*PARENT REINFORCEMENT FOR CHILD ACHIEVEMENT:
THE USE OF A LOTTERY TO MAXIMIZE
PARENT TRAINING EFFECTS*

KATHERINE A. MUIR AND MICHAEL A. MILAN

GEORGIA STATE UNIVERSITY

This study describes and evaluates a reinforcement program in which parents earned lottery tickets and won prizes for the progress made by their handicapped children during home-based intervention. An ABAB reversal design replicated across three families was used to assess the effects of the lottery on the children's mastery of language skills. Results showed that the reinforcement of the parents for training accomplishments, as indexed by their children's achievements, produced clinically significant increases in the children's progress when compared with the children's progress under the routine supportive practices of the baseline condition. The implications of the findings for parent training programs in general are discussed.

DESCRIPTORS: parent training, token economy, handicapped children, lottery, retarded children

Parent training in behavior techniques is an effective means of remediating a wide range of children's problem behaviors (Graziano, 1977). While parent training programs have given much attention to finding successful techniques for reinforcing the children's behavior, many researchers assume that the parents' behavior is reinforced by the gains made by their children. Consequently, little attention has been directed

toward the development of programs to maximize the parents' active participation in their children's treatment (Berkowitz & Graziano, 1972). Unfortunately, improvements in children's behavior do not appear to be sufficiently reinforcing to maintain treatment efforts in all parents. One solution has been to work with only those parents who are cooperative (e.g., Wagner, 1968). Besides eliminating many potential clients, there is currently no way to assess accurately which parents will carry out the therapists' instructions (Miller, 1975). Consequently, many children might be unnecessarily denied necessary services.

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Bates (1977) has recommended several strategies to encourage parents to serve as effective "therapists" for their children. He suggested that (a) the initial contact with parents should be as effort-free for them as possible; (b) the training sessions should be conducted in a pleasant setting and should include refreshments; (c) the material should be presented in an interesting manner and praise should be given for attendance and participation; (d) parent behaviors should be encouraged by the therapist through telephone calls or home visits, which should then

be gradually attenuated; (e) praise and attention for the parents should be provided by family and friends in the natural environment; and (f) money be made contingent on the completion of assignments.

With the exception of monetary reinforcement for task completion, the above strategies are usually included in the design of most parent training programs. Going beyond these routine strategies, Benassi and Benassi (1973) required an initial deposit of \$25 which could be earned back with tokens given for attendance, completion of assignments, and participation at meetings. Of six families in this case study, five earned the complete deposit back; the sixth family missed some sessions because of vacation.

Eyberg and Johnson (1974) assessed a similar strategy, except that they returned money directly, and found that the group that could earn their deposit back completed more assignments, treated more problems, and was rated higher on cooperation than the no-refund group. Similar findings were reported by Rinn, Vernon, and Wise (1975) and Peine and Munro (1973). Fleischman (1979) compared low- and middle-income families, some of whom received non-contingent "salaries" while others received no monies. The low-income group that received salaries showed greater cooperation than the group that did not; no difference between groups was seen for the middle-income families.

It thus appears that reinforcement procedures can be used successfully to influence several indicators of *parental cooperation*. However, no experimental study has examined the functional relationship between parent reinforcement and improvement in *children's behavior*. This study used single-case methodology to examine the impact of parent reinforcement for child achievement on children's progress in a home-base early intervention project for handicapped preschoolers. The parent reinforcement program took the form of a lottery in which parents could earn prizes contingent on the accomplishments of their children. This method has been used to increase staff performance (Iwata, Bailey, Brown,

Foshee, & Alpern, 1976), and to increase attendance at exercise class (Epstein, Wing, Thompson, & Griffin, 1980). The lottery was used as an alternative to the more common practice of refunding payments because the initial payment would have exerted an undue hardship on the families, who lived at or below the poverty level.

METHOD

Clients and Setting

Three handicapped children, Alice, Benny, and Candy, and their single mothers who lived in a large city in the southeastern part of the country participated. Each dyad met the following criteria: (a) they consented to participate in therapy, (b) they agreed to schedule weekly home visits by the therapist, (c) baseline recording demonstrated low levels of progress in therapy (less than one objective mastered within a month of home teaching by the parent), and (d) developmental assessment indicated the children were capable of making rapid progress through the curriculum. All contacts between therapist and family took place in the homes of the families, two of whom lived in low-rent housing projects and one in a small house in an impoverished area.

Alice had a diagnosis of developmental delay with a seizure disorder. She was the 2½-yr-old daughter of a working class mother. When tested at 27 mo of age she earned a Mental Development Index age equivalency of 8.5 mo as determined by the Bayley Scales of Infant Development. At the time of the study she had been enrolled in the project for slightly more than a year. During the day she attended a day care program and a psychoeducational center. Although Alice's mother had tried to teach her language skills under the supervision of the project staff, Alice had shown virtually no progress. Her initial repertoire consisted of some babbling and occasional compliance to simple instructions. She showed a very low rate of imitating motor and verbal behaviors.

Benny was the cerebral palsied child of a non-working mother. At the time of the study, he was 2 yr old. When tested at 21 mo of age (adjusted to 19 mo because of prematurity) he earned a Mental Development Index age equivalency of 10 mo as determined by the Bayley Scales of Infant Development. He had been enrolled in the home intervention program for slightly less than a year and was also attending a school for the developmentally delayed. He had also shown little progress in the area of language skills in response to his mother's instructional efforts. He did not imitate or follow instructions and his use of gestures was limited.

Candy also had a diagnosis of cerebral palsy. She was 2 yr old and lived with a younger sister and their mother, who worked occasionally. Her Mental Development Index age equivalency score cannot be reported because her mother did not provide informed consent for the use of such information. Candy was enrolled in the same school as Benny. Like the other children, she was delayed in her language skills despite her mother's programming. When the study began, Candy showed no vocalization or imitation and would not respond to commands.

Curriculum and Materials

Language skills. A series of tasks for both receptive and expressive language skills arranged in developmental sequence was derived from Hanson (1977). Receptive tasks included: (a) respond to name, (b) wave bye-bye, (c) imitate clapping, (d) inhibit on "no," (e) look at specific items, (f) point to pictures, (g) point to objects or body parts, and (h) follow simple directions. Expressive tasks included: (a) imitate vowel sounds, (b) imitate consonant sounds, (c) imitate two-syllable sounds, (d) imitate words, and (e) name objects. Each objective was defined operationally so that it could be measured reliably. For example, imitative waving was defined as: **Waving Bye-Bye:** (a) One hand must be raised with the fingers pointing upward and the palm facing outward. (b) At least two downward motions must be made by flexing either the fingers

or the wrist. (c) The response must be initiated within five seconds of the end of the cue.

Each new behavior to be taught was illustrated for the mother on a flow chart. For each behavior, the mother was shown the appropriate prompt to give as well as appropriate consequence, which generally consisted of praise and affection for correct responses or a sharp "no" and the repetition of the prompt for incorrect responses. Mothers were then instructed to follow the flow charts while working with their children.

Lottery tickets and prizes. Perforated tickets were printed with the name of the sponsoring project. Each ticket had a number from 1 to 100 on both the ticket and the stub. Lottery prizes consisted of toys and household merchandise solicited from a variety of local stores. In addition, restaurants were contacted and asked to provide coupons for complimentary meals or discounts on menu items. Prizes ranged from pizzas and beverages to electric appliances, toys, and dishes. Prizes of smaller value were combined so that all prizes were worth between \$5 and \$10.

Procedure and Data Collection

During the initial home visit, the child's developmental level with respect to language was established. The mother was told which prompt to give and to wait and see the child's response. If the child emitted the desired response on two out of three trials, another behavior was attempted. When three behaviors were found that did not meet this criterion, those were assigned as tasks for the next home visit.

At each subsequent visit, the mother was asked to test for mastery of each task three times, in random order, while the therapist scored the child's performance. It was the children's performance during these tests that was used to assess the effects of the procedures explored in this study. The mother was allowed to give a maximum of three prompts, including the first, each trial. Tasks that were performed correctly by the child within 5 sec of any of the three prompts on at least two out of the three trials were defined

as mastered and the next task in the curriculum was assigned for teaching in its place. Tasks that did not meet this criterion were reassigned. Modeling, feedback, and encouragement were provided to enhance the mothers' skills and participation. Alice and Benny were visited once a week; Candy was visited three times every 2 weeks.

Reliability of Measurement

Reliability data were collected by independent observers naive to the experimental conditions in the effect at that time. They accompanied the primary observer on approximately one out of every four home visits and sat out of the child's line of vision while recording. Data were recorded simultaneously with the primary observer as to whether or not the child had demonstrated the target behaviors to criterion. Data were analyzed for both occurrence and nonoccurrence by dividing the number of agreements by the sum of the agreements and disagreements and multiplying by 100. Reliability calculated in this way resulted in means of 94.0% for the occurrence of the behaviors and 96.4% for their nonoccurrence. The range for both occurrence and nonoccurrence was 50% to 100%.

Experimental Design

An ABAB reversal design consisting of the following phases and replicated across the three clients was used to assess the effects of the lottery program:

Baseline. During this phase, each mother was asked to provide instruction in the three assigned objectives as often as possible throughout each week. On the last home visit of the first baseline phase a "review" task which the child had already mastered was added to the assignment, thereby ensuring that the child would meet criterion on a task early in the following lottery phase so that the mother could make contact with the new contingencies upon their introduction. On the last home visit of the second baseline phase, the mothers were told that more prizes had unexpectedly been received and that

the lottery would be in effect on the next home visit. Because the mothers had had previous exposure to the lottery, no "review" task was assigned.

Lottery. For the first phase of this condition, the mother was given a lottery ticket and a letter explaining the procedure when the child first met criterion on one of the tasks. In essence, she was told that gifts had been donated for the parents participating in the project. She was also told that because there were not enough prizes for all the parents, the fairest solution was to raffle them to parents as they made progress with their children. Finally, she was told that for every task that her child mastered she would receive one ticket from her booklet. Since three tasks were assigned at each home visit, a maximum of three tickets could be earned each visit. Any prize that was won would be delivered on the next home visit. For the second phase of this condition, these procedures were merely reviewed verbally.

A potential problem with the lottery system is that those who are eligible to win may not receive a prize and not be reinforced for their therapeutic efforts. Consequently, an actual drawing was not used to determine on a chance basis who won prizes. Instead, the prizes were delivered in accord with a preplanned, attenuating schedule of reinforcement during both phases of this condition. A prize was "won" after both the first and second home visits on which one or more lottery tickets were earned (CRF). Prizes were then won after the second and fourth visit on which tickets were earned (FR2). Thereafter, prizes were won after every third visit on which tickets were earned (FR3). On the last home visit of both phases of this condition, the mothers were told that all the prizes had been distributed and that the lottery would be discontinued.

RESULTS

The individual developmental progress of the three children during the four phases of the

study is shown in Figure 1. The data are presented as the cumulative number of tasks mastered at each home visit. Review tasks are not represented on the graphs. In all cases, however, a ticket for a review task and/or an assigned developmental task was earned on the first day of the first lottery phase.

Alice mastered three tasks during the 13 Baseline₁ home visits and nine during the same number of visits in the Lottery₁ condition. During the second baseline phase, she mastered two tasks in 10 sessions. This increased to 10 tasks in 10 sessions when the lottery was reinstated. Benny met criterion on only one task during the six visits of the first baseline phase, followed by nine during the six visits of the first lottery phase. He did not master any during the second baseline phase, compared with seven in the final lottery phase, each of which also consisted of six

visits. Candy mastered one task in the initial six baseline visits, followed by five during the six visits when the lottery was first in effect. She did not meet criterion on any task during Baseline₂, but went on to master five during Lottery₂, each of which consisted of six visits.

Because the baseline and lottery phases were of comparable durations for each child, it is possible to compare overall task mastery for the two conditions examined. Alice attained five objectives during baseline and 19 during the lottery phases. Benny met criterion on one task during baseline and 16 when the lottery was in effect. Similarly, Candy mastered one task during baseline and increased her performance to 10 during the lottery phases. In all, the children mastered 643% more tasks during the lottery conditions than during the baseline conditions.

DISCUSSION

The results of this study show that a lottery can be an effective way to increase parental programming with handicapped children. The dramatic gains made by these children are especially impressive when one considers that each child had a long history of minimal progress in home intervention programs. A notable aspect of this program was that parents earned reinforcement contingent on actual improvements in their children's behavior rather than for the amount of time or "effort" devoted to programming, which do not necessarily result in behavioral changes in their children. In addition, the lottery was appealing to the parents, who often expressed enthusiasm on earning a ticket or winning a prize and asked for details about the gifts that were available. Finally, the parents tended to show more creativity when the lottery was in effect. For example, one mother incorporated the prompts into a game of "Simon Says," while another had a sibling demonstrate the behaviors that she wanted her daughter to imitate.

Unfortunately, the results obtained using this reversal design argue against the assumption

Fig. 1. Cumulative number of tasks mastered by each of the three clients during each home visit throughout the four phases of the study (B₁ = Baseline₁; L₁ = Lottery₁; B₂ = Baseline₂; L₂ = Lottery₂).

that improvement in their children's behavior is a powerful reinforcer for parents' instructional efforts. If this were the case, one would expect that progress made during the lottery phase would have continued during the return-to-baseline condition; instead, the discontinuation of the lottery resulted in a return to baseline rates of child progress. It should be pointed out that although the maintenance of intervention effects with the parents without reinforcement is problematic, the real clients here are the handicapped children and the goal is to allow them to reach their maximum potential. The results of this study indicate that progress toward that potential is maximal when progress-contingent reinforcement is earned by the parents. Although some people may claim it is demeaning to "bribe" or "pay" parents for something they ought do as parents, the ultimate choice is between achieving an optimal level of progress for the children or of sacrificing them on the altar of these quasi-humanistic biases. Nevertheless, future efforts should explore the manner in which parents may be encouraged to maintain their therapeutic efforts in the absence of arranged reinforcement.

The lottery procedure used here is flexible. It has potential application for a broad range of behavioral excesses and deficits. In addition, it could be implemented not only for parents, but also for paraprofessionals and volunteers. The lottery represents a low-cost procedure by which reinforcers can be tailored to the individual so as to maximize their appeal and their potency. The findings indicate that such a procedure would be a valuable adjunct to parent training programs when realistic and achievable child objectives are targeted for reinforcement. Indeed, in this time of diminishing financial resources, it might prove cost-effective to refrain from hiring additional staff to increase the number of parent contacts and instead divert those

funds to the purchase of parent "prizes" so that child progress may be maximized.

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