*APPLICATION OF DELAYED REINFORCEMENT
PROCEDURES TO THE BEHAVIOR OF AN
ELEMENTARY SCHOOL CHILD¹*

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Delayed reinforcement techniques were applied, in a multiple baseline experimental design, to modify the behavior of a mildly maladjusted sixth-grade child. The following behaviors were chosen for modification: face-touching, posture, and voice-loudness. Video-tape recordings were made of the subject's behavior during mathematics and spelling periods each day. The recordings from the mathematics period was shown to her after school, and consequences for behavior exhibited during mathematics were dispensed during the after-school viewing. This delayed reinforcement procedure produced the desired behavior changes during the mathematics period. Tapes from the spelling period, which were taken without the child's knowledge, indicated that the behavior changes generalized to portions of the day other than the mathematics period.

The successful application of reinforcement principles to modify the academic and social behavior of children in the classroom has been demonstrated in a number of recent studies. For example, Wolf, Giles, and Hall (1968) accelerated achievement in low-achieving fifth and sixth graders using a token economy and, further, found that daily performance depended on relative rate of "pay"; Hawkins (1967) modified out-of-seat behavior in a 9-yr-old emotionally disturbed boy by training the teacher to avoid talking to the boy when out of his seat and to talk to him more often when he was in his seat; Madsen, Becker, and Thomas (1968) showed the separate and combined effects of rules, praise for appropriate behavior, and ignoring inappropriate behavior; Hall, Lund, and Jackson (1968) modified children's attentiveness to their work by changing a teacher's attentiveness to the children; Madsen, Becker, Thomas, Koser, and Plager (1968) showed that a teacher's saying "sit down" can act as a reinforcer for out-of-seat behavior, and Surratt, Ulrich, and Hawkins (1969) modified the attentiveness of four

first-grade pupils using response-contingent lights that were "backed up" by various privileges. In studies to date, the reinforcement has been dispensed during or immediately after the response. However, in a classroom immediate reinforcement is not always practical. If evidence could be obtained showing that consequences applied after school and outside the classroom can successfully control classroom behavior, the efforts of teachers, school psychologists, school social workers, principals, counselors, and parents might be greatly facilitated.

Renner (1964) presented a comprehensive review of the literature on a delay of reinforcement. Although the literature as related to humans is still quite sparse, the data available tend "to agree in essence with the data from animal studies" (Renner, 1964, p. 358). In the acquisition of a response under conditions of delayed reinforcements, two factors appear to be of considerable importance. The first is the occurrence of cues produced by the response to be acquired. Brackbill and Kappy (1962) suggested that when subjects are working in the absence of such response-produced cues in a trial-and-error manner, delay of reinforcement will retard acquisition. When response-produced cues can be utilized, "then potential deleterious effects of delay on learning efficiency will be reduced by virtue of a bridging or mediating effect from responses to reinforcement" (Brackbill and Kappy, 1962, p. 17).

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The second important factor is the intertrial interval. As the delay of reinforcement is increased, the time between responses is often increased. Thus, because of a reduction in practice trials, acquisition of a response may be retarded. As Renner (1964) pointed out, with short intervals, this may have only limited effects, but when intervals of seven days are used, as in the studies of Bilodeau and Bilodeau (1958) and Denny, Allard, Hall, and Rokeach (1960), it becomes an important variable. In fact, these two studies suggest that the crucial factor in performance decrement is the delay between responses, rather than the delay of reinforcement.

Studies to date indicate that delayed reinforcement enhances resistance to extinction (Renner, 1964). The presence of response-produced cues may play an important role. Brackbill and Kappy (1962) stated that retention or resistance to extinction is "enhanced in proportion to the extent that distinctive response cues have been utilized" (p. 17). They describe the effect of delayed reinforcement on extinction as analogous to the effect of partial reinforcement.

The present experiment was designed to study the use of delayed reinforcement techniques to modify the deviant behaviors of a maladjusted child in a regular classroom.³ It was hoped that the subject's social and academic behaviors could be modified so that she would be able to function more appropriately in her environment.

METHOD

Subject

A 12-yr-old sixth-grade girl, Karen, was described by her teachers as very "self-conscious" and having a "poor self-image". She was quite homely, partly because she was poorly dressed and groomed, her posture was poor, she had a serious case of acne, and she was unusually tall for her age (5'7"). Her writing was very small,

which, along with her carelessness in keeping numbers in neat columns, appeared to contribute to her many errors in mathematics. Karen usually did her work in a slouching position with her face within three or four inches of her work. She often complained that her eyes hurt, but an eye examination just before the study indicated that she had normal vision. She also touched her face frequently—a behavior that may have been irritating to her acne. When reciting in class, Karen spoke so softly that her voice was usually inaudible to others in the room.

Apparatus

The equipment used in the experiment was a Panasonic Video-tape Recorder (Model NV-8000), a Panasonic Television Camera, and a television monitor. The loudness level indicator on a Concord tape recorder (Model 350) was used to measure voice loudness. Several stopwatches and a timer-switch were also required. Poker chips, which were exchangeable for gifts, were used as token reinforcers for specific behaviors.

Procedure

An observer was sent to the subject's classroom for several days to determine what specific behaviors were included in the global description of the problem given by the teacher. From these observations and from recommendations by the teacher, the following behaviors were selected for modification: (1) the size of her writing in mathematics; (2) her face-touching; (3) her posture while working; and (4) her voice-volume while reciting.

A television camera (enclosed in a box) and a microphone were inconspicuously placed in the classroom near the subject's desk. These were connected to the videotape recorder, which was located in a closet. The teacher turned on the recorder from a timer-switch in her desk for approximately 20 min twice a day. One recording was made during mathematics and the other during spelling. These activities were chosen because they were presented daily throughout the week and involved both writing and recitation.

The data on the behaviors studied were gathered in a variety of ways. Those on the subject's frequency of touching her face and posture were taken by viewing the videotapes after school. Face-touching was defined as any

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contact between an object and the subject's head above her collar. A touch could be made with her hands or any other object such as a pen, book, or desk-top. A stopwatch was used to record the time the subject spent touching her face. The raw time data were converted into "per cent of time touching face".

Data on Karen's posture consisted of the amount of time she spent in an excessively low posture. The camera was positioned in a fixed location, and on the wall behind the subject a horizontal line was made with tape (point A, Fig. 1). The subject's desk, with attached chair, was kept in a constant location between the camera and the wall by putting pieces of tape on the floor and requesting the subject to keep her desk on these marks, ostensibly "to avoid obstructing the camera's view of the class". The teacher checked occasionally to see that the desk was correctly positioned. The amount of time Karen's head was visually below Point A was recorded by stopwatch while observing the videotape recording. These data were converted to a percentage of the total time.

The subject's voice-loudness was recorded on the videotape and then played into a tape recorder having a loudness indicator. The number of needle inflections above a specified level on the loudness indicator was counted. A count was also made of the number of words she spoke. Thus, it was possible to calculate the ratio of the above-criterion inflections to the number of words spoken. The classroom was quiet enough and the microphone was located near enough to Karen that when she was speaking, background noise appeared to play little role in producing needle inflections.

Periodically, reliability checks were taken to determine the accuracy and objectivity of the data recorded. These checks were especially important because the experimenter also served as the main observer, and was aware of the purposes and procedures of the experiment. Reliability checks were performed by having two observers independently view or listen to the same tape at different times and comparing their data. A "per cent agreement" for each behavior was computed by taking the ratio of one observer's data on a behavior to the other observer's data on that behavior and multiplying by 100. The smaller number was always placed in the numerator. The "guest" observer was aware of the general purpose of

the experiment, but was not informed about the experimental condition being observed or the results obtained by the other observer.

The data from reliability checks are shown in Table 1. The agreement between observers ranged from 76% to 100%, with a mean of 95%.

Table 1
Reliability Data

	Day Number			
	8	22	35	48
<i>Face-Touching</i>				
A. Number of seconds counted				
1. Observer 1	333	747	23	18
2. Observer 2	339	762	23	18
B. Per cent agreement	98	98	100	100
<i>Posture</i>				
A. Number of seconds counted				
1. Observer 1	726	854	33	85
2. Observer 2	649	862	25	87
B. Per cent agreement	97	99	76	98
<i>Voice Volume</i>				
A. Number of above-criterion needle inflections				
1. Observer 1	0	0	—	4
2. Observer 2	0	0	—	5
B. Per cent agreement	100	100	—	80
C. Number of words counted				
1. Observer 1	5	15	—	23
2. Observer 2	5	17	—	23
D. Per cent agreement	100	88	—	100

The experiment was divided into the following three phases: a Baseline Phase, a Control Phase, and three sections of an Experimental Phase. During each phase, the subject's behavior during mathematics and spelling was videotaped. The teacher accomplished this by merely opening her desk drawer and turning a timer at the beginning of the mathematics and spelling periods. No children were informed of this recording, and none appeared to discover that it was being done. The observer viewed the tapes after school and recorded data on face-touching, posture, and voice-loudness.

Throughout the experiment, poker chips were employed as token reinforcers, and were exchangeable for other items of value. The items used were a bracelet, a pen, a dress, and hair-styling at a beauty salon. The "prices" of these items ranged up to 500 chips. Each time the earning of chips toward a new item was begun, a cumulative bar graph, resembling a thermometer, was constructed. At the end of each session, the height of the bar was raised

EQUIPMENT PLACEMENT

Fig. 1. Diagram of relative positioning of subject and equipment for measurement of posture.

in proportion to the number of chips earned in that session, bringing the top of the bar closer to the goal or "price" of the item. Social reinforcement in the form of attention and praise was also given. The subject earned the bracelet on Day 14, the trip to the beauty salon on Day 28, and the dress and pen on Day 51.

Baseline

During Baseline, data on face-touching, posture, and voice-volume were collected daily for 12 days. No attempt was made to contact the child, nor did the child view the tapes. The class was told by the teacher that the videotape equipment was there as a part of a study of sixth-grade classrooms. After the first day with the camera and microphone in the room, the children displayed little interest in them.

Control Phase

During the Control Phase (Days 13 to 22), the same procedures as in Baseline were followed except that the experimenter met with Karen each day after school for approximately 30 min. During these sessions, Karen's handwriting was modified by giving her poker chips

and praise for performing writing tasks in a prescribed manner. In general, the procedure involved providing visual prompts for large writing, reinforcing large writing, and then fading the prompts. The dependent variable was the size of Karen's writing in mathematics during the school day. Karen was neither shown any videotape recordings nor told about them. This phase constituted a control for the effect that might be achieved by merely giving the child extra attention and rewards. Such a technique might be considered by some therapists to be capable of improving the child's "self-concept" and thereby changing the "symptoms" exhibited. The Control Phase, then, served to ascertain whether the special individual attention to Karen and the dispensing of response-contingent reinforcement had any generalized effect on the other three behaviors of interest.

Experimental Phase 1

Following the Control Phase, the Experimental Phases began. The experimenter continued to meet with the subject after school, but now the videotape of the day's mathematics class was shown to the subject. The tapes and data collected during the spelling

period were never shown to her, but were taken to see whether any behavioral changes would generalize from mathematics to other periods of the day.

The mathematics period usually took place during the first part of the morning, so there was a lapse of approximately 5 hr between the time the behavior was taped and the time when Karen viewed it. Occasionally, the time lapse was shorter, but never less than 1 hr. During the tape-viewing sessions after school, the experimental procedures to modify the three behaviors—touching the face, posture, and voice-loudness—were carried out. However, these three behaviors were worked on successively rather than concurrently. Since the child was given no information indicating which behavior was to be worked on second, or even that there would be a second behavior chosen, the Experimental Phase for the first behavior constituted an additional Control Phase for the second and third behaviors. Similarly, the Experimental Phase for the second behavior constituted still another Control Phase for the third behavior.

Through the multiple baseline design, replication could be achieved without the need to reverse behavior to pre-experimental levels. In addition, this design allowed the assessment of possible response induction from a modified response to one or both of the other responses being measured.

Modification of face-touching behavior was attempted first. When a reliable change occurred in the face-touching behavior, a modification of posture was attempted. Concurrently, the experimenter gradually reduced the frequency of reinforcement for the absence of face-touching. Finally, voice-volume was dealt with, and a gradual elimination of reinforcers for good posture was completed.

It should be stressed here that during the Experimental Phases, reinforcement was dependent only on the behavior being observed on the television monitor. Any behavior she exhibited—such as face-touching or poor posture—while she was viewing the tape was not taken into consideration for the dispensing of the reinforcement.

Experimental Phase 1 was designed to modify face-touching behavior and began on Day 22. Until this time, Karen had not seen any videotape recordings of herself. She was not told that the recordings were from the mathe-

matics period. Karen was given a stopwatch and was instructed to observe her own behavior on the television set. She was instructed to turn on the stopwatch whenever she was not touching her face, but to reset the stopwatch to 0 whenever she saw herself touching her face. On the first day, she was given a poker chip each time she accumulated 15 consecutive seconds of not touching her face. On the next three days, the time necessary to earn a chip was increased to 30 sec, then to 1 min, and finally to 2 min. On Day 26, the first day of Experimental Phase 2, the use of the stopwatch for face-touching behavior was discontinued, but the subject was still given occasional token and social reinforcement for the absence of face-touching. After Day 27, no more token reinforcement for the absence of face-touching was dispensed, but occasional praise was presented through Day 29. After Day 29, all reinforcement for this behavior was discontinued.

Experimental Phase 2

Procedures for modification of Karen's posture began on Day 26. Again, she recorded the behavior of her image on the television screen with a stopwatch. The experimenter gave her a chip each time she accumulated 10 consecutive seconds of sitting with her head above the line drawn behind her on the blackboard (See Fig. 1, Point A). Whenever her head fell below the line, she had to reset the watch to 0 sec. On the following days, the amount of time the subject was required to spend with her head above the line to earn a chip was increased gradually. On the last day of Experimental Phase 2 (Day 33), the subject had to spend three consecutive minutes above the line to earn her chip. On Days 34 through 36, only occasional praise was presented for good posture. After Day 36, the experimenter discontinued all reinforcers for good posture.

Experimental Phase 3

Modification of Karen's voice-volume began on Day 34. A loudness indicator was placed in front of the subject, and she was instructed to observe the needle inflections of the indicator as the videotape was replaying her recitations in mathematics. She was told that she would receive six chips each time the needle inflections exceeded a specified level. Initially, the experimenter set this criterion at the same

level as was used for data collection, but there were no above-criterion inflections in the first two days, so a shaping technique was employed. The loudness indicator was adjusted to make it more sensitive, so that Karen could more easily attain the criterion voice level and receive a reward. On Days 37 to 40, the sensitivity of the indicator was reduced progressively until it was back at the original level on Day 40. The sensitivity was then maintained at the original level through the remainder of Experimental Phase 3 (through Day 51). The sensitivity of the indicator was changed only for purposes of reinforcement. The data were collected by the observer at another time with the sensitivity of the indicator adjusted to its original level. The number of chips for each inflection over the criterion was gradually reduced from six chips per inflection on Day 34 to one per inflection after Day 39.

RESULTS

When interpreting the data from Fig. 2 through 4, it should be understood that the procedures for modification of each behavior were applied after school, while the behaviors observed had occurred earlier during the same school day. Before application of a new contingency, the subject could not know what behavior was to be modified, so the earliest that a change in behavior could occur as a result of the techniques applied here would be on the day after a new contingency was first applied. Therefore, the first data point of each phase represents Karen's performance on the day after the procedures of that phase were begun.

Figure 2 shows the per cent of time Karen spent touching her face during mathematics and spelling each day. It is apparent that the extra attention, the relationship with the experimenter, and the application of response-contingent consequences (to writing behavior) in the Control Phase had no effect on face-touching during either mathematics or spelling (though Karen's writing in Mathematics nearly doubled in size).

A dramatic decrease in the time spent touching the face can be seen after experimental manipulation was begun on Day 22. It can be seen that the behavior decreased in spelling as well as mathematics, suggesting that the

decrease in face-touching generalized throughout the day. Furthermore, the low rate of face-touching was maintained throughout the remainder of the experiment (approximately seven weeks after Day 29), even though no systematic consequences for non-face-touching were given after Day 29. A followup check one month after completion of the study indicated that the low rate of face-touching was still being maintained.

Figure 3 depicts the per cent of time that the subject spent each day sitting at the low posture level (below Point A in Fig. 1) during mathematics and during spelling. The Control Phase and Experimental Phase 1 produced little change in Karen's posture, but the application of contingencies to postural behavior in Experimental Phase 2 produced an immediate improvement during both mathematics and spelling. The improved posture was maintained throughout the study, though systematic consequences for good posture were discontinued approximately three weeks before the end of the study. In the followup, the good posture was found to have been maintained in the spelling period. No followup data were obtained in the mathematics period.

The results of the attempt to modify voice-loudness are shown in Fig. 4. The data are presented as a ratio of the above criterion needle inflections per 100 words. During the first two days of this phase (35 and 36), no change in the subject's voice-volume was noted. After instituting the shaping procedure on Day 36, a general increase in the subject's voice-loudness in mathematics was observed, but this was followed by a decrease and stabilization. The loudness during spelling increased at the same time, but did not become as intense or as variable. The followup check revealed that the improved voice loudness had been maintained in both mathematics and spelling.

DISCUSSION

The present results suggest that delayed reinforcement techniques, which are capable of modifying maladaptive behaviors in school-age children, can be devised. Not only were the techniques employed in the present study effective, but their effect was rapid, generalized beyond the portion of the day used for training, and appeared to be lasting. The particu-

Fig. 2. Per cent of time face-touching occurred per day. It should be noted that there are several days shown on these and the following figures on which data were not recorded for one or more of the behaviors. The absence of data on these days resulted from two factors: (1) the malfunction of recording equipment, or (2) the cancellation of mathematics or spelling by the teacher on a particular day. In order to facilitate comparison of the figures, every session is included on every figure, even though occasionally no data were available on a particular behavior.

Fig. 3. Per cent of time per day the subject's head was below Point "A" (see Fig. 1).

lar design of the present experiment yielded some information regarding which specific aspects of the technique were essential to its effectiveness.

The Control Phase provided evidence regarding the effect of the relationship between

the experimenter and the child. The two did not know each other before this experiment, and no attempt was made to encourage the type of relationship that commonly develops in traditional forms of psychotherapy. It might still be argued that their relationship would

Fig. 4. The number of criterion needle inflections per 100 words spoken for each session.

improve the child's self-image (a hypothetical construct often referred to as an inner cause of overt behavior) and that this would result in the observed improvements in the child's behavior.

The evidence against this hypothesis is overwhelming, however. First, there were no changes in face-touching, posture, or voice-loudness during the Control Phase when the experimenter and the child worked together

daily on improving her writing. Second, there was still no improvement in posture when this relationship between the experimenter and child was continued during Experimental Phase 1, nor was there an improvement in voice-loudness during Experimental Phases 1 and 2. On the other hand, it should be added that the particular nature of the relationship between the experimenter and child may well have had an "enabling" effect, in that the improvements obtained might not have occurred so readily within some kinds of relationships. For example, had the experimenter behaved in a very dictatorial, cold, or indifferent manner, the child's behavior might not have shown such favorable changes as were obtained in this study.

Another hypothesis, which can be ruled out as an explanation for the changes obtained, has to do with the possibility of some diffuse therapeutic effect of consistently applying response-dependent consequences. It could be argued that the experimenter's being consistent or being rewarding would be therapeutic in itself. However, it was evident in the present experiment that the four behaviors observed were changed only when the contingencies were applied to them *specifically*. On the other hand, it should be added again that the experimenter's being consistent and rewarding early in the experiment may well have resulted in his being more effective in producing rapid behavioral change later in the experiment. That is, a child may be more likely to follow instructions and tolerate long delays of reinforcement if the adult giving the instructions or reinforcers has previously always "kept his promises" (followed stated contingencies).

The data also provide information indicating that the subject's viewing of her own behavior on the monitor was not sufficient in itself to produce the behavior changes that later occurred. In Fig. 3, it can be seen that while the subject was viewing the tapes during modification of face-touching (Days 23 to 26), no observable change in the subject's posture occurred. In Fig. 4, it is evident that while the subject was viewing and hearing herself during the face-touching phase (Days 23 to 26) and posture phase (Days 28 to 34), no change occurred in voice-volume. These data suggest that merely watching the videotapes was not sufficient to produce the behavior changes that

occurred and that additional variables—instructions and/or consequences—were also necessary.

It appears that the verbal instructions and the reinforcers acted together to produce the behavior changes. The data do provide some information as to the separate effects of these two variables—instructions and consequences—on both the posture and voice-volume behaviors. The classroom teacher had a conference with the subject's parents after school on Day 21. During the conference, the teacher mentioned that an attempt would be made to improve Karen's posture in the future. It can be seen in Fig. 3 that after this conference, on Days 22 and 23, the subject's posture showed some improvement. After Day 23, however, the subject's posture reverted back to her original poor posture level. This suggests that instructions from the subject's parents did produce a behavior change, but the behavior was not maintained, probably because of the absence of reinforcement contingencies for the improved behavior. Ayllon and Azrin (1964) found similar transient behavioral changes resulting from instructions alone, and more complete changes resulting from combined instructions and consequences.

Precisely how delayed reinforcement can produce behavioral change is not clear. Brackbill and Kappy (1962) suggested that response-produced cues may mediate the interval between the response and the reinforcement. In the present study, such response-produced cues may have been involved in the following manner. While watching the videotape of a specific behavior, such as sitting up straight, some muscular responses and proprioceptive stimuli associated with these responses may have occurred which were not observable to the experimenter. These responses and stimuli were probably similar to muscular responses and stimuli which actually occurred during the act of sitting up straight. Physiological experiments by Jacobson (1932) suggest this possibility. He attached electrodes to arms of several subjects and instructed them to think of hammering with the right arm. Jacobson's instruments showed two bursts of impulses from the right-arm muscles corresponding to the imagined hammering. Jacobson concluded that when the subjects imagined they were hammering, they moved their muscles in a manner characteristic of hammering, even though their

arms remained in a resting position. Therefore, it could be hypothesized that in this experiment, covert muscular responses occurred while the subject was viewing a specific behavior on the videotape. These responses were paired with reinforcers—poker chips and praise. Thus, the proprioceptive stimuli produced by the covert muscular responses became conditioned reinforcers. Such a process may have been facilitated by the fact that Karen had to observe her image on the television screen very closely in order to record it herself. In the classroom setting, the subject's overt postural responses may have been reinforced by these response-produced cues, which had become conditioned reinforcing stimuli. In this way, the response-produced cues could provide a mediating effect between the delayed reinforcers and the overt responses. Furthermore, it could be added here that imitative behavior may often be produced in a similar manner. Additional experimentation is needed in order to test these hypotheses.

Regarding the theoretical questions related to delay of reinforcement, it should be pointed out that the data of the present study support the findings of Bilodeau and Bilodeau (1958) and Denny, Allard, and Rokeach (1960), which suggest that the crucial factor in the performance decrement often observed in delayed reinforcement procedures was the delay between responses, rather than the delay of consequences. In the present experiment, the behaviors were free operants; that is, the subject could continually respond, without intervals between discrete responses. Only the reinforcers were delayed. Therefore, the fact that the responses could be continuous, in spite of the delayed reinforcement, may partially account for the success of the techniques employed in modifying the behaviors dealt with in the present study.

A number of additional factors may have in some way contributed to the effectiveness of the present techniques. Among these are age, desire to please adults, intelligence, previous instructions regarding the same behaviors modified here, and previous consequences for these behaviors. If techniques similar to those employed in the present study are applied to behaviors of children who differ from Karen in these respects, it may be determined with what types of children and problems these techniques are effective.

Changes appeared to occur in a number of Karen's behaviors other than those specifically designated for modification. These changes were reported by the experimenter, by the subject's teacher, and by others who had contact with the subject. First, within two days after the decrease in face-touching behavior, there was a dramatic improvement in the girl's acne. This, and her improved appearance when she received a hair styling at a beauty salon as a reinforcer, may have resulted in her receiving more positive social feedback from her peers. It is possible that this feedback served to help maintain the favorable behavior changes obtained. A second unplanned change was an apparent improvement in the subject's posture while walking, which was reported by the teacher. This too could have changed the social feedback Karen received. A third unplanned change was that Karen was reported by the teacher to have stopped complaining about eye strain. When she was asked about her eye problems after the completion of the experiment, she stated that she no longer was having these difficulties. This apparent reduction in eye strain may be related to the general improvement of Karen's posture while seated at her desk. That is, the eye problems may have been a result, rather than a cause of her holding her head so close to her work. A fourth change, for which only subjective data were available, was that she was speaking much louder at all times of the day. Her teacher stated that Karen was speaking louder not only during recitations in class, but also when conversing individually with others in the room. Such extensive changes occurred in Karen's behavior during the experiment that the teacher stated that the girl had gained a new "sense of personal dignity".

This study has shown that delayed reinforcement procedures can succeed, not only in the laboratory, but in a practical classroom situation. From its results, significant implications can be drawn. The use of the videotape, as in this experiment, would be an excellent means of supplying accurate reports of a child's behavior to teachers, counselors, school social workers, school psychologists, and parents. Although this technical equipment is not presently economically feasible for general use, it could be made available through a school guidance office, and, in special cases, could be loaned to parents for short-term use. Once the

initial modification of the behavior occurs, the behavior might be maintained by some other procedure, such as sending home daily progress reports of a child's behavior as a substitute for the videotapes. Further studies are needed in which the classroom teacher, counselor, school social worker, school psychologist, or parent serves as the behavioral engineer using delayed reinforcement procedures to modify the subject's behavior. Investigations should be made of media that are simpler and less costly than the videotape recorder, yet which produce sufficiently accurate and detailed feedback regarding a child's behavior.

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