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THE EFFECTS OF A PERFORMANCE-MANAGEMENT PROCEDURE ON HIGH
SCHOOL STUDENTS WITH POOR ACADEMIC ACHIEVEMENT

by

Thomas R. Harwood

A Thesis
Submitted to the
Faculty of the Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
April 1985

THE EFFECTS OF A PERFORMANCE-MANAGEMENT PROCEDURE ON HIGH
SCHOOL STUDENTS WITH POOR ACADEMIC ACHIEVEMENT

Thomas R. Harwood, M.A.

Western Michigan University, 1985

This study evaluated the effectiveness of contracting for all classes and the contingent presentation of incentives for school work completed. Fifteen high school students who earned a grade point average below 1.5 (on a 4.0 scale) volunteered for the contracting classroom. The subjects were ranked and randomly assigned to the first experimental group, the second experimental group, or the control group. The first experimental group had incentives contingent upon contracts completed, the second experimental group received the incentive noncontingent upon contract completion, and the control group did not attend the contracting classroom. After the first 3 weeks, the difference between the first experimental group versus the control group was statistically significant and the two experimental groups switched treatment conditions. After the second 3 weeks, the first experimental group decreased and the second experimental group increased. The difference between the experimental groups versus the control group was not statistically significant.

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I would like to acknowledge Dr. Richard Malott for his guidance, time, support, and valuable feedback. I feel lucky to have had the opportunity to work with him throughout most of my college career.

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And most of all, I would like to thank Gina Stickle and dedicate this work to her for her patience, love, caring, and understanding.

Thomas R. Harwood

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CHAPTER I

INTRODUCTION

Considerable research has been devoted to studying the process of learning and how that process can be improved for the student who shows no interest or effort in acquiring knowledge (Bailey, Wolf, and Phillips, 1970; Bednar and Weinberg, 1970; Clark, 1978; Cohen, Keyworth, Kleiner, and Liebert, 1971; and Dee, 1972). Homme (1966) was the first to use the term "contingency contract"; the contract indicated what the student must do in order to receive available reinforcers. Homme did not agree with the punishment of the behaviors of the failing student, but expressed the need to control this behavior by reinforcement. He suggested the use of the Premack principle for controlling student study behavior. The Premack principle states that if a high-probability behavior (going to a school basketball game) were contingent upon the lower-probability behavior (doing the required homework assignment), there would be an increase in the lower-probability behavior. Several other researchers have also used the Premack principle (Cantrell, Cantrell, Huddleston, and Woodridge, 1969; Clements and McKee, 1968; Dee, 1972; and Lovitt and Curtiss, 1969).

A number of studies showed the effectiveness of using such contracts to be very beneficial in improving academic performance (Arwood, Williams, and Long, 1974; Birdwell, 1972; Brigham and Amith, 1973, Clements and McKee, 1968; Homme, Csanti, Gonzales, and Rechs, 1969; Lovitt and Curtiss, 1969; MacDonald, Gallimore, and MacDonald, 1970;

Polzynski, 1977; Williams and Anadam, 1973; and Williams, Long, and Yoakley, 1972). Polzynski (1977) reviewed 45 articles written between 1967 and 1976 that involved the use of contracts for learning. He found that the majority of the research showed that the use of contracts caused favorable results (9 favorable studies versus 2 studies that failed to show any advantage to contracting. Forty-one studies had favorable outcomes versus only 15 studies that failed to show any advantage to contracting in which the investigator based the results on their own observations). He also noted that most of the articles came from college settings. The number of studies that focused on the college student population was 19 compared to only 7 that focused on the high school student. All 7 of the high school studies involved contracting for only one class with only one teacher. Harris and Ream (1972) indicated that "the greatest need for improved study habits is at the high school level."

To improve student performance, several studies used back-up reinforcers that occur immediately after the subject has written the contract. Back-up reinforcers were the reinforcers selected by the subjects that the investigator used in addition to grades to increase appropriate behavior. In the Clements and McKee (1968) study, back-up reinforcers were used to increase study behavior of 16 prison inmates. This study indicated that need for constant revision and development of new reinforcers, in order to maintain study behavior. The results of the McDonald et al. (1970) study showed a significant increase in school attendance with high school students when contracts were in effect. In the Bailey, Wolf, and Phillips (1970) study and the

Cohen et al. (1971) study, the use of "home-based reinforcement" was effective in increasing study behavior of problem students. The parents and the students became involved in the contracting and in the development of back-up reinforcers.

Both Arwood et al. (1974) and Williams et al. (1972) compared the effectiveness of the students and teachers jointly writing the contract versus only the teacher formulating the student's assignments, objectives, and incentives (known as a teacher proclamation). They found that both the teacher's proclamation and the written contract increased student performance; however, the written contract was statistically superior to the teacher proclamation. They concluded that contracting not only increases appropriate student behavior but that it gives the student an opportunity to control and attend to their own study behavior. Several studies have supported the idea that significant increases in academic performance can be observed when students are responsible for managing their own study behavior and the associated contingencies (Bolstad and Johnson, 1972; Clements and McKee, 1968; Gottman and McFall, 1972; and Lovitt and Curtiss, 1969).

Malott (1974) discussed the notion that behavior is more likely to be controlled and influenced by immediate and certain outcomes than by improbable and cumulative outcomes. The problem associated with study behavior is that the outcomes are only small, cumulative, and somewhat improbable. For example, what is needed to control and develop a higher rate of study is a significant, highly probable, and sizable consequence that is presented contingent upon each instance of study behavior.

Fox (1966) suggested that many students are under poor stimulus control and that the student is not required to adequately observe those features of the material that need particular attention and to determine in what environment study behavior should occur. Lovitt and Curtiss (1969) also discussed the usefulness and advantage for students being able to discriminate and manage the different stimuli associated with study behavior. They concluded that "if education is committed to educate students so that they can not only discriminate their own behavior - we must conceive of these self-controlling behaviors as capable of being taught and learned."

The present investigator made an effort to design an optimal contracting system. As stated previously, there is considerable literature to provide guidelines. Therefore, the procedures in the present study involved: (a) using incentives to increase the amount of student behaviors, (b) having the students write their own contracts with minimal teacher input, and (c) using the contract to increase the amount of study behavior.

The investigator implemented some new procedures and techniques in an effort to increase the effectiveness of the student contract. The new procedures included: (a) contracting for all classes the student was currently enrolled in, (b) contracting after school, (c) collecting weekly data from the teacher by using a student progress report form, and (d) using this weekly form to determine the appropriateness of the student's contract.

The purpose of the study was to measure how the use of contracting and the contingent presentation of incentives for school work com-

pleted would produce a change in academic achievement. The major goal of the study was to design a system that would help students improve their academic performance. Another goal of the study was to determine if a system can be set up and effective outside of the classroom and if this system can improve the student's average performance for all of their classes in a given grading period.

Preliminary Study

The investigator conducted a preliminary study which analyzed the grades of those students who were on academic probation at Kalamazoo Hackett Catholic Central High School between November 3, 1983 and January 25, 1984. On November 3, 1983, 42 students were placed on academic probation and the following memo went out to the faculty:

MEMO TO: Faculty
FROM: Principal
DATE: November 8, 1983
RE: Academic Probation

Academic probation is the result of student's failing two or more classes.

"When placed on academic probation, the student is given an advisor from among the faculty who will keep special watch of his/her progress for the coming quarter. The advisor will meet with the student periodically during the quarter to check on his/her progress. The advisor will also consult with the student's teachers and notify the parents to keep them informed. If, at the end of the quarter, the student is no longer failing his courses, he/she is no longer required to stay in the program.

The mean grade point average of the 42 students on academic probation from September 5, 1983 to November 3, 1983 was 1.295.

After implementation of the advisory system, the mean grade point

average from November 6, 1983 to January 25, 1984 was only 1.313. A correlated t-test with $t=0.2479$ failed to show significance at the .05 level.

The preliminary study also investigated the notion that if the assigned teacher was being effective in monitoring the student's academic behavior, then the effects of such monitoring should appear within that teacher's own classroom. But a negative effect occurred. On the average, the student's grade went down in the classes being taught by their assigned teacher. A correlated t-test with $t=1.446$ was significant at the .05 level.

Finally, of 37 students who were on academic probation and had the opportunity to attend Hackett High School the following year, only 13 did. The school lost 24 students from one school year to the next. Hackett High School is a private school and largely funded by student tuition. The average tuition cost is \$2,000 and with the loss of 24 students, the total loss to the school is \$48,000 per year.

As these preliminary data show, the advisory system used to help the low-achieving student was ineffective. The present study attempted to engineer a more effective program to help the student achieve at a higher level and also to engineer a program that would be efficient and would not require a large amount of time and effort from the teachers.

CHAPTER II

METHOD

Subjects

Selection of Subjects

The subjects were male and female high school students between the ages of 14 and 17, enrolled full-time at Hackett High School. They had earned a grade point average below a 1.5 (on a scale where A=4.0, B=3.0, C=2.0, D=1.0, E=0.0) for the previous marking period. They exhibited problems with completing homework assignments on time and preparing for weekly exams. Twenty subjects met the grade point requirement of the performance management program. The principal and the investigator sent a letter to the parents describing the purpose and the goals of the program (see Appendix A). The parents were requested to sign the letter and indicate whether or not they gave their permission for their son or daughter to participate. A self-addressed envelope accompanied the letter to facilitate immediate return by keeping the response cost required by each parent at a minimum. The investigator received 15 positive responses and 1 negative response (the subject was working with a private psychologist at that time). Four parents did not respond.

On the basis of the GPAs for the previous marking period, the 15 subjects were ranked from lowest GPA (0.214) to highest GPA (1.428). Using the random table, the investigator randomly assigned the first

three subjects to either the first experimental group, the second experimental group or the control group. The investigator continued randomly assigning groups of three subjects until all subjects had been assigned to one of the three treatment conditions. The mean GPAs for the marking period prior to the study was computed for each group. The difference between the GPAs prior to the study was not statistically significant at the .05 level with $F=0.6484$.

Setting

The study took place in a small classroom at Kalamazoo Hackett Catholic Central High School, a private, co-educational high school. The classroom contained enough chairs and desks to accommodate the ten students involved in the study. There was also a large desk and a chalkboard in the room. Only the investigator and the subjects were in the room during the study.

Materials

Subjects in both experimental groups were required to bring a pencil, or pen, paper, 3 x 5 inch index cards, and the books needed in order to complete their homework assignments.

Class Schedule

The subjects wrote down on a 3 x 5 inch card the classes they were currently enrolled in and the names of their teachers. This information was used to maintain consistency between what the student contracted to do and what the teacher required the student to do. The

investigator also used the class schedule for the purpose of the weekly progress report forms.

Contracting Form

Each subject was required to write out a contract for each class he or she needed to concentrate for. The contract had to include: the material to be studied, the manner in which the subject would study this material (for example, outline 20 pages, solve 20 problems, or answer 20 objectives), and the description of what the final product would be to indicate that the contract had been completed. The student needed to put their initials on the contract at that time. The student also needed to get the investigator's initials and final signature when the student finally filled out the contracting form. The investigator's signature and the student's signature has to appear on the contract before the student began his/her work on meeting the requirements of the contract. One point was awarded to the student who appropriately completed the contract. No points were awarded for an incomplete contract.

Contracting Quiz

To determine whether the subjects had the ability and the necessary skills to complete the contract form, the investigator presented each subject with a sample homework assignment and required the subject to fill out the contracting form. An example of the sample homework assignment would require the subject to read 10 pages from Chapter 1 for a history class. The subject would fill in the following: their

name at the top of the contract form, the date of the contract, the manner in which the subject intended to study the material, and their initials. Once the student completed the contract form, the investigator reviewed the contract form with the subject and pointed out any errors. Both experimental groups received the contracting quiz.

Weekly Progress Reports

The teachers were requested to fill out a weekly progress report form for their students who were involved in the study. The form sought the following information: (a) a rating of the student's progress over the past week, (b) an indication of how the rating was determined, (c) whether the teacher was giving a quiz or major assignment the following week, (d) and a description of what the quiz or major assignment would require the student to do. The purpose of the weekly progress report was to provide the investigator with the following information: (a) the weekly effects of the contracting classroom and the incentives on both experimental groups compared to the control group; (b) a reliability check for what the student was actually working on and what the teacher was assigning the student to do; and (c) an aid for the student to observe what class required more time, what assignments had to be completed for that week, and what progress was being made as a result of completing their homework assignments and filling out the contract form.

In the first session, the investigator explained to the experimental group the requirements of the contracting classroom, how to write a thorough and descriptive contract, and the incentives and

benefits of the contracting classroom for the student. The students in the first experimental group were informed that they needed to write 10 complete contracts per week in order to receive the incentive at the end of the week. The students in the second experimental group were informed that they did not have to meet the 10 contract requirement. At the end of the week, they still received the incentive no matter how many contracts they had completed. During this initial phase, the investigator gave each student a contracting quiz that required the student to answer questions regarding the necessary steps the student had to perform in filling out the contract form.

The investigator did not intervene with the control group except for the collection of weekly progress reports completed by their teachers and the collection of pre- and post-GPAs. The subjects assigned to the control group received a letter stating that due to limited enrollment they would not be able to participate in the program.

Procedure

Each contracting session lasted 60 minutes. There were 24 sessions over a period of 6 week. The student would come to the contracting classroom immediately following the normal school day every Monday through Thursday from 2:30 to 3:30. During this time, they would fill out a contracting form stating the necessary requirements needed to complete their homework assignment and/or prepare for an upcoming quiz. After filling out the form, the student would work to meet the criteria for completion of the contract. The investigator put a check mark after the word "complete" if the description/criteria of the contract was

operationally defined and, if upon completion of the contract, the investigator could measure the amount of material accomplished by the student. The investigator put a check after the word "incomplete" if the student did not appropriately write the description/criteria or did not appropriately complete the amount of material required by the contract. He also recorded with a check mark in the corresponding box whether the student (a) attended the contracting center at 2:30; (b) wrote a contract and had it signed by the investigator; (c) remained on task, except with the investigator's approval; (d) obtained feedback on the contract before leaving the contract classroom; (e) began working immediately after writing the contract; or (f) brought necessary materials to the classroom. The investigator left the corresponding box empty if the student did not meet the requirements. A half point was deducted from the student every time they received a check mark in any of the boxes found on the contract form (corresponding to the six areas above). The investigator collected all contract forms at the end of the contracting session. The points the student received for the contract could be used to acquire an incentive. The following were selected as possible incentives: free admission to the school dance, free admission to a high school athletic event, free admission to the school play, exemption from previously acquired Saturday detention, access to the school library after hours, and access to the school gym.

During baseline, the teachers were informed that they would be receiving weekly progress report forms to be filled out for their students who were in the program. The teachers were not told which stu-

dents were in the control group because they would fill out the weekly forms for all three treatment groups.

Both experimental groups were required to come to the contracting classroom daily at 2:30. The first experimental group worked to complete 10 contracts for the week, while the second experimental group would come to the contracting classroom and complete the number of contracts desired by the student for that day. This phase lasted for 3 weeks.

At the beginning of the 4th week the first experimental group was informed that they would no longer be required to complete 10 contracts per week in order to receive an incentive. The second experimental group was informed that they would be required to complete 10 contracts per week in order to receive an incentive. The investigator did not previously inform the experimental groups of this change. This phase also lasted 3 weeks. The study was terminated at the end of the grading period.

A monitor took reliability checks for a 60-minute session once a week. Reliability checks were made on the accuracy with which the investigator measured the completion of the contract form. The monitor determined the percent of reliability by utilizing the following formula: $\text{Agreements divided by (Agreements + Disagreements)} \times 100$.

At the end of the study, the investigator distributed a social validity survey to the experimental groups and the relevant teachers. The grade point averages were recorded.

CHAPTER III

RESULTS

The results of this study indicate that the contingent presentation of incentives for school work completed and the use of contracting for all classes was effective in improving the grade point averages of the students in the experimental groups during the 6-week period in which the study occurred.

Table 1 indicates that the difference between the mean GPAs for all three groups for the marking period prior to the study was not statistically significant at the .05 level.

Figure 1 and Table 1 show the effects of incentives contingent upon contract completion for the first experimental group during the first 3-week period. An analysis of variance for randomized block shows a significant difference between the groups with $F=7.806$ ($F_{critical}=4.46$), $p .05$. When comparing the mean GPA of the first experimental group (1.60) to the control group (0.40) after the first 3 weeks of the study, the first experimental group was significantly higher than the control group. The difference between the mean GPA of the first experimental group (1.60) and the mean GPA of the second experimental group (0.98) was not significant.

The first experimental group had the presentation of the incentive contingent upon the number of contracts completed; this group showed a statistically significant increase in their mean GPA of 0.594 after the first 3 weeks.

Table 1. The comparison between mean grade point averages of the experimental groups and the control group as a function of the marking period prior to the study, the first 3 weeks, and the second 3 weeks.

TABLE 1

| MARKING PERIOD PRIOR TO STUDY | | | | |
|-------------------------------|-------|-----------|-------------|------------|
| Groups | Mean | Std. Dev. | F. Obtained | F Critical |
| Experimental Group 1 | 1.006 | 0.30 | 0.6484 | 4.46 |
| Experimental Group 2 | .9924 | 0.35 | | |
| Control Group | .9282 | 0.45 | | |
| FIRST THREE WEEKS | | | | |
| Groups | Mean | Std. Dev. | F Obtained | F Critical |
| Experimental Group 1 | 1.60 | 0.74 | 7.806 | 4.46 |
| Experimental Group 2 | 0.98 | 0.66 | | |
| Control Group | 0.40 | 0.42 | | |
| SECOND THREE WEEKS | | | | |
| Groups | Mean | Std. Dev. | F Obtained | F Critical |
| Experimental Group 1 | 1.17 | 0.63 | 1.248 | 4.46 |
| Experimental Group 2 | 1.40 | 0.91 | | |
| Control Group | 0.73 | 0.69 | | |

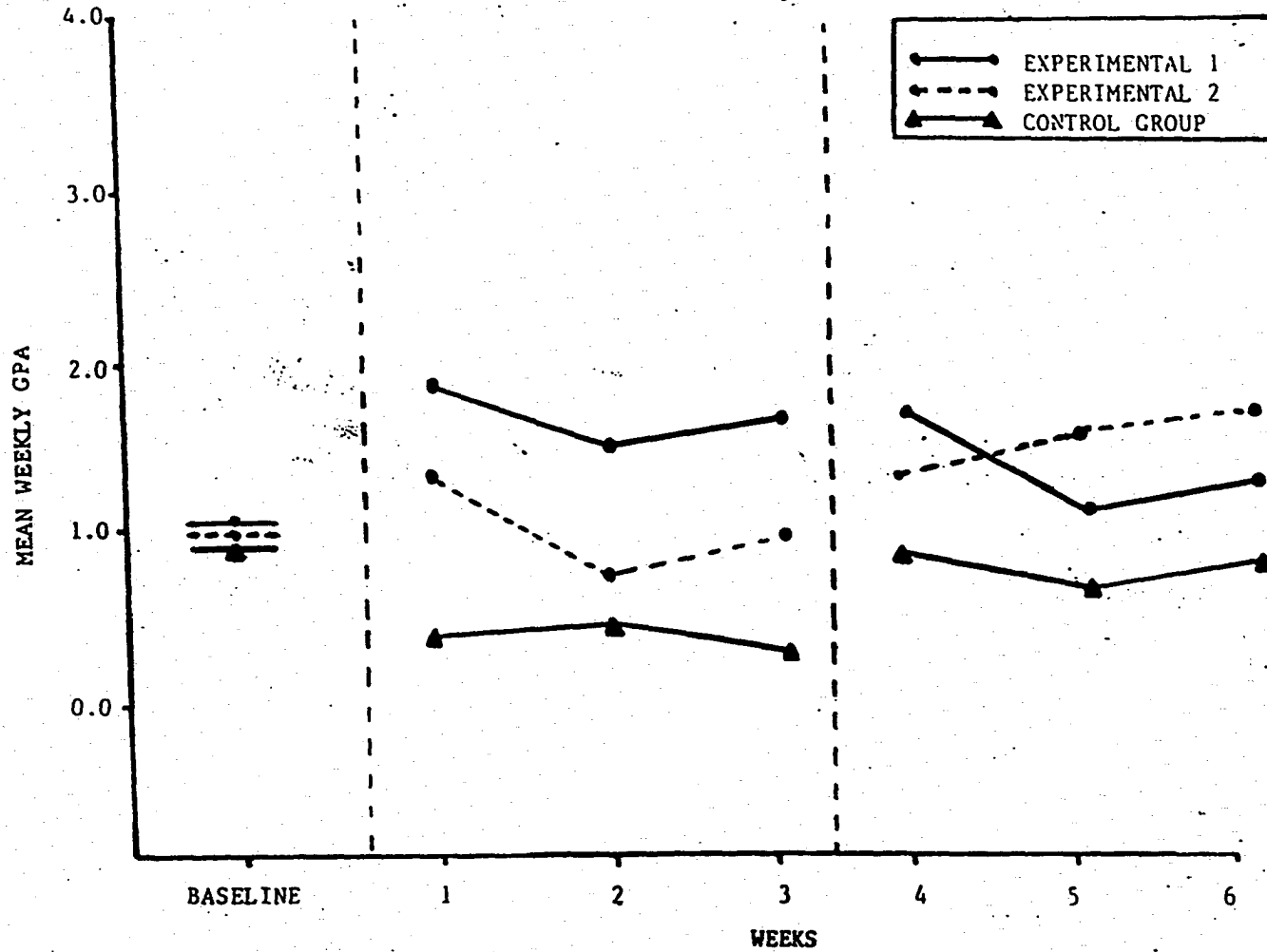


Figure 1. Mean weekly GPA for the control group and the experimental groups.

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However, the second experimental group that received the incentive noncontingent upon contract completion showed a nonsignificant decrease in their mean GPA of 0.0076. The control group showed a significant decrease in their mean GPA of 0.5282.

For the second 3-week period, Table 1 and Figure 1 indicate the effects of the second experimental group receiving the incentive contingent upon contract completion and the effects of the first experimental group receiving the incentive noncontingent upon contract completion. An analysis of variance for randomized block did not indicate a significant difference between the three groups with $F=1.248$ (F critical-4.46), $p .05$. However, the second experimental group showed a statistically significant increase of 0.42 in their mean GPA; whereas, the first experimental group showed a significant decrease of 0.43 in their mean GPA. The control group showed a significant increase of 0.33 in their mean GPA for this second 3-week period.

Table 2 shows a comparison of the GPAs of students for the first 3 weeks and for the second 3 weeks for both experimental groups. Four subjects in the first experimental group had a decrease in their GPA, while one student decreased to the point of failing all courses. Four subjects in the second experimental group had an increase in their GPA, while one subject decreased in their GPA. Figures 1 and 2 support the data shown in Table 1 by comparing the experimental groups to the control group for each of the matched triads.

Figure 4 is a bar graph that indicates the number of individual course grade improvements for both experimental groups. There were 8

Table 2. The comparison between grade point averages of students after the first 3 weeks and after the second 3 weeks for the first experimental group and the second experimental group.

TABLE 2

| Experimental Group 1 | | |
|----------------------|------------------------|-------------------------|
| Subject | After First 3 Weeks | After Second 3 Weeks |
| 1 | 0.75 | 0.25 |
| 2 | 1.40 | 1.00 |
| 3 | 1.33 | 1.33 |
| 4 | 2.75 | 2.00 |
| 5 | 1.75 | 1.25 |

| Experimental Group 2 | | |
|----------------------|------------------------|-------------------------|
| Subject | After First 3 Weeks | After Second 3 Weeks |
| 1 | 0.33 | 1.00 |
| 2 | 0.25 | 0.00 |
| 3 | 1.17 | 1.75 |
| 4 | 1.50 | 2.25 |
| 5 | 1.67 | 2.00 |

NOTE: Maximum grade point average = 4.0.

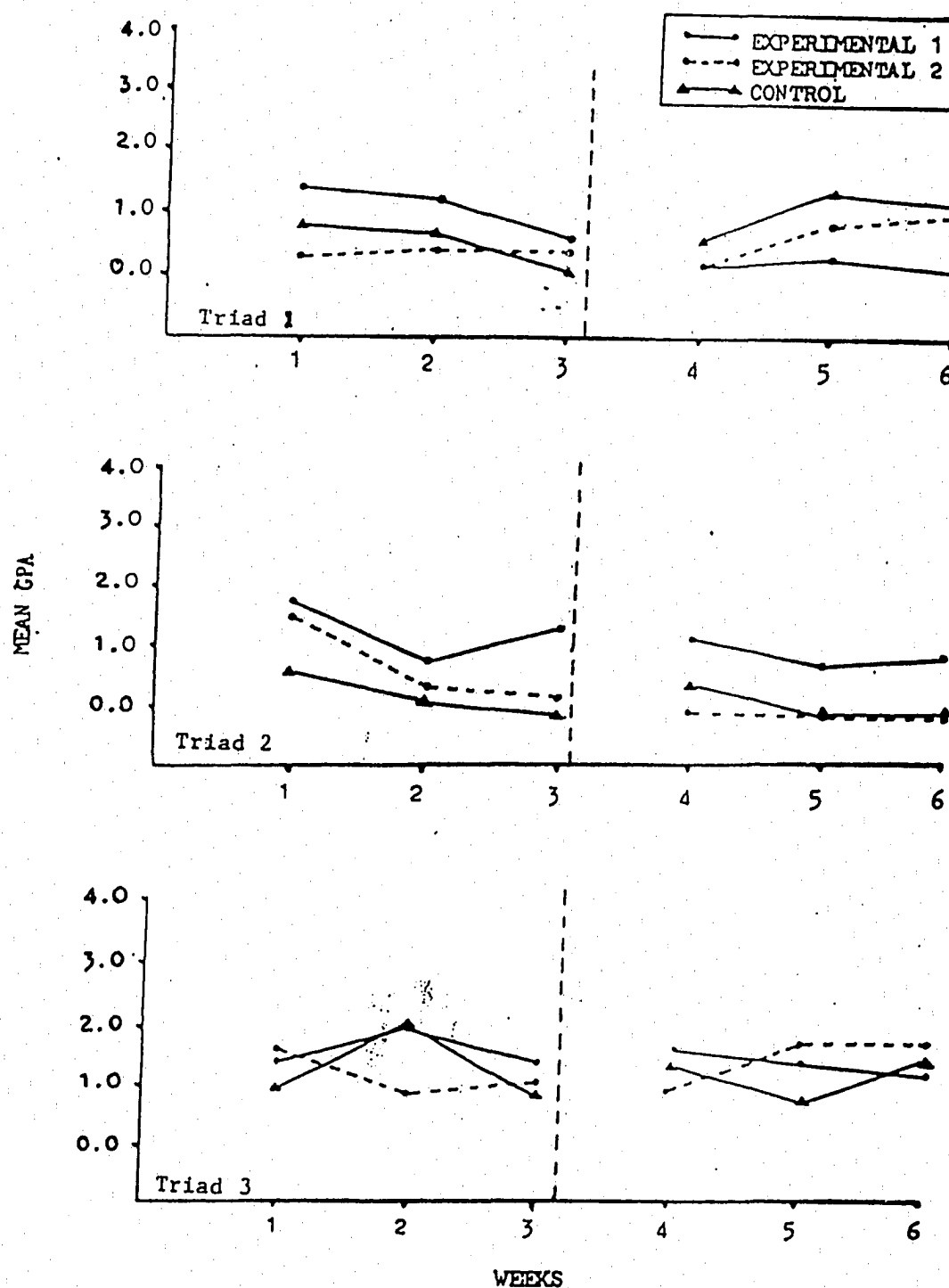


Figure 2. Mean GPAs of students in the control group and the experimental group for each matched triad.

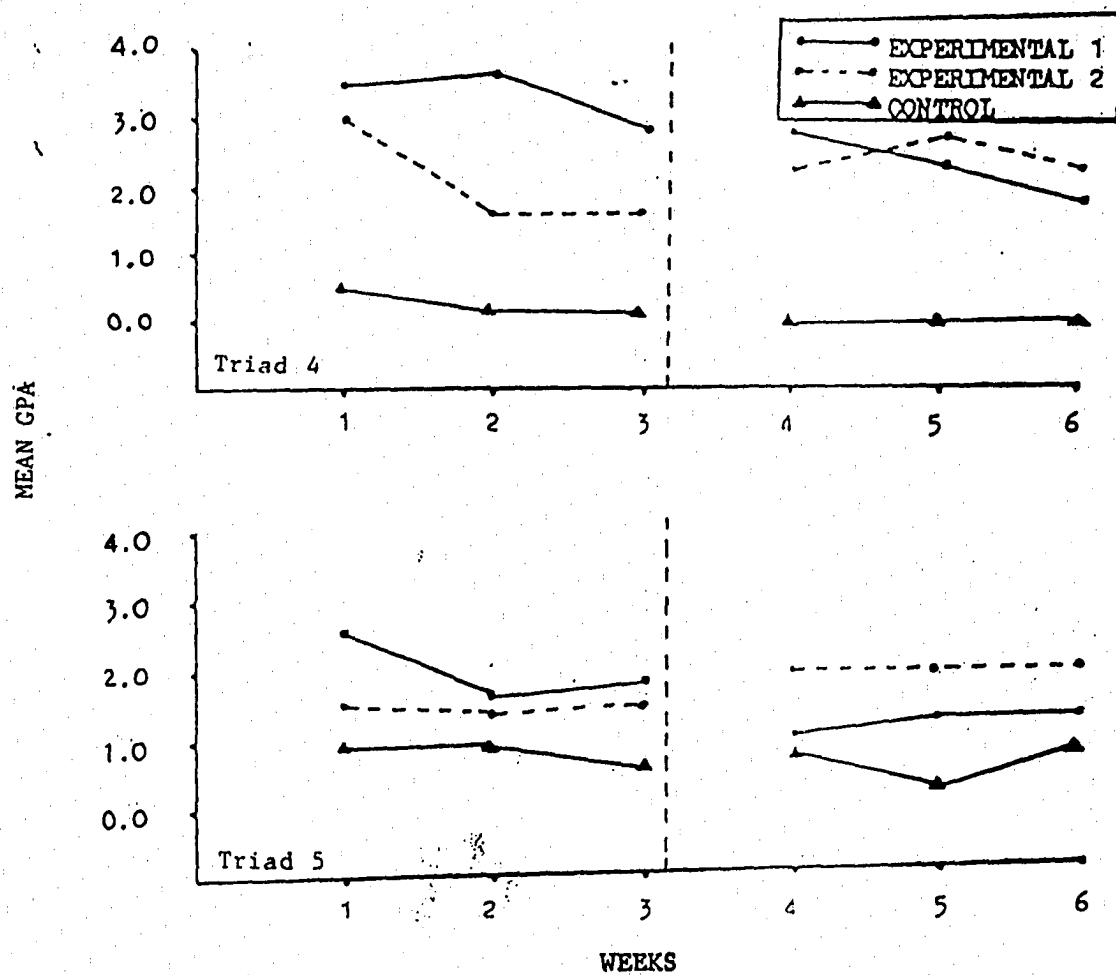


Figure 3. Mean GPAs of students in the control group and the experimental group for each multiple triad.

students out of 10 experimental subjects who improved in at least one of their courses. One student improved in five out of the six courses they were taking at the time of the study and two students showed improvement in four of their courses.

Two students in the control group improved their course grade in only one class. The remaining three students in the control group showed no improvement in any of their courses. All of the students in the study were enrolled in the same classes as in the previous marking period.

The percentage of on-task behavior for the experimental groups during the first 3 weeks is shown in Figure 5. Both experimental groups had difficulty remaining on task and beginning their work immediately. Overall, Figure 5 shows a higher percentage of on-task behaviors for the first experimental group when compared to the percentage of on-task behaviors for the second experimental group.

Figure 6 represents the percentage of on-task behavior both experimental groups exhibited during the second 3-week period. The second experimental group exhibited a higher percentage of on-task behaviors when compared to the first experimental group. However, the lowest percentage still occurred when the student was required to remain on task or to begin work immediately.

Figure 7 shows the percent of contracts completed for both experimental groups. During the first 3-week period, the first experimental group completed 91% of all of the contract written. However, the second experimental group completed only 69% of all the contracts written. For the second 3-week period, the first experimental group

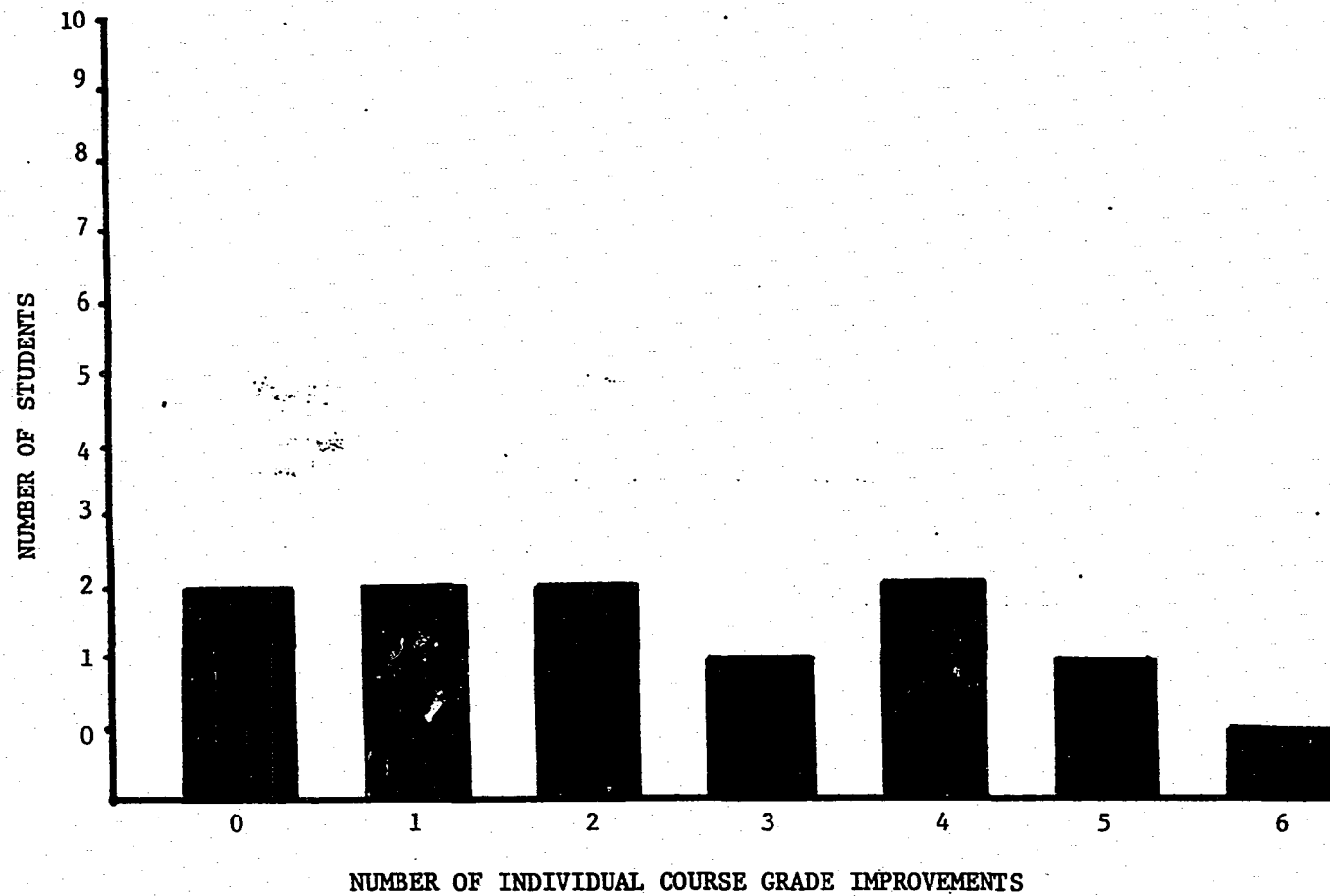


Figure 4. Number of individual course grade improvements for both experimental groups.

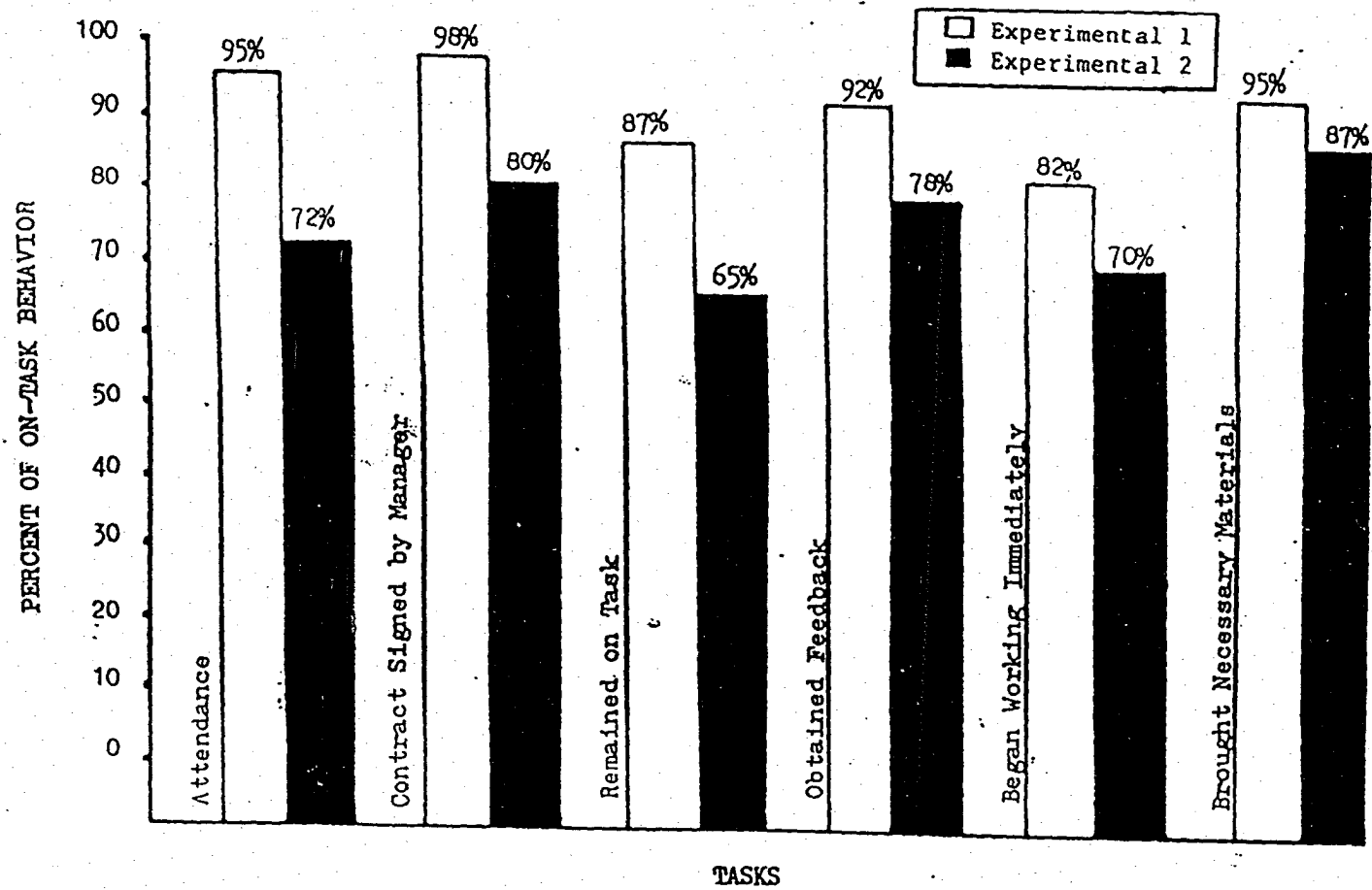


Figure 5. Percent of on-task behavior for each of the six contract tasks for the first 3 weeks.

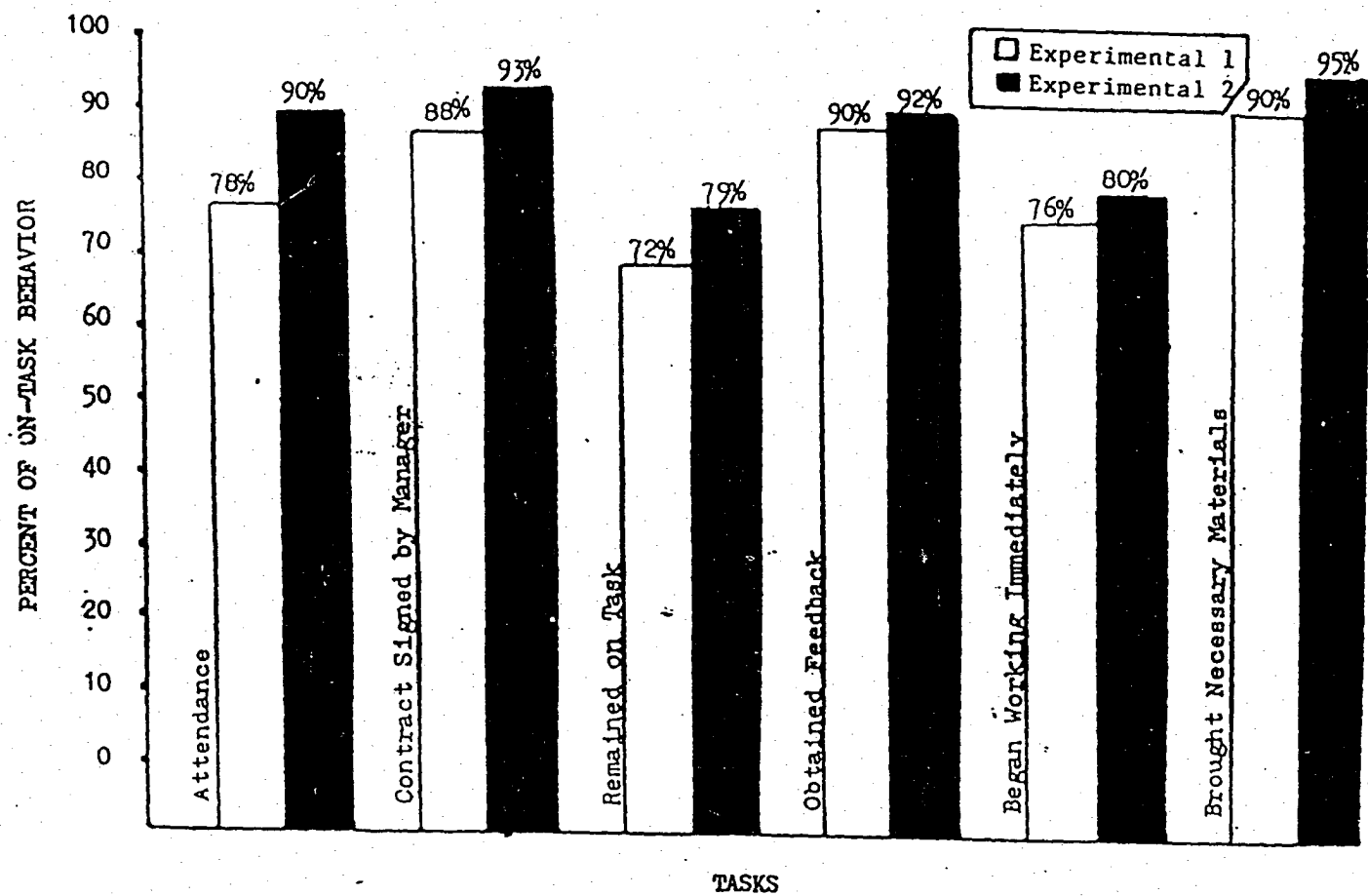


Figure 6. Percent of on-task behavior for each of the six contract tasks for the second 3 weeks.

completed only 73% of the contracts written, whereas, the second experimental group completed 85% of all of the contracts written.

A monitor conducted reliability on the accuracy with which the investigator determined whether the contract was complete or incomplete and whether the student exhibited on-task behaviors (Figures 5 and 6). There was 97% reliability between monitor and investigator.

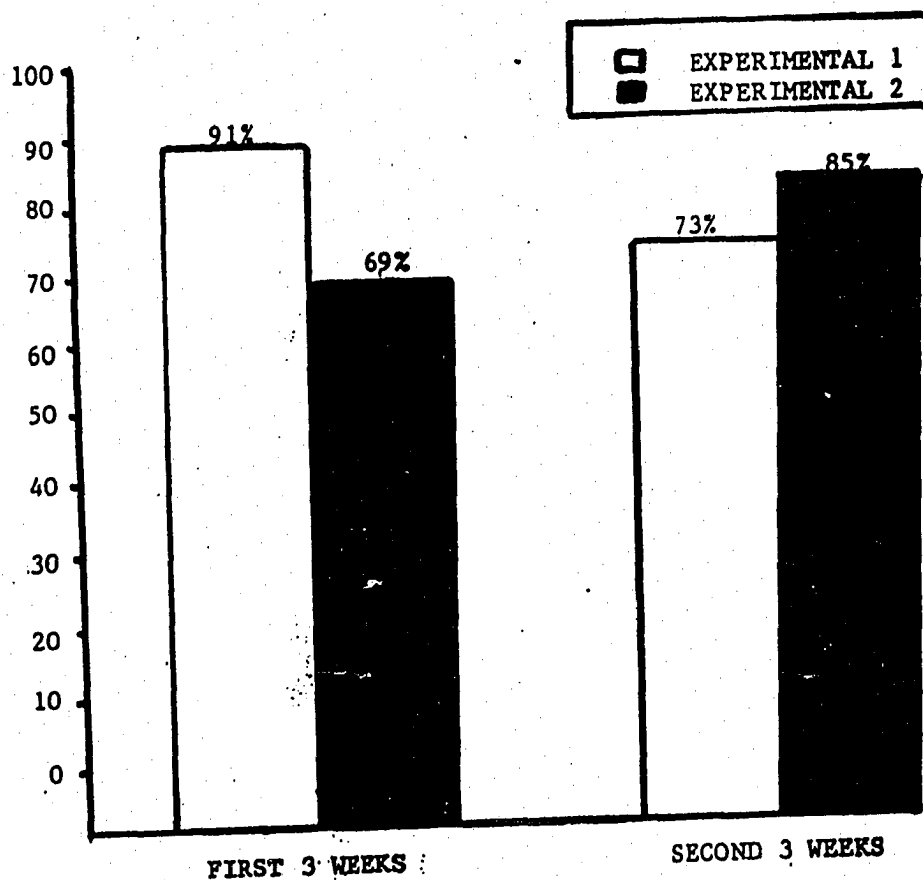


Figure 7. Percent of contracts completed for both experimental groups during the first and second 3 weeks.

CHAPTER IV

DISCUSSION

The present study investigated the effects of contracting for all classes and the contingent presentation of incentives for school work completed on academic achievement. This approach supported the notion that the student can increase their course grade and improve their academic performance as a function of an incentive being contingent upon contract completion.

At the end of the first 3-week period, the data showed a significant difference between the first experimental group (incentives being contingent upon contracts completed) and the control group. Although the results were not significant at the end of the second 3-week period, the second experimental group showed an increase in GPA. This increase for the second experimental group was due to the change in experimental conditions where the incentive became contingent upon the number of contracts completed. However, the first experimental group GPA decreased when no longer required to complete a specific number of contracts to receive an incentive.

The study was consistent with Baily, Wolf, and Phillips (1970) and Cohen et al. (1971) who showed the effectiveness of using back-up reinforcers to improve student performance. The incentives used in the present study were chosen by the subjects as possible back-up reinforcers for completing the contract. This approach was similar to that of Lovitt and Curtiss (1969) where an improvement in student performance

occurred when the subjects chose their own incentives.

The teachers, the students, and the parents viewed the study positively. During an informal faculty meeting, the teachers expressed their support for the study in the hope that it would save them time and energy and would help improve the performance of their low-achieving students. The students' reactions regarding the usefulness of the study varied.) Eight of the students in the experimental groups indicated that they needed to work on their study behavior. There were two students who mentioned that they were failing their classes so their parents would have to send them back to their previously attended high school. The parents also were verbal in their acceptance of the goals of the study. One parent wrote on the signed letter, "As a parent who has struggled with this problem for some time, I applaud your action and thank you for your help."

The present study attempted to design an optimally effective contracting system. There were some problems that caused the system to be less effective in improving student performance. A problem associated with the study was that it had to take place after school hours. First, the investigator could not have sufficient contact with the relevant teachers. The only time the teachers were available for discussing student progress was after school hours. Since the investigator needed to monitor the contracting classroom after school, the opportunity to contact the teacher was extremely limited. A problem associated with this lack of teacher contact occurred when the student had been given a homework assignment that was not adequately defined.

Secondly, there were several competing reinforcers available

(for example, athletic team practices, going home) after school for these students and this affected attendance rates and their on-task behavior. This analysis was consistent with Malott (1974) in that these competing reinforcers were sizable, immediate, and highly probable exerted more control over the student's behavior than the reinforcers associated with coming to the contracting classroom.

Another problem that occurred during the study was associated with the collection of the weekly progress forms. The investigator distributed the weekly progress reports to 25 teachers each week. Five teachers refused to fill out the weekly progress reports and indicated that they did not grade the students on a weekly basis. At least three other teachers were inconsistent in returning the completed form. Williams and Anadam (1973) concluded in their study that a high level of teacher consistency had to occur in order for the behavior contracting system to be effective.

The final problem was one of investigator-to-student ratio. There were 10 subjects that came to the contracting classroom on a daily basis. The only supervisor of the contracting classroom was the investigator. He was the only one in charge of reviewing all contracts written by the student and filling out the on-task behavior checklist for each student. The 1-to-10 investigator-to-student ratio limited the availability of the investigator to observe specific study behaviors exhibited by the students.

Polzynski (1977) indicated that there were only a few studies that occurred in the high school setting the common feature found in these studies was that the student contracted with only one teacher for only

one class. The present study showed the effectiveness of the behavioral contract for all classes in which the high school student was enrolled. The study demonstrated that the presentation of a sizable, highly probable, and significant incentive for a specified amount of study behavior causes an increase in the student performance.

Fox (1966) discussed the notion that the low-achieving student is under poor stimulus control. As the data show in Figures 5 and 6, the lowest percentage of on-task behavior occur when the student was required to fulfill the contract and when the student was required to begin working immediately. Only these two tasks (fulfilling the contract and beginning work immediately) required the student to independently attend to relevant stimuli associated with the homework assignment. However, the students exhibited a variety of off-task behaviors such as: cleaning out their notebooks, staring out the window, talking and asking irrelevant questions. At first, the students required constant feedback regarding how they should study the material. By the end of the second week, the students were able to work on their homework assignments with little assistance.

The weekly progress reports were shown to each student. There were four students who wanted the reports copied so that could bring them home to show their parents. All of the students expressed that they weren't aware of exactly how good or how bad they were doing in the classes. The progress report provided the student with this information and served as a means by which the student could observe their performance in a specific class. It also provided the student with relevant information regarding an upcoming quiz or major assign-

ment due date.

Cost-Effective Analysis

The investigator ran a cost-effective analysis to determine how much time was required by the teacher, the student, the parent, and the investigator to run the program. The teachers reported spending an average of 3 minutes for every progress report form. The number of progress report forms the teacher had to fill out each week ranged from 1 to 10. This information was obtained from the social validity survey. The student spent 4 hours per week coming to the contracting classroom. The parents of the students who had to make a special trip to school to up their son or daughter spent an average of 30 minutes per trip (2 hours per week). The time spent by the investigator in the contracting classroom was 4 hours per week, the time spent filling out the weekly progress report forms for all of the student's class was 2 hours, the time spent graphing data was 2 hours per week, and the time spent filing the progress report forms, contracts, and on-task data was 1 hour. Therefore, the total time the investigator spent per week running the program was 9 hours.

Four students in the experimental groups significantly increased their GPA for the marking period in which the study occurred which allowed them to go off academic probation. Due to the fact that they are no longer on academic probation, the assumption could be that these students will attend Hackett High School the following year. The average tuition cost at Hackett High School is \$2,000; therefore, the school would save \$8,000 by having these low-achieving students enroll

in the contracting classroom. The only expense to the school would be the payment of one teacher to spend 9 hours per week running the contracting classroom.

Social Validity Survey

Wolf (1978) advocated the use of a social validity survey to determine whether the subjects in the study and all those associated with the effects of the study were satisfied with the goals of the study, the method the investigator used during the study, and the results of the study. The last week of the study, a survey was distributed to both the relevant teachers associated with the study and the students in the experimental group.

Eighty percent of the teachers indicated that they were satisfied with the goals of the program. The negative comments regarding the goals were the need for more structure and more contact with teachers in letting them know more about the program. All but one of the teachers were satisfied with the weekly progress reports. The one teacher indicated they did not grade on a weekly basis and the form was not appropriate. During the present study and during the presentation of the social validity survey, the teachers were not aware of which students were in the experimental groups and which students were in the control group. Out of 25 social validity surveys distributed, the investigator received 15.

The investigator distributed a social validity survey to both experimental groups and found that eight of the students were satisfied with all components of the program (the goals, the method, and the

results) of the program. The two students who were not satisfied with the program did not attend the contracting classroom on a regular basis and did not show any improvement in any of their courses.

Recommendations

In the present study, the major goal was to help low-achieving students improve their academic performance. There is a need to continue recording student academic performance to determine whether this goal has been met. Such follow-up data would provide information regarding the acquisition of self-monitoring behavior and the effects of the contracting system.

The study center should occur during the regular school day. One possible solution is to offer the contracting classroom as an elective course the low-achieving student agrees to take as part of his or her course schedule. By having the contracting classroom occur during the day, the investigator will have more available contact time with the teachers to discuss any problems that may be occurring. During schools hours there would be the available source of student helpers that could assist the investigator in checking student contracts and answering questions regarding specific study material.

The amount of teacher input was crucial to the success of the contracting classroom. More time needs to be spent working with the teachers, explaining the goals of the program and the need for consistent and specific information regarding the students in the contracting classroom.

A final consideration would be the identification of the low-achieving student when they first enter in the high school setting. There is a need to have the low-achieving student participate in the contracting classroom as soon as possible. All of the students who were in the present study had a long history of academic failure.

APPENDICES

Dear Parent:

Currently at Hackett Catholic Central, there is a research project being conducted that involves students who are receiving low grades. The purpose of the project is to give those students who are achieving poorly an increased opportunity to analyze their current study habits and skills. The project will require the student to fill out written contracts on their homework assignments and to attend the contracting classroom on a regular basis from 2:30 to 3:30, Monday through Thursday. The project will last from Feb. 4 to March 28. We, at Hackett Catholic, feel that we give a quality educational experience for your son or daughter and this project is an attempt on our part to help guide them towards achieving better grades.

The project will be conducted by Tom Harwood, a masters student in clinical psychology at Western and the mens' and womens' tennis coach at Hackett Catholic Central. The principal and the guidance counselor will be consultants for this project.

Students that become involved in the project are taken on a volunteer basis. All student records and names will be kept strictly confidential and data from the project will only be available upon request to the parents, principal, guidance counselor, and the teachers involved in the project.

Enclosed you will find a self-addressed envelope to be filled out and sent back to Hackett Catholic as soon as possible. If you have any further questions, please feel free to contact Tom at his home (327-3307) or his office (383-0039). Thank you for your time and cooperation.

Sincerely,

Thomas R Harwood

Thomas R. Harwood

Richard J Martin

Mr. Richard Martin

Nora Wade

Ms. Nora Wade

☐

Yes, I would like my son/daughter involved in the research project.

☐

No, I am not interested at this time.

Parent Signature _____

Appendix B

CONTRACT FORM

38

Student Name _____

| <u>Date</u> | | <u>Initials</u> | <u>Results</u> |
|-------------|----------------------------------|--------------------------|------------------------------------|
| _____ | Contract #1-Description/Criteria | Std. _____ Mgr. _____ | Complete _____ Incomplete _____ |
| _____ | Contract #2-Description/Criteria | Std. _____ Mgr. _____ | Complete _____ Incomplete _____ |
| _____ | Contract #3-Description/Criteria | Std. _____ Mgr. _____ | Complete _____ Incomplete _____ |
| _____ | Contract #4-Description/Criteria | Std. _____ Mgr. _____ | Complete _____ Incomplete _____ |
| _____ | Contract #5-Description/Criteria | Std. _____ Mgr. _____ | Complete _____ Incomplete _____ |
| _____ | Contract #6-Description/Criteria | Std. _____ Mgr. _____ | Complete _____ Incomplete _____ |
| _____ | Contract #7-Description/Criteria | Std. _____ Mgr. _____ | Complete _____ Incomplete _____ |

Manager's Signature _____

Appendix C

ON-TASK BEHAVIOR CHECKLIST

39

1. Attended contracting center at 2:30.
2. Wrote a contract and had it signed by manager.
3. Remained on-task, except with manager approval.
4. Obtained feedback on contract and review before leaving center.
5. Began working immediately after writing contract.
6. Brought necessary materials to center.

| MON | TUES | WED | THUR |
|-----|------|-----|------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

STUDENT PROGRESS REPORT

40

TEACHER _____

STUDENT _____

CLASS _____

- 1) Please rate _____'s progress for the week of _____,
(circle one)

| | | | | |
|---|---|---|---|---|
| 4 | 3 | 2 | 1 | 0 |
| A | B | C | D | E |

- 2) How is the rating determined? (circle all that apply)

- a) Quiz scores
- b) Papers
- c) Homework assignments
- d) Other:

- 3) Are you giving a quiz or major assignment next week?
If yes, please explain:

- 4) If you would like to make any additional comments, please feel
free to write them here.

Please place this form in my mailbox in the main office sometime on Monday.

Tom Harwood

CONTRACTING CLASSROOM SURVEY

41.

The following is a survey attempting to determine the strengths and weaknesses of the Contracting Classroom as perceived by the teachers. Your responses will help any future Contracting Classroom be more effective and efficient. Your comments will be kept anonymous. Please place the completed survey in my mailbox by the end of the day.

Thank you for your time and cooperation.

Time limit: 15 minutes

Tom Harwood

- 1) Are you satisfied with the goals of the Contracting Classroom?

YES NO (circle one)

If no, what would you change?

- 2) Are you satisfied with the method by which the weekly progress reports were given?

YES NO (circle one)

If no, what would you change?

- 3) Are you satisfied with any changes that you noticed in your students' performance?

YES NO (circle one)

If no, what would you change?

- 4) How many progress reports did you fill out each week?

- 5) How long did it take to fill out the progress report forms?

- 6) Are you satisfied with the format of the progress report form?

YES NO (circle one)

If no, what would you change?

- 7) Any additional comments about the Contracting Classroom?

CONTRACTING CLASSROOM SURVEY

42

The following is a survey attempting to determine the strengths and weaknesses of the Contracting Classroom as perceived by the students. Your responses will help any future Contracting Classroom be more effective and efficient. Your comments will be kept anonymous.

Time Limit: 15 minutes

- 1) Are you satisfied with the goals of the Contracting Classroom?
YES NO (circle one)
If no, what would you change?
- 2) Are you satisfied with the method in which incentives were given?
YES NO (circle one)
If no, what would you change?
- 3) Are you satisfied with any changes that you noticed in your academic performance?
YES NO (circle one)
- 4) Are you satisfied with the format of the Contracting Classroom?
YES NO (circle one)
- 5) Any additional comments:

BIBLIOGRAPHY

- Arwood, B., Williams, R., and Long J. The effects of behavior contracts and proclamations on social conduct and academic achievement in a ninth grade English class. Adolescence, 1974, 9, 425-436.
- Bailey, J.S., Wolf, M.M., and Phillips, E.I. Home-based reinforcement and the modification of pre-delinquents' classroom behavior. Journal of Applied Behavior Analysis, 1970, 3, 223-233.
- Bednar, R.L. and Weinberg, S.L. Ingredients of successful treatment programs for underachievers. Journal of Counseling Psychology, 1970, 17, 1-7.
- Birdwell, J. Behavioral contracts in reading and study. Reading Improvement, 1972, 8, 92-94.
- Bolstad, O.D. and Johnson, S.M. Self-regulation in the modification of disruptive classroom behavior. Journal of Applied Behavior Analysis, 1972, 5(4), 443-454.
- Brigham, T. and Amith, M. Using conditional contingency contracting to improve academic work. Educational Technology, 1973, April, 60-61.
- Cantrell, R.P., Cantrell, M.L., Huddleston, C.M., and Wooldridge, R.L. Contingency contracting with school problems. Journal of Applied Behavior Analysis, 1969, 2, 215-220.
- Clements, C.B. and McKee, J.M. Programmed instruction for institutionalized offenders: Contingency management and performance contracts. Psychological Reports, 1968, 22, 957-964.
- Cohen, S.I., Keyworth, J.M., Kleiner, R.I., and Liebert, J.M. The support of school behaviors by home-based reinforcement via parent-child contingency contracts. In E.A. Ramp and B.L. Hopkins (Eds.) A new direction for education: Behavior Analysis. Lawrence, Kansas: Department of Human Development, University of Kansas, 1971, 282-308.
- Dee, V.D. Contingency management in a crisis class. Exceptional Children, 1972, 38, 631-634.
- Fox, L. Effecting the use of efficient study habits. In R. Ulrich, T. Stachnik, and J. Marby (Eds.), Control of Human Behavior, Glenview, Ill: Scott Foresman, 1966.

- Gottman, J.M., and McFall, R.M. Self-monitoring effects in a program for potential high school dropouts: A time series analysis. Journal of Consulting and Clinical Psychology, 1972, 39(2), 273-281.
- Harris, M.B., and Ream, F. A program to improve study habits of high school students. Psychology in the Schools, 1972, 9, 325-330.
- Homme, L. Human motivation and the environment. In N. Haring and R. Whelan (Eds.) The learning environment: relationship to behavior modification and implications for special education. Lawrence, Kansas: University of Kansas Press, 1966.
- Homme, L., Csanti, A., Gonzales, M., and Rechs, J. How to use contingency contracting in the classroom. Champaign, Ill: Research Press, 1969.
- Lovitt, T.C. and Curtiss, K.A. Academic response rate as a function of teacher and self-imposed contingencies. Journal of Applied Behavior Analysis, 1969, 2, 49-53.
- MacDonald, W.S., Gallimore, R., and MacDonald, G. Contingency counseling by school personnel: An economical model of intervention. Journal of Applied Behavior Analysis, 1970, 3, 175-182.
- Malott, R.W. A behavioral-systems approach to the design of human services. In D. Harshbarger and R.F. Maley (Eds.) Behavior analysis and systems analysis: An integrative approach to mental health programs. Kalamazoo, Michigan: Behaviordelia, Inc., 1974, 318-342.
- Polzynski, J.J. Contract learning--what have we done lately? Where are we going? New Directions in Teaching, 1977, 6, 1-18.
- Williams, R.L. and Anadam, K. The effects of behavior contracting on grades. Journal of Educational Research, 1973, 66, 230-236.
- Williams, R.L., Long, J.D., and Yoakley, R.W. The utility of behavior contracts and behavior proclamations with advantaged high school students. Journal of School Psychology, 1972, 10(4), 329-338.
- Wolf, M.M. Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. Journal of Applied Behavior Analysis, 1978, 11, 203-214.