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## ABSTRACT

This study reports on the results of a classroom management system designed to facilitate academic performance in elementary school children. The management system is applicable to an entire class, is operable by one teacher, is cost-free, shows improvement of the student's academic performance, and takes into account individual differences in students' academic performance. Twenty-two third-grade students considered to be low-average in academic performance were given 25 arithmetic problems each week and were allowed to participate in recess activities, which were divided into three levels of desirability. Access to one or more levels during a given week was based on a comparison of individual in-class performance during the previous two weeks. A gain of 12 percent or a rise to 92 percent or higher allowed the subject to participate in any of the three levels of activity; a change of 11 percent restricted the subject to the lower two activity levels; and a decrease in performance of 12 percent or more restricted the subject to the least desirable activity level. Findings suggest that a cost-free behavior management system can be readily applied by one teacher to improve the academic performance of an entire class and that the emphasis upon individual improvement should be designed into future management programs in an attempt to maximize performance of all class members. (A 5-item bibliography and two tables are included.) (PD)

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THE EFFECTS OF CONTINGENT USE OF RECESS ACTIVITIES  
ON THE ACADEMIC PERFORMANCE OF A THIRD GRADE CLASSROOM

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In spite of the contributions that behavior modification has made to education, concern has been voiced about the practicality of certain classroom management techniques. Recent research in this area has continued to focus on classrooms with fewer than ten students (e.g. Brigham, Finfrock, Breunig and Bushell, 1972), or more than one teacher (e.g. Brigham, Graubard and Stans, 1972). Many reward systems are still expensive (e.g. Fjellstedt and Sulzer-Azaroff, 1973).

This study reports on the results of a classroom management system designed to avoid many of these previously encountered problems while still retaining a maximum effect. More specifically, the program was designed to facilitate academic performance (in regard to arithmetic) in elementary school children by using a three step hierarchal scale of recess activities as the back up reinforcer. The design was an extension of an earlier paper reported by McIntire, Davis, and Pumroy (1970), in which reinforcement for performance of classroom academic skills was delayed until another time and place.

The present study's objectives were to design a classroom management system, on a modification of the McIntire et al (1970) design, that had the following qualities: applicable to an entire class; operable by one teacher; cost-free; show improvement of the student's academic performance; and take into account individual differences in student academic performance.

## Method

### Subjects

The subjects were 22 students in a regular third-grade public school classroom. The students were considered to be low-average in academic performance.

The teacher was a white, 24 year old female with two and one half years of previous teaching experience. She had never used a systematic contingency management program.

### Materials

The dependent variable was the weekly per cent of correctly completed arithmetic problems out of an arbitrarily chosen twenty-five. Twenty-five was chosen because of the easy convertability to percentages of ratios with 25 as a denominator, and because it was an adequate number of problems on which to assess a subject's performance.

### Contingency

The contingency chosen, recess activities, is one with which typical third grade students rarely reach a satiation level. To eliminate the need for more than one personnel, the contingency was designed so that all subjects took part in it for the same amount of time but differed in what they could do during that time.

Based on a poll taken of third graders recess activities were divided into three levels of desirability: blue, yellow and red. Examples of the lowest, or blue, level activities were jacks,

hopscotch, puzzles, walking, and indoor type board games. The middle, or yellow, level included all the activities of the blue level plus others such as catch, tag, dodgeball, and races. Finally, the red, or highest, level included activities of the yellow and blue levels and highly desired activities such as kickball, swings, jump rope and basketball.

Access to one or more levels during a given week was based on a comparison of the individual student's in-class performance during the previous two weeks. If the comparison for a given child showed a gain of 12% in weekly arithmetic performance, or a rise to 92% or higher, the child had access to any of the activities of the three recess activity levels. If the comparison showed a change of  $\pm$  11%, the child was restricted to the lower two activity levels. If the comparison showed a decrease in performance of 12% or more, the student was restricted to the least desirable recess activity level.

### Procedure

An ABAB reversal design was used in which each baseline period was three weeks in length and each treatment phase, four weeks in length. During the two baseline phases students had non-contingent access to all recess activities, two days per week, for one-half hour per day. On the last day of the initial baseline period, full instructions were given to the subjects in regard to the contingency management system..

Within each reinforcement period, the independent variable was access to different types of recess activities, for 30 minutes,

twice per week.

The behavior management system was in operation only during the arithmetic period which lasted 50 minutes per day, Monday through Friday. All work on arithmetic problems was done in class, and only during the time allotted for such work.

A reliability check was made by the E in regard to the accuracy of teacher correction of problems. In a total of 22 days the workbook papers were graded by both the teacher and the E with 100% agreement on the accuracy of the answers.

### Results

The use of contingent recess produced substantial and reliable increases in both the class and individual data. During the first baseline phase the class average for correct arithmetic items was 52%.

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This figure rose to 79% correct when contingent recess was applied, fell to 56% during the second baseline phase, and averaged 82% when contingent recess was reinstated.

All but one student showed similar reliable changes in per cent correct during the four phases. The range of individual increases during the first contingent recess stage was from 3% to 53% over initial baseline averages. The second contingent reinforcement period produced individual gains of from 5% to 52% over the averages in the second baseline stage.

By the end of the second treatment phase the seven class members who collectively had the lowest initial baseline average (35%) were performing at a level of 78%. The seven students with the highest collective baseline average (70%), raised their second treatment average to 86%. Thus, the performance discrepancy between the two groups of 36%, seen in the first baseline stage, was narrowed to 8%.

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The dramatic increase in performance for the low baseline group could possibly be attributable to the attempt to individualize the reinforcement system. A low-performing student could gain access to all three activity levels through a 12% improvement in his weekly average. The emphasis upon reinforcing an individual's improvement rather than requiring all students to achieve a specific pre-determined percent possibly served as an added incentive to students with low weekly scores. This contention is substantiated by the fact that 54% of the time members of the low baseline group gained access to all activity levels. In addition, when contingent recess was in effect, the members of low baseline groups either maintained or improved their arithmetic scores from week to week 72% of the time. In comparison, during the baseline phases the low group maintained or improved their weekly performance only 26% of the time.

Two further points should be noted. First, no subject spent more than two weeks in the blue level. Secondly, only on two occasions was a student in a level by himself, each time at the most

restricted level.

### Discussion

The results of this study indicate that it is possible to successfully implement a practical program of contingency management in a public school situation. That is, it has been shown that arithmetic achievement can be increased by using a systematically structured recess period as a reinforcer. This increase can be effected by a single teacher within a typical class situation at no cost to the school. These findings add support to the small amount of studies that have shown it is possible to implement successful programs of contingency management involving cost-free reinforcers in natural classroom settings (e.g. Campbell & Sulzer, 1971; McLaughlin & Lalaby, 1972).

An important aspect of the design of the present study is the emphasis on improvement of performance. In this regard, all students have an equal opportunity to earn the highest level of reinforcement. There was no advantage given to the brighter student because there was no absolute level (ie. 85% of all problems correct) that had to be attained before the reinforcer was given. Rather, the student was reinforced for incremental improvement in his performance. Thus, no matter what their basal level of performance was they all had an immediate opportunity to earn the highest reinforcer. This statement was supported by the fact that all subjects earned the red level the first week of the contingent recess.

The fact that the implementation of the reinforcement stage brought about performance increases in almost all subjects points to the possibility that while the typical reinforcers found in the school are sufficient to motivate many students, they may not bring many students to peak performance levels. It was not until a tangible reinforcer was added to the already existent social reinforcers that the students performed at minimal levels.

The present program has a flexibility that allows it to be implemented into other classroom situations and settings. The teacher was pleased with the simplicity of the procedures and educators in the school district requested that the system be tested more widely during the present school year.

In conclusion, the findings suggest that a cost-free behavior management system can be readily applied by one teacher to improve the academic performance of an entire class of children. It is suggested that the emphasis upon individual improvement should be designed into future management programs in an attempt to maximize performance of all class members.

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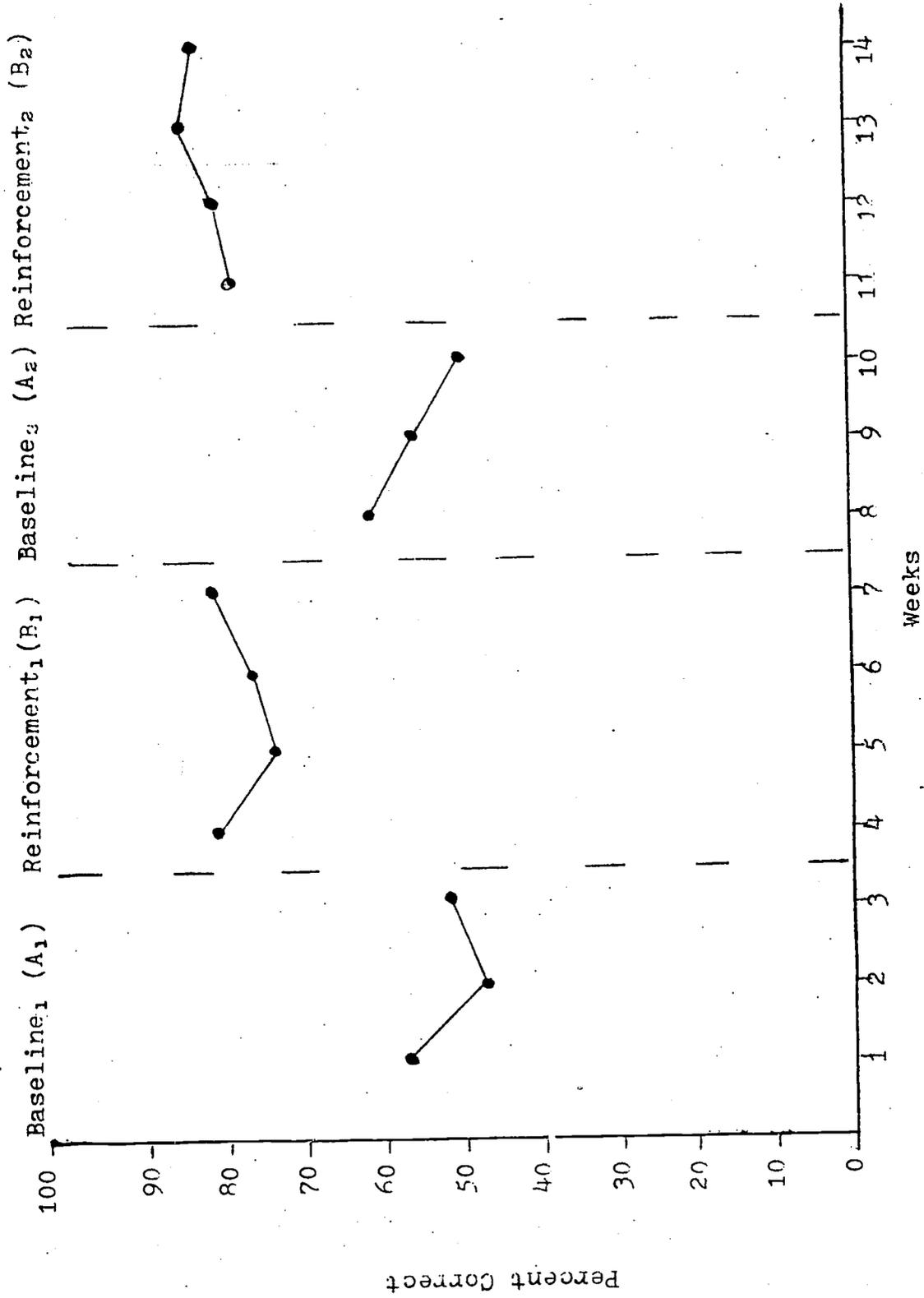


Figure 1: Mean Percent of Arithmetic Problems Done Correctly Each Week of Study by All of the Ss

Table 1

Mean Performance (in Percentage Points) of Students Grouped According to Low, Medium, or High Mean Performance During Period  $A_1$

Period	Performance Groups		
	L	M	H
$A_1$	34.67	50.83	70.10
$B_1$	74.14	80.38	83.86
$A_2$	50.48	51.00	68.76
$B_2$	77.64	83.13	85.57