*THE EFFECTS OF TOKEN REINFORCEMENT
ON THE BEHAVIOR OF DELINQUENTS
IN COTTAGE SETTINGS¹*

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A token economy designed to modify the behavior of 125 adolescent males committed to a state correctional institution was implemented in the boys' cottages, focusing on social behavior (peer interaction), rule following, and task completion. The program was sequentially introduced in a multiple-baseline design in three independent cottages; a fourth group served as a comparison cottage. Appropriate behavior increased when the token program was introduced in each cottage. Data were collected for 14 months. Thus, the long-term effects of initial behavior change were assessed.

DESCRIPTORS: token economy, correctional institution, social behavior, token reinforcement, delinquents

Behavioral interventions with delinquents and predelinquents have involved parent-training programs (Eyberg and Johnson, 1974; Patterson, 1974; Patterson, Cobb, and Ray, 1973; Patterson and Reid, 1973; Reid and Hendriks, 1973; Wiltz and Patterson, 1974), contingency contracting (Alexander and Parsons, 1973; Stuart, 1971; Stuart and Lott, 1972; Stuart and Tripodi, 1973), negotiation of conflict situations (Kifer, Lewis, Green, and Phillips, 1974), academic programming (Cohen, 1972; Martin, Burkholder, Rosenthal, Tharp, and Thorne, 1968), and community based, residential token economies (Bailey, Wolf, and Phillips, 1970; Harris, Finck, Giles, Hart, and Tsosie, 1975; Phillips, 1968; Phillips, Phillips, Fixsen, and Wolf, 1971). Applications of token economy programs

to delinquents in institutional settings have focused on academic and social behaviors (Stump-hauzer, 1973) but have been limited to small samples (Bednar, Zelhart, Greathouse, and Weinberg, 1970; Burchard, 1967; Burchard and Barrera, 1972; Burchard and Tyler, 1965; Fine-man, 1968; Graubard, 1969; Hauserman, Zwe-back, and Plotkin, 1972; Horton, 1970; Meichenbaum, Bowers, and Ross, 1968; Tyler, 1967; Tyler and Brown, 1968). With the exception of anecdotal reports describing large-scale token economy programs (Cohen and Filipczak, 1971; Jesness and DeRisi, 1973; Karacki and Levinson, 1970), the effects of token reinforcement on the social behavior of a large, institutionalized population have not been demonstrated. The present study evaluated the effects of a token economy in the cottage program of an institution for delinquent boys. Social behavior was one of the primary target behaviors.

METHOD

Subjects

One hundred twenty-five adjudicated delinquent males, committed to the Alabama Boys Industrial School (ABIS), ranged in age from 12 to 15 yr (mean of 14 yr, four months). Their IQs, obtained from the students' case files and in almost all cases based on individually

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administered intelligence tests, ranged from 50 to 137 (mean of 75). Thirty per cent of the boys were mildly or moderately retarded, 42% had borderline intellectual ability, and 28% had average, above-average, or superior intellectual ability. Sixty-five per cent were black and 35% were white. A majority of the students had six or more charges ranging from truancy and being uncontrollable to arson and homicide. The average duration of commitment at ABIS was nine months.

Setting

ABIS is one of three state training schools for delinquents and is located in an urban area. Career educational programs, consisting of academic and vocational instruction, are provided. Boys reside in five independent cottage units. Recreational activities are conducted and opportunities offered to engage in individual or group counselling. Four of the cottage units, each containing approximately equal numbers of boys, were the setting for the present study. Seventeen staff members, 13 male and four female, were involved in the token economy (mean educational level = 1 yr of college, mean age was 40.3 yr). The staff-student ratio was 7.35 boys per staff member. One cottage supervisor was primarily responsible for the treatment program in each cottage. A counsellor in each cottage served as a reliability observer. The staff had no behavioral training before the program.

Procedure

Training and program planning. Two behavioral consultants conducted a group training program for the cottage staff. This program consisted of three 4-hr introductory sessions covering basic operant principles and techniques. Hall's (1971) *Managing Behavior Series* (parts 1, 2, and 3) was used as a text. A lecture format, "homework" assignments, and small discussion groups were utilized. The superintendent and assistant superintendent occasionally attended and stressed the importance of the behavioral program. The superintendent praised cottage super-

visors who appeared to be putting forth the most effort. Following the group sessions, individualized sessions were held twice weekly in each of the cottages over a three-month period. The following topics were discussed: the identification and definition of target behaviors, observational techniques, methods of assessing reliability of observations, means of recording and tabulating data, social and token reinforcement, and reinforcement delivery systems. Committees were formed of staff and administrative personnel to identify target behaviors, back-up reinforcers, and to work out logistical problems. While the consultants attempted subtly to guide decision-making, the final responsibility for program planning was clearly placed on the staff. After the initial training and planning phases were completed, follow-up sessions were held weekly to assess operation of the program.

Target behaviors. Cottage Behaviors BD and AD (see below) were selected as target behaviors because the staff was concerned about the low frequency of appropriate social behavior before and after dinner. Some students interacted very little, while others showed high frequencies of disruptive and aggressive behaviors. Also, many students failed to participate in group recreational activities. Line Behavior was selected because staff reported a high frequency of assaultive behavior when students were walking to and from destinations on campus. Students frequently walked in unorganized groups, which made monitoring by the staff difficult.

The specific behaviors were:

1. Cottage Behavior BD

- a. Following rules of group games (e.g., football, baseball, basketball).
- b. Completing chores assigned by the cottage supervisor (e.g., sweeping, carrying out garbage, mopping floor, cleaning bathroom).
- c. Following cottage rules (e.g., no smoking during recreational period, staying in the recreation room, not destroying property of self, others, or institution).
- d. Following instructions of cottage super-

visor (e.g., familiarizing a new student with game and cottage rules, decreasing noise level of play, sharing games).

e. Cottage Behavior BD was scored as inappropriate if any assaultive behavior occurred. Examples of assaultive behavior are cursing, loud accusations, threats, hitting, kicking, and shoving.

2. Cottage Behavior AD

a. Interacting with one or more peers 30 to 50% of the time (depending on the cottage) between dinner and bedtime. Interacting was defined as a boy's behavior meeting at least four of the following conditions: maintaining a proximity of three feet or less from a peer(s), talking to a peer(s), looking at a peer(s), having his body oriented toward a peer(s), and manipulating game materials in accord with game rules.

b. Following cottage rules.

c. Following instructions of the cottage supervisor.

d. Cottage Behavior AD was scored as inappropriate if any assaultive behavior occurred.

3. Line Behavior

a. Walking to and from destinations on campus in a group.

b. Walking in a straight line.

c. Following instructions of cottage supervisor.

d. Line Behavior was scored as inappropriate if any assaultive behavior occurred.

A boy's behavior had to meet each of the criteria in order to be judged appropriate.

Data collection. The boys' names were listed on a daily behavior chart and the cottage supervisor marked each behavioral category when the boy had met the criteria for appropriate behavior. Thus, both group and individual data were obtained.

The three target behaviors were recorded in the following manner:

1. *Cottage Behavior BD*—the cottage supervisor began observing the boys' behavior when they returned to the cottage from school or

vocational assignment and continued observing for approximately 1 hr until the boys prepared to leave for dinner. Then he rated each boy on the daily behavior chart.

2. *Cottage Behavior AD*—the cottage supervisor began observing at the beginning of the recreation period immediately after dinner and when all of the students were in a large recreational room. The cottage supervisor positioned himself so that he could observe all of the students. He continued observing for 2 hr. When the boys began preparing for bed, he rated each boy's behavior on the daily behavior chart.

3. *Line Behavior*—the cottage supervisor began observing the boys' behavior when they formed a line to leave the cottage for dinner. He continued to observe until the boys arrived at the dining hall. After dinner, he observed their behavior as they returned to the cottage. Then he rated each boy on the daily behavior chart.

No other specific structure was imposed on the observational system.

Baseline and token reinforcement. Cottage staff gathered baseline data by observing and tabulating whether each boy met the criteria for each of the categories on a daily behavior chart. The boys were told that the staff was taking records. No further explanation was provided. A multiple-baseline design (Baer, Wolf, and Risley, 1968) was employed by sequentially introducing the token reinforcement phase across cottages. One of the six cottages on the ABIS campus was eliminated at the outset because of high staff turnover. A second cottage served as a comparison cottage and continued the baseline phase. This cottage was a temporary residence, where orientation was provided for boys entering ABIS. The following criteria were used to determine the onset of token reinforcement: the ongoing, consistent collection of data; observer agreement of 80% or more; enthusiasm and interest of the cottage and administrative staff as subjectively assessed by the authors. Due to practical considerations, token reinforcement

Table 1
Means and Ranges of Reliability Estimates

Cottage	Line Behavior		Cottage Behavior BD		Cottage Behavior AD	
	Mean	Range	Mean	Range	Mean	Range
A	93%	80-100%	90%	80-100%	87%	80-100%
B	83%	60-100%	82%	70- 97%	85%	40-100%
C	98%	93-100%	98%	90-100%	97%	91-100%
D	73%	50-100%	72%	50-100%	75%	54-100%

NOTE: Reliability estimates made during staff training, baseline, and token reinforcement phases are included.

was implemented for all three target behaviors simultaneously in each cottage.

When token reinforcement began in each cottage, the supervisor discussed the behavioral criteria for each category. Signs were posted listing the criteria. The boys were told the number of tokens they could earn in each category. Before bedtime and before the boys left the cottage for school, the cottage supervisor counted the tokens each boy had earned. A printed paper token, equal in size to a dollar bill, was issued to the boy and contained the boy's name, the cottage supervisor's code number, date, and number of tokens earned.

Back-up reinforcers. The boys went to a token economy store weekly and exchanged their tokens for a variety of reinforcers including drinks, candy, trinkets, toys, games, and cigarettes.² Tokens could be saved in a bank, which paid interest, for more expensive reinforcers, such as on- and off-campus recreational activities and trips to football and basketball games, and to a nearby girl's training school where dances were held. Also, tokens could be used to purchase a four-day pass home; final release from ABIS was contingent on the cumulative number of tokens earned.

Reliability. Boys in each cottage were independently rated on each target behavior by two staff members (cottage supervisor and cottage counsellor) who completed a daily behavior

chart. The cottage counsellor knew the boys well, was familiar with the cottage routine, and was trained in the response-definition and data-collection procedures. Seventy-five reliability checks were made throughout the study (mean of 1.2 checks per week). Reliability estimates were computed in the following manner: (number of agreements/number of agreements + disagreements) $\times$ 100. An agreement was defined as both observers simultaneously and independently rating a boy's behavior as appropriate or inappropriate with respect to a given target behavior. The number of agreements refers to the number of boys within a given cottage that were given identical ratings by the observers. The number of agreements plus disagreements refers to the total number of boys observed. The means and ranges of the reliability estimates for the three target behaviors in the four cottages are shown in Table 1.

Recalculation of percentages of agreement was conducted by dividing the number of times both observers marked the target response as occurring (agreements) by the number of agreements plus the number of times one observer marked response occurrence and the other did not, and multiplying by 100 (Kazdin, 1974).³ This re-analysis yielded an average decrease of 4.6 percentage points, with a range of one to eight percentage points.

²A more detailed description of specific aspects of the ABIS token economy, including back-up reinforcers, their costs, and token earning power, is available from the authors.

³Because some estimates in Table 1 may have been inflated by a low frequency of response occurrence, reliability estimates were recalculated. At the time of this re-analysis, the original raw scores for Cottage A were no longer available.

RESULTS

Figure 1 illustrates the effects of the token program on Cottage Behavior BD. Data were collected for 14 months for three of four cottages. Due to practical difficulties, data collection for Cottage C was delayed. When introduced, the token system resulted in an increase in mean percentage of appropriate behavior for each cottage, with no noticeable improvement in other cottages.

For Cottage A, appropriate behavior increased from a baseline mean of 66% to a treatment mean of 91.6%; for Cottage B, from a mean of 46.7% to 80.8%; and for Cottage C, from a mean of 73.2% to 94.2%. Cottage D indicated a fairly stable mean percentage of appropriate behavior over time.

Figure 2 illustrates the effects of the token system on Cottage Behavior AD. Increases in mean percentage of appropriate behavior from baseline to experimental phases were: from 47.3% to 75.9% for Cottage A; from 33.9% to 80.6% for Cottage B; and from 56.4% to 80% for Cottage C. In Cottage D, with no token system, performance was stable.

Figure 3 represents the effects of the token economy when applied to Line Behavior. Increases in mean percentage of appropriate behavior from baseline to experimental phases were: 49.6% to 96.4% for Cottage A; 56.7% to 86.9% for Cottage B; and 51.8% to 78.2% for Cottage C. Cottage D indicated a generally high and stable mean percentage of appropriate behavior across phases.

Although two cottages reflected ascending baseline trends (Cottage A in Figures 1 and 2; Cottage B in Figure 1), generally the mean percentage of appropriate behavior increased after the token system was introduced.

DISCUSSION

The major purpose of this study was to document the effectiveness of a large-scale behavior-change program for delinquent youngsters in an

applied setting. Thus, analyses of the contribution of each program component (instructions, token novelty, observers), as well as possible interaction effects between subject characteristics (age, race, socioeconomic level, *etc.*) and the token program were not of major concern. Although such data would certainly be of interest, the practical value of this study lies in the demonstration of the functional and noticeable effects of a "package" token economy program.

The timing of program initiation in each cottage was determined by baseline trends and also by staff motivation and interest. Ideally, it would have been preferable to postpone introduction of the token system in each cottage until baseline data had either stabilized or shown descending trends. The authors predicted however, that continued delay would result in a corresponding decrease in commitment and cooperation from the cottage parents.

Table 2 indicates the cost of the token economy program to the institution above and beyond regular costs for general maintenance, food, clothing, and other basic operating expenses. The institution's monthly financial expenditure for the token economy averaged \$7.85 per boy per month. The program was developed and continually supervised by the authors. The Jefferson County Department of Health provided these services free in return for administrative cooperation and support for the behavioral program. Actual staff time required to develop and maintain the program structure averaged 3 hr per cottage per week. The degree of professional supervision averaged 8 hr per

Table 2
Program Costs to ABIS

<i>Item</i>	<i>Amount</i>
Staff Salaries	\$ 9,339.00
Token Store and Capital Outlay	1,517.04
Printing, Paper, and Supplies	504.00
Miscellaneous	420.00
Total	\$11,780.04
Per Boy per Year	94.24
Per Boy per Month	7.85

Fig. 1. Cottage Behavior BD: mean percentage of appropriate behavior recorded during the 2-hr after-noon period. This time period extended from the group's return from school (or vocational assignment) to the evening meal. Each data point represents the mean percentage for a 15-day interval.

Fig. 2. Cottage Behavior AD: mean percentage of appropriate behavior recorded during the cottage activity period following the evening meal and before bedtime.

Fig. 3. Line Behavior: mean percentage of appropriate behavior recorded during group movement between the cottage and the dining hall.

week for the total cottage program. Initial expenses were somewhat higher than the general expenditures required to maintain the program.

Beyond reporting initial behavior modification, few studies have generated data reflecting the long-term effectiveness of a token economy, especially with an institutionalized delinquent population. While data from the ABIS program reflect maintenance of initial behavior change for periods ranging from seven to 12 months (depending on the cottage) within the program, no data are available regarding maintenance of behavior change after release from the program. The generalization of program effects from a treatment to a nontreatment environment remains therefore a critical question.

Anecdotal data indicated a gradual deterioration of the program structure in the 14 months after the formal research program was terminated. During this time, three primary trends emerged: the development of competing institutional priorities, the intensification of intra- and interorganizational conflicts, and the administration's increasing neglect of supervision and coordination of the token economy. These problems are similar to those described in other behavioral programs in correctional settings (Repucci and Saunders, 1974).

During the past year, the ethical, moral, and legal problems associated with the use of behavioral procedures in institutions have received increasing attention (Repucci and Saunders, 1974; Saunders, Note 1; Wexler, 1973). The most important ethical issue emerging from the ABIS program involved a resolution of conflicts between the interests of the administration and the interests of students. The institution chose some target responses in order to maximize convenience for the staff, rather than because these behaviors might contribute to the students' successful community adjustment. Line Behavior is an example. As long as the administration controls access to the population, the resolution of these conflicts may favor the administration. Behavioral consultants may therefore be faced with a choice between negotiated compromise

regarding program objectives or termination of the consulting relationship. Obviously, the consequences of nonintervention must be carefully weighed, as well as the consequences of intervening in community systems whose program objectives may not all be in the best interests of the client. Unfortunately, there are no clear guidelines for dealing with this ethical dilemma.

REFERENCE NOTE

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