coaches for principals and/or teachers. The long-range payoff for both of these activities, in the form of prevention of student academic failure and its many related problems, could be substantial.

A major advantage of the present procedure is that school leaders stand to accomplish much at a minimal cost. By carefully incorporating brief regular classroom visits into their daily or weekly routines, they can sequentially implement the management package described here with their teachers. Checking records, praising student and/or teacher accomplishments, and setting goals took principals only a few moments. In a sense, this sort of management strategy resembles the "management by walking around" (MBWA) (Peters & Austin, 1986), a technique that encourages managers to spend less time in their offices and more among employees, that is becoming popular in business and industry. Yet the type of technique used in these two experiments carries MBWA several steps further by including precise management of contingencies.

In addition to assessing simple mastery of academic material, future research might examine adding fluency building as an aspect of goal setting (K. Johnson & Layng, 1992). Another intriguing question is whether the intervention coincides with improvements in students' social behavior. Research has shown that student deportment sometimes improves as a corollary to the application of

instructional management practices that lead to increased academic achievement (e.g., Sulzer, Hunt, Ashby, Koniarski, & Krams, 1971). Consequently, schools in which principals involve themselves in the sorts of methods described here may find that their students' conduct also improves, with evidence of student progress potentially influencing material and attitudinal support for the school. Should even a small proportion of these potential gains be realized in any one school, the principal's minimal investment eventually will more than pay for itself.

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