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ABSTRACT

Incentives in this study were identified as the consequences of behavior which act to guide the future form and frequency of that behavior. This would include factors such as money, security, knowledge of personal success, peer or authority figure approval, and opportunity to engage in desirable activities. The study was designed to test over an eight-week instructional period the combined effects of three incentive models. The subject pool consisted of first, second, and third grade students from four of the eight elementary schools in San Jose, California district. The major purposes of this pilot study were to formulate the process of implementation of an incentives program and the methodology which would underlie subsequent field studies of incentive models. The statistical findings are generally supportive of the initial research hypothesis of the effectiveness of objective-based incentive techniques in promoting student learning in reading and mathematics at the primary level. This pilot study was funded by a Title III grant. (BW)

A PILOT STUDY OF THE USE OF INCENTIVES TO ENHANCE SCHOOL LEARNING

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The use of incentives in schools is universal. Incentives, whether or not they are identified as such, exist for all participants in the schooling process. We speak of incentives here as the identifiable consequences of behavior which act to guide the future form and frequency of that behavior. Factors such as money, security, knowledge of personal success, peer or authority figure approval, and opportunity to engage in desirable activities are probably operating to influence a large percentage of the behaviors which could be observed in any school in the country.

Recent events have stimulated serious interest in the use of incentives to improve academic performance. The belief that school programs of the past decade have failed to achieve their goals has led to a flurry of contracts between school systems and private firms, binding the firms to produce specified student reading and mathematics achievement gains in return for payments for the instructional services rendered (Education Turnkey Systems, 1970). Such contracts have strongly suggested that the private educational firms know something that school personnel do not know about causing children to learn. An examination of the techniques used by performance contractors usually reveals a heavy emphasis on technological innovations and on incentives to learners.

This pilot study to examine the use of incentives grew out of a feasibility study conducted at the American Institutes for Research in 1970 under contract to the U.S. Office of Education (Jung, Lipe, & Wolfe, 1971). An extensive review of the literature on the use of

various types of incentives in educational settings revealed that incentive techniques had been applied rather narrowly to improving maladaptive and disruptive classroom behavior by giving incentives to students. The dominant model governing the design of these studies was a microincentive model, which made the delivery of incentives to students contingent upon relatively short durations of the desired behaviors.

The feasibility study report concluded that incentives, broadly interpreted, held great promise from motivating low-achieving students to acquire basic mathematics and reading skills, and identified seven incentive models:

(1) the student microincentive model;
(2) the student macroincentive model;
(3) the competitive teacher model;
(4) the cooperative teacher model;
(5) the teacher group participation model;
(6) the paraprofessional incentive model; and
(7) the parent incentive model.

Six of the models were designated as essentially breaking new ground in the systematic analysis of incentives in education. The one model which was not proposed for further research was the microincentive model, since it has received substantial research attention and has already been applied with considerable success. The microincentive model provides for delivery of incentives to students upon small positive increments in performance. These increments in performance, either observed directly by the teacher or teacher aide or reflected in short mastery tests covering content previously studied, are often rewarded with tokens which the student can exchange for desired rewards of various kinds - toys, food, use of desired equipment, etc.

The remaining six models proposed in the feasibility study would provide incentives to students, teachers and parents based upon student attainment of well-defined performance objectives in the areas of reading and mathematics. The student macroincentive model provides for incentive delivery to students contingent upon very large units of student performance, such as improvement on standardized achievement tests from the beginning to the end of a school year. In the pilot study reported here, incentive delivery was contingent upon students' mastery of individually assigned objectives which was measured by criterion-referenced tests. At the time of the San Jose pilot study very little research had been done on this macroincentive model. The substantial time lapse between the reception of the incentive and the learning upon which the incentive was contingent suggests that the incentive itself would have rather little impact on the student's effort to improve his/her performance, especially since improvement on standardized achievement tests requires sustained, cumulative learning. Nevertheless, macroincentives seemed highly likely to give good results, if certain conditions were met: (1) the material incentive would be made contingent upon some well-publicized gain in level of group performance; (2) the most functional and desirable incentives would be selected; (3) student group involvement would be fostered; (4) teachers would be encouraged to offer extra help and tutoring to those students who desired it; and (5) intervals shorter than a full school year could be identified, to allow for more frequent incentive delivery.

Three incentive models for teachers were proposed. The competitive model, used in the pilot study, would give incentives to individual teachers based upon the performance gains of their classes as compared to pre-established teacher goals. Teachers were not actually in competition with one another, since in this model each teacher could earn incentives based on his or her class's performance. The cooperative model provides for incentives to teachers as a group, based on student performance. A third proposed teacher incentive model, the teacher group participation model, would go one step beyond incentives per se to involve teachers cooperatively in the diagnosis of student needs and prescription of remedial programs. As paraprofessional roles within schools are expanded, paraprofessionals might be designated as incentive recipients. Finally a parent incentive model would provide incentives to parents along with instructions on the type of student behaviors for them to foster in their children.

In all of these models incentives are delivered to target groups dependent upon demonstrated gains in student achievement. Furthermore the efficacy of any of these models in producing gains in student achievement is linked to the participants' awareness of what they need to do in order to help students learn. The techniques for measuring achievement gains and for monitoring the changes in the instructional process in response to the incentive treatment will be discussed later.

The pilot study conducted in the Franklin-McKinley School District in the spring of 1971, had three purposes:

(1) to see whether or not a successful experimental field study of incentives could be implemented;

(2) to develop and refine the methodology which would be required to conduct a larger field study of incentives; and
(3) to obtain some preliminary estimates of the effects of incentives on student achievement in order to assess better the potential pay-off of further research on the topic.

The study was designed to test over an eight-week instructional period (later compressed to six weeks) the combined effects of three incentive models. The student macro incentive model, the competitive teacher model, with the addition of teacher participation in selecting student objectives, and the parent incentive model were combined into a single treatment. Primary level teachers from three schools participated in the study, beginning by selecting or writing the instructional objectives for reading and mathematics for grades 1, 2, and 3. Incentives to teachers and to students were made contingent upon demonstrated student achievement over the six-week period. The parent model provided for incentives to parents contingent only upon their participation in efforts to improve their children's mathematics achievement. Parents thus received rewards for participation alone, not based on demonstrated achievement by their children.

The Franklin-McKinley School District is a small elementary school district situated on the southeastern edge of San Jose, California, serving children from pre-school through eighth grade. The past decade has witnessed the rapid urbanization in this area - from a semi-rural area covered with orchards to a "slurb" of low-to-medium cost, single-and multiple-family tract homes bordered on the northeast by Bayshore Freeway. Only thirty percent of the former orchard lands remain undeveloped. A survey in December 1970 revealed

that there were 1,265 single and 1,626 multiple family dwellings planned or under construction within the District boundaries. The transformation of the landscape has been paralleled by changes in the ethnic and socio-economic characteristics of the school population. As of October 1970, approximately thirty-eight percent of the school-age children in the District had Spanish surnames, five percent was classified as Black, and two percent belonged to other minorities. Of the 6,500 children enrolled in District schools in 1970-71, 1,175 - or nineteen percent - were receiving assistance through the Aid to Families of Dependent Children (AFDC) Program.

Four of the eight elementary schools in the District participated in the study. All first, second, and third grade classroom--four per grade level--in one school received the experimental treatment, a combination of the student macroincentive model, the competitive teacher model, and the parent incentive model. The teachers in sixteen classrooms from two other schools participated in the determination of instructional objectives, and their students took both criterion-referenced and standardized pre- and posttests. These classrooms thus served as active controls, and did not receive the incentive treatment. Six classrooms in a fourth school did not participate in the study and served as passive controls. The students in these classes--two classrooms at each of the first three grade levels--took the pre- and posttests, but teachers and students had no involvement with the study (Figure 1).

TARGET GROUPS	TYPE OF PARTICIPATION	EXPERIMENTAL SCHOOL	ACTIVE CONTROL SCHOOLS (2)	PASSIVE CONTROL SCHOOL
STUDENTS	TAKE PRE- AND POSTTESTS	X	X	X
	RECEIVE INCENTIVES BASED ON INTERIM TEST PERFORMANCE	X		
TEACHERS	PARTICIPATE IN SELECTING OBJECTIVES	X	X	
	RECEIVE INCENTIVES BASED ON STUDENT GAINS	X		
PARENTS	REWARD THEIR CHILDREN	X		
	RECEIVE INCENTIVES FOR PARTICIPATING	X		

Figure 1. Experimental and control treatments.

Since notification of funding for the Title III proposal under which the study was to be carried out was not received until late March 1971, the planning phase of the study was considerably compressed and the treatment period was six weeks instead of the proposed eight weeks. The short duration of the treatment close to the end of the school year and the decision to combine three incentive models into one treatment makes it difficult to give significant weight to the statistical results. The statistical findings are generally supportive of the initial research hypothesis of the effectiveness of objectives-based incentive techniques in promoting student learning in reading and mathematics at the primary level. Therefore, while the statistical results will be presented and

discussed later, in this paper we will focus on the first two purposes of the pilot study - the process of implementation of an incentives program and the methodology which would underlie subsequent field studies of incentive models.

The proposed project was first explained to the School Board of the Franklin-McKinley School District at two of its meetings. After the Board consented to allow the District participation in the study, the Assistant Superintendent, Dr. L. J. McClanahan, met with three District principals, who expressed strong interest in the study and asked to participate. One of the three principals nominated his school as the experimental site and the other two agreed to have their schools serve as active control sites. First, second, and third grade teachers from those schools were invited to a dinner meeting at which AIR staff described the objectives of the project and outlined the responsibilities of participating teachers.

Subsequently all teachers and principals in the District were invited to an evening lecture-discussion on preparing instructional objectives, presented by Dr. Robert Mager. Following this meeting, each participating teacher in the experimental and active control schools received a document outlining "Procedures for Stating Educational Objectives" and a "Comprehensive Objectives List" of primary level reading and mathematics objectives and was asked to construct a list of objectives that she wanted 85% of her students to have mastered by the end of the school year. Finally, a representative group of the participating teachers negotiated a final list of objectives compiled from the teacher-prepared lists.

Based on this final list of objectives, AIR staff constructed criterion-referenced tests. Criterion performance items were developed for each objective, and the items were sequenced to reflect the prerequisite capabilities within the mathematics and reading subject areas. Although three grade levels were involved, it was decided to develop only one test (two forms) for each of the two subject areas, covering all objectives deemed appropriate for grades 1 through 3. The tests were administered as pre- and posttests to all students, including active and passive controls. First grade students started at the beginning of the test and went as far as they could go. Second and third grade students began on whatever page of the test their teacher considered appropriate for the objectives of her course, which in practice was the ninth page of the test.

The tests were scored by objective. Since the criterion-referenced tests included several items to measure each objective, the total number of items answered correctly was totalled for each objective on the student's test paper. Results were keypunched, and each experimental and active control teacher was provided with a computer printout of the scores of each of her students on each objective. The printout listed the objectives that each of her students had already mastered and, separately, those which had not yet been mastered. Thus the pretest helped teachers to pinpoint student weaknesses and select appropriate learning objectives for each student.

In addition, the Word Study Skills and Arithmetic subscales of the Stanford Achievement Test (Forms W and X) were administered to

all experimental and control students as a pre- and posttest in order to be able to estimate the results of the experiment in comparison with national norms.

The planning steps which have been described all had to be completed before the first incentive period could commence. The incentive period was the basic unit of the project. For each incentive period of approximately two weeks, each class could receive an incentive if 85% of the children in the class had mastered all of the objectives which had been individually assigned to them by their teacher. Each teacher had $115 which she was free to apportion among the four incentive periods. The AIR research staff recommended that the first incentive be a local field trip--a large incentive--to evoke high student interest and involvement in the program from the beginning

At the beginning of the first incentive period each teacher explained the new program to her class. Teachers were instructed to explain the program clearly to their students, emphasizing the direct relationship between hard work and mastery of their objectives (as measured by the criterion-referenced tests), and their receipt of group rewards. After this explanation, the teacher and students in each class selected their first incentive. Eight of the twelve experimental classes chose a trip to the beach; two classes visited a local hamburger franchise for a lecture and free samples; and two classes chose a trip to the San Jose Zoo. Arrangements were then made, subject to each class's meeting its goal in mathematics.

Each teacher then assigned objectives to her students individually for each incentive period. Teachers were instructed

to assign objectives congruent with the child's ability, so that each child would be able to attain mastery of his objectives during the incentive period, but so that fast learners as well as slow learners would be required to work equally hard to earn the incentive. In order to ensure that each class would have at least one success experience in working with objectives--that is, that all the classes would earn at least one incentive--teachers were instructed to establish less rigorous performance standards for students during the first incentive period than during the following three incentive periods. The first incentive period was on mathematics, the second on reading, then mathematics again, and reading. Due to time limitations, the incentive periods overlapped somewhat (Figure 2).

At the end of each incentive period, each teacher constructed her own test on the objectives assigned. Often she constructed one big test and had each student do only specified pages, according to the objectives he had been assigned. For the second and third

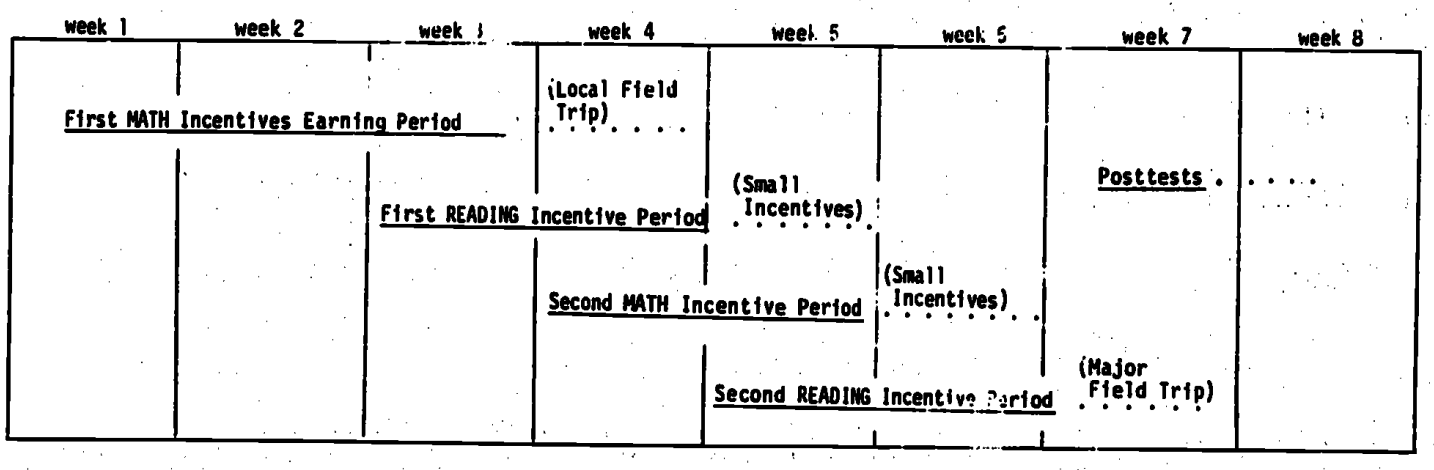

Figure 2. Treatment calendar.

incentive periods, teachers were given the option of providing individual incentives such as felt pens and clay or group incentives such as a game for the whole class, again contingent upon 85% of the students in the class mastering all of their assigned objectives for the incentive period. Therefore while the incentive might be given to either individual students or the class as a whole, it was contingent upon the performance of class as a group, not solely upon the individual child's mastery of his or her own objectives. If the group performance standard was not reached, no one would receive individual prizes.

For the final incentive period, all the classes selected field trips. Four of the classes selected a trip to the San Francisco Zoo. The remaining eight classes selected a trip to Marine World, an aquatic park with special shows and displays.

After the macroincentive model had been implemented with the students, participating teachers in the experimental school, the District Assistant Superintendent, and AIR staff met to discuss and establish the teacher incentives system. The amount budgeted for teacher incentives was approximately $280 for each of the 12 experimental treatment teachers. The AIR research staff stipulated that these funds were to be awarded to teachers in the form of credit toward the purchase of classroom supplies, toys, and special equipment for the classroom--all of which equipment would remain with the teacher as long as she taught within the District, but which would remain with the District should she leave. Since each teacher taught two reading groups and one math class, it was determined that each teacher would

receive $100 for her participation in the project and $60 for each of her three groups which attained its established goals. If the half-way mark was reached, but not the full goal, half payoff ($30 per group) would be given. Thus, each teacher could earn a maximum of $180 in addition to the $100 that she was guaranteed.

Each teacher's goals were negotiated in individual conferences between the principal, a member of the AIR project staff, and the teacher, so that goals could be set taking into account the differing abilities of students in each classroom. Once these goals were agreed to, the teachers' involvement in the incentives program consisted solely of working with students on their assigned objectives in order to maximize the student achievement upon which receipt of teacher (and student) incentives was based.

The parent incentive treatment was initiated during the third week of the project. Every participating teacher in the experimental school nominated her five lowest achieving students, a total of sixty nominees. The parents of each nominated child were sent a letter inviting them to attend a late afternoon meeting to learn about the parent involvement program. The letter promised a gift certificate for their attendance. Every parent was also telephoned to reinforce the request, and to offer baby-sitting service and transportation if needed.

Parent involvement was two weeks in duration, corresponding to the second mathematics incentive earning period. During that two-week period, the five selected children in each class could earn a blue card by working especially hard in mathematics. The

blue card stated: "__(child's name)__ did very well in math class today. Please show how pleased you are by (1) Praising your child, and (2) Offering your child a special treat." Parents were asked to reward their child's extra effort with a treat or a privilege that they knew the child would want. Each parent was given a record form on which to record when their child brought home a blue card and what the parent provided as a treat or privilege. The teachers' orientation to the parents stressed that a blue card indicated extra effort and especially good work on the part of the child. The child would not be expected to bring home a blue card every day. A total of 49 out of the original 60 parents elected to participate and returned their completed record forms to the school. They filled out a brief questionnaire on their reactions to the project and received a $12 gift certificate for dinner for two at a local restaurant.

Thirty-six of the parents reported that they liked the practice of rewarding their children at home for work done well at school, and the rest said it did not matter one way or the other. All of the parents said their children liked being rewarded at home for bringing home a blue card, and about half of the parents reported that their children spent more time working on mathematics after she or he started bringing home blue cards than before the program was started.

AIR-constructed criterion-referenced tests in reading and mathematics were used as a measure of student mastery of assigned objectives over the entire period of the pilot study, and thus as the basis for awarding teacher incentives. Points were earned on

the basis of 2 for 100% mastery of an objective, 1 for partial mastery (at least 2/3 of the items correct for that objective, but less than 100%), and 0 for non-mastery. Tables 1, 2, and 3 summarize the data on gains in mastery of objectives by school and grade. These figures represent only the performance of those students who took both pre- and post-experimental tests, which accounts for differences in N's between reading and math and for some of the very small N's in some of the schools. Furthermore, in the passive control school a large number of students in the six participating classes had non-participating teachers for reading. For example, in the second grade at that school only 18 students had participating teachers for both reading and mathematics.

Table 4 shows the results of the teacher incentive agreements which were negotiated with the experimental teachers. Each teacher could gain a possible $60 in mathematics and $120 in reading toward credits for the purchase of special classroom materials for the following school year. Obviously the agreements in mathematics were considerably under-negotiated. Point gains were generally three to four times what had been predicted by the teachers. In reading, however, gains were not as pronounced. Gains on the reading test were generally smaller than expected, and may be attributable more to the nature of the posttest than to the nature of the reading instruction in the participating classes. Two reading classes, both at the first grade level, both fell slightly short of the performance in reading required for full incentive credit for the teachers. These two teachers each received $60 credit in reading.

Table 1

Average Gain on Criterion-Referenced Tests
Grade 1

School	Math			Reading		
	Total Gain	N	Average Gain	Total Gain	N	Average Gain
Experimental	1417	88	16.18	383	88	4.35
Active Control 2	1709	82	20.84	447	82	5.45
Active Control 1	686	34	20.18	150	34	4.41
Passive Control	281	35	8.03	193	30	6.43

Table 2

Average Gain on Criterion-Referenced Tests
Grade 2

School	Math			Reading		
	Total Gain	N	Average Gain	Total Gain	N	Average Gain
Experimental	3076	105	29.30	981	99	9.91
Active Control 2	955	63	15.16	382	61	6.26
Active Control 1	829	30	27.63	173	31	5.58
Passive Control	320	31	7.42	444	18	24.67

Table 3

Average Gain on Criterion-Referenced Tests
Grade 3

School	Math			Reading		
	Total Gain	N	Average Gain	Total Gain	N	Average Gain
Experimental	1613	76	21.22	912	69	13.22
Active Control 2	694	66	10.51	461	44	10.48
Active Control 1	175	31	5.64	171	34	5.03
Passive Control	381	38	10.26	-27	32	0

Table 4

Teacher Incentives

Grade	Teacher	Math[1] Goal	Math Gain	Result	Reading[1] Goal	Reading Gain	Result
1	01	57	254	Full	89	149	Full
	02	156	663	Full	65	97	Full
	03	224	246	Full	67	54	1/2
	04	72	254	Full	96	83	1/2
2	05	174	744	Full	80	212	Full
	06	268	832	Full	212	297	Full
	07	108	771	Full	90	200	Full
	08	92	729	Full	81	272	Full
3	09	153	633	Full	129	316	Full
	10	118	253	Full	66	299	Full
	11	170	364	Full	50	75	Full
	12	37	333	Full	81	222	Full

[1]prorated to reflect the point total for the number of students who actually received both pre- and posttests

The general underestimates on mathematics gains and the overestimates for two reading classes suggest that the objectives-based procedures for establishing teacher incentive goals need more refinement in order to be both challenging and clearly understood. However, despite these difficulties in making realistic estimates of performance, this method based on criterion-referenced tests has considerably more promise as a basis for awarding teacher incentives than does the use of standardized test scores.

The summary statistics of the pre- and post-experiment administrations of subscales from the Stanford Achievement Test battery are presented in Tables 5 and 6. General inspection of these statistics reveals that in reading the students are generally performing at or

slightly above the average grade equivalent as determined by the national norms of this test, and in arithmetic they are at or slightly below the average. Gains (or losses) over the six-week experimental period are mixed, and undoubtedly reflect the combined effects of the experimental treatment, the expected decline of test performance levels during the last month of school, and the effects of the large amount of testing during this period--end-of-school evaluations, the California state-wide testing program, and the criterion-referenced testing.

The teachers generally felt that the standardized tests were much too difficult and that they made the students feel anxious and discouraged. One teacher pointed out that the standardized tests "did not have anything to do with the other things we were doing," indicating an understanding of the direct relationship between the student objectives and the criterion-referenced tests especially developed to correspond to the selected objectives.

Incentives alone may provide motivation but they do not provide the means for improving student achievement. During the interim between the time that incentive inducements are offered and the subsequent point when the target students' achievement gains are measured, something is expected to occur that will improve the students' achievement. Students might exhibit increased attention and effort in class and in out-of-school study. They might be able to study more effectively because they have a clear understanding of the objectives which have been set for them. They might also get help from others who have mastered the objectives they are studying,

Table 5

Summary Statistics for SAT Word Study Skills Grade Equivalent Scores by School and Grade

Grade		Experimental	Active Control 1	Active Control 2	Passive Control
1	N	71	53	90	40
	pre mean	1.66	1.78	1.84	1.48
	pre sd.	.44	.77	.53	.35
	N	70	53	89	43
	post mean	1.99	2.13	1.88	1.61
	post sd.	.85	.95	.64	.40
2	N	96	47	62	35
	pre mean	2.92	3.16	3.18	2.69
	pre sd.	1.27	1.61	1.86	1.41
	N	94	42	63	*
	post mean	3.23	3.06	3.11	
	post sd.	1.44	1.34	1.30	
3	N	86	31	61	39
	pre mean	3.96	4.49	4.33	3.66
	pre sd.	1.72	2.17	1.64	1.55
	N	86	49	57	34
	post mean	3.99	4.11	4.15	3.48
	post sd.	1.75	1.94	1.67	1.61

* Passive control 2nd grade teachers did not complete SAT word study skills posttests.

Table 6

Summary Statistics for SAT Arithmetic Grade Equivalent Scores by School and Grade

Grade		Experimental	Active Control 1	Active Control 2	Passive Control
1	N	46	45	84	40
	pre mean	1.81	1.82	1.82	1.57
	pre sd.	.46	.40	.35	.30
	N	67	48	85	43
	post mean	1.82	2.00	1.93	1.76
	post sd.	.65	.54	.36	.31
2	N	92	48	57	34
	pre mean	2.30	2.32	2.51	2.11
	pre sd.	.66	.59	.95	.70
	N	97	45	*	33
	pre mean	2.61	2.58		2.61
	post sd.	.80	.65		.76
3	N	86	50	61	37
	pre mean	3.13	3.39	3.13	3.23
	pre sd.	1.01	1.13	.89	.89
	N	86	50	61	39
	pre mean	3.74	3.48	3.39	3.20
	post sd.	1.17	1.18	1.04	.89

* Active Control 2 2nd grade teachers did not administer SAT math posttests.

or they might give help to other students, so that the class as a whole can earn the incentive. Twelve students--one from each experimental class--were interviewed individually at the end of the project, and nine of the twelve did report the occurrence of peer tutoring to help the class earn its incentives. Due to time and budget constraints, no data are available about increases in study time, students' preference for having objectives clearly specified and assigned, or changes in likelihood of asking the teacher for additional help or clarification. The interviews with children also indicated that the children clearly understood the contingency between their academic achievement and the incentives they received. The twelve children interviewed all said they had received the incentives for working hard and for doing well on the tests. All of them said they would like to participate in an incentives project again.

Classroom instruction was monitored in two ways. Each teacher completed questionnaires at the beginning and at the end of the project on the materials and techniques she used in teaching reading and mathematics. Teachers were asked to list materials, personnel, and special services such as curriculum specialists. They were also asked to describe their grading practices, parent involvement, and student motivation techniques. Analysis of the questionnaire data reveals a trend toward a relative increase in time spent by the experimental teachers in preparing for and teaching mathematics and reading, as compared to the active control teachers. This is in line with the added requirements of participating in the study. Also, outside observers entered the classrooms unannounced at random

intervals, and observed teacher and student behavior. Due to budget limitations, extra observers could not be hired and trained. Therefore while the classroom observation procedures were developed and tried out, it was not possible to obtain baseline observations, or to observe active and passive control classrooms for comparative purposes.

In addition the experimental teachers were interviewed at the end of the project about their attitudes toward the various components of the incentives treatment. All of the 12 experimental teachers were favorable toward the use of behavioral objectives. Behavioral objectives, they stated, gave them a definite idea of what students did and did not know and thus guided them in deciding what to teach. Ten of the twelve teachers specifically expressed their approval and their belief in the effectiveness of incentives for academic achievement. The teachers felt that the students had worked harder to earn the incentives. Several also endorsed the "positive" approach of incentives which "reinforced the successes" the students earned.

While the criterion for earning incentives was that 85% of the students in the class had to master all of their assigned objectives (by correctly answering all the test items on them), at some point in the study most of the teachers awarded individual incentives on an individual performance basis rather than on the prescribed group performance basis. Several teachers felt that the children tried harder when they were rewarded for their individual performance, and that they liked the personal attention the incentive implied. Mastery of an objective required that all the criterion-referenced

test items for that objective be answered correctly. Some teachers misinterpreted this standard at some time during the study, and thought that 85% of the objectives assigned to a student were to be mastered. As one teacher said, "It is hard to get 100% right on a test."

The problems that a pilot study is designed to pinpoint and resolve were amply present in this pilot study of incentives. The three-month delay in funding shortened the experimental period, pushed the operation of the study to the end of the school year, and compressed the project's operations to the point that many staff decisions, of necessity, were made on a day-to-day basis. On the basis of the experience of the AIR project staff and school district personnel in implementing the study, the following recommendations emerged:

- Adequate time should be scheduled for required orientation and other preparatory activities before the first incentive period begins. Teachers must be oriented to the project; they must be instructed in both reinforcement principles and the writing of instructional objectives; and they must compile the year's objectives. Then, following designation of objectives, the criterion-referenced pre-tests must be constructed, tried out, revised, and printed. Simultaneously parents must be oriented to the project and given some instruction in their reinforcement and tutoring roles.

- The basic unit of the project is the incentive earning period. All other administration and evaluation activities are preparatory to or stem from the incentive earning period. In the case of student incentives, the first incentive period might be made relatively short, the level of student achievement required in order to earn the incentive should be well within the teacher's expectation for the students to attain, and the incentive payoff should be quite high. Thus, students will learn

that the system is real, and that they can, in fact, earn the rewards that are promised. Subsequent incentive earning periods could be extended for longer and longer durations of time and they should require progressively higher levels of student performance to earn a given incentive.

- Formation of a community council early in the project can provide an invaluable community liaison mechanism that would serve to identify incentive sources in the community. In this pilot study, the local business managers were especially pleased to contribute services and merchandise that were "earned" by students as opposed to being "handouts." Moreover, a community council can interpret the program to the community and help to enlist community support for the aims of the program.

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