

EFFECTS OF TEACHER ATTENTION ON STUDY BEHAVIOR¹

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The effects of contingent teacher attention on study behavior were investigated. Individual rates of study were recorded for one first-grade and five third-grade pupils who had high rates of disruptive or dawdling behavior. A reinforcement period (in which teacher attention followed study behavior and non-study behaviors were ignored) resulted in sharply increased study rates. A brief reversal of the contingency (attention occurred only after periods of non-study behavior) again produced low rates of study. Reinstatement of teacher attention as reinforcement for study once again markedly increased study behavior. Follow-up observations indicated that the higher study rates were maintained after the formal program terminated.

A series of studies carried out in preschools by Harris, Wolf, and Baer (1964) and their colleagues demonstrated the effectiveness of contingent teacher attention in modifying behavior problems of preschool children. In these studies inappropriate and/or undesirable rates of isolate play (Allen, Hart, Buell, Harris, and Wolf, 1964), crying (Hart, Allen, Buell, Harris, and Wolf, 1964), crawling (Harris, Johnston, Kelley, and Wolf, 1964), and a number of other problem behaviors were modified by systematically manipulating teacher-attention consequences of the behaviors. Similarly, teacher and peer attention were manipulated by Zimmerman and Zimmerman (1962), Patterson (1965), and Hall and Broden (1967) to reduce problem behaviors and increase appropriate responses of children enrolled in special classrooms.

To date, however, there has been little sys-

tematic research in the application of social reinforcement by teachers in the regular school classroom beyond the successful case studies reported by Becker, Madsen, Arnold, and Thomas (1967) in which no attempt was made to evaluate the reliability of these procedures through experimental reversals.

The present studies analyzed experimentally the reliability with which teachers could modify the study behavior of children of poverty-area classrooms by systematic manipulation of contingent attention.

GENERAL PROCEDURES

Subjects and Setting

The studies were carried out in classrooms of two elementary schools located in the most economically deprived area of Kansas City, Kansas.² Teachers who participated were recommended by their principals. The teachers nominated pupils who were disruptive or dawdled. They were told that one or two observers would come regularly to their classrooms to record behavior rates of these pupils.

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Observation

The observers used recording sheets lined with triple rows of squares, as shown in Fig. 1. Each square represented an interval of 10 sec. The first row was used to record the behavior of the student. (The definition of study behavior was somewhat different for each student and depended on the subject matter taught. Generally, study behavior was defined as orientation toward the appropriate object or person: assigned course materials, lecturing teacher, or reciting classmates, as well as class participation by the student when requested by the teacher. Since each pupil was observed during the same class period, however, the response definition was consistent for each student throughout the course of an experiment.) Teacher verbalizations to the student were recorded in the second row. The third row was used to record occasions when the teacher was within a 3-ft proximity to the student.

EXPERIMENTAL CONDITIONS

Baseline

Rates of study were obtained for the selected pupils. Thirty-minute observations were scheduled at a time each day when the pupils were to be working in their seats. In most cases observations were made two to four times per week. After obtaining a minimum of two weeks of baseline, the students' study rates were presented graphically to the teachers. Then, selected studies (Hart *et al.*, 1964; Allen *et al.*, 1964; Hall and Broden, 1967) were presented to the teachers, the fundamentals of social reinforcement were discussed, and a pupil was selected for systematic study.

Reinforcement₁

During reinforcement sessions the observer held up a small square of colored paper in a manner not likely to be noticed by the pupil whenever the pupil was engaged in study.

SECONDS						ONE MINUTE																		
10	20	30	40	50	60																			
N	N	N	N	N	N	N	S	S	S	S	N	N	S	S	S	S	N	N	N	N	N	N	N	N
		T	T	T							T												T	T
			/	/				/		/														

- ROW 1 N Non-Study Behavior. S Study Behavior.
- ROW 2 T Teacher Verbalization directed toward pupil.
- ROW 3 / Teacher Proximity (Teacher within three feet).

Fig. 1. Observer recording sheet and symbol key.

These observations were made during each 10-sec interval of each session. The observers sat at the rear or the side of the classroom, and avoided eye contact or any other interaction with pupils during observation sessions.

Inter-observer agreement was analyzed by having a second observer periodically make a simultaneous observation record. Agreement of the two records was checked interval by interval. The percentage of agreement of the records [$\frac{\# \text{ agreements} \times 100}{\# \text{ agreements} + \# \text{ disagreements}}$] yielded the percentage of inter-observer agreement.

Upon this signal, the teacher attended to the child, moved to his desk, made some verbal comment, gave him a pat on the shoulder, or the like. During weekly after-school sessions, experimenters and teachers discussed the rate of study achieved by the pupil and the effectiveness of attention provided by the teacher, and made occasional adjustments in instructions as required.

Reversal

When a satisfactory rate of study had been achieved, the observer discontinued signaling

and (as much as possible) the teacher returned to her former pattern, which typically consisted of attending to non-study behavior.

Reinforcement₂

When the effect of the reversal condition had been observed, social reinforcement of study was reinstated. When high study rates were achieved again, the teacher continued reinforcement of study behavior without the observer's signals.

Post Checks

Whenever possible, periodic post-checks were made through the remainder of the year to determine whether the new levels of study were being maintained.

Correlated Behavioral Changes

Where possible, other behavioral changes, including teacher reports, grades, and other records of academic achievement were recorded. Because such data are difficult to evaluate, their importance should not be unduly stressed.

INDIVIDUAL EXPERIMENTS

Robbie

Robbie was chosen because he was considered a particularly disruptive pupil who studied very little. Figure 2 presents a record of Robbie's study behavior, defined as having pencil on paper during 5 sec or more of the 10-sec interval. During baseline, study behavior occurred in 25% of the intervals observed during the class spelling period. The behaviors which occupied the other 75% of his time included snapping rubber bands, playing with toys from his pocket, talking and laughing with peers, slowly drinking the half-pint of milk served earlier in the morning, and subsequently playing with the empty carton.

During the baseline period the teacher would often urge Robbie to work, put his milk carton away, etc. In fact, 55% of the teacher attention he received followed non-study behavior. Robbie engaged in continuous study for 60 sec or more only two or three times during a 30-min observation.

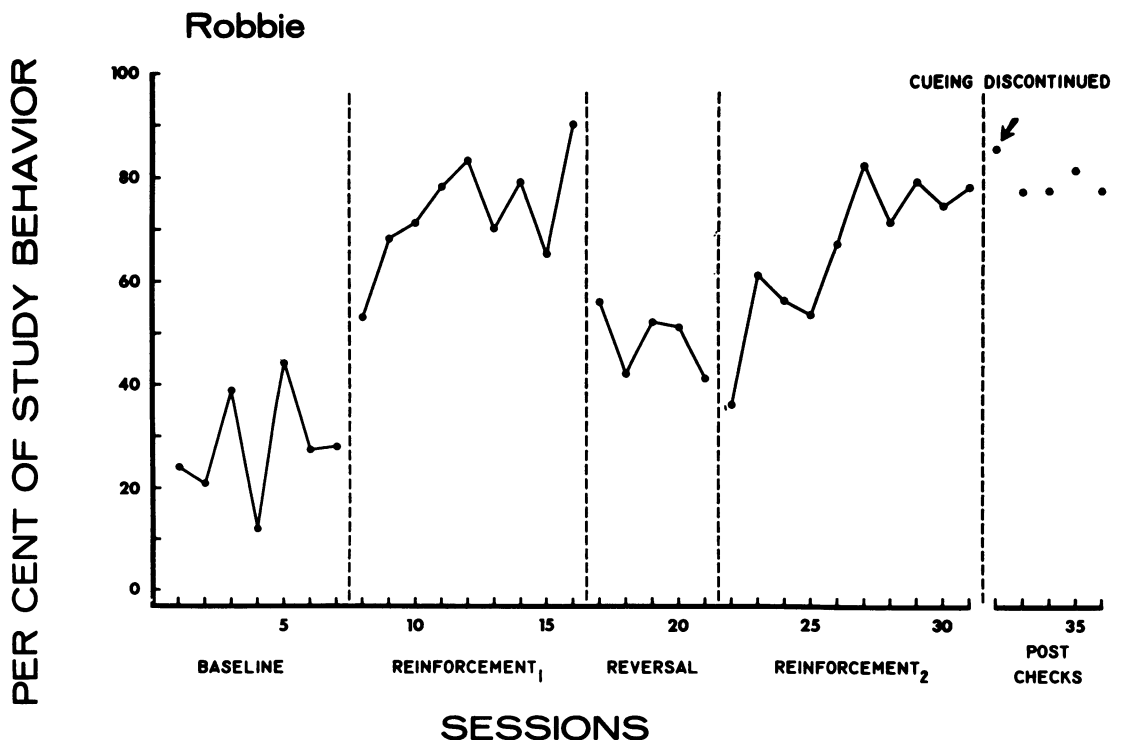


Fig. 2. A record of study behavior for Robbie. Post-check observations were made during the fourth, sixth, seventh, twelfth, and fourteenth weeks after the completion of Reinforcement₂ condition.

Following baseline determination, whenever Robbie had engaged in 1 min of continuous study the observer signaled his teacher. On this cue, the teacher approached Robbie, saying, "Very good work Robbie", "I see you are studying", or some similar remark. She discontinued giving attention for non-study behaviors including those which were disruptive to the class.

Figure 2 shows an increased study rate during the first day of the first reinforcement period. The study rate continued to rise thereafter and was recorded in 71% of the intervals during this period.

During the brief reversal period, when reinforcement of study was discontinued, the study rate dropped to a mean of 50%. However, when reinforcement for study was reinstated, Robbie's study rate again increased, stabilizing at a rate ranging between 70% and 80% of the observation sessions. Subsequent follow-up checks made during the 14 weeks that followed (after signaling of the teacher was discontinued) indicated that study was being maintained at a mean rate of 79%. Periodic checks made during each con-

dition of the experiment revealed that agreement of observation ranged from 89% to 93%.

Robbie's teacher reported behavior changes correlated with his increased rate of study. During Baseline, she reported that Robbie did not complete written assignments. He missed 2 of 10, 5 of 10, and 6 of 10 words on three spelling tests given during Baseline. By the final week of Reinforcement₂, she reported that he typically finished his initial assignment and then continued on to other assigned work without prompting. Disruptive behavior had diminished and it was noted that he continued to study while he drank his milk and did not play with the carton when finished. He missed 1 of 10 words on his weekly spelling test.

Rose

Rose was a classmate of Robbie. Baseline observations were made during the math and/or spelling study periods. The mean rate of study during Baseline was 30%, fluctuating from 0% to 71%. Her non-study behaviors included laying her head on the desk, taking

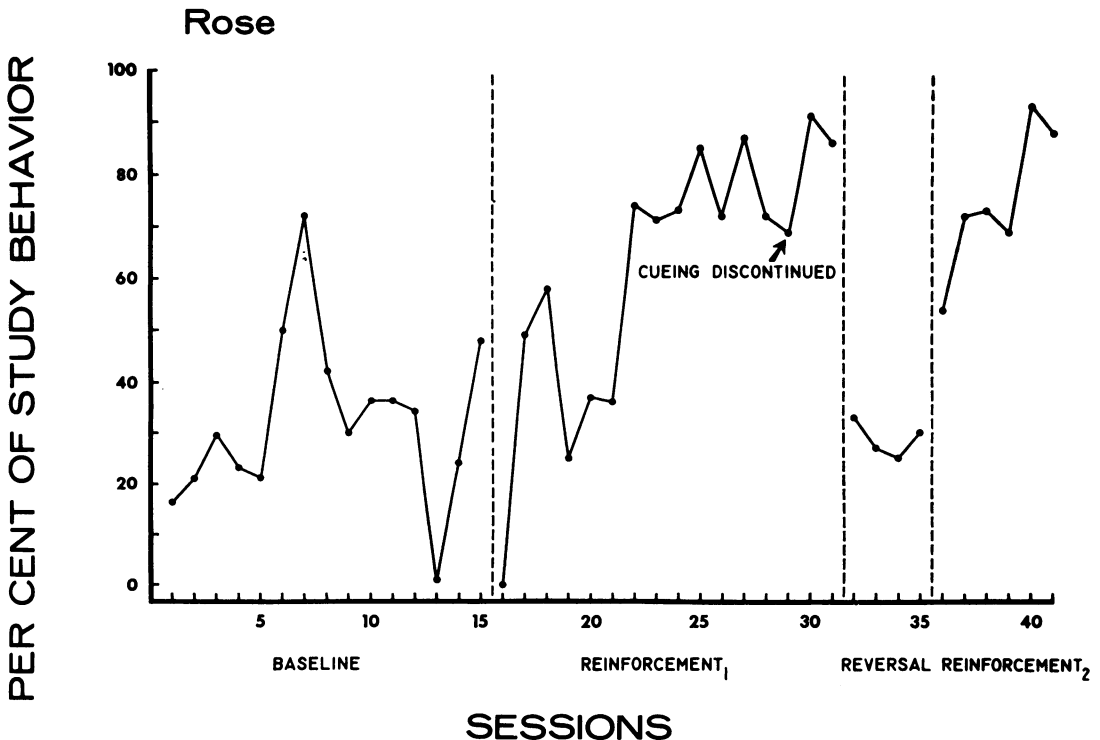


Fig. 3. A record of study behavior for Rose.

off her shoes, talking, and being out of her seat.

On the day her teacher was first to reinforce Rose's study behavior, Rose did not study at all, and the teacher was thus unable to provide reinforcement. Therefore, beginning with the second reinforcement session, the teacher attended to behavior that approximated study (e.g., getting out pencil or paper, or opening her book to the correct page). Once these behaviors were reinforced, study behavior quickly followed, was in turn reinforced, and had risen to 57% by the third reinforcement session.

During the fourth session, however, study dropped to 25%. An analysis of the data indicated Rose had increased in out-of-seat behavior, to have her papers checked and to ask questions. Consequently her teacher thereafter ignored Rose when she approached but attended to her immediately if she raised her hand while seated. There was an immediate drop in out-of-seat behavior and a concurrent increase in study behavior. As can be seen in Fig. 3, during the last 10 sessions of Rein-

forcement₁, study behavior ranged between 74% and 92%, the mean rate for the entire period being approximately 71%. A high rate of study was maintained after the observer discontinued signaling after the thirteenth reinforcement session.

During the four reversal sessions, study was recorded in only 29% of the intervals. However, a return to attention for study immediately increased study behavior and during the second reinforcement period study was recorded in 72% of the observed intervals. Observer agreement measured under each condition ranged from 90% to 95%.

An analysis of the attention provided Rose by her teacher demonstrated that it was not the amount of attention, but its delivery contingent on study which produced the changes in this behavior. Figure 4 shows these amounts, and the general lack of relationship between amount of attention and experimental procedures.

In fact these data show that when teacher attention occurred primarily during non-study intervals there was a low rate of study.

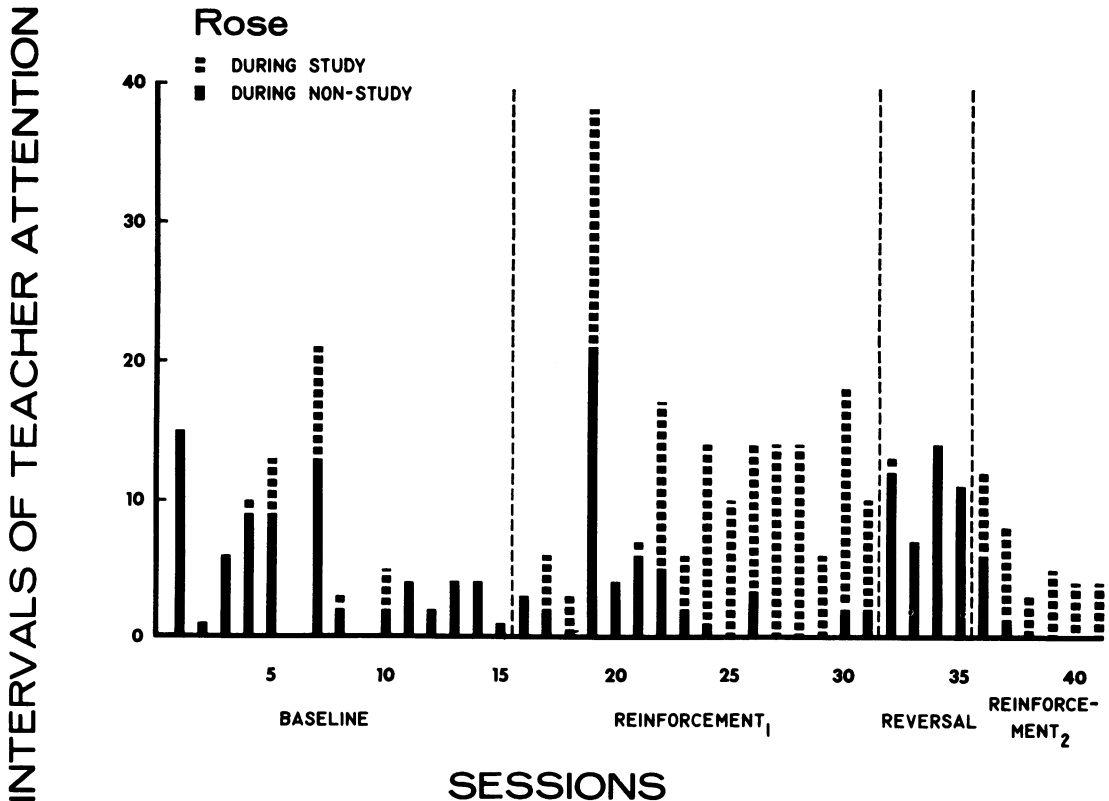


Fig. 4. A record of teacher attention for Rose.

When teacher attention occurred primarily during study intervals there was a higher rate of study. Figure 4 also shows that the mean rate of total teacher attention remained relatively stable throughout the various experimental phases, rising somewhat in the Reinforcement₁ and Reversal phases and declining to baseline levels in the Reinforcement₂ phase.

Rose's grades at the end of the baseline phase were D in arithmetic and D in spelling. Her grades for the reinforcement phase of the experiment were C- in arithmetic and B in spelling.

Ken

Ken was one of the other 41 pupils in Rose's class. He had a wide range of disruptive behaviors including playing with toys from his pockets, rolling pencils on the floor and desk, and jiggling and wiggling in his seat. His teacher had tried isolating him from his peers, reprimanding by the principal, and spanking to control his behavior. These efforts apparently had been ineffective. Study

behavior ranged from 10% to 60%, with a mean rate of 37%, as seen in Fig. 5.

Reinforcement of study behavior was begun at the same time for both Ken and Rose. The observer used different colored cards to signal when the behavior of each pupil was to be reinforced. Ken's study increased to a mean rate of 71% under reinforcement conditions. However, during his brief reversal, Ken's rate of study was again about 37%. The re-introduction of the reinforcement for study recovered study behavior in 70% of the observed intervals. Agreement between observers measured during each of the conditions ranged from 90% to 92%.

Ken's teacher reported several correlated behavior changes. Before the experiment she had stated that he rarely, if ever, finished an assignment. His grades for the baseline period included D in math, D in spelling and U (unsatisfactory) in conduct. After reinforcement was instituted his teacher reported a marked decrease in disruptive behavior and stated, "He's getting his work done on time now." Ken's report card grades subsequently

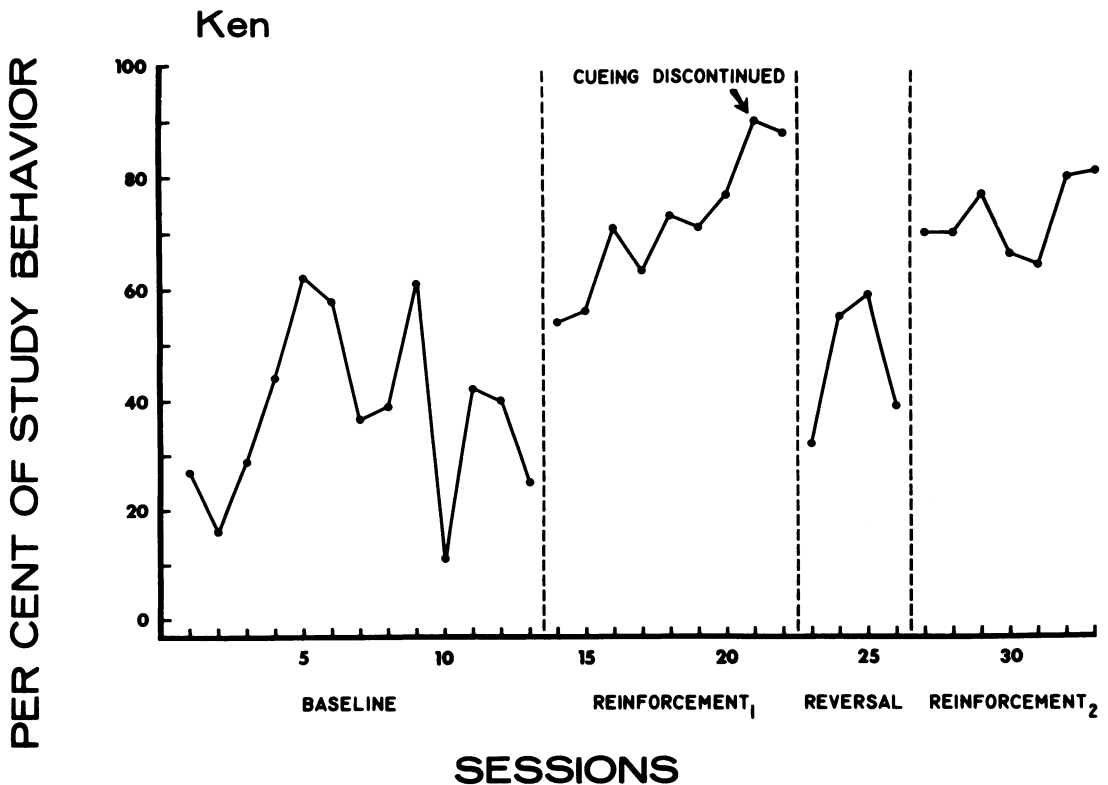


Fig. 5. A record of study behavior for Ken.

were C in spelling, C in arithmetic and S (satisfactory) in conduct.

Gary

Gary, a third-grade boy in another classroom of 39 pupils was chosen as a subject because he failed to complete assignments. The course of Gary's program is shown in Fig. 5. Observations made during the 30-min morning math period indicated that Gary engaged in study during 43% of the 10-sec intervals observed. Non-study behaviors included beating his desk with a pencil, chewing and licking pages of books, moving his chair back and forth in unison with a classmate, banging his chair on the floor, blowing bubbles and making noises while drinking his milk, and punching holes in the carton so that milk flowed onto the desk. He would also gaze out the window or around the room and would say "This is too hard", "Shoot, I can't do this", and "How did you say to work it?"

Gary had been observed to engage in appropriate study for 60 sec or more at least one to three times during most study periods. The

observer thus signaled the teacher whenever Gary had engaged in study for six consecutive 10-sec intervals, and he was attended to by the teacher only on those occasions.

As shown in Fig. 6, reinforcement produced a marked increase in studying. With the rise, almost all disruptive behavior disappeared. He still talked out of turn in class but typically to say "I know how to do it", "He's wrong", "Can I do it, teacher?", "Oh, this is easy." Gary engaged in study during approximately 77% of the 10-sec intervals observed during Reinforcement₁.

After the twentieth session a reversal was programmed, and the teacher was signaled whenever Gary engaged in non-study behavior for 30 sec. When this occurred, the teacher gave Gary a reminder to get back to work. No attention was given for study behavior.

As can be seen, this resulted in a fluctuating but declining rate of study during the 30-min math period. At this point it was noted that Gary's rate of study was again rising, and that the teacher was in fact providing intermittent reinforcement for study. Therefore,

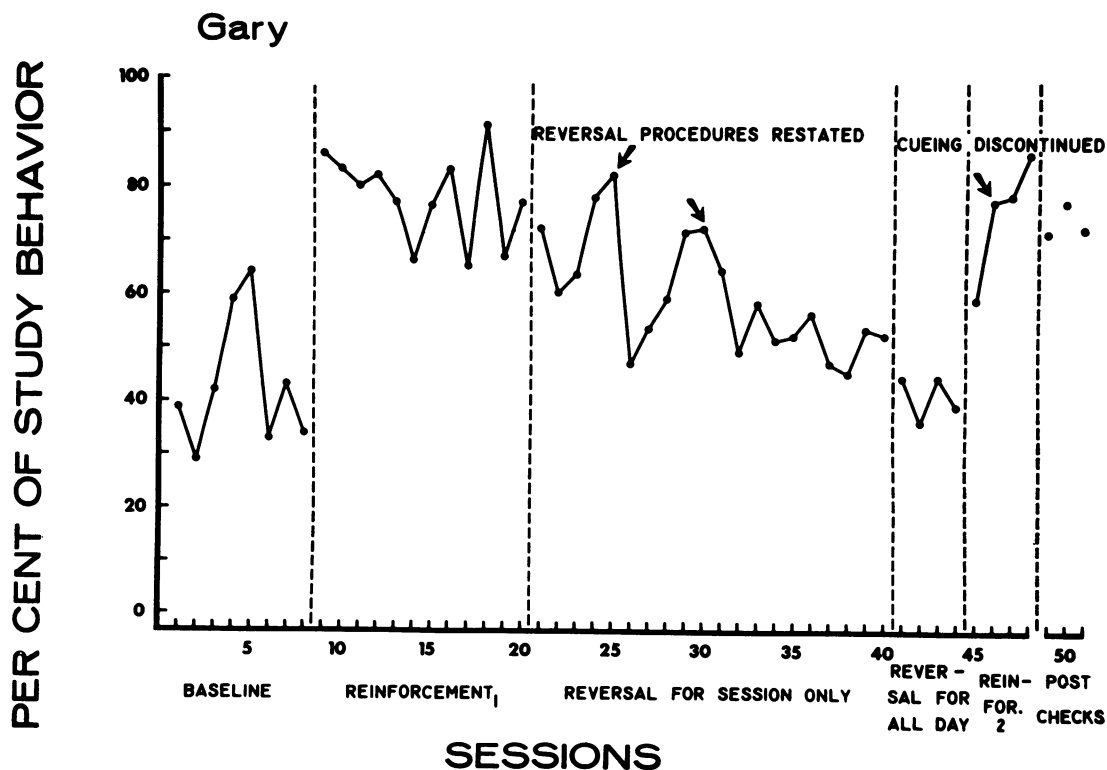


Fig. 6. A record of study behavior for Gary. Post-check observations were made during the first, fourth, and tenth weeks after completion of Reinforcement₂ condition.

on two occasions the procedures for reversal were gone over once again in conference with the teacher and a subsequent slow but steady decline in study rate was achieved. There also appeared to be an increase in disruptive behavior. The mean rate of study at this point of Reversal was about 60%.

It was then noted that a more rapid reversal effect had been brought about in the previous studies, probably because that teacher had carried out reversal procedures for the entire day whereas Gary's teacher practiced reversal only during the 30-min observation period. Reversal of reinforcement conditions was, therefore, extended to the entire day. The mean rate for these sessions was approximately 42%. However, resumption of reinforcement immediately recovered a study rate of 60% which increased as reinforcement continued. After the first day of this reinforcement phase the teacher expressed confidence in being able to work without cues from the observer. Signaling was therefore discontinued without loss of effect. Periodic checks made during subsequent weeks indicated study behavior was being maintained at a level higher than 70%. The reliability of ob-

servation measured during each condition ranged from 92% to 96%.

Joan

Joan, one of Gary's classmates, did not disrupt the class or bother other pupils but was selected because she dawdled. Typically, during arithmetic study period, she would lay her head on her desk and stare toward the windows or her classmates. At other times she would pull at or straighten her clothing, dig in her desk, pick or pull at her hair, nose or fingernails, draw on the desk top or play with her purse. During baseline her study rate was approximately 35%.

During the Reinforcement₁ phase, after the observer signaled that 60 sec of continuous study had occurred, the teacher made comments such as, "That's a good girl", and often tugged lightly at Joan's hair or patted her shoulder. As can be seen in Fig. 7 this resulted in an immediate increase in study behavior. The observer discontinued signaling after Session 20 when the teacher stated it was no longer necessary. Though the study rate fluctuated in subsequent sessions it generally remained higher than in Baseline. The lowest

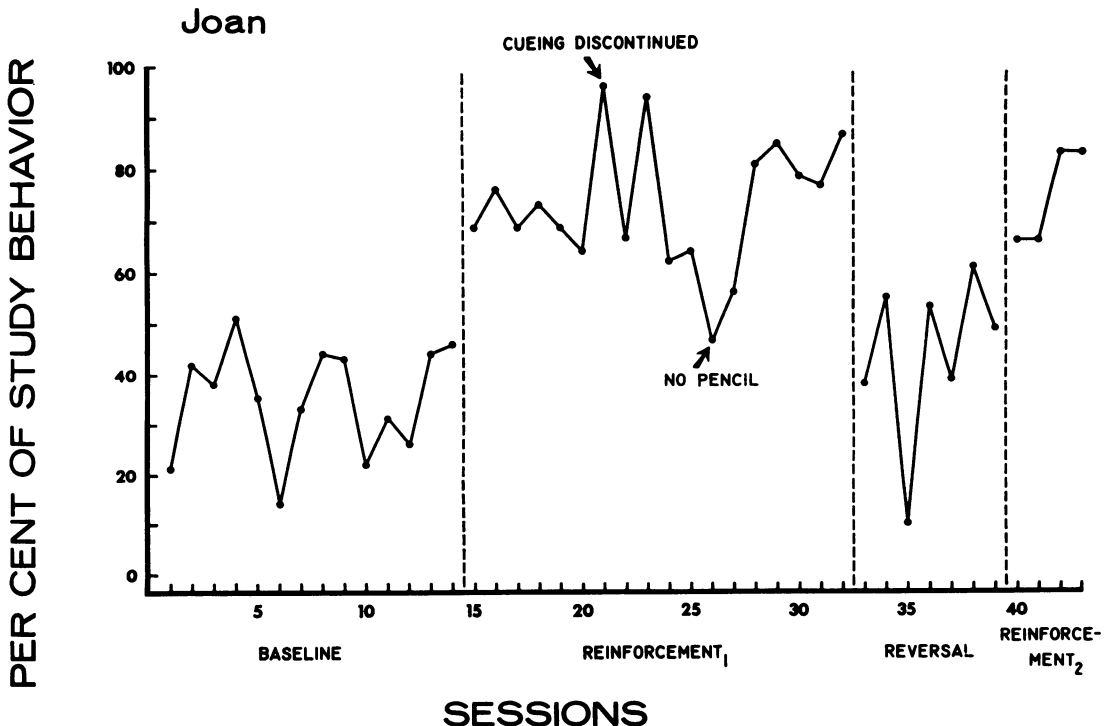


Fig. 7. A record of study behavior for Joan.

rate of study came in Session 26 when Joan was without a pencil through the first part of the session. Study was observed in 73% of the intervals of the Reinforcement₁ phase.

During Reversal, Joan's study rate declined markedly and play with clothes, pencils, and head on desk behaviors appeared to increase. The mean study rate for the reversal sessions was approximately 43%. Reinstatement of reinforcement for study, however, resulted in a rapid return to a study rate of approximately 73%. No post-checks were obtained because of the close of school. Observer agreement ranged from 93% to 97%.

Joan's arithmetic-paper grades provided interesting correlated data. During Baseline a sampling of her arithmetic papers showed an average grade of F. During Reinforcement₁ they averaged C. All her arithmetic papers graded during Reversal were graded F. In Reinforcement₂ the average grade on arithmetic papers was C-.

Levi

Levi was a first-grade boy who was selected because of his disruptive behaviors. Although he achieved at a fairly high level, he often dis-

turbed the class by making loud noises, by getting out of his seat, and by talking to other students. The school counselor suggested using reinforcement techniques after counseling with the pupil and teacher brought about no apparent improvement in Levi's behavior.

The counselor was trained in the observation procedures and he obtained baseline rates of Levi's study and disruptive behaviors during seatwork time. A second observer was used to supplement data gathering. During Baseline, Levi's rate of study was approximately 68%, ranging from 34% to 79%. An analysis of teacher attention during baseline showed that although Levi had a relatively high rate of study, he received almost no teacher attention except when he was disruptive (*i.e.*, made noise or other behaviors which overtly disturbed his neighbors and/or the teacher).

During Reinforcement₁ the teacher provided social reinforcement for study and, as much as possible, ignored all disruptive behavior. No signals were used since Levi had a relatively high study rate and the teacher was confident she could carry out reinforcement without cues. Figure 8 shows that study

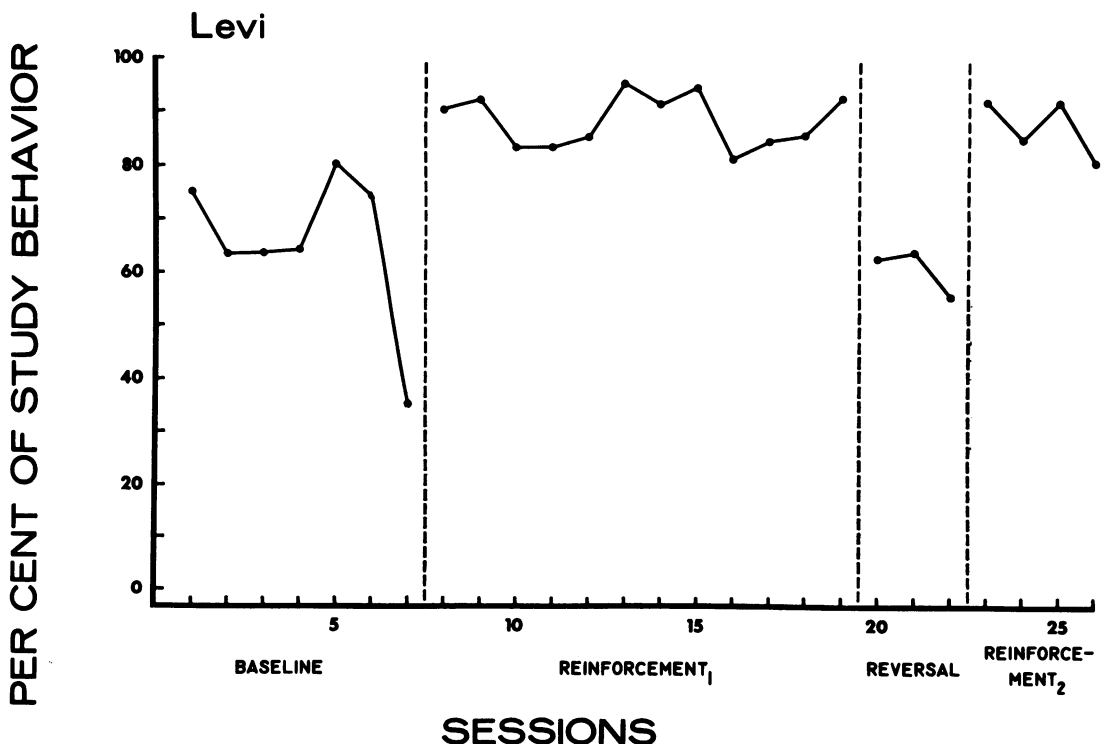


Fig. 8. A record of study behavior for Levi.

occurred in approximately 88% of the intervals of Reinforcement₁ and at no time went below that of the highest baseline rate. A brief reversal produced a marked decrease in study to a mean rate of 60%. However, when reinforcement for study was reinstated study again rose to above the baseline rate (approximately 85%).

Figure 9 presents the disruptive behavior data for the four periods of the experiment. Disruptive behavior was defined to occur when Levi made noises, got out of his seat or talked to other students and the response appeared to be noticed by the teacher or another student. During Baseline the mean rate of disruptive behavior was 7%. During Reinforcement₁ the mean rate declined to 2.2%. During the brief Reversal phase the mean rate rose to 3.2%. In Reinforcement₂ the rate declined to an almost negligible 0.25%. No follow-up data were obtained because of the close of the school year. Observer agreement measured under each condition was consistently over 80%.

The teacher and the school counselor re-

ported at the conclusion of the experiment that in their opinion Levi was no longer a disruptive pupil.

DISCUSSION

These studies indicate clearly that the contingent use of teacher attention can be a quick and effective means of developing desirable classroom behavior. Effective teachers have long known that casually praising desired behaviors and generally ignoring disruptive ones can be useful procedures for helping maintain good classroom discipline. What may appear surprising to school personnel, however, is the degree to which student behavior responds to thoroughly systematic teacher attention.

One purpose of these studies was to determine whether the procedures could be carried out by teachers in public school classrooms. Although these teachers were initially unfamiliar with reinforcement principles and had had no prior experience with the procedures, they were clearly able to carry them

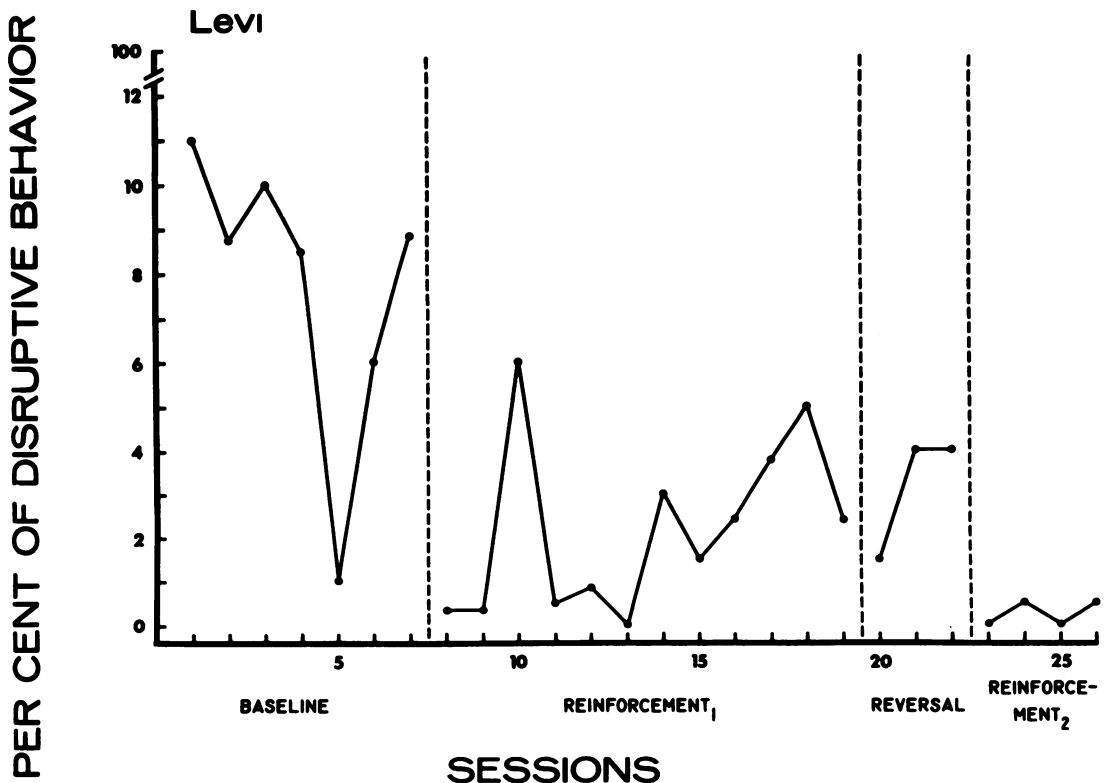


Fig. 9. A record of disruptive behavior for Levi.

out with important effect. The fact that they were carried out in crowded classrooms of schools of an urban poverty area underscores this point. In such areas one would expect a high incidence of disruptive behaviors and low interest in academic achievement, conditions generally conceded to make teaching and motivation for study difficult. Yet, with relatively slight adjustment of the social environment, it was possible to increase rates of study with comparative ease.

The teachers in these studies did not have poor general control of their classrooms. Most of their pupils seemed to apply themselves fairly well, although a few did not. When their baseline data were analyzed, it became clear that these pupils were in effect being motivated not to study. It became apparent that for these pupils, most teacher attention was received during non-study intervals rather than when they were studying. This was not surprising since many of the non-study behaviors were disruptive and thus seemed to the teacher to require some reprimand.

Several aspects of the teacher training program appear worthy of mention. During baseline, as far as the teacher was concerned, the primary purpose was to determine study rates. After baseline, a simple procedure designed to increase those study rates was emphasized (rather than the fact that the teacher had in all probability been reinforcing the very behaviors which were causing concern).

The teacher was constantly informed of the results of each day's sessions and its graphed outcome. These daily contacts, plus weekly conferences in which the procedures were discussed and the teacher was praised for bringing about the desired behavioral changes, may have been central to the process of a successful study.

The teachers readily accepted the advisability of carrying out a brief reversal when it was presented as a means of testing for a causal relationship between teacher attention and pupil behavior. All, however, felt reversal sessions were aversive and were glad when they were terminated.

These procedures did not seem to interfere greatly with ongoing teaching duties. For one thing they did not necessarily result in more total teacher attention for a pupil. In fact, the teachers had more time for constructive teaching of all pupils because of the de-

crease in disruptive behaviors in the classroom.

Two teachers reported they were able to utilize systematic attention to increase appropriate study of other pupils in their classrooms who were not included in these studies. No corroborative data were collected to verify their reports. Investigation of the degree to which this kind of generalization occurs should be a goal of further research, however, since such a result would be highly desirable.

In the first five subjects, cueing of the teacher was initially used to make certain that the teacher could discriminate when study behavior was occurring. Later, cueing was discontinued without loss of effectiveness. In the case of Levi, cueing was never used. Further research will be needed to determine how often cueing contributes to the efficiency of the procedures.

In one classroom, a teacher was unable to carry out the procedures in spite of the fact that the same orientation and training processes were used which had previously proved successful. Although the teacher seemed sincere in her efforts to reinforce study, she observably continued to give a high rate of attention for non-study behaviors. Observations indicated that the teacher gave almost no praise or positive attention to any member of the class. Virtually her entire verbal repertoire consisted of commands, reprimands, and admonitions. Consequently the teacher was instructed to provide positive verbal reinforcement for appropriate behavior of all class members. This did result in a measurable increase in the number of positive statements made to individuals and to the class. According to both the teacher and the observers, this greatly improved general classroom behavior. Only slight increases in study were recorded for the two pupils for whom data were available, however, and the close of the school year prevented further manipulations.

This failure prompted the authors to begin developing a system for recording appropriate behavior rates for an entire class. It also indicates that there may be certain teachers who need different or more intensive training to carry out these procedures effectively.

Finally, it should be noted that the pupils of this study did have at least a minimal level of proficiency in performing the academic

tasks and thus seemed to profit from the increased time they spent in study. The teachers apparently assigned study tasks within the range of the pupils' skills, and correlated gains in academic achievement were noted. If teachers were to use the procedures but failed to provide materials within the range of the pupil's level of skill, it is unlikely that much gain in achievement would result.

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