

*POSITIVE PRACTICE OVERCORRECTION: THE EFFECTS OF
DURATION OF POSITIVE PRACTICE ON
ACQUISITION AND RESPONSE REDUCTION*

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The effects of long and short durations of positive practice overcorrection were studied, for reduction of off-task behavior after an instruction to perform an object-placement task. Off-task behavior, correct responses, and approximate responses were all observed. Off-task behavior received positive practice. The short and long practice durations (30 seconds and 3 minutes) produced equally rapid reduction of off-task behavior and acquisition of correct object-placement performance. Over sessions, much less time was required for positive practice when the short practice duration was used. Approximate responses, which also avoided positive practice, occurred at low rates relative to correct responding. Negative side effects were observed to occur primarily during sessions with long positive practice. These results indicate that use of short durations of positive practice can reduce the practice time required and negative side effects, with no loss of training effectiveness either for reducing inappropriate behavior or increasing a desired alternative behavior.

DESCRIPTORS: overcorrection, positive practice, duration, educational effects

The term overcorrection describes a class of treatment procedures aimed primarily at decreasing inappropriate behaviors. Two components of overcorrection are "restitution" and "positive practice." They may be used separately or together. In positive practice the misbehaving individual is required to practice appropriate forms of responding, contingent upon observed instances of the inappropriate behavior.

Writers have not agreed about the 'educative' capabilities of positive practice. (Axelrod, Brantner, & Meddock, 1978; Hobbs, 1976). Some confusion may stem from semantics. In this article, 'education' will be defined as acquisition of a trained response under the control of the discriminative stimuli used in training. This contrasts with previous studies (Denny, 1980;

Epstein, Doke, Sajwaj, Sorrell, & Rimmer, 1974) where responses were measured that were different from those that had been trained.

Foxx and Azrin (1972) recommended that overcorrection should be of extended duration. This suggestion was justified by the notion that overcorrection involves time-out from positive reinforcement. Animal research data show that punishment is more effective with long durations and severe intensities (Azrin & Holz, 1966).

Successful application of the overcorrection procedure has been reported using widely different durations, from 30 sec (Carey & Bucher, 1981; Luiselli, Helfen, Pemberton, & Reisman, 1977; Shapiro, Barrett, & Ollendick, 1980) to 2 h (Webster & Azrin, 1973). The primary measure of treatment efficacy in most overcorrection studies has been response reduction. Educative effects have seldom been assessed and never with respect to treatment duration. The few studies that have studied educative effects have reported response acquisition with relatively short treatment durations of 30 sec (Carey & Bucher, 1981; Shapiro et al., 1980), 2 min (Roberts, Iwata,

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McSween, & Desmond, 1979; Wells, Forehand, & Hickey, 1977) and 5 min (Cavalier & Ferretti, 1980).

Conley and Wolery (1980) examined duration of positive practice for eye gouging of two preschool blind children, one of whom was severely retarded. One child received 5 min of forced arm exercises while the other received 2 min. Both durations of positive practice produced rapid deceleration in eye gouging, for both children. The authors concluded that a short duration of positive practice was as effective as a long duration, and reduced treatment time for both the child and the trainer. These findings are limited by defects in the internal validity of the experiment. An A-B design was used, with no reversal.

There is some evidence that increasing the duration of overcorrection increases its effectiveness for reducing inappropriate behaviors. Four studies examined longer durations when the inappropriate behaviors were not reduced by treatment at the initial duration. Increasing the duration of overcorrection increased its reductive power in three of these four studies (Foxy & Azrin, 1973a; Ollendick & Matson, 1976; Sumner, Meuser, Hsu, & Morales, 1974). The first two of these studies included positive practice in their overcorrection procedures. The fourth study found no increased effect of the longer duration, using restitutional overcorrection (Barnard, Christophersen, & Wolf, 1978). These studies did not examine educative effects as a function of duration. In addition, all these studies used the longer duration after the initial procedure had failed to produce satisfactory results. Such research designs are subject to intervention interference (Hersen & Barlow, 1976).

The present study examined treatment duration for positive practice. Off-task behavior was studied, for retarded children. An "alternating treatments" design was used (Barlow & Hayes, 1979). We measured educative effects associated with the positive practice, as well as reductive effects.

METHOD

Participants and Settings

Five children were selected from a local institution for retarded children. There were four boys and one girl. Their average age was 12 yr, 2 mo with a range of 10 yr, 11 mo to 13 yr, 7 mo. The average length of institutionalization was 6 yr, with a range of 4 to 9 yr.

Four of the children had been classified by the institution as in the severe range of retardation, and one was classified as moderately retarded. Data on adaptive behavior skills were not available. All had a limited degree of receptive language and two had some productive language. The children had all previously participated in structured remedial behavioral programs. None had any physical handicap that would restrict their performance of the required motor tasks. Ward staff reported that none of the children had the necessary skills to perform the experimental tasks correctly. This was confirmed when, during pretesting, none of the children could perform a single correct response. These children were selected because they had a history of noncompliance, which limited their progress in educational programs.

Two different settings were used daily for each child—one for each of the two treatment procedures. Three of the five children participated in two daily sessions in their home cottage. One session was in an empty bedroom (30' × 20') containing two chairs and a long table. The second room was the dining room (50' × 15'), with several tables and chairs. The two rooms were located at opposite ends of the cottage. The other two children participated in one daily session in the special school they attended daily from 9:00 a.m. to 3:00 p.m. A therapy room (20' × 20') at the school was used for the morning sessions. This room was equipped with a table, two chairs, and a one-way observation mirror with intercom system. Afternoon sessions for these two children were con-

ducted after school in the dining room of the residential cottage.

Apparatus

A cassette tape recorder with prerecorded numbered intervals was used to signal the end of 10-sec intervals, at which time the therapist scored, on a recording sheet, the occurrence or nonoccurrence of certain target behaviors. A stopwatch was used to monitor the length of time that the child engaged in positive practice.

Experimental Tasks

A different task was associated with each of three treatment conditions. Two of the tasks were used for training in the two positive practice treatment conditions, and one was used as a "nonremediation" control. Tasks were assigned randomly to treatment conditions. Task A required the child to place 10 nickels, one by one, into a red slot (1" long) in a box with five slots, all of different colors. Task B required the child to place 10 red marbles ($\frac{1}{2}$ " diameter), one at a time, into a blue hole ($\frac{5}{8}$ " diameter), cut in a cardboard box with five differently colored holes. Task C, which was used for the control, required the child to place 10 circular poker chips, one at a time, into the proper position in a container that had spaces that could accommodate chips that were circular, square, triangular, or hexagonal in shape. All tasks demanded a similar motor response (i.e., an object-placement response) but a different color or shape discrimination.

Experimental Design

Two procedures were run concurrently in an "alternating treatments" design (Barlow & Hayes, 1979). The two procedures were "Long Positive Practice" (Lpp-3 min of positive practice) and "Short Positive Practice" (Spp-30 sec of positive practice). The design was also a multiple baseline across all children except for Ed, who participated later than the others. The same therapist administered all treatments. To

enhance discrimination between the two training procedures, the therapist wore a costume (hat, glasses, and blue artist's smock) while training one task.

Each child participated in two training sessions per day—one in the morning and one in the afternoon, so that they received both training conditions (Lpp and Spp) each day. Each condition was always associated with the same task and training setting for a given participant; but the initial assignment of task to condition, and setting to task, was randomized for each participant. The daily order of conditions was randomized, so that whatever task was associated with Lpp was trained in the morning on some days and the afternoon on others.

Positive transfer was assessed across tasks, using a "nonremediation probe." This involved occasional presentation, without training, of a task that was similar to the ones being trained. These nonremediation probe sessions were given twice for each child—once during baseline and once when the child reached criterion on a training task. These sessions were conducted in one of the rooms where training of the other tasks had taken place.

Response Definition and Recording Procedure

Responses were measured by the therapist, who recorded their occurrence or nonoccurrence in 10-sec intervals, over the entire session, excluding time in positive practice. A correct response was recorded if the participant placed one or more objects into their correct slots or holes. An off-task response was recorded if there were three or more consecutive seconds of not interacting functionally with the task materials. A functional interaction was defined as one in which the two task materials were brought into contact with each other (e.g. the nickel with the box). An approximate response was recorded if there was a functional interaction with task materials that did not result in a correct response—for instance, placing an object in the wrong slot. All three of these re-

sponses were possible within each 10-sec interval, but each could be scored only once. This recording method was chosen over event recording because it was easier for the therapist to do. The percentage of intervals in which each type of response occurred for each session was calculated by counting the number of intervals in which that response was observed and dividing by the total number of intervals in the session. Thus, the three percentages could sum to over 100%.

Negative side effects were also measured. The frequency of inappropriate behavior was divided into two categories: *aggression*—defined as hitting, pushing, biting, or kicking directed at the therapist and *disruption*—defined as throwing the task materials around the room or screaming. The therapist recorded the instance of these events when they occurred. No interobserver agreement data were taken for these events.

Experimental Procedures

Baseline. Participants were treated one at a time. They were seated at the table where the task materials were located, and were given the instruction to perform the task. The instruction associated with Task A was: "Place all of the nickels, one at a time, into a red slot." The instruction for Task B was: "Put the marbles, one by one, into the blue hole."

During baseline there were no consequences for off-task or approximate responding. Correct responding elicited verbal feedback from the therapist, delivered in a neutral tone of voice, (e.g., "That's right. Go on to the next one."). The therapist sat beside the child and delivered the instruction every 30 sec. The sessions lasted 20 min.

Nonremediation probe. A "nonremediation probe" session was given during baseline. The participant was brought to one of the two session rooms and asked to perform a third task (Task C). The child was instructed every 30 sec to: "Put the chips into the round hole, one at a time." Baseline contingencies were in effect. These sessions were 5 min long. Occurrence or

nonoccurrence of correct responses were scored in successive 10-sec intervals.

Treatment. Each child had one task trained with "Long Positive Practice" (Lpp) and the other with "Short Positive Practice" (Spp). Sessions lasted 20 min, including time for positive practice. Both practice procedures were identical except for their duration (3 min versus 30 sec). When off-task responding occurred the therapist started the stopwatch and said: "No, you are supposed to put all of the _____ into the holes." She then used hand-over-hand guidance to assist the child to pick up the objects (marbles or nickels) and place them in the correct hole. At the same time, the therapist delivered instructions in a neutral tone of voice (e.g., "First you pick up the nickel like this and then you slide it into the red slot like this."). The therapist was instructed to use the minimum guidance necessary to ensure correct responding, at a rate of at least one every 5 sec. After positive practice the therapist again delivered the task instruction.

As during baseline, correct responding produced only verbal feedback from the therapist. Edibles were delivered at the beginning and end of the session to reward the child for coming and remaining in the session. Approximate responses received no experimenter consequence, and thus permitted the child to avoid positive practice.

When correct responding occurred in at least 80% of the scored intervals in two consecutive sessions the "nonremediation probe" was readministered.

Therapist Training and Agreement Measurements

The therapist was trained to make observations and conduct intervention, through lectures, role-modeling, and rehearsal. The same therapist was used in all sessions. The therapist had extensive experience in behavioral intervention procedures. She was not informed about the experimental questions under investigation.

Observer agreement was assessed using a second observer. For each behavior, interval

agreement between the two observers was the number of intervals with agreement that a behavior occurred divided by the number of intervals in which at least one observer recorded the presence of the behavior. Agreement measurements were taken in 14 sessions across all participants and conditions. At least one measurement was made for each condition for each participant.

Judges (ward staff) were enlisted to provide ratings on the degree to which the therapist used the minimum necessary amount of physical guidance to ensure correct practice. They rated the entire session on a scale of 1 to 7 with 1 the minimum necessary guidance. They were not informed of the experimental questions being studied or that the therapist was instructed to

use minimum necessary guidance. Each judge observed four sessions in which two children received both the Spp and Lpp condition. This provided four ratings for each condition—two judges for each of two children. Student's *t* test was used to assess differences between the two training procedures.

RESULTS

Results are presented in Figures 1, 2, and 3. Figure 1 shows the percentage of 10-sec intervals in which correct responding occurred. Figure 2 shows the percentage of off-task responses and Figure 3 shows the percentage of approximate responses. Positive practice treatment time is excluded from these calculations. Table 1 presents the amount of time (in minutes) spent

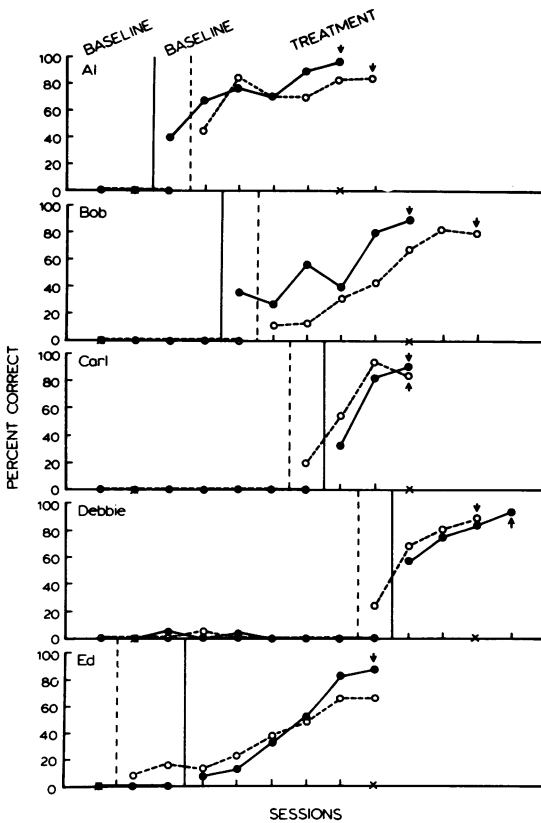


Fig. 1. Percentage of intervals in which correct responding was observed, for Long and Short Positive Practice. O = Long Positive Practice; ● = Short Positive Practice; X = Nonremediation Probe; and ↑↓ indicates session where criterion was reached.

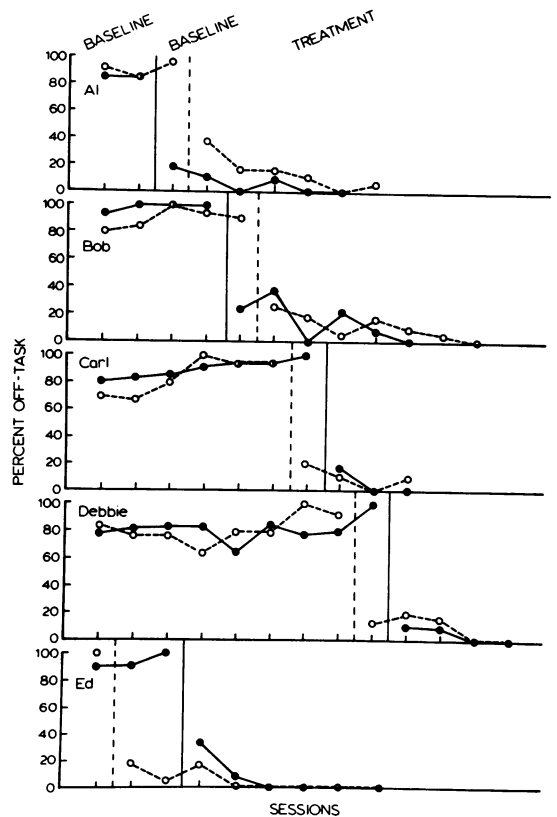


Fig. 2. Percentage of intervals in which off-task responding was observed, for Long and Short Positive Practice. O = Long Positive Practice; ● = Short Positive Practice.

Table 1
Time Spent in Positive Practice to Reach Criterion, as a Function of Duration of Practice

	Positive Practice Time									
	Short					Long				
	Al	Bob	Carl	Deb	Ed	Al	Bob	Carl	Deb	Ed*
Practice Trials to Criterion	34	36	13	21	20	24	20	13	14	18
Practice Time to Criterion (min)	12	18	6.5	10.5	10	72	60	39	42	54
Session Time to Criterion (min)	120	120	60	80	100	120	140	80	80	160
% of Session Time in Positive Practice	10	15	11	13	10	60	43	49	53	34

*Criterion was not reached for this participant; data are based on 8 sessions.

in positive practice before criterion was reached. Figure 1 shows that Al and Bob reached criterion after only six sessions for Spp training. Al also reached criterion in six sessions for Lpp

training whereas Bob took seven sessions. Carl, Debbie, and Ed received Lpp training one day before Spp training. The graph shows that the rates of acquisition were similar for both training conditions although Carl and Ed reached criterion faster in Spp. Ed did not reach criterion in the Lpp condition. At the point when criterion was achieved with Spp he performed correct responses in only 70% of the Lpp session intervals.

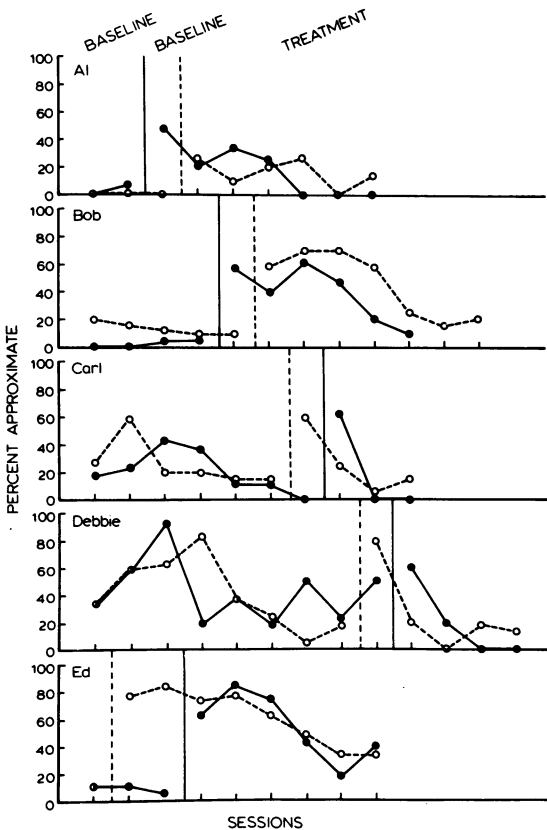


Fig. 3. Percentage of intervals in which approximate responding was observed, for Long and Short Positive Practice. ○ = Long Positive Practice; ● = Short Positive Practice.

Figure 1 shows no indication of positive transfer across tasks or subjects. When treatment was initiated with one task while baseline conditions remained in effect for the second task, there is evidence of acquisition with the task receiving treatment but not in the other task. However, due to the short length of the baseline phases, only one data point was usually available to assess transfer effects. There was also no indication of acquisition during the nonremediation probes.

Figure 2 shows reductive effects. There was an immediate and drastic reduction in off-task responses for all participants in both conditions, with no clear superiority of either treatment, nor any indication of transfer across tasks or children.

Figure 3 shows the percentage of intervals in which approximate responses were observed. Al, Bob, and Ed showed very low rates of approximate responding during baseline. Typically, they sat and engaged in self-stimulation.

Treatment produced a sudden jump in the frequency of approximate responses, which avoided positive practice. Responding gradually shifted from approximate to correct. This same pattern was also evident with Carl and Debbie although they showed higher rates of approximate responding during baseline. Approximate responses declined during baseline but rose sharply when treatment was instituted. No evidence of transfer across tasks or subjects was apparent.

The two treatments showed no visible difference between rates of acquisition or response reduction, but there was a wide discrepancy in the amount of treatment time required to reach criterion. Table 1 shows that the Spp condition usually involved more positive practice episodes per session than the Lpp condition, but less time in positive practice. The mean percentage of session time spent in positive practice was 11.8% for Spp, and 47.8% for Lpp.

Negative side effects, such as aggression and disruption, were also measured. Eleven incidents of inappropriate responding were observed, for all five participants. All occurred during the treatment conditions. Nine occurred during Lpp training and two during Spp training. Of these 11 incidents, 10 occurred during positive practice episodes.

Agreement measurements. Fourteen sessions were scored by a second observer. These were equally distributed across participants and conditions. The mean percent agreement for the three response categories were as follows: correct = 95.9% (range = 93.9%-97.8%), off-task = 91.5% (range = 84.8%-98.3%), approximate = 86.0% (range = 77.6%-95.5%).

Two judges rated, on a scale from 1 to 7, the degree to which the therapist used the minimum necessary physical guidance. Two children were rated by each judge in each treatment condition. Student's *t* test was used to assess differences between the two training procedures. The results revealed no appreciable difference between the two procedures ($t = .58$, $df = 6$, $p > .05$). The mean rating was 2.3 for the Spp condition and 2.8 for the Lpp condition.

DISCUSSION

This study demonstrated that short durations of positive practice may be at least as effective as longer durations in facilitating both educative and reductive behavior change. All five children showed immediate reduction of off-task behavior and also acquired appropriate responding in both positive practice conditions. Shorter positive practice also had fewer negative side effects.

It should be noted that these results were obtained with a select population and specific target behaviors. The same effects might not extend generally over other populations and behavior problems. Recently, however, many studies have focused on the educative aspects of positive practice and on teaching appropriate toy play or an object manipulation response as alternatives to stereotyped behavior (Carey & Bucher, 1981; Carey, Mosk, & Hranchuk, in press; Denny, 1980; Roberts et al., 1979; Rollings, Baumeister, & Baumeister, 1977; Shapiro et al., 1980; Wells et al., 1977). The present results suggests that the duration of positive practice be kept short for these types of behavior.

Generalizing these results to more severe problems behaviors may not be warranted, although Conley and Wolery (1980) found that short positive practice (2 min) was as effective as a longer duration (5 min) in suppressing eye gouging.

Our findings are not consistent with those of Foxx and Azrin (1973a), Ollendick and Matson (1976), and Sumner et al. (1974), who all found increased response suppression with longer durations of positive practice. This discrepancy might be in the nature of the alternative incompatible responses. The primary goal of treatment in these three studies was reduction of inappropriate responding. Providing an appropriate alternative behavior can play a significant role in reducing inappropriate responding. Extended duration may be more potent when the procedure is used primarily as a punishment, but less influential when positive practice teaches an appropriate alternative response.

The rapid acquisition of novel forms of responding in all five children substantiates earlier reports of the educative potential of positive practice (Carey & Bucher, 1981; Carey et al., in press; Roberts et al., 1979; Wells et al., 1977). Acquisition occurred with no positive reinforcement of correct responses indicating that children performed the desired response to avoid positive practice. One should note that response reduction could have been achieved by approximate responding, without acquisition of correct responding. However, high rates of correct responding occurred for all children. Correct responses, approximate responses, and off-task responses could be recorded in the same interval, so that shifts in behavior cannot be attributed to measurement artifacts.

Overcorrection procedures, in general, have been criticized for the time required (Doleys, Wells, Hobbs, Roberts, & Cartelli, 1976) and for producing negative side effects in clients and staff (Axelrod et al., 1978). The present findings indicate that these problems could be reduced by shortening the treatment duration. Using short durations of positive practice increases the potential frequency of training intervals and allows for more frequent feedback. Shorter durations of positive practice may also produce less opposition and negative side effects.

Current ethical guidelines would seem to dictate that shorter durations be used where possible, since they constitute a less restrictive treatment procedure. Should the short duration prove ineffective, then some previous research (Foxy & Azrin, 1973*b*; Ollendick & Matson, 1976; Sumner et al., 1974) indicates that increasing the duration may increase treatment effectiveness for behavior reduction. The present study demonstrated that positive practice can produce acquisition of novel forms of responding and this characteristic makes it unique among reductive techniques. An important test of education, however, is whether or not the new responses generalize to appropriate situations and settings other than the ones they used in training. Future research should examine this issue.

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