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ABSTRACT

The comparative effectiveness of two student monitoring and reinforcement strategies was assessed among primary school students. The 50 participating students met in a multi-purpose instructional center during one of two sessions for academic periods of 30 minutes, three times a week. Students were assigned to one of six study groups in the center, one group for each multi-media learning station. Three target behaviors were identified and measured utilizing a variety of data collection procedures; the behaviors investigated were start up time, appropriate utilization of instructional hardware, and group decorum. Data were first collected during a teacher-monitored baseline condition. Subsequent interventions consisted of student-leader monitoring and student self-monitoring procedures. Across both interventions a token economy was introduced that allowed students to choose free time in the center as reinforcement. Results indicated that, in comparison with teacher-monitored baseline performance, both student monitoring strategies improved student behavior. Student-leader monitoring was more effective than student self-monitoring in managing the three targeted study behaviors. It is suggested that primary grade teachers might delegate to trained, student-leader monitors many managerial responsibilities that are related to study behaviors. (RH)

The Effects of Two Student Monitoring Procedures and Contingency Reinforcement on Three Task-Attending Behaviors

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Abstract

Fifty primary elementary level students were employed to test the comparative effects of two student monitoring strategies and contingency reinforcement on start up latency, appropriate utilization of instructional hardware, and group decorum. Both student monitoring strategies were superior to the teacher-monitored baseline conditions; however, student leader-monitoring was more effective than student self-monitoring in managing the three targeted study behaviors.

The Effects of Two Student Monitoring Procedures and
Contingency Reinforcement on Three Academic Task-Attending Behaviors

Over the past decade, self-monitoring procedures have accumulated a plethora of empirical support as an effective behavior change strategy. These procedures generally include providing a student with systematic data collection skills that enable him/her to accurately monitor and record pertinent aspects of a target behavior during a specific time frame (Karoly & Kanfer, 1982).

Self-monitoring techniques have been successful in a variety of instructional classroom arrangements. Within a tutorial environment, Braden, Hall, and Mitts (1971) made significant positive changes in two eighth grade students' inappropriate academic behavior by utilizing student self-monitoring procedures and subsequent social praise provided by the students' teacher and school counselor. Bolstad and Johnson (1972) were able to modify targeted students' disruptive behavior within a regular classroom setting by intervening with a combination of student self-recording and a token economy contingent reinforcement program. Self-recording procedures combined with contingent reinforcement were also successfully employed within a regular classroom environment with the participation of the entire classroom student membership (e.g., Cross & Drabman, 1982; Packard, 1970). Simmons and Wassik (1973) were able to replicate Packard's (1970) findings with an entire class participating through small group student leader-directed clusters within the regular classroom setting.

While self-monitoring procedures have effected positive academic and social behavior change, the utilization of these techniques has been primarily limited to students who reflect strong group cohesiveness through same homeroom-same peers identification (i.e., single group, classroom-wide membership). An additional feature of the single class setting is the extended time frame in which the self-monitoring procedures can be taught to the students. Since

academic instruction takes place under numerous organizational arrangements such as multiple option student schedules and departmentalization, the efficacy of differential monitoring procedures within these paradigms needs to be accomplished.

The purpose of the present study was to evaluate the comparative effectiveness of two student monitoring strategies coupled with individualized contingent activity reinforcement on a multi-homeroom student group, meeting during a restricted instructional time interval.

Method

Students and Setting

The 50 students who were selected to participate in this study had average or above average intellectual ability according to standardized group intelligence test scores. They were receiving instruction in an urban private religious school situated in the southwest region of the country. The students were at the 2.4 grade level at the commencement of the investigation and were at the 3.6 grade level when the study was completed 14 months later. The 50 students were randomly assigned and equally distributed to one of two classrooms. Random student assignment was accomplished twice over the course of the investigation, once at the beginning of the second grade year and once more at the beginning of the third grade year.

The students met in a multi-purpose instructional center during one of two sessions for academic periods of 30 minutes, three times a week. In the center, students were assigned to one of six study groups, one group for each multimedia learning station. Programmed instruction focused on mathematics and reading skills.

Targets and Behavioral Measures

Three target behaviors were identified and subsequently measured utilizing a variety of data collection procedures.

Start up time was defined as the amount of time necessary for each team member to commence assigned tasks at their learning station following the teacher's verbal cue to begin the day's lesson. For this target, latency data were collected.

Appropriate utilization of instructional hardware was defined as using headphones for listening purposes and teacher-designated students operating the audiotape equipment. Inappropriate use would be signified by pulling on the cords of the audiotape equipment, volume control readjustments, and talking into the microphone boom of the headphones. A momentary time sample was collected every six minutes on this target behavior.

The last target behavior was group decorum. This behavior was defined as all group members exhibiting rule-governed study behavior during the assigned lesson at the learning station. The rules for appropriate group decorum were: 1) all group members working on the same academic task; 2) all group members would be engaged in the same academic behavior (e.g., notetaking, sentence completion); and 3) group discussions would be at a volume level that would not distract other groups in the center. Inappropriate group decorum would be characterized by one or more students lagging behind his/her group in a lesson and loud, disruptive group discussions. This target behavior was measured by a momentary time sample collected every six minutes, during alternate three minute cycles with the other time-sampled target behavior, utilization of educational hardware.

Data Collection Procedures

For measurement purposes, data for the three targets were collapsed following the random assignment of the 12 study groups into data group A and data group B. This random assignment was instituted for the second grade interval and then repeated for the third grade interval.

Start up time data were collected by the teacher at the beginning of each

session. Group decorum data and utilization of instructional hardware data were collected by the teacher and the student monitors. The number of student monitors was determined by the particular monitoring intervention being employed. Regardless of the intervention, the teacher alternately collected data every three minutes between group decorum and utilization of instructional hardware (i.e., 2:03 decorum, 2:06 instructional hardware). The student monitors were given data recording sheets and instructed to collect target data 17 minutes and 23 minutes into the session. These times were signified by the teacher ringing a small bell. The teacher utilized a similar data collection instrument which supplied the interrater reliability.

The interrater reliability index indicates the amount of agreement between the teacher and student monitors in the collection of data on the target behaviors. This degree of reliability was determined by dividing the number of raters' agreements by the number of raters' disagreements plus agreements multiplied by 100. Utilizing the Simmons and Wassik scale (1973) across the interventions, the mean interrater reliability on group decorum and utilization of instructional hardware was 83%.

The raw data compiled on each data group for group decorum and utilization of instructional hardware were subsequently collapsed from four data points to two data points per target for each session.

Experimental Design

A multiple baseline design (Cooper, 1981) across data groups A and B allowed a comparison between preintervention and intervention data within the instructional setting. Similar results for both groups during intervention on the target behaviors and contrasting results while one group was receiving treatment while the other groups was delayed from treatment would isolate the effects of the independent variables. The four conditions included baseline, student-leader monitoring, student self-monitoring, and a return to student-

leader monitoring.

Procedures

Baseline. Baseline data collection began on the first day of the study and was terminated after four days. During baseline, the teacher managed the students through verbal cues presented in the form of praise and negative feedback. The teacher collected data on the three target behaviors. No student monitors were employed during this phase of the investigation.

Antecedent instruction. Baseline was followed by two days of antecedent instruction. During this interim period, the teacher reviewed with the students the three target behaviors and what constituted appropriate behavior for each target. A large poster was displayed in the center to remind the students about the appropriate criteria for the target behaviors. Concurrently, a token economy program (Walker & Shea, 1980) was introduced. The students chose free time in the center as the back up reinforcement contingency. Recording sheets were presented and all 50 students were taught the data collection skills necessary to accurately monitor and record group decorum behavior and utilization of instructional hardware behavior. The recording methodology consisted of utilizing a plus sign for appropriate target behavior and a minus sign for inappropriate target behavior at the designated monitoring intervals.

Intervention one. The first intervention, employing student-leader monitors, began on the seventh day of the study and was terminated after six days. During this intervention, each group selected a student leader who was solely responsible for the recording procedure. His/her record of the designated target behaviors when in compliance at the 80% level or better with the teacher's data dictated the award of a token to the group and the contingent reward of free time. The study groups elected leaders for each instructional session. The teacher continued to collect start up time data without student assistance.

Interim period. The interim period between the first intervention phase

and the second intervention phase began on the 13th day of the study and was terminated on the 135th day. During this period, no formal data were collected by the teacher on the target behaviors, and the token economy program was discontinued. However, the study groups continued to use student-leader monitors during this period. Prior to the commencement of the second intervention phase, structured contingent reinforcements were reintroduced to the students. At this time, the students elected to receive free choice of group membership and free choice of academic lessons in lieu of a free time period.

Intervention two. The second intervention, employing student self-monitoring procedures, began on the 136th day of the study and was terminated three days later for data group A and five days later for data group B. During this intervention phase, each student recorded his/her confidential evaluation of their individual performance relative to group decorum and utilization of instructional hardware. These evaluations were averaged for each group, compared to the teacher's data, and the majority evaluation (i.e., overall plus or minus) within the established reliability criteria dictated the award of tokens to the groups.

Return to intervention one. The reinstatement of the first intervention, employing student-leader monitors, was accomplished with data group A on the 140th day of the study and continued for six days. The return to intervention one was accomplished with data group B on the 141st day of the study and continued over a period of four days. During this phase, the study groups again selected student leaders to record their group's targeted behaviors.

Results

Figure 1 presents the average start up time for data groups A and B across the baseline and intervention phases of the investigation. As Figure 1 indic

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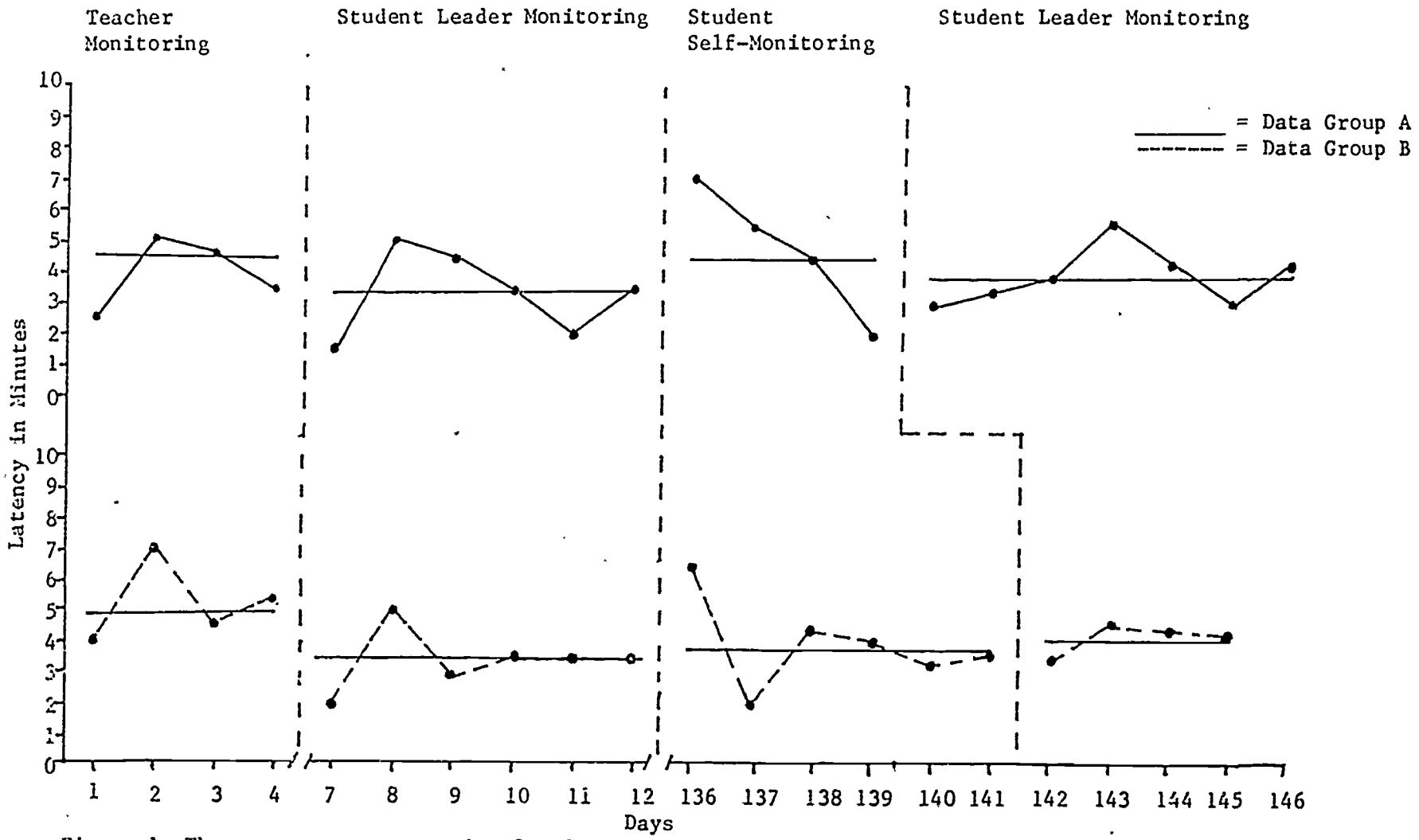

Figure 1. The average start-up time for data groups A and B across the baseline and intervention phases.

the average start up time during baseline was 4 minutes, 30 seconds for data group A and 5 minutes for data group B. During the student-leader monitoring condition, average start up time decreased 25% to 3 minutes, 30 seconds for data group A and 34% to 3 minutes, 20 seconds for data group B. During the student self-monitoring condition, average start up time increased 21% over the first intervention phase for data group A and increased 12% for data group B. However, both data groups A and B demonstrated slight (i.e., 2%) to moderate (i.e., 25%) average decreases in start up time latency behavior in the self-monitoring condition over baseline functioning. With the reinstatement of the student-leader monitoring condition, average start up time again decreased 9% over baseline and 8% over the second intervention to 4 minutes, 5 seconds for data group A. Upon the return to student-leader monitoring, average start up latency again decreased 24% over baseline but increased 2% over the second intervention to 3 minutes, 50 seconds for data group B.

Figure 2 presents the average percentage of appropriate utilization of instructional hardware for data groups A and B across the baseline and intervention phases of the investigation. As Figure 2 indicates, the average

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percentage of appropriate utilization of instructional hardware was 56% for data group A and 47% for data group B. During the first intervention phase (i.e., student-leader monitoring), data group A's average appropriate use of the equipment increased to 92% while data group B's average appropriate use increased to 88%. During the second intervention phase (i.e., self-monitoring), average appropriate utilization of instructional hardware declined to 80% for data group A and to 85% for data group B. With the reinstatement of student-leader monitoring, average appropriate use of hardware again increased to 89% for data group A and increased to 90% for data group B.

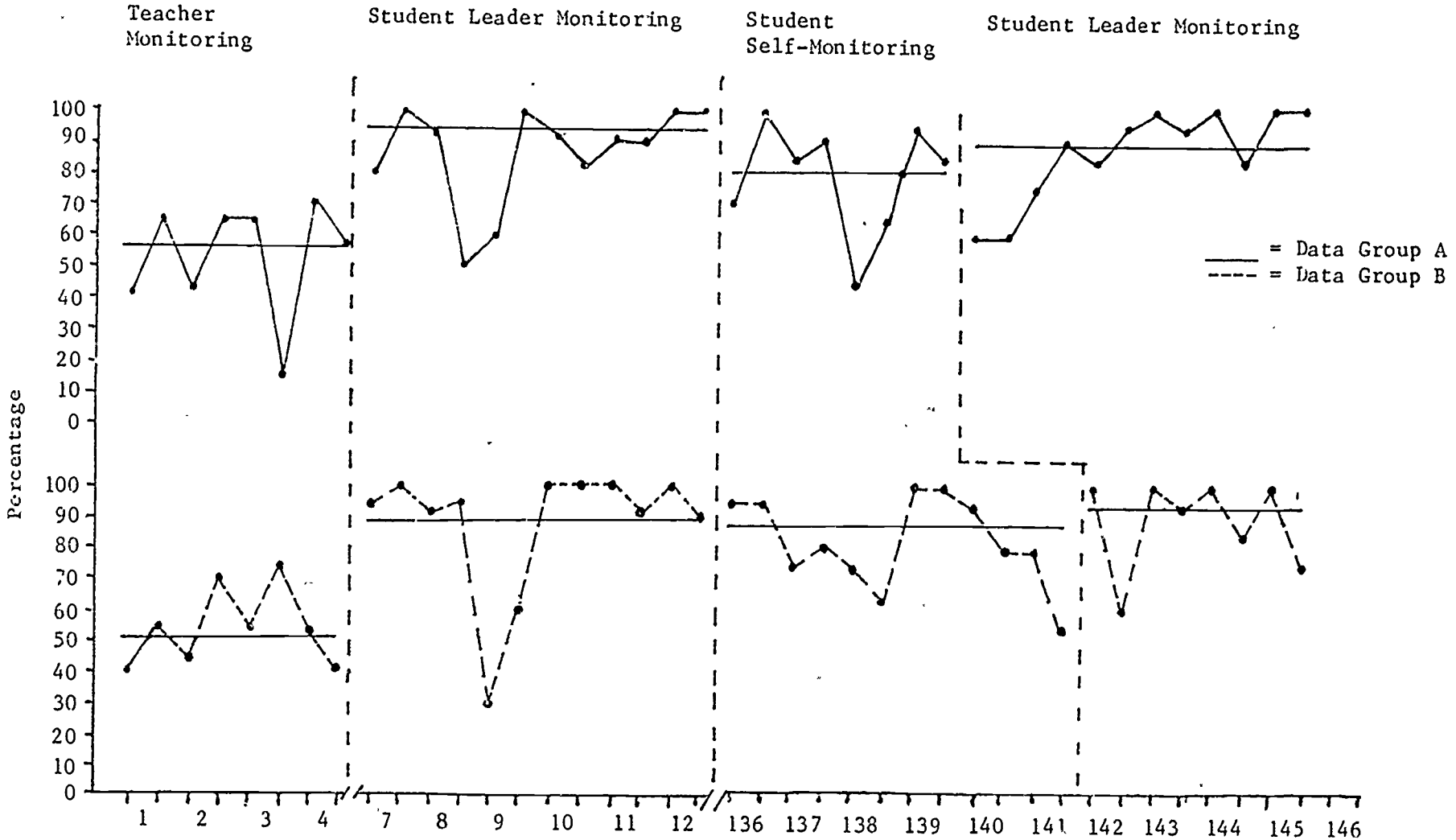

Figure 2. The average percentage of appropriate utilization of instructional hardware for data groups A and B across baseline and intervention phases.

Figure 3 presents the average percentage of appropriate group decorum for data groups A and B across the baseline and intervention phases of the investigation. As Figure 3 indicates, the average percentage of appropriate group

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decorum was 47% for data group A and was 47% for data group B. During the student-leader monitoring phase, the average appropriate group decorum was 90% for data group A and was 84% for data group B. During the student self-monitoring phase, the average appropriate group decorum declined over the first intervention to 70% for data group A and to 79% for data group B. With the reinstatement of the leader monitoring condition, the average appropriate group decorum rose again to 84% for data group A and 95% for data group B.

Combined treatment effects were compared to baseline functioning relative to each of the three target behaviors in order to demonstrate the overall effectiveness of student monitoring procedures. For start up time behavior, data group A had a 12% decrease and data group B had a 28% decrease over baseline. For appropriate utilization of instructional hardware, data group A had a 31% increase and data group B had a 39% increase over baseline. In group decorum, data group A had a 34% increase while data group B had a 39% increase over baseline.

Collapsed student-leader monitoring treatment effects were compared to student self-monitoring procedures relative to each of the three target behaviors in order to demonstrate the possible differential effectiveness of the two student monitoring techniques. Compared to student-leader monitoring, percentage of appropriate behaviors decreased in all three target behaviors during the student self-monitoring condition. For data group A, there was a 12% increase in start up time, a 10% decrease in appropriate utilization of instructional hardware, and a 17% decrease in appropriate group decorum. For

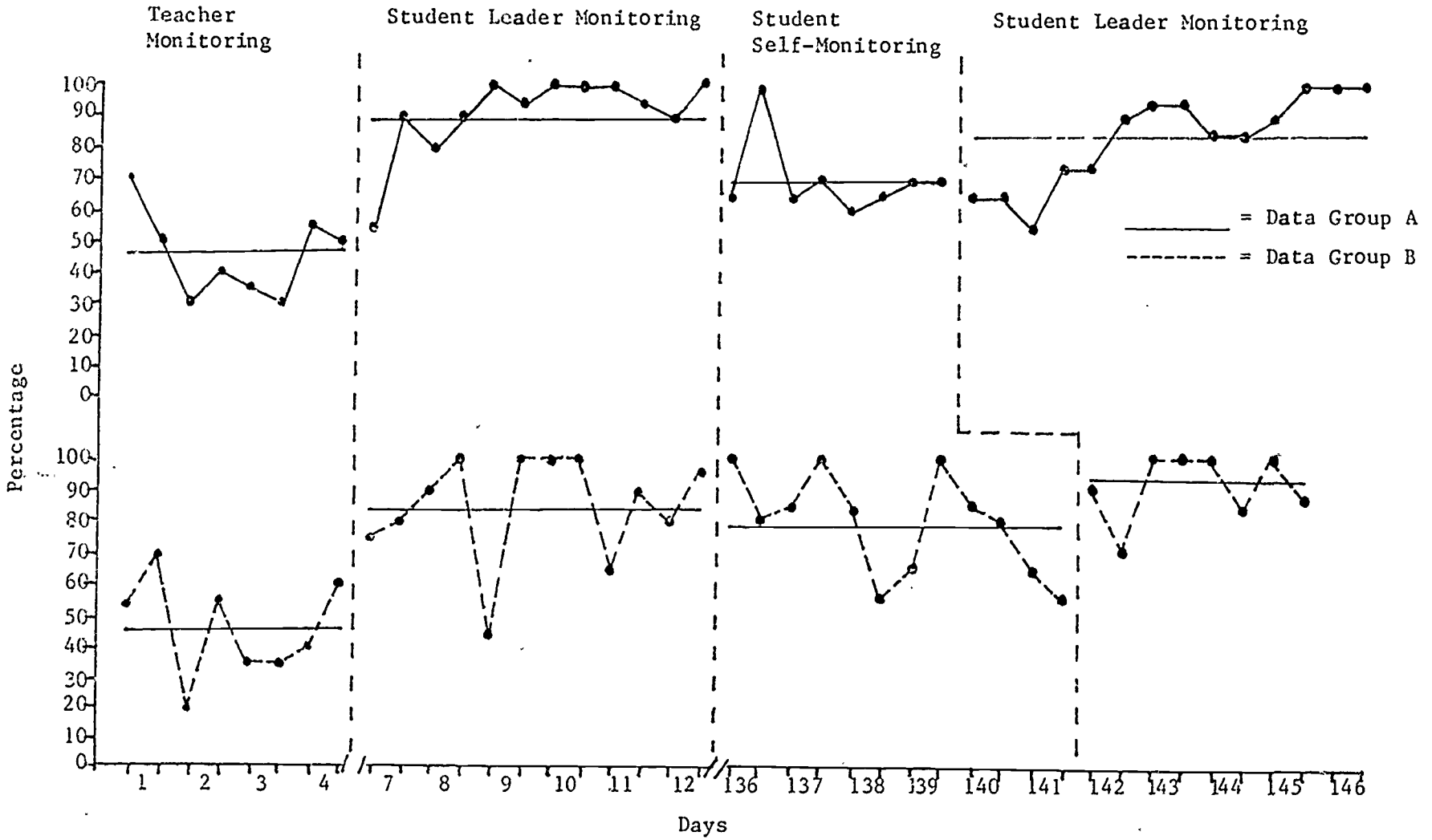

Figure 3. The average percentage of appropriate group decorum for data groups A and B across baseline and intervention phases.

data group B, there was a 5% increase in start up time, a 2% decrease in appropriate utilization of instructional hardware, and a 10% decrease in appropriate group decorum.

Discussion

Student self-monitoring techniques have been successful in positively influencing student academic and social target behaviors under a variety of instructional arrangements. In the present study, two student monitoring procedures were systematically implemented in a multi-purpose center with a multiple homeroom student group, meeting during a restricted time period. The data clearly indicates that both student monitoring procedures with contingent reinforcement were superior to the teacher-monitored baseline condition in affecting the targeted study behaviors. Furthermore, student leader-monitoring appeared more potent than the student self-monitoring procedure relative to the start up time latency period, appropriate utilization of instructional hardware, and appropriate group decorum. However, there are some weaknesses in the experimental design that must be addressed in future research on comparative student monitoring techniques.

Since the teacher did not employ a token economy system with contingent reinforcement during the baseline period, the relative merits of teacher-monitoring cannot be clearly ascertained under conditions that were not equivalent to the student-monitoring conditions. Concurrently, the two student-monitoring conditions within the multiple baseline across groups design present much more valid comparisons. It appears that for these primary grade students, leader-monitoring was a more superior technique to manage study behavior than the self-monitoring procedures. Perhaps developmental characteristics of primary grade students are more amenable to external behavioral management strategies. Yet it is also apparent in the present study that classroom teachers, even in the primary grades, might easily delegate many managerial responsibilities

related to student study behaviors to trained, student-leader monitors.

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