*CONTINGENT EXERCISE: A MILD BUT POWERFUL
PROCEDURE FOR SUPPRESSING INAPPROPRIATE
VERBAL AND AGGRESSIVE BEHAVIOR*

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Two single-subject experiments were conducted in public school classrooms for severely emotionally disturbed children. Both experiments investigated the effects of a treatment requiring a child to exhibit a simple exercise task after a verbal or aggressive response, using reversal and multiple-baseline designs. The independent variable, contingent exercise, required standing up and sitting on the floor five to ten times contingent on an inappropriate behavior. It was found that contingent exercise was easy to carry out, and following it, the child quickly returned to the learning task that had been interrupted by the inappropriate behavior. The contingent exercise procedure required a minimum of prompting or manual guidance. Although contingent exercise was not topographically related to the inappropriate response, it decreased those responses dramatically. The results suggested that contingent exercise was not only more powerful than DRO but also could be administered independently. It was concluded that contingent exercise may constitute an alternative procedure that can be used by therapists confronted with severely abnormal behaviors. It would appear to be particularly relevant in settings where procedures such as timeout and painful consequences find restricted use. Finally, a number of guidelines have been proposed as a safeguard against the misuse of this mild but powerful procedure.

DESCRIPTORS: contingent exercise, punishment, autistic behavior, aggressive behavior

Self-injurious, self-stimulatory behaviors, and atypical patterns of personal interaction comprise a large portion of the repertoires of many children described as autistic, autistic-like, severely emotionally disturbed, or retarded (Berkson & Davenport, 1962; Ornitz, 1974; Rimland,

1964). The last 15 years have witnessed increased application of behavioral techniques with this population, and a large percentage of applied behavior analysis studies have set out to reduce or eliminate behavior exhibited by autistic-like people (Luce, Note 1). Several published studies have successfully reduced autistic-like behaviors. Two of the most frequently researched punishment procedures used to reduce behaviors consist of the use of painful and/or noxious consequences (Koegel & Covert, 1972; Lovaas & Simmons, 1969; Sajwaj, Libet, & Agras, 1974; Tanner & Zeiler, 1975) and timeout (Wolf, Risley, & Mees, 1964).

Despite their success in suppressing behaviors, both timeout and painful consequences have been found to be unacceptable in some situations, including many public school classrooms (May, Risley, Twardosz, Friedman, Bijou, & Wexler, 1976). Because timeout and painful conse-

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quences represent some of the most researched procedures currently used to reduce behavior, it was not surprising that the literature contains very few published studies that reduced autistic behaviors in public school classrooms. The dearth of studies in public school settings contrasts with recent legislative directives stating that the agencies now responsible for the treatment of autistic children are those that provide the least restrictive environments (Public Law 94-142).

Many applied behavior analysts have investigated more acceptable procedures to reduce autistic behaviors. One such procedure has been called contingent effort (Kazdin, 1975; May *et al.*, 1976; Luce, Lipsker, Christian, & Hall, Note 2) and has required a subject to exhibit a change in behavior as a consequence.

In most cases, the form of response cost used with autistic behaviors has been overcorrection (Epstein, Doke, Sajwaj, Sorrell, & Rimmer, 1974; Foxx, 1976, 1977; Foxx & Azrin, 1972, 1973; Freeman, Graham, & Ritvo, 1975; Harris & Romanczyk, 1976; Ollendick, Matson, & Martin, 1978; Simpson & Sasso, 1978; Wells, Forehand, Hickey, & Green, 1977). In these cases, the subjects were required to exhibit behaviors that were topographically related to the inappropriate target behavior or an appropriate behavior that was related to the inappropriate response.

There have been fewer examples of studies focusing on autistic behaviors that used effort in the form of requiring a change in behavior that was topographically unrelated to the behavior. Epstein *et al.* (1974) reduced a foot as well as a hand response with a hand overcorrection procedure. Ollendick *et al.* (1978) attempted to use a topographically dissimilar contingency (contingent hand overcorrection for inappropriate head weaving and laughing) but found topographically related contingencies to decrease those behaviors more effectively.

Sailor, Guess, Rutherford, and Baer (1968) reduced tantrums by requiring the child to change from a simple to a more difficult task

as a consequence. This represented one of the few studies in which a behavior that could not be considered overcorrection or positive practice was used as a consequence to reduce autistic behavior. Jacobson, Bushell, and Risley (1969) demonstrated the effects of a similar contingency called response requirement with task switching behavior.

Luce and Hall (Note 3) demonstrated that contingent exercise in conjunction with DRO served to suppress the rate of inappropriate verbalizations, despite the fact that the exercise tasks were topographically unrelated to the suppressed behavior. Luce and Hall (Note 3) indicated that several questions were unanswered regarding the function of DRO. For example, two of the studies contained phases in which DRO and contingent exercise were presented alone. During contingent exercise phases, the frequency of inappropriate verbal responses remained low; and during phases in which DRO was used, the frequency of inappropriate verbal responses was high. Frequencies were reduced only with the introduction of contingent exercise.

The purposes of the present research were: (a) to isolate the function of contingent exercise; (b) to determine the effects of contingent exercise on a nonverbal behavior such as aggression; (c) to compare the effect of contingent exercise and DRO; and (d) to provide additional replications of research on the effects of contingent exercise.

GENERAL METHOD

Participants and Settings

Ben and Peter were selected as participants for the two experiments on the basis of the inappropriate behaviors they exhibited. The behaviors were considered serious enough to target for reduction, and they had shown no signs of decreasing when adult attention was withheld. Both children were enrolled in a public school program for severely disturbed children in Shaw-

nee Mission Public Schools, a suburban Kansas City school district.

Both experiments were conducted on the grounds of public schools populated predominantly by normal children. The children were taught in classrooms with four to six other children by a certified special education teacher and a teacher's aide. No special training was conducted for the staff who implemented these procedures. The teacher and aides had been selected for employment at least several months prior to the outset of these studies. The teacher held a bachelor's degree in special education and had 2 years experience with disturbed children. Three teacher aides, who were trained by the Responsive Parent Program (Clark-Hall, Collier, Leiker, Grinstead, Kearns, Robie, & Rotton, 1976), were involved with the teacher in taking measures and implementing procedures. Two of the three did not hold college degrees. With the exception of some of the reliability checks, the teacher and aides were responsible for the measurement of the behavior as well as the administration of the procedures.

Consent to conduct this research was obtained from the parents of both children studied. The consent process included a description of the target behavior(s) selected and a number of treatment options including contingent exercise. The risks and benefits of the options and the nature of the research being carried out were discussed. The parents were informed of their right to terminate the use of the procedure at any time. Because the children lived at home, the parents were informed of their child's progress daily. It was suggested that the parents consult their child's physician if they had any doubts about the use of the procedure. The option of carrying out the treatment at home, under supervision, was also made available to the parents. In addition, the procedures used in this experiment were reviewed by the regulatory bodies of the University of Kansas, the Shawnee Mission Unified School District, and the Kansas State Department of Education, Office of Innovative and Exemplary Programs.

Dependent Measure

The target behaviors of the experiments included specific verbal responses exhibited by the child at excessive frequencies or specific aggressive responses. In Experiment II, both behaviors were recorded and treated. Recording was done by the teacher or aides during a daily observation session which consisted of the entire school day (6 hours). Frequency or event recording, as described by Hall (1971), was used to tally the target behaviors for each experiment.

Reliability. Interobserver agreement was assessed in every condition of both experiments. A second observation was provided by the other adult in the classroom or a naive adult from outside the classroom. Levels of agreement were computed by dividing the smaller frequency count by the larger and multiplying by 100. These scores are depicted on the graphs accompanying the experiments. In Experiment 1, eight reliability checks were conducted yielding scores ranging from 87.5% to 100% with a mean of 97%. In Experiment 2, 21 reliability checks were conducted with scores between 82% and 100% with a mean of 95.3%.

EXPERIMENT 1

Luce and Hall (Note 3) showed that a combination of contingent exercise and DRO was carried out without aggressive behavior or escape, and with only one incident of crying which was easily avoided by shortening the exercise period. In most cases, the contingencies were carried out by low functioning children without prompting or resistance. Despite the successes with verbal behaviors, a natural question growing out of this research revolved around the generality of the results to behaviors other than inappropriate vocalizations.

The purpose of Experiment 1 was to determine the effects of contingent exercise alone on nonverbal aggressive behavior. Although other experiments (Luce & Hall, Note 3) incorporated reinforcing consequences to other be-

haviors, this experiment investigated the effects of contingent exercise alone.

METHOD

Subject and Setting

Ben was a 7-yr-old male who had been in the program for 2.5 yr when the present experiment was conducted. A psychologist, not associated with this research, diagnosed Ben as developmentally delayed and cited several examples of behaviors called "autistic behaviors." The most notable were high rates of self-stimulatory behaviors, severe tantrums, and abnormal language patterns characterized by repetitive and echolalic responding. A review of the procedures used with Ben before the present experiment showed that other inappropriate behaviors had been reduced by using DRO, differential reinforcement of an incompatible behavior (DRI), planned ignoring, restitutional overcorrection with positive practice, and contingent exercise (Luce & Hall, Note 3). There was no evidence to suggest that Ben had been exposed to any other forms of punishment, systematic or unsystematic, prior to being enrolled in the present program.

As one of the children in the Luce and Hall study (Note 3), Ben had been exposed to contingent exercise in the form of a 20-sec run and DRO for inappropriate verbalizations. His previous exposure to contingent exercise, administered several months earlier, had led to an elimination of the defined inappropriate verbal response. Since that time, Ben had moved to a new school with different teachers and classmates. The new staff was aware of the previous study; however, they had not used the 20-sec run contingency. Although nonverbal aggressive behavior was not affected by the contingent exercise procedure used earlier, it was a response routinely monitored with all the children in the program. When the school staff noticed an increase in Ben's hitting, it was decided to target that behavior in preparation for a treatment.

Ben's hitting reportedly occurred infrequently

at home. The parents were concerned with his hitting at school and wanted it reduced immediately. Because they had seen good results with contingent exercise in the earlier study, they suggested the same consequence without the DRO procedure. They believed the DRO procedure to be ineffective and time consuming. After a review of the options and the possible advantages of using DRO with contingent exercise, consent to use contingent exercise was sought and received from the parents.

Dependent Measure

The target behavior for this experiment was defined as any hit with open hand or closed fist. The frequency of "hits" was recorded over the entire school day.

Experimental Procedure

A reversal design (Baer, Wolf, & Risley, 1968) was used in order to analyze the effects produced by contingent exercise.

Baseline (days 1-17). During this phase of the experiment there were no systematic contingencies for aggressive behavior. Teachers typically handled fighting that appeared to be dangerous to the students by separating the children.

Contingent exercise (days 18-27). The exercise consisted of standing up and sitting on the floor 10 times. In the beginning, it was necessary to prompt contingent exercise by holding Ben's hand and lifting his hand over his head to prompt standing up and pulling his upper body forward to prompt sitting down. These physical prompts were accompanied by the verbal prompt of "stand up," "sit down" for 10 exercises, alternating repetitions of each motion. All successive consequences were preceded by a command from the nearest adult such as "Ben, no hitting. Stand up and sit down 10 times." The staff typically counted out loud with the child and were instructed to begin the procedure again if hitting occurred during the required episodes of exercise.

Baseline (days 28-35). After the frequency of hits had decreased, teachers returned to the baseline conditions described above.

Contingent exercise (days 36-43). Contingent exercise (stand up and sit down) for hitting was again implemented.

RESULTS AND DISCUSSION

Figure 1 shows the number of times Ben hit each school day. The frequencies recorded during the first 6 days of the baseline phases were somewhat lower than the following 9 days. Ben was not in school on day 14. The introduction of contingent exercise was followed by a rapid decrease in the number of hitting responses. Scores of more than one hit were recorded in the first 2 days of the treatment only. When

the baseline procedures were reinstated, the behavior remained low for 4 days but then increased to levels similar to those recorded during baseline. The reinstatement of contingent exercise on day 36 resulted in an immediate drop in the frequency of hitting. The frequency of hits was recorded, with reliability checks, for 2 months beyond the 43 days depicted in Figure 1. In that time, hitting occurred once each on days 53, 58, and 76. The remainder of the days were without hits. An interview with Ben's teacher 18 months after day 43 revealed a complete elimination of hitting despite a total turnover among classroom staff.

The results showed that contingent exercise was effective in reducing hits exhibited by Ben. The behavior was suppressed without the use of any DRO contingency which had been pres-

Fig. 1. The number of hits exhibited by a 6-yr-old autistic male during 6-hour sessions while at school. During *Baseline* the behavior was ignored and no contingencies were provided for aggressive behavior; *Contingent Exercise*, stand up and sit on the floor exercise contingent on hitting.

ent in the earlier studies. Despite the fact that periodic probes revealed no reinforcement for not hitting, the reduction was both rapid and permanent.

The staff reported that Ben did exhibit some verbal resistance to the contingency on a few occasions; however, physical prompting was necessary only on the first few training trials. Subsequently, verbal reminders served to prompt the exercise task.

EXPERIMENT 2

Although Experiment 1 demonstrated that contingent exercise could be used independently, the relative functions of DRO and contingent exercise were not determined. The purpose of the following experiment was to use contingent exercise with aggressive comments and aggressive actions in a way that would make this comparison possible.

METHOD

Subject and Setting

Peter was a 10-yr-old male enrolled in the same class as Ben. A speech and language consultant ranked Peter as more verbal than any of the children with whom contingent exercise had been used. Despite his ability to hold a conversation with people, Peter's records reported that he was nonverbal at the age of four, was legally blind, and he wore glasses. Peter was diagnosed by a psychologist not associated with the present research as "borderline trainably retarded." In the accompanying psychological evaluation, a number of behavioral deficits were cited in addition to his delayed language acquisition. Self-stimulation and "acting out" were suggested to be "autistic-like" in nature. Although Peter had been enrolled in a special class for retarded children, he was deemed too disruptive for that group and was placed in the classroom for severely disturbed children 18 months before this experiment took place. A review of the procedures implemented with Peter

in the time between enrollment and the onset of the present experiment revealed that other inappropriate behaviors had been treated with DRO, DRI, planned ignoring, and the contingent removal of a reinforcer. There was no evidence in Peter's records to suggest that he had been exposed to any other forms of punishment, systematic or unsystematic, before being enrolled in the program in which the present research took place.

Dependent Measure

Two behaviors were measured in this experiment. First, nonverbal aggressive actions were recorded each time Peter hit, kicked, choked, pushed, or pulled another person. The second behavior category, aggressive comments, was defined as any phrase or sentence that included threats said in an angry tone of voice, such as "I'm going to kill you" or "I'm going to step on your face." The frequencies of both aggressive actions and aggressive comments were counted over the entire school day.

Experimental Procedures

A combination reversal and multiple-baseline design was used. The effects of contingent exercise and DRO were replicated in reversal fashion across two behaviors. Contingent exercise was initially introduced in the first baseline to determine the independence of the two behaviors. After determining that the reduction of one behavior had no consistent effect on the other baseline, a comparison between the two treatments was undertaken.

Aggressive Actions

Baseline (days 1-7). The conditions of baseline included no systematic consequences for hits, kicks, chokes, pushes, or pulls. Serious aggressive incidents were terminated by separating the children.

Contingent exercise (days 8-11). Contingent exercise in the form of standing up and sitting on the floor was administered contingent upon nonverbal aggression as described in Experiment

1. In addition, the child's advanced verbal skills enabled the staff to explain the behaviors and the contingencies to him.

Baseline (days 12-13). The baseline conditions described above were reinstated. An explanation of behaviors and contingencies was given to the child (i.e., Peter was told that he would not have to stand up and sit down for fighting).

Contingent exercise (days 14-19). The contingent exercise procedure for aggressive actions only was reinstated as above.

Baseline (days 20-21). Again, a period of time without any systematic consequences for hits, kicks, chokes, pushes, or pulls was implemented.

Differential reinforcement of another behavior (days 22-25). Peter was on a point system, as were all the children in the classroom. The school day was divided into 15-min intervals at the end of which a staff member rated each of the target behaviors that appeared on a point sheet attached to the child's desk. The rating consisted of a plus or a minus sign in the appropriate box. Points were exchanged at least twice per day for privileges or edibles.

During the DRO phase, "not fighting" was entered on the point sheet, and rated along with the five or six other behaviors appearing on Peter's point sheet. In addition to points, the staff delivered praise to the child for a plus mark at the end of each interval. Praise consisted of phrases such as, "Good, Peter, you didn't fight at all this period." Minus marks were given without any teacher comment immediately following an aggressive action. As in all phases, the conditions were explained to the child.

Contingent exercise (days 27-33). Following each aggressive action, contingent exercise was administered as described above.

Aggressive Comments

Baseline (days 1-16). During baseline, aggressive comments were ignored.

DRO (days 17-20). The phrase, "talking nicely," was put on the daily point sheet attached

to the child's desk. The point system described above was used. The procedure was discussed with the child when the DRO was initiated.

Baseline (day 21). The phrase, "talking nicely," was removed from the point sheet in front of the child.

DRO (days 22-25). The conditions of the point reinforcement for "talking nicely" were reinstated.

Baseline (day 26). The phrase, "talking nicely," was removed from the point sheet in front of the child.

Contingent exercise (days 27-32). Contingent exercise in the form of standing up and sitting down 10 times was made contingent on each defined aggressive comment. The procedure used was the same as described in Experiment 1, with the exception of the prompting procedure. Because contingent exercise had been previously implemented with this child for aggressive actions, no prompting trial was necessary. Again, as with all conditions of the experiment, the child was informed of the contingencies and target behaviors at the beginning of the phase.

RESULTS AND DISCUSSION

Figure 2 shows the effects of the various treatments on the two behaviors. The early baselines of both behaviors were generally stable. Aggressive actions occurred at erratic but stable rates. After an initial period of stability, aggressive comments also became erratic. Although at day 10 it appeared that aggressive comments reacted to the contingencies placed on aggressive actions, the cessation and reintroduction of the same contingency (days 12 and 14) failed to replicate this reaction. Frequencies during the reversal phases after contingent exercise were predominantly higher than the pretreatment baseline and, in some cases, considerably higher.

The means recorded for both behaviors reflect the differential effects of the two treatment contingencies. The mean numbers of aggressive actions under the three contingent exercise phases were 8.3, 2.7, and 2.3; whereas the mean

EXPERIMENT 2

Fig. 2. The number of aggressive actions and aggressive comments exhibited each school day by a 10-yr-old disturbed and retarded male. Experimental phases were: *Baselines*, no consequences for the target behaviors; *Contingent Exercise*, 10 stand up and sit responses contingent on each incident; *DRO*, points for 15-min intervals without the target behavior being exhibited.

during the DRO phase was 38.5. Similarly, the mean frequencies of aggressive comments in the two DRO phases were 14 and 48.5, and in the contingent exercise phase the mean was 8.5.

Six weeks after the last session depicted in Figure 2 (Session 32), the mean frequencies of aggressive actions and aggressive comments was 1.2 and 2.2, respectively. Both behaviors con-

tinued to decrease while contingent exercise remained in effect.

Both aggressive actions and aggressive comments were consistently reduced in frequency by contingent exercise. A complete comparison of DRO and contingent exercise was only possible with aggressive actions because a reversal and reinstatement of contingent exercise did not occur with aggressive comments. However, because both behaviors reacted similarly to DRO and contingent exercise, the data obtained on aggressive comments lend support to the following conclusion. Judging from the relatively high rates recorded during DRO phases, it would appear that contingent exercise was a more effective punishment procedure. While contingent exercise was in effect, neither behavior displayed the ascending tendencies seen with DRO. As can be seen in Figure 2, the suppression of one behavior did not result in any consistent trend in the other, despite the fact that often both target behaviors were being exhibited simultaneously.

The design of this experiment had a number of attributes that enabled a careful analysis of the data. The early part of the experiment (days 1-16) not only provided data concerning the functional relationship of contingent exercise as a consequence for aggressive actions, it also enabled a functional analysis of that operation with Peter's aggressive comments. Although on day 10 it may have been suspected that aggressive comments would covary with aggressive actions, later manipulations showed these two categories of behavior to be independent.

After establishing the independence of the two behaviors, it was possible to proceed with an investigation of the suppressive activities of DRO and contingent exercise. Both behaviors in this experiment were suppressed by DRO during the earliest days of the initial phases of this contingency. This temporary suppression was found to be in contrast to the effects of contingent exercise which resulted in maintained low rates of aggressive comments and actions with each reinstatement of this procedure. In most

cases (days 1-25) only one phase change was conducted per day. In other words, days in which the contingencies for aggressive actions and aggressive comments changed together occurred only after day 25. This design permitted detection of any interactive effects early in the study.

In reference to order effects, the results of Luce and Hall (Note 3) in which DRO was introduced before contingent exercise were similar to those found with Peter where contingent exercise was introduced first. The similarity of the results in Luce and Hall (Note 3) and Experiments 1 and 2 (where contingent exercise was introduced after DRO, without DRO, and before DRO, respectively) showed that despite order of presentation, contingent exercise resulted in reduced rates of inappropriate behaviors.

GENERAL DISCUSSION

The results of these experiments demonstrated that contingent exercise effectively decreased inappropriate verbal and aggressive behaviors. The present results, being quite similar to the results of the earlier work with contingent exercise (Luce & Hall, Note 3), shed some light on the generality of the procedure across the population studied (Sidman, 1960). However, further replications are needed with other children in other settings to determine the generality more clearly.

The actual exercise task was chosen on the basis of four attributes: (a) The task could be prompted by a voice command with a minimum of physical guidance after the first few applications of the contingency, (b) The task involved responses that the children had exhibited frequently in many playtime situations, (c) The task was relatively unobtrusive and could be carried out in any setting, and (d) The task was assumed to tire the child quickly without inflicting any unnecessary strain. The children were required to exercise at levels that physical education consultants said would be beneficial to the child's general fitness.

Overcorrection and positive practice procedures were found to be the most frequently used form of effort in the literature of studies reducing autistic behaviors (Luce, Note 1). Contingent exercise, like overcorrection and positive practice, required behavior entailing increased effort. Three major components commonly included with applications of overcorrection and positive practice were altered in the present experiments:

1. Contingent exercise trials were less than 30-sec long, whereas most overcorrection trials have been 2 to 45 min long. Short trials enabled the child to return quickly to the learning environment in which appropriate behaviors were reinforced.

2. Contingent exercise required very little manual guidance training (Foxy & Azrin, 1972). The teachers were prepared to use additional physical prompts, but as was the case in earlier studies of contingent exercise, the majority of the trials were controlled by voice command only. The lack of manual guidance made it possible for teachers to continue to attend to the other students while administering the procedure and pleased school administrators who considered extensive physical prompting as appropriate only as a last resort.

3. Contingent exercise tasks were not topographically related to the target behaviors. The success of the topographically dissimilar behaviors may contradict the results of Ollendick *et al.* (1978) and suggests that some elaborate procedures that match the consequence to the target behavior might contain superstitious components. One rationale for matching the consequence to the target behavior has been to make the consequence educational. Foxy and Azrin (1972), for example, reported that one of their clients learned to make a bed, which was a task in the overcorrection regimen. Many questions remain unanswered as to the relative merit of overcorrection and other procedures in obtaining more desirable side effects. These questions seem most relevant with nonverbal or partially verbal children who may be less likely than normal children to recog-

nize the relationship between the target behavior and its consequences.

Several weeks after the completion of these studies, the teachers and aides who had implemented contingent exercise were individually asked to give their comments regarding the procedure, its effectiveness, and applicability with disturbed children. In every case, the staff members rated the procedure as effective. Some of the staff went on to comment that contingent exercise could be carried out in any setting without the objections of people in contact with their classroom. In addition, each of the teachers who participated in the earlier experiments (Luce & Hall, Note 3), as well as the teacher who implemented the present experiments, went on to use contingent exercise successfully with other behaviors and children after all involvement by the experimenters had been discontinued.

As with most effective procedures, contingent exercise could easily be misused to the extent that it could become a detriment to the child. Care must be taken to ensure that milder procedures are ineffective prior to its use. Problems associated with isolation and confinement (Wyatt *v.* Stickney, 1972) should not occur with contingent exercise, but other misapplications such as requiring exercise that is too strenuous are not hard to imagine. For that reason, a number of guidelines for the use of contingent exercise must be formulated. Contingent exercise should be subjected to the same restrictions and guidelines as all aversive consequences. The exercise tasks chosen should closely resemble responses exhibited frequently and spontaneously by the child. Choosing behaviors that occur frequently under some stimulus conditions (e.g., free play) assures a level of proficiency that enables the exercise to be performed without extensive prompting or unnecessary strain to the child. This guideline would also safeguard against the use of exercise tasks which might be physiologically inappropriate for the child. Along these lines, the use of contingent exercise would be considerably limited with physically handicapped children.

On the other hand, an appropriately selected exercise may become too strenuous if carried out excessively. By limiting each trial to about 20 sec in length, as in the present studies, the possibility of injuring a person by excessive exercise should be decreased. Because problems associated with exercise may not be apparent to non-medical people, the consultation of medical personnel familiar with the subject's medical history and present condition is also recommended.

It was the intention of this research to provide therapists confronted with deviant behaviors of seriously disturbed children with an acceptable and effective procedure that is in the best interest of all concerned. The results suggest that contingent exercise may meet those criteria.

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