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# A Comparison of Time-Out & Response-Cost Conditions within a Token Economy Using Trainable Mental Retardates

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A COMPARISON OF TIME-OUT AND RESPONSE-COST  
CONDITIONS WITHIN A TOKEN ECONOMY USING  
TRAINABLE MENTAL RETARDATES

A Thesis  
Presented to  
the Faculty of the Department of Psychology  
Western Kentucky University  
Bowling Green, Kentucky

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts

by  
James V. Willis  
May 1975

A COMPARISON OF TIME-OUT AND RESPONSE-COST  
CONDITIONS WITHIN A TOKEN ECONOMY USING  
TRAINABLE MENTAL RETARDATES

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"A teacher will rarely, if ever, be called on the carpet or denied tenure because his students have not learned anything; he most certainly will be rebuked if his students are talking or moving about the classroom, or even worse-found outside the room and he may earn the censure of his colleagues as well. Nor will teachers receive suggestions from their supervisors as to how to improve their teaching methods and materials; they will receive suggestions for improving 'discipline.' Thus, the vows of silence and stillness are often imposed on teachers who might prefer a more open, lively classroom."

Silberman (p. 144)

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A COMPARISON OF TIME-OUT AND RESPONSE-COST CONDITIONS  
WITHIN A TOKEN ECONOMY USING TRAINABLE  
MENTAL RETARDATEES

James V. Willis

May 1975

33 pages

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An investigation was done on the relative effectiveness of time-out and response-cost conditions in reducing inappropriate behaviors in a token-economy classroom using trainable mental retardates as subjects. A significant difference was found between baseline levels of inappropriate behaviors in each of the two conditions but no significance was indicated between time-out and response-cost conditions.

### Introduction

The employment of some form of a token reinforcement economy in the classroom has been shown to be very effective in reducing undesired inappropriate behaviors exhibited by school children (Birnbrauer, Wolf, Kidder & Tague, 1965; Broden, Hall, Dunlap & Clark, 1970; Clark, Lachowicz & Wolf, 1968; Giradeau & Spradlin, 1964; Haring & Hauck, 1969; Hewett, Taylor & Artuso, 1969; Meichenbaum, Bowers & Ross, 1968; O'Leary & Becker, 1967; O'Leary, Becker, Evans & Saudargas, 1969; Staats, Minke, Finley, Wolf & Brooks, 1964; and Wolf, Giles & Hall, 1968). Although the literature yields a great deal of research on the effectiveness of using direct positive continuous reinforcement to increase desired behaviors, sometimes, the use of a token system alone does not suppress the undesired behaviors (Allen & Magaro, 1971; Atthowe & Krasner, 1968; Ayllon & Azrin, 1965; Hunt, Fitzhugh & Fitzhugh, 1968; Hunt & Zimmerman, 1969; and Zimmerman, Zimmerman & Russell, 1969). In such cases another behavior management technique, time-out, has been used effectively.

Time-out has typically taken one of two forms: 1) the experimenter discontinues the administration of positive reinforcement, or 2) the subject is removed from the reinforcement area and placed, usually for a short period of time, in a less reinforcing environment. However, in both

forms, the administration of time-out is contingent upon the occurrence of undesirable behavior. Time-out has been effective with autistic children in reducing tantrums and self-destructive behavior (Wolf, Risley & Mees, 1964), aggressive or destructive behavior in severely retarded patients (Hamilton, Stephens & Allen, 1967), misbehavior of delinquents in a training cottage (Tyler & Brown, 1967), and inappropriate mealtime behavior of institutionalized, retarded patients (Hamilton & Allen, 1967). Other research has shown that the use of time-out in conjunction with a token reinforcement system has been effective in reducing disruptive and aggressive behaviors with retarded patients (Bostow & Bailey, 1969), and Holz, Azrin, and Ayllon, (1963) suggest that the simultaneous application of reinforcement for desirable behaviors may enhance the effectiveness of a time-out procedure.

Another technique useful in modifying or managing behavior is the use of "response-cost". Response-cost generally refers to the removal of reinforcers (money, points, etc.) from the subject upon the occurrence of the undesirable behavior. Unlike time-out, response-cost can only be effective when some type of reinforcer is being used with the subject. The effectiveness of using a response-cost technique was clearly indicated in a study by Phillips (1968) with pre-delinquent boys in a community-based, home-style rehabilitation setting. Behaviors such as using aggressive statements and speaking the word "ain't" were suppressed while bathroom cleanliness, punctuality to school,

and completion of homework were effectively increased through the use of fines. Behaviors through which points were earned were reading books, performing homework, turning lights out when not in use, keeping one's person neat and clean, obtaining desirable grades on report cards, doing dishes, cleaning and maintaining neatness in one's room, and watching the news on television or reading the newspaper. The loss of points resulted from receiving failing grades on a report card, speaking aggressively, forgetting to wash hands before a meal, arguing, disobeying, being late, disobeying, being late, displaying poor manners, engaging in poor posture, using poor grammar, and stealing, lying or cheating.

Other evidence supporting the effectiveness of response-cost includes suppressing anti-social behavior in retardates (Burchard, 1967), reducing normal speech disfluencies (Seigel, Lenske & Boren, 1969), reduction of failed appointments (Kaufman, 1964), and public undressing by female mental patients (Schaefer & Martin, 1969). Winkler (1970) described the effectiveness of response-cost in token economies for institutionalized mental patients in which failure to perform certain behaviors resulted in the loss of tokens. MacVaugh (1970) failed to find a significant difference in comparing the effects of response-cost and positive reinforcement as both conditions were effective in reducing inappropriate behaviors. This effect is supported by Harris (1972) where response-cost, positive reinforcement, and a combination of the two on the

discrimination learning of children of average intelligence was compared. Although no significant difference was found between response-cost and positive reinforcement, a combination of the two conditions was significantly more effective than either condition alone. Talkington (1971) found that with educable mentally retarded children, a response-cost condition and a combination response-cost/reward condition resulted in more rapid stimulus discrimination than either positive reinforcement or non-reinforcement conditions. Harris and Tramontana (1973) found that when working with borderline retarded children, both response-cost and a combination condition (response-cost and positive reinforcement) were significantly more effective than positive reinforcement alone. This significance was not found when working with the moderately retarded group, suggesting that intelligence may serve as a factor in selecting which reinforcement contingency is more effective. Burchard and Barrera (1972) studied the time-out and response-cost magnitude variable using mildly retarded adolescents with high rates of anti-social behavior. The higher magnitudes (30 tokens response-cost and 30 minutes time-out) were significantly more suppressive than the lower values (five tokens or five minutes). There were few differences found between time-out and response-cost of similar magnitude.

In view of the research presented concerning the existence of a difference in effectiveness between response-cost and time-out while operating within a token reinforce-

ment system, it appears that there is a need for clarification on which technique would be most effective in modifying a behavior.

### Review of Literature

Ferster (1958) defined time-out as a technique in which the removal of a positive stimulus serves as the aversive stimulus. Isolating a disruptive child from the classroom or removing the food tray from a "food stealer" are examples of such a technique. An advantage of time-out is that there are few negative side effects and no administration of aversive stimuli. Leitenberg (1965) raised the question of time-out from positive reinforcement being an aversive event. In his review of the evidence he tentatively concluded that in some studies the resulting avoidance and escape behavior from time-out led to greater positive reinforcement over a given period of time than did the absence of such behavior (Ferster, 1958; Mechner & Ray, 1959; Morse & Herrnstein, 1956; and Thomas, 1964). In other studies escape behavior did not lead to positive reinforcement other than the removal of the aversive stimuli preceding non-reinforcement (Adelman & Maatch, 1956; and Wagner, 1963). Leitenberg (1965) noted that some research indicated that ongoing behavior being maintained by positive reinforcement was accelerated in the presence of a pre-time-out stimulus but that some behavior was suppressed in the presence of a pre-shock stimulus (Ferster, 1958; Herrnstein, 1955; and Leitenberg, 1965a). The differential observed between time-out and pre-shock stimuli

would lend support to the conclusion that time-out is not an "aversive" stimulus. However, Leitenberg pointed out that in these studies the pre-time-out stimuli acquired less aversive properties than did the pre-shock stimuli and that stimuli preceding time-out elicited a "conditioned excitement" that acted upon the ongoing behavior to cause accelerated response rates.

Time-out with human subjects. The fundamental concepts of time-out have been demonstrated in controlled laboratory settings with animals as subjects and this concept has also been shown to be effective with human subjects. Ayllon and Michael (1959), using the removal of positive reinforcement as a contingency, successfully eliminated the disruptive behavior of several resident patients in a psychiatric hospital. The personal attention given to these patients was withheld when such behaviors occurred. Baer (1960) demonstrated that for school children ranging in age from four to six years, the removal of a positive reinforcement (sound and sight of a cartoon being viewed by the subject) could establish an operant response (bar pressing) that is regular in rate and effective in the avoidance of the aversive stimulus which controls it. This same contingency was used in another study to suppress thumbsucking behavior in three five-year-old boys (Baer, 1962). One important observation of the latter study was that contingent withdrawal followed by representation of the cartoon was very effective but a yoked contingency (two subjects viewing the same screen but only the behavior of one subject is con-

tingent upon viewing the cartoon) did not have an effect of suppressing the thumbsucking.

The tantrums and self-destructive behaviors of an autistic child were effectively reduced using a time-out procedure each time the behavior occurred and removing the time-out condition when the behavior subsided (Wolf, Risley & Mees, 1964). The destructive or aggressive behavior of five severely retarded patients was greatly reduced using time-out from 30 minutes to two hours after each incidence of behavior (Hamilton, Stephens & Allen, 1967). Inappropriate mealtime behaviors have been modified in retarded children by time-out from the meal (Barton, Guess, Garcia & Baer, 1970; Hamilton & Allen, 1967). Isolation from a group (being sent to a room) has been shown to be very effective when used at home with the parents acting as the behavior managers (Zeilberger, Sampen & Sloane, 1968).

Pendergrass (1972) suppressed persistent high rate inappropriates (banging toys, biting, jerking motions of entire body, and tearing clothes from one's body) utilizing a time-out procedure of isolating the subject for a two-minute duration.

Time-out with positive reinforcement. Using time-out and reinforcement, Bostow and Bailey (1969) reduced loud vocal behavior in one patient and aggressive behavior in another to near-zero levels in an institutional setting. Inappropriate behavior around a pool table followed by a brief 15-minute time-out eliminated such behavior with delinquents at a training cottage (Tyler & Brown, 1967).

Removal from the classroom was used as a time-out procedure in modifying uncooperative behaviors of resident children enrolled in the Rainer School Programmed Learning Classroom (Birnbrauer, Wolf, Kidder & Tague, 1965). This time-out technique was used in conjunction with a token reinforcement system. In that study time-out was ineffective during a 21-day no-token period but became effective when token reinforcement was resumed. Pendergrass (1968) and Risley (1968), also found isolated time-out ineffective with autistic children when no systematic positive reinforcement was administered for other behaviors.

Token economies with positive reinforcement. A prerequisite of any response-cost program is the establishment of a positive reinforcement system such as a token economy. Long before formal token programs of reinforcement were used in the classroom, teachers had used stars for academic achievement and pins for attendance in Sunday School. The systematic use of rewards in the classroom had not evolved before Staats developed his program in 1961 with delinquent children who had severe reading problems (Staats, Staats, Schultz & Wolf, 1962). Staats, Minke, Finley, Wolf and Brooks (1964) maintained reading behaviors of 4-year-old children for long periods of time in a study where tokens were exchangeable for a wide variety of rewards. This study was particularly important since a wide choice of reinforcers (reinforcement menu) were used and not just one reward.

Decreases in disruptive behaviors using token systems

with more than one backup reinforcer have proved very successful with emotionally disturbed children (O'Leary & Becker, 1967), normal classroom children (O'Leary, Becker, Evans & Saudargas, 1969), and institutionalized offenders (Meichenbaum, Bowers & Ross, 1968). Study behavior was increased from a rate of 29% to over 80% in a class of 13 seventh and eighth grade students (Brodin, Hall, Dunlap & Clark, 1970). One of the first major studies investigating the effects of a token reinforcement program was reported by Hewett, Taylor, and Artuso (1969) using six classrooms of 8- to 11-year-old emotionally disturbed children. Each class was matched for I.Q., age, reading level, achievement level, and size (N=9) in which arithmetic achievement, reading achievement, and task attention were the dependent measures under investigation. One class served as a control (C) and received no tokens for the entire year while another class (E) received tokens all year. Two more classes (CE) had control procedures the first semester and tokens the second semester while the last two classes (EC) received tokens the first semester and control procedures the second semester. Greater gains in arithmetic and task attention occurred in class E than in class C. Both CE classes had greater gains in both arithmetic and task attention during the second semester than did class C. However, the EC class showed an increase in task attention when tokens were withdrawn when compared with class E. This lends support to the idea that children do not become totally dependent upon backup reinforcers but one might also conclude that task

attention was suppressed during the token system operation.

Token economies with response-cost. The use of time-out from positive reinforcement and token economies have proven to be effective tools of the teacher for maintaining appropriate behaviors in the classroom. The distribution of tokens as reinforcers in a token program has been used in many classrooms to modify behaviors. The loss of tokens, privileges, and fines of points earned are techniques sometimes used by teachers to further facilitate the effectiveness of token programs. Burchard and Burrera (1972) compared time-out and response-cost effectiveness in reducing undesirable behavior in a programmed token system with a group of mildly retarded adolescents. The frequent emission of anti-social behaviors (stealing, fighting, and swearing) were used as a baseline. The subjects were between the ages of 15-19 and all were mildly retarded (I.Q. 50-70). There were four conditions throughout the study and each subject was observed under each condition. Each condition lasted 12 days and consisted of the following: 1) five token response-cost, 2) thirty token response-cost, 3) five minute time-out, and 4) thirty minute time-out. The two variables analyzed were the amount of time spent in time-out and the amount of the token cost. It was found that higher response-costs and longer time spent in time-out resulted in greater response suppression. However, the two lower conditions (five minute time-out and five token response-cost) resulted in an increase in time-outs with respect to the baseline. This phenomenon, however, was possibly due to

both conditions being in effect during baseline and the combinations of the two resulted in greater suppression of time-outs than when each condition was presented in isolation.

White, Nelson, and Johnson (1972) found that a one-minute time-out duration had a marked suppression over a no-time-out condition until it was contrasted with a 15- and a 30-minute duration. In the 30-minute duration the effect was to increase rather than to suppress the occurrences of time-outs.

Although research has been ongoing concerning time-out and response-cost techniques, very few studies have investigated these techniques as to which is most effective when operating within a token system. It was the intention of this study to investigate the relative effectiveness of time-out and response-cost techniques while operating within a token system with retarded children.

## Method

### Subjects

The subjects were eight children enrolled in a summer program at the Laboratory School of Western Kentucky University. Of the eight children, five were functioning within the Trainable Mentally Retarded range (I.Q. 30-50), two within the Educable Mentally Retarded range (I.Q. 51-75), and one had encountered learning difficulties and was entered into the program from a first grade class. Four of the eight subjects had performed under a token system prior to the present study.

### Procedure

Baseline I. The recording of inappropriate behaviors occurring during the first five days constituted the baseline. Inappropriate behaviors consisted of the following: out-of-seat (no physical contact between the subject and chair with a hand or foot contact not sufficient) without permission of the teacher, talking aloud (except as a response to an ongoing activity), fighting (which includes hitting, scratching, poking another person, or biting), playing with tokens, temper tantrums, and throwing obstacles in the classroom. Data were collected during three sessions in the morning: 1) individualized folder work, during which the student teachers worked closely with the subjects at their desks; 2) the class's viewing Sesame Street on television

while sitting in chairs arranged in a half-circle in front of the television; and 3) speech stimulation, during which the class was seated around the teacher, responding to questions.

Experiment I. During this 12-day phase a token reinforcement system was begun using miniature poker chips as tokens. The subjects could earn a maximum of five tokens during each recording session for a total of 15 each day. All tokens had to be spent the day they were earned. The class was randomly divided into two groups, of which four subjects were on a time-out condition (three minutes)<sup>1</sup> and four were on a response-cost condition (one token).

During individual folder work (Data Recording I), a subject could earn one token for completion of each task (up to a maximum of four tokens), and one token for on-task behavior, defined as sitting correctly (contact between subject's seat and chair seat with both feet on the floor), and working toward completion of his assignment. Fifteen minutes after the task began a subject was reinforced for on-task behavior. Tokens were paired with social praise such as "that's good work you're doing", "good sitting", or "good paying attention" when they were distributed.

Each subject had a plastic vial mounted on his desk

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<sup>1</sup>A time-out booth was constructed of particle board (4 ft. x 5 ft. x 6 ft.) and once a subject was inside he could hear but not see what was going on in the classroom. A Cra-Lab 15 minute timer with a green light attached was used to signal the subject when to leave the time-out booth. Activation of the green light indicated the end of three minutes.

with a childproof cap (to discourage stealing) with a slot cut in the cap so the tokens could be easily stored. The vials were light amber in color to allow the subject to see at all times how many tokens he had earned that day.

If a subject were in the response-cost condition and "costed-out" (had to forfeit a token due to the occurrence of an inappropriate behavior), then the teacher withdrew the cap of his vial and the subject withdrew a token and gave it to the teacher.

Tokens were earned during Data Recording II (viewing Sesame Street) in the following manner: one token was earned for properly moving his chair from his desk to the front of the television, sitting down with his feet on the floor, and watching the program; three tokens for on-task behavior on a fixed-interval of seven minutes; and one token for properly returning his chair to his desk and sitting down after the program ended. On-task behavior was defined as sitting in his chair with both feet on the floor, facing the front, quiet, and watching the television screen. Inappropriate behaviors that resulted in not earning a token were turning over his chair while moving toward the television, shoving his chair into others moving their chairs or into those already seated, talking to each other, or not returning directly to his desk after the program ended. Other inappropriate behaviors as defined in Baseline I resulted in either time-out or response-cost depending upon assigned contingencies. Any verbal or physical

responses elicited by the television program during on-task intervals were not considered off-task behaviors.

During Recording Session III (speech stimulation), subjects were reinforced with one token by the speech teacher for properly coming to the speech corner, taking a seat with both feet on the floor, and quietly waiting for the rest of the class. An on-task token was distributed every seven minutes during the speech stimulation lesson for a total of three tokens. On-task behavior was defined as being seated with feet on the floor, quiet (unless responding to a question from the teacher), and facing toward the speech teacher. Inappropriate behaviors such as talking to another subject without permission, purposively responding inappropriately to attract attention, rocking back in his chair (raising the front or rear legs off the floor), or fighting with anyone resulted in time-out or response-cost depending upon assigned contingencies. The fifth token was earned by a subject upon returning to his desk when given permission and sitting down. If a subject was in time-out while tokens were being distributed, he did not earn a token. During Data Recording II and III, when the subjects were not at their desks, tokens were taken directly from the individual. Any tokens earned away from their desks were always immediately placed in the vials by the subjects upon returning to their desks.

The last 30 minutes of each day were used as a cash-in period. A reinforcement menu was devised from observation

of what activities the subjects engaged in most frequently and consisted of the following items: going outside on the playground (12 tokens), playing inside the doll house in the classroom (10 tokens), using colored chalk on the blackboard (9 tokens), painting with water colors (9 tokens), crayon coloring (8 tokens), working puzzles at desk or on the floor (8 tokens), working with pegboards (7 tokens), look at library books in the reading center (6 tokens), one M & M candy (1 token), and sitting at desk until time to go home (zero tokens).

Cash-in period began with the teacher instructing each subject to count the number of his tokens earned that day. Anyone who had difficulty counting was helped by the teacher. If greater than seven tokens were earned, the subjects was asked what he wanted to do and, if he had earned enough tokens, was allowed to proceed to that chosen activity. However, if he did not have the appropriate number, he was told so and then was asked what else he would like to do. If less than seven tokens were earned, the subjects immediately were told what activities he could choose. Any extra tokens were cashed-in for one M & M candy per token. During the reinforcement period all activities were verbally reinforced but no one was allowed to engage in any activity not earned.

Interim. During these two days no tokens were distributed, no time-out or response-cost contingencies were in operation, and all the vials were removed from the desks.

No data were collected during this period.

Experiment II. During this 12-day phase the same procedures were followed as under Experiment I except that the contingencies for inappropriate behaviors were reversed (those subjects that were grouped under response-cost were changed to time-out and those grouped under time-out were changed to response-cost).

### Results

All data were recorded using frequency tallies for inappropriate behaviors exhibited by the subjects. Due to extended absences by three subjects, only the data for five subjects were submitted for analysis. As viewed in Table 1, it can be seen that all behaviors were suppressed irrespective of the condition under which the subjects were operating. Subject A, under baseline, emitted inappropriate behaviors at an average of 15.5 per day. In Experiment I, this level was suppressed to 1.08 per day and finally to .30 per day under Experiment II. Subject E, also exhibiting a similar suppression of inappropriate behaviors, averaged 3.4 under baseline, .87 under Experiment I and .00 under Experiment II. However, these two subjects were operating under different conditions in each experiment.

The data were subjected to a Friedman two-way analysis of variance (Siegel, 1956) to determine if any significance existed among the matched-pairs. The Friedman yielded a significance among the matched-pairs ( $\chi^2 = 111.2$ ,  $df = 2$ ,  $p < .001$ ). Further analysis using a Wilcoxon matched-pairs signed-ranks test (Siegel, 1956) was used to determine which pairs differed significantly from one another. It was found that significant differences existed between 1) baseline and time-out conditions and 2) baseline and response-

TABLE 1  
Daily Average of Inappropriate Behaviors  
by Experiment

Subjects	Baseline	Experiment I	Experiment II
A	15.5	1.08 (T-0)	.30 (R-C)
B	10.2	.36 (T-0)	.08 (R-C)
C	13.2	1.54 (T-0)	1.33 (R-C)
D	2.2	.50 (R-C)	.10 (T-0)
E	3.4	.87 (R-C)	.00 (T-0)

TABLE 2  
Daily Average of Inappropriate Behaviors  
by Condition

Subjects	Baseline	Response-Cost	Time-Out
A	15.5	.30	1.08
B	10.2	.08	.36
C	13.2	1.33	1.54
D	2.2	.50	.10
E	3.4	.87	.00
$\bar{X}$	8.9	.61	.61

cost conditions. No significance was found between response-cost and time-out conditions (see Table 2).

### Discussion

As expected, the frequency of inappropriate behaviors was suppressed significantly. However, there remains the strong possibility that the token system alone would have been sufficient to suppress the inappropriate behaviors. This could possibly explain the fact that no significance was found between the time-out and response-cost conditions. Further research comparing each of the two conditions with a token system baseline may not yield a significant difference in suppressed behaviors.

Another effect that occurred was that whichever condition was imposed first on a subject, the second condition furthered the effect of suppressing inappropriates (see Figure 1). This was found to be true for all the subjects. Additional study is suggested to investigate which condition would initially suppress the inappropriates in greater magnitude. Another aspect that deems additional investigation is which sequence, 1) time-out and then response-cost or 2) response-cost and then time-out, would result in the greatest suppression of inappropriate behaviors.

Another point that could be of importance to teachers, particularly when keeping the education of the child in view, is that both time-out and response-cost offer dif-

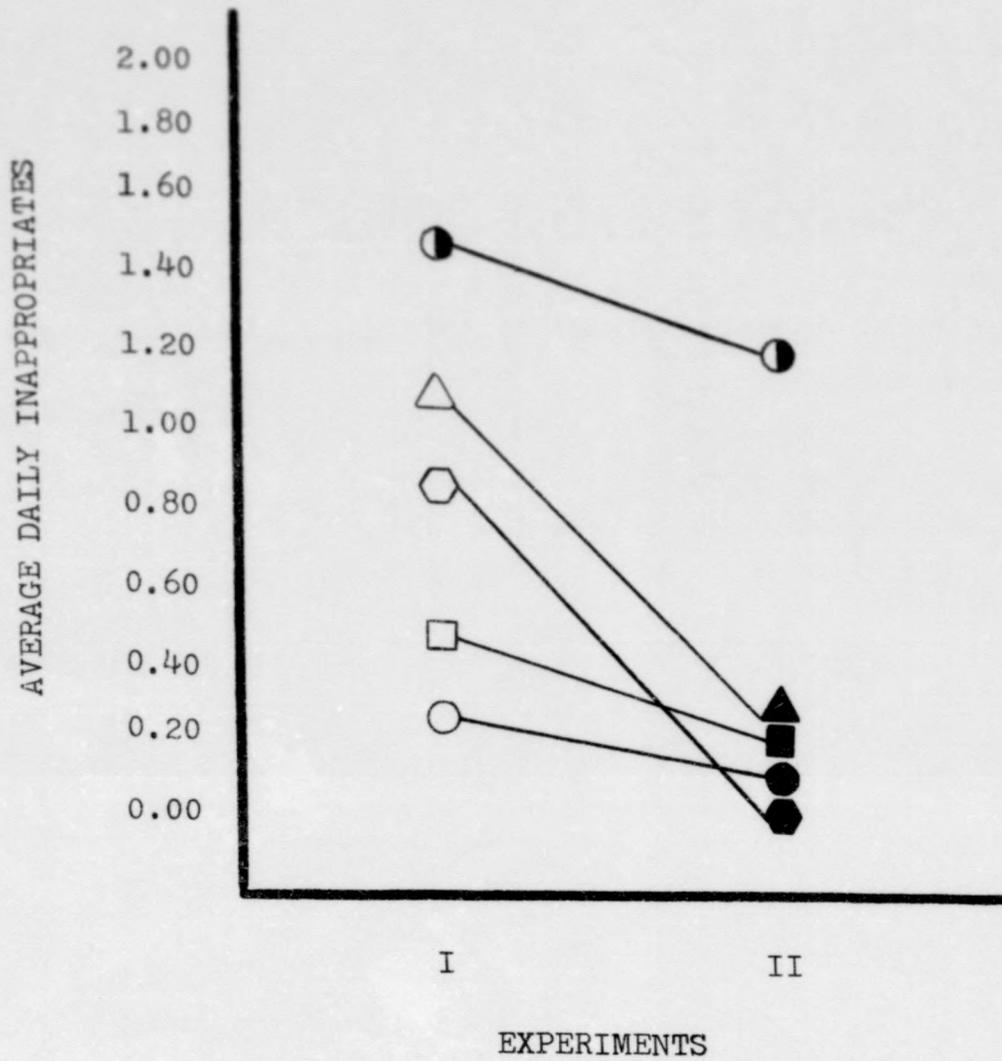


FIG. 1. Daily average in inappropriate behaviors for each subject under Experiment I and Experiment II.

ferent advantages and disadvantages. There are two advantages in using the response-cost condition. One advantage is that a response-cost does not remove the subject from the chance of emitting the proper desired behavior. When the subject is in time-out, he has no opportunity to engage in the proper behavior, and can only wait until he may return to the class. The time he spends in time-out is non-productive as far as learning is concerned. Another advantage is that if the subject is not removed from the classroom setting then he stands a chance of learning and receiving some type of reinforcement for what he learns. A point to be considered is that when a subject is placed in time-out he does not get the opportunity to decide if he wishes to learn or persist in the unwanted behavior. However, there exists some disadvantages in using a response-cost. Frequently, there are instances where the child demonstrates intense emotional reactions during a response-cost activity. This activity may be reinforcing. Remarks such as "take all my tokens, I don't care" and persisting in the inappropriate behavior simultaneously in an attempt to receive more costing would have the tendency to discourage the teacher-manager. In these situations, perhaps removing the subject from the area to allow a cooling-off period could alleviate a difficult situation for the teacher while increasing his overall efficiency in controlling the child's behavior.

The use of time-out has advantages. Some classrooms

operate without a token system. In these classrooms the use of time-out would be advantageous since a brief isolation from any reinforcing situation acts as a time-out. It may be found that in these classes, the teacher alone serves as sufficient reinforcement to warrant an effective suppression of inappropriate behavior. Also a time-out allows an opportunity for both the child and the teacher to "cool-off" if the behavior was severe in nature.

Teacher will have to make the decisions as to which technique to use in their classrooms. Whichever technique is implemented, the result should be a reduction of inappropriate behaviors allowing the teacher to better do her job and allowing the children to have a better chance of learning.

### Bibliography

- Adelman, H. M. and Maatch, J. L. Learning and extinction based upon frustration, food reward, and exploratory tendency. Journal of Experimental Psychology, 1956, 52, 311-315.
- Allen, D. J. and Magaro, P. A. Measures of change in token-economy programs. Behavior Research and Therapy, 1971, 9, 311-318.
- Atthowe, J. M. and Krasner, L. Preliminary report on the application of contingent reinforcement procedures (token economy) on a "chronic" psychiatric ward. Journal of Abnormal Psychology, 1968, 73, 37-43.
- Ayllon, T. and Azrin, N. H. The measurement and reinforcement of behavior of psychotics. Journal of the Experimental Analysis of Behavior, 1965, 2, 357-383.
- Ayllon, T. and Michael, J. The psychiatric nurse as a behavioral engineer. Journal of the Experimental Analysis of Behavior, 1959, 2, 323-334.
- Baer, D. M. Escape and avoidance responses of pre-school children to two schedules of reinforcement withdrawal. Journal of the Experimental Analysis of Behavior, 1960, 3, 155-159.
- Baer, D. M. Laboratory control of thumbsucking by withdrawal and representation of reinforcement. Journal of the Experimental Analysis of Behavior, 1962, 5, 525-528.

- Barton, E. S., Guess, D., Garcia, E., and Baer, D. M.  
Improvement of retardates' mealtime behaviors by timeout procedures using multiple baseline techniques. Journal of Applied Behavioral Analysis, 1970, 3, 77-84.
- Birnbrauer, J. S., Wolf, M. M., Kidder, J. D., and Tague, C. E. Classroom behavior of retarded pupils with token reinforcement. Journal of Experimental Child Psychology, 1965, 2, 219-235.
- Bowtow, D. E. and Bailey, J. Modification of severe disruptive and aggressive behavior using brief timeout and reinforcement procedures. Journal of Applied Behavioral Analysis, 1969, 2, 31-37.
- Broden, M., Hall, R. V., Dunlap, A., and Clark, R. Effects of teacher attention and a token reinforcement system in a junior high school special education class. Exceptional Children, 1970, 36, 341-349.
- Burchard, J. D. Systematic socialization: a programmed environment for the habilitation of antisocial retardates. Psychological Record, 1967, 11, 461-476.
- Burchard, J. D., and Barrera, F. An analysis of timeout and response cost in a programmed environment. Journal of Applied Behavioral Analysis, 1972, 5, 271-282.
- Clark, M., Lachowicz, J., and Wolf, M. A pilot basic education program for school dropouts incorporating a token reinforcement system. Behavior Research and Therapy, 1968, 6, 183-188.
- Ferster, C. B. Control of behavior in chimpanzees and

- pigeons by time-out from positive reinforcement. Psychology Monographs, 1958, 72, No. 461.
- Girardeau, F. L. and Spradlin, J. E. Token rewards in a cottage program. Mental Retardation, 1964, 2, 345-351.
- Hamilton, J. and Allen, P. Ward programming for severely retarded institutionalized residents. Mental Retardation, 1967, 5, 22-24.
- Hamilton, J., Stephens, L., and Allen, P. Controlling aggressive and destructive behavior in severely retarded institutionalized residents. American Journal of Mental Deficiency, 1967, 7, 852-856.
- Haring, N. G. and Hauck, M. A. Improved learning conditions in the establishment of reading skills with disabled readers. Exceptional Children, 1969, 35, 341-352.
- Harris, L. M. The effects of response cost and positive reinforcement on discriminative performance in children. Un published doctoral dissertation, University of Mississippi, 1972.
- Harris, L. M., and Tramontana, J. Discrimination learning of retarded children as a function of positive reinforcement and response cost. American Journal of Mental Deficiency, 1973, 78, 216-219.
- Herrnstein, R. J. Behavior consequences of the removal of a discriminative stimulus associated with variable interval reinforcement. Unpublished doctoral dissertation, Harvard University, 1955.
- Hewett, F. M., Taylor, F. D., and Artuso, A. A. The Santa

Monica project: evaluation of an engineered classroom design with emotionally disturbed children. Exceptional Child, 1969, 35, 523-529.

Holz, W. C., Azrin, N. H., and Ayllon, T. Elimination of behavior of mental patients by response produced extinction. Journal of the Experimental Analysis of Behavior, 1963, 6, 407-412.

Hunt, J. G., Fitzhugh, L. C., and Fitzhugh, K. B. Teaching "exit-ward" patients appropriate personal appearance by using reinforcement techniques. American Journal of Mental Deficiencies, 1968, 73, 41-45.

Hunt, J. G. and Zimmerman, J. Stimulating productivity in a simulated sheltered workshop setting. American Journal of Mental Deficiencies, 1969, 74, 43-49.

Kaufman, A. E. A procedure for reducing experimental dropouts. Journal of the Experimental Analysis of Behavior, 1964, 7, 400.

Leitenberg, H. Is time-out from positive reinforcement an aversive event? Psychological Bulletin, 1965, 64, 428-441.

Leitenberg, H. Conditioned acceleration versus conditioned suppression in the pigeon. Unpublished doctoral dissertation, Indiana University, 1965a.

MacVaugh, G. S. A comparison of the effects of cost and reward token methods on the behavior of long term mental hospital patients. Unpublished doctoral dissertation, University of Mississippi, 1970.

- Mechner, F. and Ray, R. Avoidance of time out from fixed interval reinforcement. Journal of the Experimental Analysis of Behavior, 1959, 2, 261.
- Meichenbaum, D. H., Bowers, K. S., and Ross, R. R. Modification of classroom behavior of institutionalized female adolescent offenders. Behavior Research and Therapy, 1968, 6, 343-353.
- Morse, W. H., and Herrnstein, R. J. The maintenance of avoidance behavior using the removal of a conditioned positive reinforcer as the aversive stimulus. American Psychologist, 1956, 11, 430.
- O'Leary, K. D., and Becker, W. C. Behavior modification of an adjustment class: a token reinforcement program. Exceptional Child, 1967, 33, 637-642.
- O'Leary, K. D., Becker, W. C., Evans, M. B., and Saudargas, R. A. A token reinforcement program in a public school: a replication and systematic analysis. Journal of Applied Behavioral Analysis, 1969, 2, 3-13.
- Pendergrass, V. E. Behavior modification with autistic children using time-out procedures. Paper presented at the meeting of the American Psychological Association, San Francisco, 1968.
- Pendergrass, V. E. Timeout from positive reinforcement following persistent, high-rate behavior in retardates. Journal of Applied Behavioral Analysis, 1972, 5, 85-91.
- Phillips, E. L. Achievement place: token reinforcement procedures in a home-style rehabilitation setting for

- pre-delinquent boys. Journal of Applied Behavioral Analysis, 1968, 1, 213-223.
- Risley, T. R. The effects and side effects of punishing the autistic behaviors of a deviant child. Journal of Applied Behavioral Analysis, 1968, 1, 24-31.
- Schaefer, H. and Martin, P. Behavioral Therapy. New York: McGraw-Hill, 1969.
- Seigel, G. M., Lenske, J., and Boren, P. Suppression of normal speech disfluencies through response cost. Journal of Applied Behavioral Analysis, 1969, 2, 265-276.
- Siegel, S. Non-parametric statistics: For the behavioral sciences. New York: McGraw-Hill, 1956.
- Silberman, C. E. Crisis in the classroom. New York: Random House, 1971.
- Staats, A. W., Minke, K. A., Finley, J. R., Wolf, M. M., and Brooks, L. O. A reinforcer system and experimental procedure for the laboratory study of reading acquisition. Child Development, 1964, 35, 209-231.
- Staats, A. W., Staats, C. K., Schultz, R. E., and Wolf, M. M. The conditioning of textual responses using "extrinsic" reinforcers. Journal of the Experimental Analysis of Behavior, 1962, 5, 33-40.
- Talkington, L. W. Response chain learning of mentally retarded adolescents under four conditions of reinforcement. American Journal of Mental Deficiencies, 1971, 76, 337-340.
- Thomas, J. R. Avoidance of time-out from two VI schedules

- of positive reinforcement. Journal of the Experimental Analysis of Behavior, 1964, 7, 168.
- Tyler, V. O. and Brown, G. D. The use of swift, brief isolation as a control device for institutionalized delinquents. Behavior Research and Therapy, 1967, 5, 1-9.
- Wagner, A. R. Conditioned frustration as a learned drive. Journal of Experimental Psychology, 1963, 66, 142-148.
- White, G. D., Nielsen, G., and Johnson, S. M. Time-out duration and the suppression of deviant behavior in children. Journal of Applied Behavioral Analysis, 1972, 5(2), 111-120.
- Winkler, R. C. Management of chronic psychiatric patients by a token reinforcement system. Journal of Applied Behavioral Analysis, 1970, 3, 47-55.
- Wolf, M. M., Giles, D. K., and Hall, R. V. Experiments with token reinforcement in a remedial classroom. Behavior Research and Therapy, 1968, 6, 51-64.
- Wolf, M. M., Risley, T., and Mees, H. Application of operant conditioning procedures to the behavior problems of an autistic child. Behavior Research and Therapy, 1964, 1, 305-312.
- Zeilbergen, J., Sampon, S. E., and Sloane, H. N. Modification of a child's problem behaviors in the house with the mother as therapist. Journal of Applied Behavioral Analysis, 1968, 1, 47-53.
- Zimmerman, G. H., Zimmerman, J., and Russell, C. D.

Differential effects of token reinforcement on instruction-following behavior in retarded students instructed as a group. Journal of Applied Behavioral Analysis, 1969, 2, 101-112.