

*ACHIEVEMENT PLACE: MODIFICATION OF THE  
BEHAVIORS OF PRE-DELINQUENT BOYS  
WITHIN A TOKEN ECONOMY<sup>1,2,3</sup>*

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The "pre-delinquent" behaviors of six boys at Achievement Place, a community based family style behavior modification center for delinquents, were modified using token (points) reinforcement procedures. In Exp. I, point losses contingent on each minute late were effective in producing promptness at the evening meal. During the reversal phase, threats (which were not backed up with point losses) to reinstate the point consequences initially improved promptness but the last two of five threats were ineffective. In Exp. II, point consequences effectively maintained the boys' room-cleaning behavior and, during a fading condition where the percentage of days when the contingency occurred was decreased, the point consequences remained effective for over six months, even when they were delivered on only 8% of the days. Experiment III showed that the boys saved considerable amounts of money when point consequences were available for deposits but saved little money when no points were available. Also, when points were given only for deposits that occurred on specific days the boys deposited their money almost exclusively on those days. In Exp. IV, point consequences contingent on the number of correct answers on a news quiz produced the greatest increase in the percentage of boys who watched the news and, to a lesser extent, increased the percentage of correct answers for the boys who watched the news. The results indicate that "pre-delinquent" behaviors are amenable to modification procedures and that a token reinforcement system provides a practical means of modifying these behaviors.

Token economies have been developed by Ayllon and Azrin (1968) to initiate and maintain the work and self-care behaviors of institutionalized psychotics; by Cohen, Filipczak, and Bis (1965) to improve and maintain the academic skills of institutionalized delinquents; and by Birnbrauer, Wolf, Kidder, and Tague (1965), Clark, Lachowicz, and Wolf (1968), and Wolf, Giles, and Hall (1968) to decrease behavioral problems and increase the academic behavior of children in special classrooms. Experimental evaluations of these token economies have indicated that teachers,

therapists, and ward personnel can produce dramatic changes in many behaviors by manipulating their consequences. Phillips (1968) described the use of a token economy at Achievement Place, a community based, family style behavior modification program for pre-delinquents. Phillips provided evidence that indicated that contingent tokens could be used to decrease the incidence of aggressive statements and poor grammar and increase tidiness, punctuality, and amount of homework completed.

The aims of the present research, which was also conducted at Achievement Place, were to evaluate the effects of the token economy on promptness at meal time, room cleaning, saving money, and accuracy of answers on a news quiz. An additional aim was to examine the effects of threats, a fading procedure, and a "fixed-interval schedule of reinforcement" on behavior in an applied setting.

## PROGRAM

### *Subjects*

All the youths in Achievement Place were adjudicated by the local juvenile court and

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custody was given to the county Department of Social Welfare. In the opinion of the juvenile court, all of the youths were in danger of becoming habitual law breakers if some corrective action was not taken. Some of the descriptive terms used in records made by parents, teachers, and court officials to describe the youths later committed to Achievement Place were "aggressive", "inferior attitude", "dangerous to other children", "openly hostile toward teachers", "poor motivation", "general lack of cleanliness", and "low interest". Four boys participated in Exp. I and Exp. II, five boys in Exp. III, and six boys in Exp. IV. The boys' ages ranged from 12 to 15 yr.

#### *Token Reinforcement System*

The token economy at Achievement Place has been described by Phillips (1968). The tokens continue to be points that are earned for specified appropriate behaviors and lost for specified inappropriate behaviors. As points are earned or lost, the number of points and the behavior are recorded on a 3 by 5 in. index card each boy carries with him. At the end of each day, each boy subtracts the total number of points lost from the total number of points earned and the resulting point difference is used to buy privileges for the following day or is accumulated until the end of the week, as described below. Thus, points are made directly contingent on the occurrence of some behavior and are later used by the youths to purchase less-easily manipulated but more important consequences (privileges).

In the 2 yr since the Phillips report, the following changes have been made in the token system at Achievement Place. Originally, there was only one point system, the weekly point system, whereby the youths earned and lost points each day, the points were accumulated over a seven-day period, and privileges were purchased with those points for the following week. After noting the behavior of the youths on the weekly point system, two problems became apparent. First, the youths earned fewer points on the first few days after purchasing their privileges than on the few days preceding the next purchase day. Thus, when privileges were purchased on Friday for the following week, the youths earned fewer points on Saturday, Sunday, and

Monday than they did on Wednesday, Thursday, and Friday. To remedy this situation, each youth was required to earn a point difference of at least 1500 points each day in order to engage in his weekly privileges on the following day. Thus, although a youth bought privileges for an entire week, he had to make a point difference of 1500 points each day in order to engage in those privileges the following day.

The second problem was that for some youths entering the Achievement Place program, the point consequences did not produce large, reliable effects on some important behaviors for several weeks. To increase the effectiveness of the point system during those first weeks, a daily point system was arranged for all youths entering Achievement Place. On the daily point system, the point difference at the end of each day was used to buy privileges for the next day. Thus, the delay between earning points and purchasing privileges was minimized.

The privileges the youths could buy with their points have also changed somewhat. Table 1 describes the privileges and their price in points under the daily and weekly point system. The "basic" privileges were sold as a package and included the use of tools, telephone, radio, recreation room, and the privilege of going outdoors. The basic privileges had to be purchased before any other privilege because these were difficult for the teaching-parents to monitor. The other privileges could be purchased in any order. As shown in Table 1, a youth could live comfortably by earning a point difference of

Table 1

Privileges that can be earned with points on the daily and weekly point systems.

<i>Privileges</i>	<i>Price in Points</i>	
	<i>Weekly System</i>	<i>Daily System</i>
Basics (hobbies and games)	3000	400
Snacks	1000	150
TV	1000	150
Allowance (per \$1.00)	2000	300
Permission to leave Achievement Place (home, downtown, sports events)	3000	*
Bonds (savings for gifts, special clothing, <i>etc.</i> )	1000	150
Special privileges	Variable	*

\*Not available

10,000 each week. In contrast, Phillips (1968) reported a point difference of only 7000 each week was required for approximately the same privileges. Thus, inflation has occurred in the Achievement Place token economy.

## EXPERIMENT I

### PROMPTNESS

Phillips (1968) conducted an analysis of promptness at school, bedtime, and on errands and found that point losses for each minute each youth was late produced punctual behavior. In the time since that study, promptness at the evening meal became a problem. This led to the following systematic replication of the Phillips (1968) procedures.

### PROCEDURES

Promptness was recorded for each evening meal, seven days a week. Approximately 5 min before dinner each evening, the boys were told "Dinner will be ready in about five minutes." A bell that could be heard throughout the house was rung when dinner was ready and a stopwatch was started at the same time. The stopwatch was stopped when the last boy sat down at the table. The time between starting and stopping the watch defined "minutes late". If a boy sat down at the table with dirty hands, uncombed hair, *etc.*, his presence was counted and he was asked to go clean up after the last boy was seated.

### Conditions

All conditions were announced, except Baseline.

*Baseline.* The time elapsed between ringing the bell and the last boy seating himself at the table was recorded by the teaching-parents each evening. There were no reprimands, reminders, or other scheduled consequences for being early or late.

*Points.* Each boy lost 100 points for each minute he was late. Other than being initially informed of the change in procedure, the boys were given no verbal reprimands or reminders. There were no scheduled consequences for being early. Point losses, if any, were delivered to each boy after he sat down at the table.

*Threats no points.* Identical to the Baseline condition, except on the sixth, tenth, thirteenth, fourteenth, and eighteenth days of this

condition the following threat was given to the boys after the last boy was seated: "If you are late for dinner tomorrow night, you will lose points." None of these threats were backed up with point consequences on the following day.

## RESULTS

There were 22 reliability checks during the study. With two observers independently recording minutes late to the nearest second, they never differed more than 6 sec.

As shown in Fig. 1, during Baseline the last boy to sit down at the table was about 10 min late. When the 100-point fine was made contingent on each minute late, the boys were more prompt and, by the end of the Points condition, all the boys were seated at the table less than 60 sec after the dinner bell rang. Under the Threats No Points condition, the behavior reverted to about 10 min late; during the final Points condition the boys were again prompt in coming to dinner. These data indicate that point losses were effective in producing punctual behavior at dinner time. Although not shown in Fig. 1, the "last boy to sit down at the table" varied from day to day among all the youths. Thus, the data in Fig. 1 represent all four youths in the experiment and not just one habitually tardy youth.

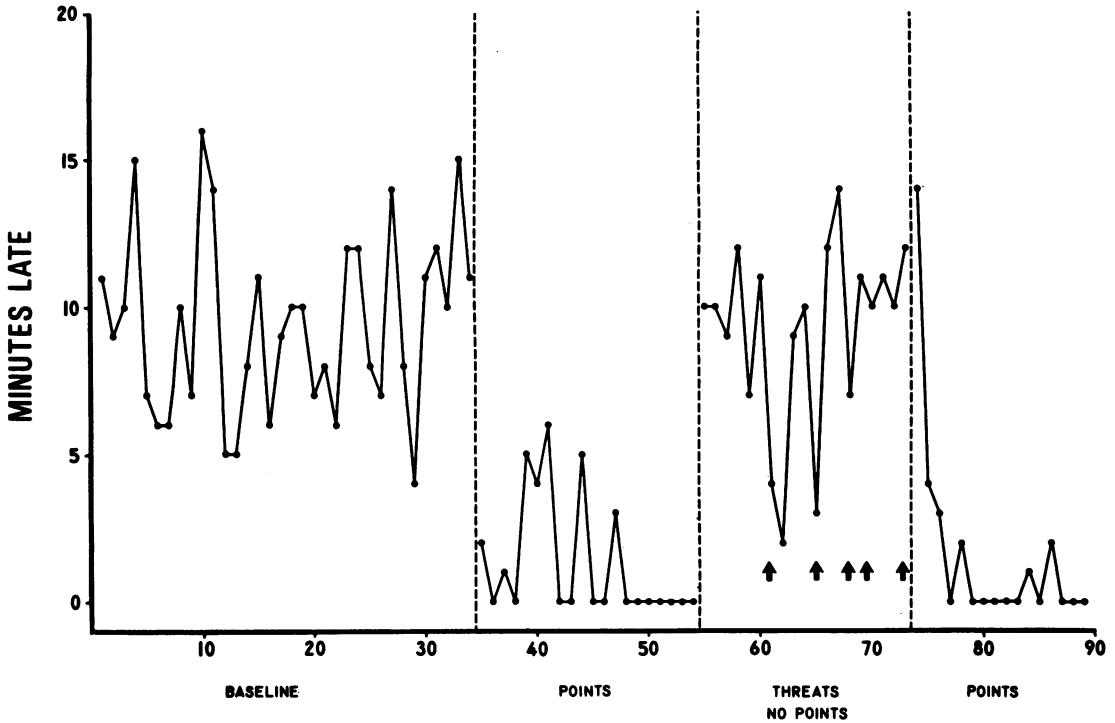
For an analysis of threats in the Threats No Points condition, Fig. 2 shows the average minutes late on the days before each threat was made (including the day of the threat) and the minutes late on the day following each threat. It can be seen in Fig. 2 that only the first three threats to reinstate the point loss condition produced improvements in punctuality on the day following the threat. The last two threats produced no appreciable change in punctuality, possibly because none of the threats were backed up with point losses on the next day.

## EXPERIMENT II

### ROOM CLEANING

Another problem involved a general lack of cleanliness and tidiness, which was typical of the youths when they arrived at Achievement Place. Reports by social workers and probation officers suggested that in many cases the homes of the boys were unkempt and disar-

Promptness At Meals



SESSIONS

Fig. 1. Minutes late for each evening meal under Baseline conditions where there were no consequences for promptness and under Points conditions where each boy lost 100 points for each minute he was late. The arrows in the Threats No Points condition mark the day following a threat to reinstate point consequences for promptness.

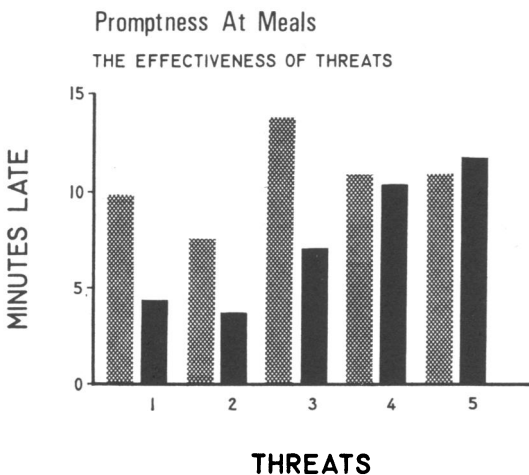


Fig. 2. The cross-hatched bars represent the average minutes late on the days before each threat was made (including the day of the threat) and the solid bars represent the minutes late on the day following the threat.

ranged. Teachers' reports also commented on the poor hygiene habits and inappropriate clothing of the youths.

To alleviate a portion of this problem, token reinforcement procedures were designed to establish the cleanliness of the boys' rooms and to maintain the room-cleaning behavior in the absence of daily consequences.

PROCEDURES

Response Definition

Room cleaning was divided into 10 major areas, which were explicitly defined according to a set of objective criteria. In addition, each major area was scored for the number of items that met the definition, up to a maximum. For example, *Dirty Clothes*, a major area, was defined as follows: "All clothes not neatly placed in the wardrobe, dresser, or

closet should be in the dirty clothes hamper (in the utility room). There should be no clothes visible without opening doors or drawers (maximum = 13)." Thus, if all clothes were put away and met the definition, a score of 13 was assigned to the area *Dirty Clothes*. Each piece of clothing that was visible or improperly put away was subtracted from the score of 13. The other nine areas and their maximum scores were *Shades and Windows* (max. = 4), *Bed* (max. = 20), *Floor* (max. = 15), *Closet* (max. = 15), *Doors and Drawers* (max. = 4), *Furniture* (max. = 4), *Desk* (max. = 10), *Surface Tops* (max. = 10), and *Baskets* (max. = 5). Therefore, the maximum number of items totalled 100 for each of the four boys in this experiment.

#### Conditions

A list of room-cleaning definitions was posted on a bulletin board at the beginning of the study and remained there throughout the experiment. The boys were free to remove the list of definitions to check their rooms at any time. All conditions were announced. Without telling the boys, data were recorded each week-day morning shortly after the boys left for school.

*Points.* Under the Points condition, each boy made 500 points if his total score was 80 or above and lost 500 points if his score fell below 80. In addition to the point consequences, each boy was given feedback concerning the exact nature and location of the items that did not meet the definitions of room cleaning.

*No points.* During this condition there were no point consequences for room cleaning. However, several probes were made during the No-Points condition: the feedback was discontinued and reinstated; the boys were threatened that "If you boys don't start cleaning your rooms it will be necessary to start points on rooms again"; they were given instructions that "Boys, your rooms are a mess. Clean them up as soon as possible"; and it was demanded that "Boys, your rooms are a mess. I want you to go up and clean your rooms now!"

*Fading points.* The Points condition was reinstated with the exception that no feedback was given. After 13 days of recording data and delivering consequences for room cleaning each day, the percentage of days the

contingency occurred and consequences were delivered was reduced from 100% to 50% for eight days, then to 33% for nine days, to 16% for 27 days, and then to 8% for 25 days. Although the points were given on a variable and intermittent schedule, the cleanliness of the rooms was measured every day.

When the intermittency was introduced, an "adjusting consequence" was added to avoid reducing both the frequency and magnitude of the points at the same time. The potential number of points that could be earned or lost accumulated each day the contingency did not occur. Thus, if the contingency was finally applied after five days, five times as many points would be earned or lost than if the contingency had occurred on each successive day. The adjusting consequence was discontinued after 38 days and a fixed number of points occurred as the consequence for each intermittent contingency thereafter. The value of this new consequence was equal to a five-day accumulation of points under the adjusting consequence.

*Post checks.* During this condition, room cleaning was measured and point consequences were delivered on 8% of the days for over six months. Thus, data were recorded only on the days the consequences were to be delivered.

Inter-observer agreement among three observers was measured on 22 occasions throughout the study; agreement, computed by dividing the total number of agreements by the total number of agreements plus disagreements, ranged from 96% to 100% and averaged 99%.

#### RESULTS

Figure 3 shows the almost perfect level of cleanliness of the boys' rooms under the Points condition. At this time, the Points condition had been in effect for nearly two months. When the contingency was removed during the No Points condition, the number of items completed decreased. The effects of a number of variables were probed during this reversal period. Precise feedback was supplied to each boy during the Points condition and was continued during the beginning of the No Points condition. The feedback consisted of a diagram of the rooms and indicated the exact nature of the items that did not meet the criteria. Neither discontinuing nor reinstating

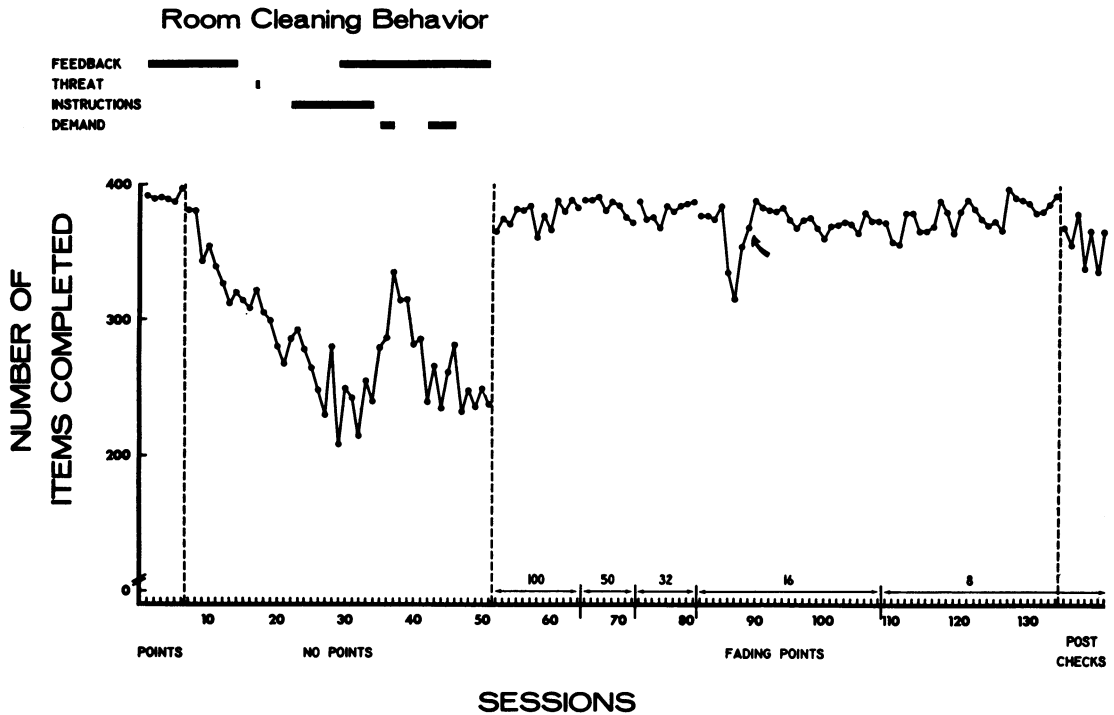


Fig. 3. The total number of items completed for all four boys each week day. The bars over portions of the Points and No Points conditions indicate the sessions Feedback, Threats, Instructions, and Demands were given. The numbers above the abscissa in the Fading Points condition indicate the percentage of days the point contingency occurred. The arrow in the Fading Points condition indicates the session where the "adjusting consequence" was discontinued.

this procedure during the reversal stage appeared to have any effect. Also, when the Points condition was reinstated without the feedback there did not seem to be any loss of control. Apparently, while precise feedback may have been functional in the beginning, it clearly no longer was.

Instructions that they clean their rooms and a threat to reinstate the point contingency if they did not produced no change in the youths' room-cleaning behavior. Demands resulted in the boys going to their rooms and engaging in apparent room-straightening behavior. The first group of demands also produced an increase in room-cleaning behavior. However, the remaining demands had almost no effect on the room cleanliness measure.

In the Fading Points condition, when the daily point contingency was reinstated, the room-cleaning behavior immediately increased to the level seen in the initial Points condition. As the percentage of days on which the point consequences were delivered was reduced from 100% to 8%, the room-cleaning

behavior remained at a stable, high level. At the arrow in Fig. 3, the adjusting consequence was discontinued and a fixed number of points occurred as the consequence for each intermittent contingency with no loss of control. During the Post Checks condition, when the behavior was measured and consequences were delivered on only 8% of the days, room cleaning decreased slightly over the six month period but was still above the criterion of 80% items completed for all the boys.

These data indicate that the point consequences were effective in maintaining the boys' room-cleaning behavior and that the consequences for room cleaning remained effective even when they were delivered on as few as 8% of the days.

### EXPERIMENT III

#### SAVINGS

One set of goal behaviors at Achievement Place may be described as "planning for the future". Obviously, "planning ahead" involves

a large class of behaviors. Considering the financial history of many of the families of the boys in Achievement Place, one member of this class which was of immediate practical interest was saving money.

To encourage saving money the teaching-parents purchased a plastic "piggy bank" for each of the boys and labelled each one with a boy's name. Each piggy bank had a narrow slot at the top to insert coins and bills and did not have any means of removing the money short of breaking the bank open. Before beginning the study, each boy was asked to specify what he was saving his money for, the price of his anticipated purchase was established, and the money was removed from the bank only when that purchase price was equalled or exceeded. The boys saved their money for records, a record player, model cars, and a bicycle. Money that was removed from the bank had to be spent on the originally specified item or some other item that was equal in cost. Thus, withdrawals could not be re-deposited.

PROCEDURES

Saving was recorded by having each boy bring his bank and the money he wished to deposit to the teaching-parents. The teaching-parents noted the amount of the deposit in the boy's "savings account book" and watched as the money was inserted into the bank. The "savings account book", therefore, provided a data record for the experimenters' use. At the end of the experiment, the total amount deposited was compared with the money actually removed from the banks. The "savings account book" was found to be in agreement with the actual withdrawals within a few pennies.

Conditions

*Baseline.* The date and amount of each deposit were recorded in the "savings book". There were no scheduled consequences for deposits.

*Points.* Under the Points condition, each boy was given 10 points for every penny he deposited. Points could be earned for deposits that occurred on any day of the week.

*Points specific days.* Each boy was given 10 points for every penny he deposited but points could be earned only for deposits that oc-

curred on certain days of each week, as described in the Results section.

RESULTS

Figure 4 shows the cumulative dollars saved each day for each condition of the study for all the boys. The arrows mark Friday of each week for all conditions. Under Baseline conditions very little money was saved. Under the Points conditions, where deposits earned points on any day of the week, a considerable amount of money was saved and there was a strong positive correlation between the amount saved and Friday of each week. For the first Points Specific Days condition, it was announced that saving money would earn points only if the deposits occurred on a specific day each week, namely, Saturday, Monday, Wednesday, and Monday, respectively, for the next four weeks. As shown in Fig. 4, deposits occurred exclusively on the designated day each week. When the baseline condition was again replicated there were no deposits made. Under the third Points condition, the cumulative dollars saved increased

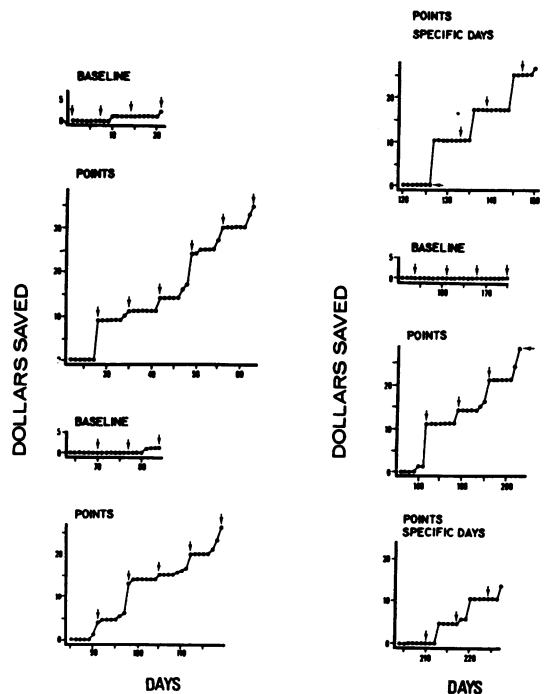


Fig. 4. The cumulative dollars saved for all five boys each day of the experiment. The arrows mark Friday (the day points were exchanged for privileges) of each week for all conditions.

and the correlation between amount saved and Friday was replicated. During the second Points Specific Days condition, deposits again occurred almost exclusively (there were two exceptions) on the designated day, Monday of each week.

The data in Fig. 4 clearly show that saving behavior never became independent of the point consequences. In order to promote saving money it seems to be necessary to pay the boys "interest" on their deposits.

## EXPERIMENT IV

### NEWS

Many of the boys who come to Achievement Place have little knowledge of events that occur in the United States and the world. Some of the boys had never read any part of the newspaper except the comic section and seldom, if ever, watched a TV news program. Since knowledge of current national and international events had a conversational value in general and was particularly stressed in classes concerning government in school, token reinforcement procedures were designed to increase news watching and comprehension.

### PROCEDURES

An observer watched the Huntley-Brinkley news broadcast each weekday evening. During the broadcast the observer composed several "fill in the blank" questions concerning news items that were given special attention in the broadcast (*i.e.*, usually a film clip with accompanying dialogue concerning a major news event). After the broadcast the observer telephoned the questions and answers to the teaching-parents, these were recorded on audio tape, and within 1 hr after the broadcast, the boys were given a news quiz over the evening news. The news quiz consisted of the boys listening to the recorded questions and independently writing down the answers in the presence of the teaching-parents. The boys' answers were then compared with the answers supplied by the observer and the per cent correct was recorded. A percentage measure was used because the number of questions on the news quiz varied from seven to nine during the course of the experiment. All boys were required to take the news quiz each evening. The observer was not told when conditions were changed and did not receive any

information on the results of the study until the end of the experiment.

On four occasions during the study an assessment of variations in the difficulty of the questions asked was made by having two observers watch the same program and submit an equal number of questions to the teaching-parents. On each occasion, half of the boys were given one observer's questions and half were given the other observer's questions with the boys counterbalanced across the two observers across all four occasions. On the first occasion, all boys were required to watch the news and the two groups were 43% and 54% accurate in answering the news questions. On the next two occasions, none of the boys was allowed to watch the news and the accuracy scores were 20% and 20% and 12% and 17% for the two groups on the second and third occasions, respectively. On the fourth occasion, all boys were again required to watch the news and the accuracy for the two groups was 67% and 67%. Thus, with two observers independently composing questions, the two groups of boys responded to the questions with equal accuracy on two occasions and the greatest difference in accuracy was 11%.

On one other occasion during the study two boys were not allowed to watch the news, two boys were required to watch the CBS news with Walter Cronkite, and two boys were required to watch the NBC news with Huntley-Brinkley. The observer composed the questions while watching Huntley-Brinkley. All the boys then took the same news quiz. The two boys who did not watch the news were 11% and 15% accurate in answering the news questions, the two boys who watched Walter Cronkite were 15% and 19% accurate, and the two boys who watched Huntley-Brinkley were 45% and 66% accurate. These data suggest that the proportion of correct answers on the news quiz depended to a great extent on watching the appropriate newscast and not on information available on other newscasts or on information from other sources available to the boys.

### Conditions

All conditions, except Baseline, were announced and a description of the point consequences in effect was available on the bulletin board during each condition.

*Baseline.* There were no point consequences



for watching news or for correct questions on the quiz.

*Sampling 100+*. Each boy was given 100 points for each question he answered correctly. In addition, a sampling procedure was used such that two of the five boys available during this condition were required to watch the news each night. The sampling procedure consisted of having the boys rotate watching news in the order AB, BC, CD, DE, EA, etc.

*100+*. This condition was the same as the Sampling 100+ condition except none of the boys was required to watch the news.

*600+*. Each boy was given 600 points for each question he answered correctly. No one was required to watch the news.

*600±*. In this condition, each boy earned 600 points for each correct answer only if 40% or more of the questions were answered correctly. If a boy failed to reach the 40% criterion he lost 600 points for each answer below the criterion. Thus, if there were seven or eight questions, a boy would make 1800 points for three correct answers, 2400 points for four correct answers, 3000 points for five correct answers, and so forth. However, he would lose 600 points for only two correct answers, lose 1200 points for one correct answer, and lose 1800 points if he answered none of the questions correctly. If there were nine questions the same point scale applied, except the requirement for making points was four correct answers instead of three (four correct answers earned 2400 points, three correct lost 600 points). No one was required to watch the news.

*600-*. This condition was identical to the 600± condition except no points could be earned. Thus, the lost side of the point scale used for the 600± condition was again used but, instead of earning points for 40% or more correct answers, the boys simply avoided losing points. No one was required to watch the news.

*Sampling 1000+ for watching news*. In this condition, about half of the boys were required to watch the news each evening. The sampling procedure was similar to that used in the Sampling 100+ condition. The 1000-point consequence, however, was contingent on watching the newscast and not on answering the news questions correctly. There were no consequences for correct or incorrect answers on the news quiz.

*Sampling 600±*. This condition was identical to the 600± condition except that about half of the boys were required to watch the news each evening.

## RESULTS

Figure 5 shows the mean per cent correct for all boys on the news quiz within each condition. During Baseline the boys answered less than 20% of the questions correctly. When the Sampling 100+ condition was initiated, the mean per cent correct increased to about 25%. When the sampling procedure was discontinued in the 100+ condition, the mean percent correct decreased across days to less than 20%. After the 100-point consequence for each correct answer was replaced by a 600-point consequence in the 600+ condition, there was an initial increase in the mean per cent correct but this faded across days to less than 20%. The next two conditions replicated these results; the 600+ condition, relative to the 100+ condition, did not produce a reliable, durable effect on the mean percentage of correct answers on the news quiz and both the 100+ and 600+ conditions resulted in a lower mean per cent correct than the sampling 100+ condition. When the 600± condition was instituted there was an immediate increase in the percentage of questions answered correctly to about 60%. When the 600+ condition was again replicated the boys answered about 20% of the questions correctly, slightly more than in the previous 600+ conditions. To test the effects of the lost side of the 600± point scale, the 600- condition was next employed. Under the 600- condition, the boys answered about 35% of the questions correctly, which was less than the 60% that resulted from the 600± condition but more than the 10% to 20% in the previous 600+ conditions. Following the 600- condition, the boys were returned to the 600+ condition and the mean per cent correct decreased to less than 15%. The 600± condition was then replicated and the result once again was about 60% of the news questions answered correctly. When the Sampling 1000+ for Watching News procedure was used, the mean per cent correct decreased to about 10%. This was about 15% lower than the mean per cent correct found under the Sampling 100+ procedure where there was a 100 point consequence contingent on each correct answer. Under the next Sam-

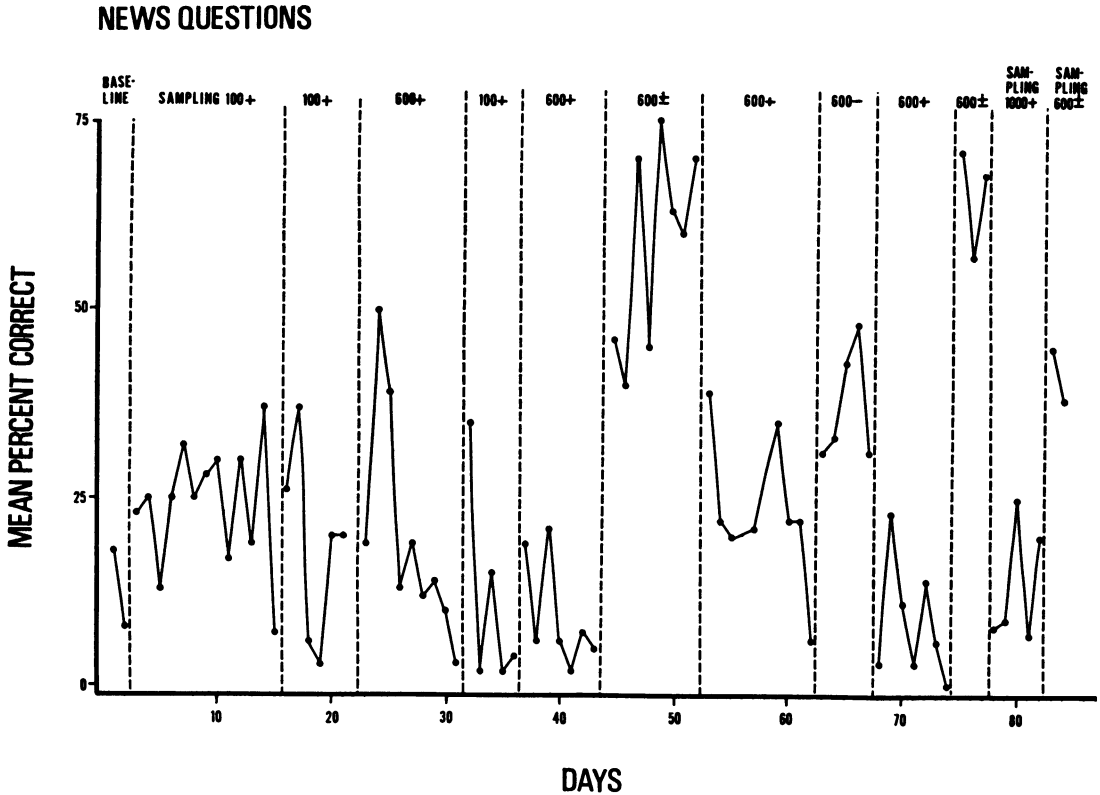


Fig. 5. The mean per cent correct for all boys on the daily news quiz.

pling  $600\pm$  condition the boys answered about 40% of the news questions correctly.

The results presented in Fig. 5 indicate that the  $600\pm$  and, to a lesser extent, the  $600-$  conditions produced a greater percentage of correct answers on the news quiz relative to the other conditions. These results may have been due to (a) actual changes in the percentage of correct answers for those who watched the news or, since the number of boys who watched the news broadcast was controlled only during the sampling conditions, (b) changes in the number of boys who watched the news, or (c) some combination of (a) and (b). To determine which of these alternatives best fit the data, the results were further analyzed into the mean per cent correct of those who watched the news, the mean per cent correct of those who did not watch the news, and the percentage of boys who watched the news each day. These data appear in Fig. 6. "Watching news" was defined as a boy sitting in the room looking at the TV for at least 25 min of the 30-min newscast. In practice, the boys who did not meet this definition were not in the

room at all and thus did not watch any of the newscast. Rarely, a boy would watch TV for 5 to 10 min then leave the room and not watch the remainder of the newscast.

Figure 6 shows that the point consequence produced a clear effect on the percentage of boys who watched the news and did not substantially effect the mean per cent correct of those who watched or did not watch the news. The boys who watched the news averaged about 50% of the news questions answered correctly and the boys who did not watch the news averaged about 5% to 10% correct across most of the conditions. The large changes in mean per cent correct in Fig. 5 thus appear to have been more a function of the number of boys who watched the news than of actual changes in the mean per cent of those who watched the news.

There is some evidence in Fig. 6, however, that suggests that the changes in point contingencies produced changes in the mean per cent correct for those who watched news. The mean per cent correct under the  $600\pm$  conditions appeared to be slightly greater than

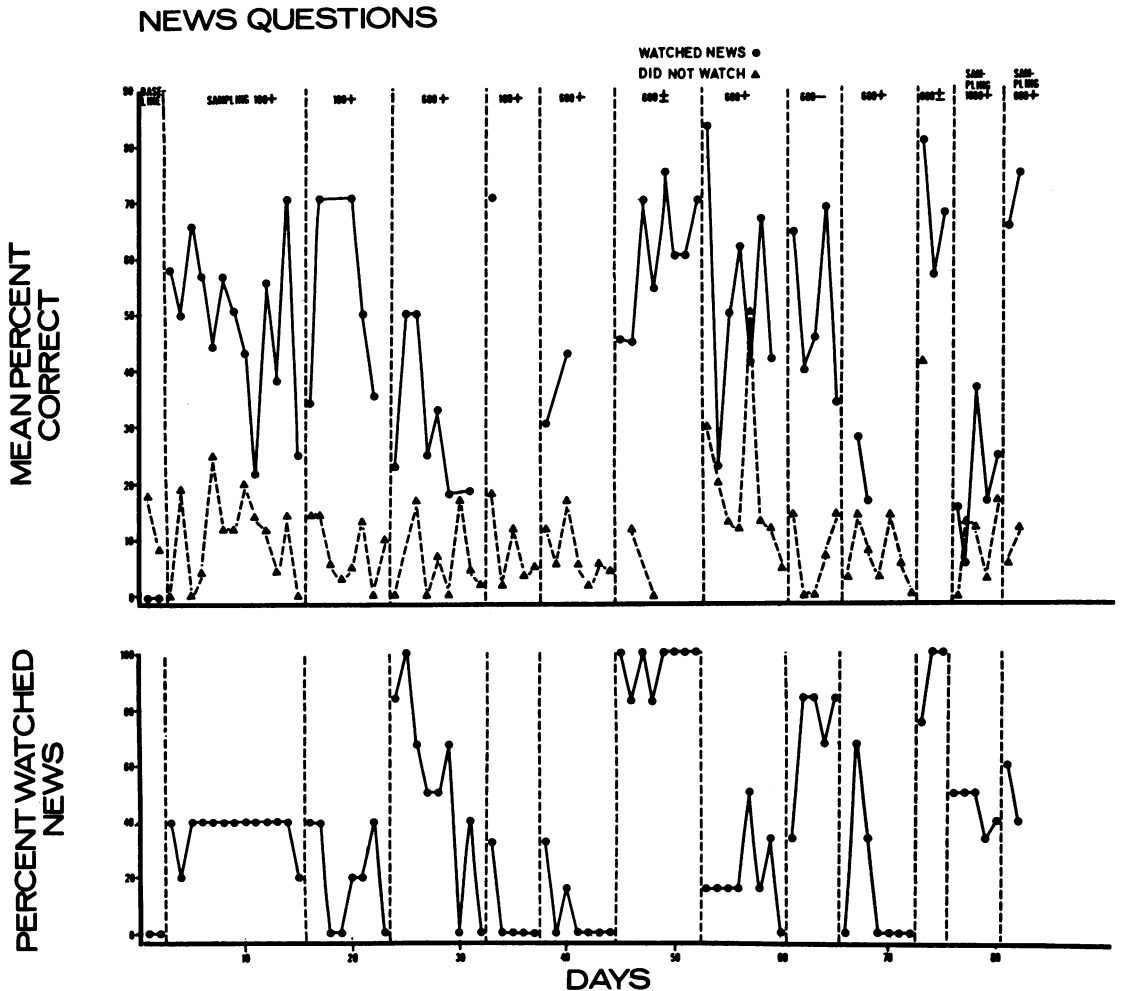


Fig. 6. The mean per cent correct for the boys who watched the news, the mean per cent correct for the boys who did not watch the news, and the percentage of boys who watched the news each day for all conditions.

that resulting from the other conditions but, due to the wide variability across all conditions, no unequivocal conclusion can be stated. To test whether the points contingent on number of correct answers had any effect at all, the point consequences were discontinued for correct answers and placed on merely watching the news during the Sampling 1000+ for Watching News condition. These results in Fig. 6 show that the curves for those who watched and those who did not watch the news did not differ substantially. Furthermore, the mean per cent correct for those who watched the news was appreciably lower than during the Sampling 100+ condition where there was a 100-point contingency for each correct answer. When the sampling procedure was maintained and the 600± point conse-

quences were made contingent on number of correct answers in the Sampling 600± condition, the mean per cent correct of the boys who were required to watch the news increased from about 20% to about 70% and the mean per cent correct for those who did not watch the news remained at about 10%.

It appears then that the point consequences had their greatest effect on the percentage of boys who watched the news but also effected the percentage of correct answers for those who watched the news.

### DISCUSSION

The results of these experiments indicated that point consequences contingent on promptness, room cleaning, saving money, and

accuracy of answers on a news quiz produced significant and reliable improvements in each behavior. Furthermore, the results of Exp. I showed that threats to reinstate the point consequences were only temporarily effective in improving promptness at meal time. Similarly, the threats and instructions given in Exp. II had very little effect on the cleanliness of the boys' rooms. Demands in Exp. II initially produced an improvement in room-cleaning behavior but this effect was not replicated with the second group of demands. These data indicate that threats, instructions, and demands, when they are not discriminative stimuli for future point losses or loss of privileges, at best produce only temporary changes in behavior. In this light, it is interesting to note in Fig. 1 that the announcement of the first Points condition produced an immediate improvement in promptness but the announcement of the second Points condition, which occurred after several threats had been made and not backed up, had no immediate effect on promptness. On the second day of the second Points condition, a large improvement in promptness occurred, possibly because the last "threat" (the announcement) had been backed up with point consequences.

The results of the Fading Points condition in Exp. II indicated that a high level of room-cleaning behavior could be maintained over a considerable period of time when point consequences were delivered on only 8% of the days. To achieve these results, a fading procedure was employed that systematically reduced the percentage of days on which the contingency occurred and, at the same time, increased the point consequences of each contingency. While this was done to avoid reducing the total number of points that could be earned for room cleaning while decreasing the percentage of days on which the contingency occurred, no functional analysis of the importance of the adjusting consequence was attempted.

In Exp. III, the systematic changes in the probability of the boys making deposits each day of the week during the Points conditions resembled the "scallops" that characterize behavior under control of fixed-interval schedules of reinforcement. The scallops initially appeared even though the point consequences for deposits were available any day of the week. On an *a priori* basis one might expect

the boys to deposit most of their money on Saturday or Sunday because they bought their allowance on Friday (\$1.00 to \$4.00 a week depending on the number of points each boy was willing to pay) and many of the boys did odd jobs on Saturday for which they earned money. However, Friday was the day the boys used the points they had earned for the week (up to and including Friday) to purchase privileges for the following week. Thus, by depositing money in their banks on Friday, the boys earned points which were almost immediately exchanged for the back-up privileges.

To test the effects of point consequences when the purchase of back up privileges was delayed, it was announced that saving money would earn points only if the deposits occurred on a specific day each week. Throughout this time, points continued to be exchanged for privileges on Friday evening, so the delay between earning points for deposits and exchanging those points for privileges was as much as six days when Saturday was the designated day. Under the Points Specific Days condition, deposits occurred almost exclusively on the designated day. Thus, the point consequences increased savings even when there was a delay between earning points for deposits and buying privileges. These data are similar to those obtained with human subjects by Weiner (1969) who used a response cost procedure and a fixed-interval schedule to produce the characteristic scallops. With this procedure reinforcement in the form of 100 points on a counter (points were later exchanged for money) was available on a fixed-interval schedule. However, each response the subject made cost one point, *i.e.*, one point was subtracted from the counter. Subjects on the fixed-interval response cost schedule made very few responses, almost all of which were correlated with the end of the fixed interval. Although there was no scheduled response cost procedure in Exp. III, deposits made early in the week under the Points condition "cost" the boys the potential use of that money later in the week. Therefore, the "natural" consequences of spending money (*i.e.*, not having that money available for future purchases) may have partially controlled the emergence of the fixed-interval scallops noted in the Points conditions.

The results of Exp. IV indicated that point

consequences contingent on number of correct answers on the news quiz significantly increased the percentage of correct answers, but changes in the value of the point consequences produced little effect on the number of correct answers for the boys who watched the news. Similarly, Tyler and Brown (1968) found only a small (about one-half answer) difference between one group of delinquent boys that was given tokens for the number of news questions answered correctly and another group that was given tokens noncontingently. However, in the present experiment changes in the value of the point consequences did have a large, reliable effect on the percentage of boys who watched the news. It appeared that the  $600\pm$  condition also produced an increase in the mean per cent correct of those who watched news (Fig. 6) to about 60% to 70% relative to 50% or less for the other conditions. In addition, the  $600\pm$  condition resulted in nearly 100% of the boys watching the news. The  $600-$  condition had no observable effect on the mean per cent correct for those who watched news but did result in about 80% of the boys watching the news. In addition to these data, the teaching-parents reported that during the  $600\pm$  conditions the boys appeared to take notes during the news cast, seemed to discuss the news among themselves, and appeared to study their notes before the news quiz. These behaviors were not noted by the teaching-parents during any other condition in the experiment. Thus, the  $600\pm$  consequences on output (*i.e.*, number of correct answers) resulted in nearly 100% participation by the boys, slightly increased accuracy for the boys who watched the news, and appeared to have generated and maintained a long chain of "study" behaviors.

Taken together, the results of these four experiments indicate that "pre-delinquent" behaviors are amenable to modification procedures and that a point system administered by two professionally trained teaching-parents and backed up with privileges naturally available in most homes provides a practical means of modifying these behaviors.

When any token economy is developed, the goal is to establish or modify certain target behaviors with the reinforcing consequences that are available. Although this goal is common to all token economies, the arrangement of the economy itself can vary across at least

two important dimensions. The first dimension concerns the relationship between the tokens and behavior. An economy can be "all positive", that is, tokens can be given for certain specified behaviors but they cannot be removed. Or, an economy can be "all negative" where each youth starts off each day with a full complement of tokens and can only lose them for certain behaviors. Another possibility is an economy where tokens can be both earned and lost, a "positive and negative" economy. A second important dimension in a token economy concerns the relationship between the number of tokens that can be earned and the cost of privileges. It would be possible to construct an economy where there was a fixed number of tokens available for specified behaviors each day and where an equal number of tokens was required to purchase the desired privileges. In such a "fixed" system it would be somewhat arbitrary whether the consequences were all in terms of earning tokens for behavior, losing tokens for behavior, or a combination of the two. For example, in a fixed economy, failure to earn 100 tokens would be equal to losing 100 tokens since each would result in the direct loss of some privilege. In a fixed token economy there would be no way to make-up unearned or lost tokens. Thus, it is not really possible to distinguish between positive reinforcement and punishment in a fixed economy. Nevertheless, it would also be possible to construct a token economy where there were nearly unlimited opportunities to earn tokens for specified behaviors but where a certain number of tokens was required to purchase the desired privileges. In this "flexible" economy tokens that are unearned or lost can be made up in a variety of ways. Thus, the loss of tokens does not necessarily mean the loss of privileges, only additional effort to earn tokens in order to buy the privileges.

In the Achievement Place token economy, points could be earned and lost, it was a "positive and negative" system. Second, a set number of points were required to earn the privileges described in Table I. Third, the opportunities for earning points were almost unlimited and, therefore, there existed the opportunity to earn more points than were required each day. Thus, it was also a "flexible" economy. There are several advantages to the Achievement Place system. First, certain

appropriate behaviors that have an initially low baseline rate can be strengthened using only positive points (no points can be lost). An example of this was seen in Exp. III. Second, certain inappropriate behaviors that have an initially high baseline rate can be eliminated by using only negative points (no points can be earned). An example of this was seen in Exp. I. Third, there are certain appropriate behaviors that are critical to the overall treatment program or to the operation of the home. For these behaviors, a positive and negative consequence can be used (points can be either made or lost depending upon the level of the behavior). Examples of this procedure were seen in Exp. II and IV. The fourth advantage is that points can be earned in a variety of ways and point losses can be made up. In a flexible system such as this, point losses do not necessarily correlate with the loss of privileges. Rather, point losses mean that additional appropriate behaviors must be engaged in in order to recoup the lost points so all the privileges can be acquired. This is, in fact, what the Achievement Place boys generally do. In a recent 13-week period, only one of the seven boys in the home failed to earn a sufficient point difference in one week to buy all of the first five privileges in Table I; he was unable to buy "permission to leave Achievement Place" that one week.

Thus, while the Achievement Place token economy depends partially on mild punishment (contingent loss of points) for its effectiveness, the flexibility in the economy means that, in reality, the boys seldom suffer the loss of their privileges. On the other hand, one can conceive of a more "fixed" token economy based entirely on "positive reinforcement" but where the participants would frequently fail to earn all the back-up reinforcers. The aversiveness of a token economy would seem to be better measured by the degree of success that the participants have in earning the back-up reinforcers, rather than by the presence or absence of contingent point losses.

The results of Exp. IV indicated that losing points was more effective than making an equal number of points (compare the 600+ and 600- conditions in the bottom half of Fig. 6). This result can be explained in terms of the general token economy at Achievement Place. There were many opportunities for the

boys to make points each day and the boys were free to choose among the tasks that would earn them points. After the daily point difference requirement (1500 points) was surpassed, the boys would tend to choose those tasks that maximized the points they could earn and minimized the time and effort required, or select tasks that they most enjoyed. Thus, earning 600 points for each correct answer on the news quiz was only one of many choices the boys had for earning points. However, losing 600 points for each incorrect answer below the 40% criterion meant that the boy who lost points would have to earn additional points to recoup his losses. That is, he would have to expend greater effort in order to achieve his required daily point difference.

One final point should be made. The point system is the "work horse" of the treatment program at Achievement Place. By making points contingent upon objectively defined behaviors, major changes have been effected in each boy's social, academic, and self-help behaviors. Point consequences provide immediate, concrete feedback to the youths each day and provide a powerful treatment tool. However, the world outside Achievement Place does not always provide systematic consequences for appropriate and inappropriate behavior. For this reason, a merit system was devised. To be advanced to the merit system, a youth must display exceptionally good behavior on the weekly point system over a period of several weeks. On the merit system, all privileges are free and only social consequences are supplied for the youth's behavior. If the youth continues to behave appropriately for several weeks on the merit system he becomes a candidate for the homeward bound system, his parents are prepared for his return, and he begins a gradual transition from Achievement Place to his natural home. If, however, the youth engages in inappropriate behavior that is considered to be critical to his eventual success in the community, he can be taken off the merit system and returned to the weekly point system for further training until, once again, he earns his way onto the merit system. Therefore, the point system provides the motivation needed to change the youths' behaviors and the merit system is used to reduce the dependence of those behaviors on immediate consequences.

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