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ABSTRACT

This study examined the effectiveness of self-evaluation, self-observation, and self-observation plus self-recording in reducing disruptive classroom behaviors. The initial study was conducted with seven primary level students divided into the three treatment conditions, and a replication study was conducted with eight intermediate level students also divided into the three conditions. Students in the self-evaluation condition evaluated their behavior at the end of each class. Students in the self-observation conditions watched videotaped recordings of themselves and those in the self-observation plus self-recording also recorded their disruptive behaviors on a card. In general, the self-evaluation intervention did not result in concurrent changes in disruptive behaviors in either group. The self-observation alone treatment did not result in behavior changes in the primary level students, though decreases in problem behaviors were seen in the intermediate level students. However, the self-observation plus self-recording intervention was found to be effective in reducing disruptive behaviors in all the students receiving this intervention. Maintenance without further intervention was found for the intermediate level students. (Contains 41 references.) (DB)

The Effects of Self-Evaluation, Self-Observation, and Self-Observation Plus Self-Recording on the Occurrence of Disruptive Behaviors in Classroom: Extension Study

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FOR LEARNING TO OCCUR IN A CLASSROOM, STUDENTS MUST BE ABLE TO ATTEND TO THE assigned task. However, students with emotional and behavioral disorders (EBD) spend less time attending to required tasks and more time engaging in problem behaviors. Not only do these students fail to learn but their behaviors also disturb other students in the learning environment. As a result, teachers spend a disproportionate amount of their time managing inappropriate behavior, instead of focusing on academic instruction. Thus, the education of children with EBD has been a critical concern of both regular and special educators (Kauffman, 1989; U.S. Department of Education, 1991).

As Ritter (1989) indicated, the most significant areas of need for EBD students are nonacademic. In national surveys regarding programming and placement options for EBD students, Grosenick and Huntze (1980) found that school officials were most concerned about how to cope with the problem behaviors presented by EBD students. Walker and Rankin (1983) found that teachers' most unacceptable behaviors in their classroom were related to classroom control, general discipline, and compliance with teacher directives. Changing problem behaviors has long been the concern of teachers, administrators, and support staff (e.g., school psychologists, counselors) who have developed an array of intervention strategies to increase the occurrence of appropriate and decrease the occurrence of inappropriate behaviors.

Within the last decade, a number of treatments have been developed to decrease the disruptive behaviors of EBD students. Researchers have investigated the effectiveness of using self-management procedures to promote students' academic and social behaviors

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(Karoly & Kanfer, 1982; Mahoney & Thoresen, 1974). Various self-management procedures have been designed to teach students to manage their own behaviors. Among them, self-evaluation has been shown to be effective in many previous studies (Rhode, Morgan, & Young, 1983; Smith, Young, West, Morgan, & Rhode, 1988; Sweeney, Salva, Cooper, & Talbert-Johnson, 1993). In the self-evaluation procedure, students make their own judgement about their behavior or academic performance based on established criteria. Self-evaluation procedures have been studied, however, they have been incorporated into treatment packages that also include teacher or experimenter managed strategies (e.g., token economy, matching with teacher's evaluation, positive reinforcement).

Self-recording is another self-management strategy that has become an increasingly important and useful procedure for changing inappropriate behaviors because of ease of implementation (Lloyd, Bateman, Landrum, & Hallahan, 1989; Mclaughlin, 1984; Piersel, 1985). Self-recording is defined as the act of observing one's own behavior and the subsequent recording of its frequency. Self-recording has been used successfully with a variety of students and grade levels to increase students' behavior and academic productivity (Lloyd, Bateman, Landrum, & Hallahan, 1989; McLaughlin, 1984; Nelson, Lipinki, & Boykin, 1978; Piersel & Kratochwill, 1979; Studwell & Moxley, 1984; Sugai & Rowe, 1984). However, many previous uses of the self-recording procedure required external contingencies (e.g., token economy or rewards), external agents as observers, and an obtrusive self-recording device (Nelson, Lipinki, & Boykin, 1978; Piersel, 1985).

Another self-management strategy for behavior change is "self-observation" with videotape. "Self-observation" is defined as the process of observing one's self performing appropriate-only behavior (Dowrick, 1983). This definition assumes that occurrence of behavior is affected by the repeated observation of one's self on videotapes in which only desired behaviors are shown. Although self-observation with videotape is a relatively new strategy in school settings, it has been used successfully to improve children's behavior (Davis, 1979; Dowrick & Raeburn, 1977; Esveldt, Dawson, & Forness, 1974; Greelis & Kazaoka, 1979; Kehle, Clark, Jenson, & Wampold, 1986; Kehle, Owen, & Cressy, 1990; McCurdy &Shapiro, 1988; Weisbord, 1976; Woltersdorf ,1992). While the effect of self-observation appears to be immediate and relatively strong with respect to the amount of actual time spent viewing the edited videotapes, the procedure needs proper editing equipment and time and effort for editing each videotape to eliminate inappropriate behaviors. In addition, the immediate effect of self-observation on behavioral occurrences decreases because time elapses between acting in the real situation and viewing the edited tape (Sanborn III, Pyke, & Sanborn, 1975).

Progress is being made in the development and use of self-evaluation, self-recording and self-observation strategies to reduce disruptive classroom behaviors. However, they require the use of external contingencies, external agents, and obtrusive self-recording devices. Self-observation also requires editing time, effort, and equipment. The challenge is to develop interventions that (a) are easy and feasible for teachers to apply, (b) have immediate and durable effects, and (c) are more powerful compared to current treatments. The purpose of this study was to examine the effectiveness of self-evaluation, self-observation, and self-observation plus self-recording in reducing disruptive classroom behaviors.

Method

Subjects and Settings

For the initial study, seven primary level (kindergarten to second grade) students par-

ticipated in this study. All seven primary level students were divided into three treatment conditions: (a) self-evaluation condition (n=2), (b) self-observation condition (n=2), and (c) self-observation plus self-recording condition (n=3). Table 1 summarizes the characteristics of each subject in the initial study.

For the replication study, eight intermediate level (third to fifth garde) students participated in this study. All eight intermediate level students were divided into three treatment conditions: (a) self-evaluation condition (n=2), (b) self-observation condition (n=3), and (c) self-observation plus self-recording condition (n=3). Table 2 summarizes the characteristics of each subject in the replication study.

Table 1. Subjects' Characteristics of the Primary Students Study

Subject Condition	Age	Gender	Grade	Problem Behavior	Experimental
One	4	Male	K	Out of seat, Talking out	Self-Evaluation
Two	8	Female	2	Looking around, Talking out	Self-Evaluation
Three	6	Male	1	Talking out, Out of seat	Self-Observation
Four	9	Female	2	Looking around, Talking out	Self-Observation
Five	6	Female	1	Talking out, Out of seat, Tantrum	Self-Observation, Self-Recording
Six	7	Male	1	Out of seat, Talking out, Fights	Self-Observation, Self-Recording
Seven	7	Male	1	Looking around, Out of seat	Self-Observation, Self-Recording

Dependent Measures

Daily data collection occurred throughout all five phases (baseline, baseline with videotaping, instruction, intervention, and follow-up phases) of the study for all students by using a partial interval time sampling method. This time-based direct observation system required dividing the total observation intervals into small and equal intervals of time, and recording the occurrence or nonoccurrence of the target behavior during each interval (Tawney & Gast, 1984). Table 3 lists and defines each target behavior.

Experimental Procedures

A multiple baseline across subjects design was used to examine the effects of each intervention condition on displays of disruptive behavior. Experimental procedures and activities in the classroom focused on the five major phases of the multiple baseline design: (a) baseline, (b) baseline with videotaping, (c) instruction, (d) intervention (i.e., self-evaluation, self-observation, or self-observation plus self-recording), and (e) follow-up.

Baseline

In the first baseline, no video camera was present, and two observers recorded students' behavior during language arts or math class until relatively stable trends were noted for all subjects of each intervention group.

Baseline with Videotaping

During the second baseline, a video camera was used to record students' behaviors in math or language arts periods. Students were

Table 2. Subjects' Characteristics of the Intermediate Study

Subject Condition	Age	Gender	Grade	Problem Behavior	Experimental
A	9	Male	4	Looking around, Fights	Self-Evaluation
B	10	Male	4	Looking around, Short attention span	Self-Evaluation
C	10	Male	4	Out of seat, Talking out	Self-Observation
D	11	Male	5	Looking around, Talking out	Self-Observation
E	11	Male	5	Looking around, Talking out, Out of seat	Self-Observation
F	10	Male	4	Looking around, Talking out, Out of seat	Self-Observation, Self-Recording
G	10	Male	4	Talking out, Out of seat, Looking around	Self-Observation, Self-Recording
H	10	Female	4	Looking around, Talking out	Self-Observation, Self-Recording

told that (a) for a few weeks a graduate student from the university would be studying the daily activities of their classroom; (b) they should follow normal classroom routines and rules; (c) they should not talk to the person who operated the camera; and (d) if they had questions, ask the teacher after the class was over. This second baseline was used to accustom students to the presence of a video camera and to assess students' reactions to the video camera.

Instruction

Prior to the implementation of the interventions, each student in each treatment condition was instructed separately for 20 minutes. Using observable definitions and giving demonstrations (i.e., modeling) of each type of disruptive behavior, the investigator instructed students how to identify disruptive behaviors. Students in the self-evaluation condition received additional instruction on how to mark a picture on a self-evaluation card. The investigator modeled how to draw a circle around the picture that best expressed the student's degree of satisfaction with his or her classroom behavior.

Students in the self-observation plus self-recording intervention group received additional instruction on how to record their disruptive behaviors by using a recording card. By placing a slash on the recording card, the investigator modeled the self-recording response and then had the student practice self-recording.

Intervention

At the beginning of each math or language arts class, the investigator set up a video camera and taped the lesson and the students' behaviors. The last five minutes of each class lesson were used for the self-observation activity. The classroom teacher was instructed to teach the math or language arts class as she

normally would. At the end of class, the investigator asked the students in the self-evaluation condition to mark the picture on their self-evaluation cards that best expressed their level of satisfaction about their behaviors from that class. These cards were collected, and students were directed to their next activity.

At the end of the lesson, students in the self-observation intervention condition were asked by the investigator to go to an adjacent room to view a videotape of their classroom behaviors during language arts or math class. While viewing the last five minutes of the videotape, the investigator told the students to carefully watch their behaviors. At the end of the viewing, students were returned to the classroom and directed to their next activity. No other discussion about the videotape or the students' behavior occurred.

Immediately after math class, students in the self-observation plus self-recording condition went to an adjacent room and watched a videotape of the last five minutes from their class and were told by the investigator to watch and record their disruptive behaviors with a slash in the appropriate section of their self-recording card. The investigator gave occasional verbal praise when students recorded their disruptive behaviors. No other discussion about their behavior, self-recording, or the videotape took place. After viewing the videotape, the investigator asked the students to return to their classroom and directed them to their next activity.

Results

In general, the results from this study suggested that the use of the self-observation plus self-recording intervention was associated with observed decreases in disruptive student behaviors. The results of each intervention are described separately.

Effect of Self-Evaluation

The percentage of intervals in which disruptive behaviors was emitted by Subjects One and Two (primary level) and Subjects A and B

Table 3. Operational Definitions of Target Behaviors

Target Behavior	Code	Definition
Talking Out	T	The student speaks without raising one's hand and being acknowldeged by the teacher, or interrupts the teacher or another student who is talking (e.g., calling names, yelling, answering without permission).
Out of Seat	S	The student moves from his or her chair without teacher permission. The student is considered out of his or her seat if their buttocks ever leave the chair (e.g., standing up from chair, going other places in the classroom.
Making Noise	N	The student creates any audible noise other than vocalization (e.g., kicking desk, slamming boks on desk, tapping a pencil on desk).
Touching Others	O	The student touches others or their property with hands, feet, or objects or pulls other student (e.g., pushing, grabbing, any other physical contact).
Looking Around	L	Instead of looking at the teacher, study book, or notebook, the student looks at other places (e.g., looking at the wall, looking at other people across the room, looking at the floor or ceiling).

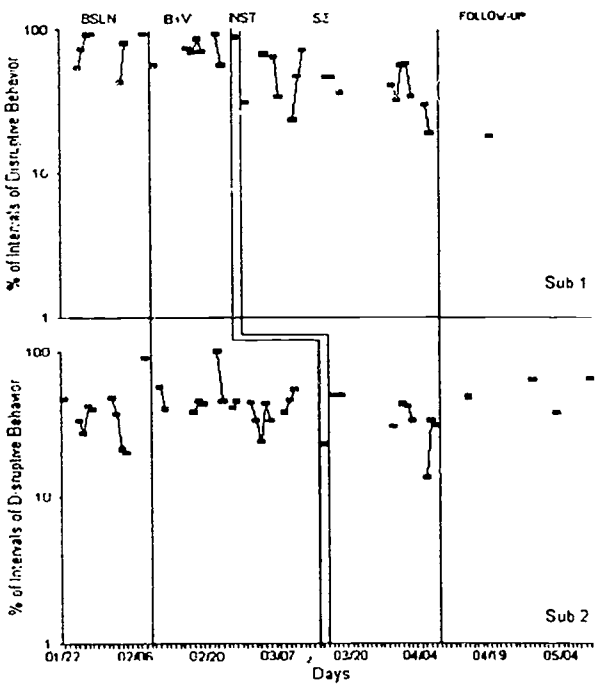
(intermediate level) by experimental phase is shown in Figures 1 and 2, and summarized in Tables 4 and 5.

In general, the self-evaluation intervention did not result in concurrent changes in the disruptive behaviors of primary and intermediate level students.

Effects of Self-Observation

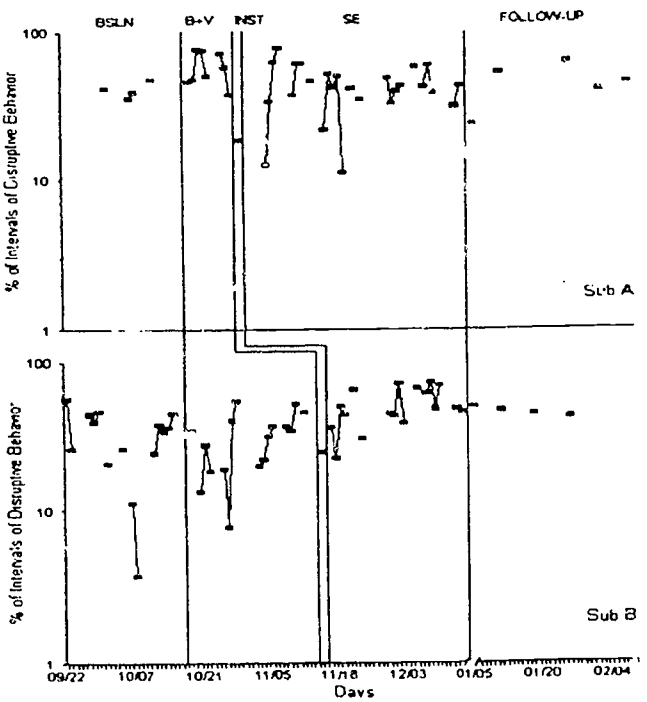
The percentage of intervals in which disruptive behaviors were emitted by Students Three and Four (i.e., primary level) and Students C, D, and E (i.e., intermediate level) by experimental phase is shown in Figures 3 and 4 and summarized in Tables 6 and 7.

Contrasting results were found between the primary and intermediate level students. The introduction of the self-observation intervention did not result in a change in occurrence of the primary level students' disruptive behaviors; however, decreases were seen in the disruptive behaviors of the intermediate level students. The presence of the video camera was associated with contrasting results between primary and intermediate level students. The presence of the video camera led to a slight increase in the occurrence of the primary level students' disruptive behaviors, but did not appear to affect the disruptive behaviors of the intermediate level students.



BSLN = Baseline
INST = Instruction
B+V = Baseline with Videocamera
SE = Self-Evaluation

Figure 1. Percentage of intervals in which disruptive behaviors occurred across baselines and self-evalua tion conditions (Primary Level).



BSLN = Baseline
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SE = Self-Evaluation

Figure 2. Percentage of intervals in which disruptive behaviors occurred across baselines and self-evaluation (Intermediate Level).

Table 4. Percentage of Intervals of Disruptive Behavior (Primary Level/Self-Evaluation)

Phase	Median	Range	Trend	Variability
Subject One				
Baseline	80	43.21-92.31	slightly increase	high
B+Video*	70	56.25-91.67	no change	low
Instruction	87.50	one data point	–	–
SE:**	42.73	18.75–71.43	slightly decreasing	high
Follow–up	60.00	one data point	–	–
Subject Two				
Baseline	38.75	20.00–90.00	slightly decreasing	high
B+Video*	44.4	24.00–100 00	slightly decreasing	high
Instruction	23.08	one data point	–	–
SE:**	33.33	13.33–50.00	slightly decreasing	low
Follow–up	56.33	38.10–65.22	slightly decreasing	low

* Baseline with videotaping; ** Self-evaluation.

Table 5. Percentage of Intervals of Disruptive Behavior (Intermediate Level/Self-Evaluation)

Phase	Median	Range	Trend	Variability
Subject A				
Baseline	40.48	35.29-47.50	increasing	low
B+Video*	53.85	37.04–76.32	slightly decreasing	high
Instruction	18.18	one data point	–	–
SE:**	42.31	11.00–77.78	slightly decreasing	high
Follow–up	44.68	23.53–61.7	increasing	high
Subject B				
Baseline	35.23	3.70–56.25	slightly decreasing	high
B+Video*	33.3	7.69–54.55	increasing	high
Instruction	25.00	one data point	–	–
SE:**	48.15	22.58–72.73	slightly increasing	high
Follow–up	45.87	42.31–50.00	slightly decreasing	low

* Baseline witn videotaping; ** Self-evaluation.

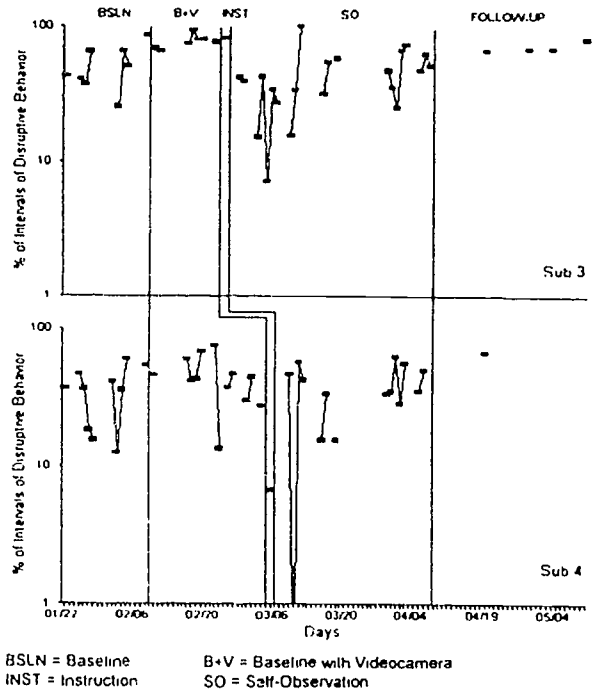


Figure 3. Percentage of intervals in which disruptive behaviors occurred across baselines and self-observation conditions (Primary Level).

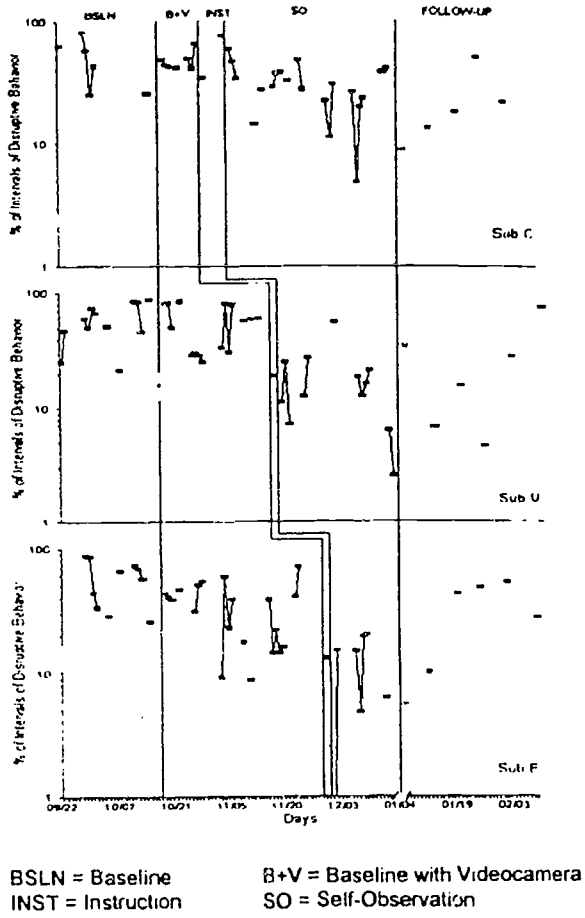


Figure 4. Percentage of intervals in which disruptive behaviors occurred across baselines and self-observation conditions (Intermediate Level).

Effects of Self-Observation Plus Self-Recording

The percentage of intervals in which disruptive behaviors were emitted by Subjects Five, Six, and Seven (i.e., primary level) and Subjects F, G, and H (i.e., intermediate level) by treatment phase is shown in Figures 5 and 6 and summarized in Tables 8 and 9.

Results from this study showed that the self-observation plus self-recording intervention was effective in decreasing students' disruptive behaviors in class. All six primary and intermediate level students decreased their disruptive behaviors concurrently with each implementation of the self-observation plus self-recording intervention. Follow-up data for the intermediate level subjects, except Subject G, suggested that the effect of the self-observation plus self-recording intervention maintained without direct intervention, while the disruptive behavior of the primary level subjects returned to the baseline level after terminating the intervention.

Table 6. Percentage of Intervals of Disruptive Behavior (Primary Level/Self-Observation)

Phase	Median	Range	Trend	Variability
Subject Three				
Baseline	46.05	25.00–84.62	decreasing	high
B+Video*	43.33	40.74–64.29	slightly increasing	low
Instruction	55.00	34.21–75.00	increasing–	high
SO:**	29.29	4.7	increasing	high
Follow-up	69.40	66.67–82.61	slightly increasing	low
Subject Four				
Baseline	36.60	12.50–60.00	slightly increasing	high
B+Video*	42.86	13.00–75.00	decreasing	high
Instruction	6.33	one data point	–	–
SO:**	35.15	0.00–62.50	no change	high
Follow-up	66.67	one data point	–	–

* Baseline with videotaping; ** Self-evaluation.

Table 7. Percentage of Intervals of Disruptive Behavior (Intermediate Level/Self-Observation)

Phase	Median	Range	Trend	Variability
Subject C				
Baseline	50.00	25.00–81.25	decreasing	high
B+Video*	43.33	40.74–64.29	slightly increasing	low
Instruction	55.00	34.21–75.00	increasing	high
SO:**	29.29	4.76–58.33	dereasing	high
Follow-up	18.18	8.57-50.00	increasing	high
Subject D				
Baseline	56.00	21.21–87.23	increasing	high
B+Video:*	56.52	25.00–83.33	increasing	high
Instruction	19.05	one data point	–	–
SO:**	14.31	2.50–55.56	decreasing	high
Follow-up	21.88	4.55–76.32	increasing	high
Subject E				
Baseline	61.00	25.33–87.50	decreasing	high
B+Video:*	38.28	8.70–70.00	decreasing	high
Instruction	13.04	one data point	–	–
SO**	14.81	0.00–20.00	increasing	low
Follow-up	34.96	5.71–52.63	increasing	high

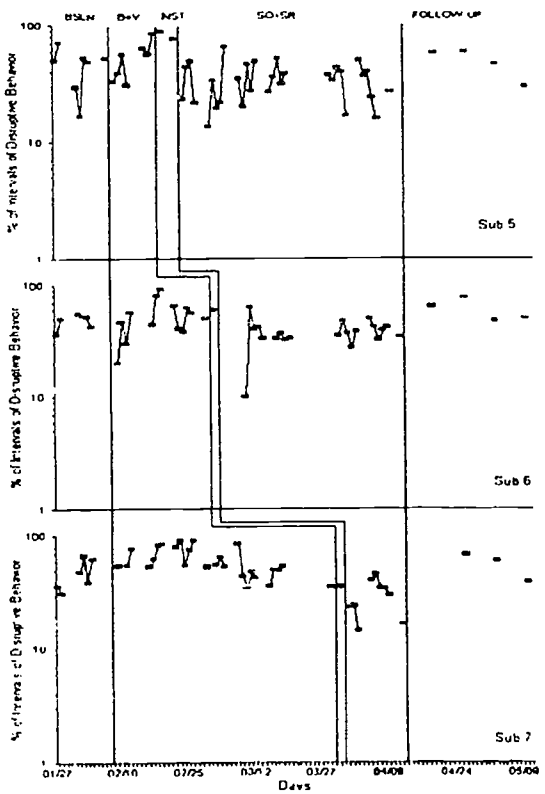
* Baseline with videotaping; ** Self-evaluation.

Discussion

The purpose of this research was to examine the usefulness of three self-management strategies in reducing the disruptive behaviors of elementary age students in class. The replication study with intermediate level students demonstrated (a) generality of the treatment effects on higher grade level students, (b) reliability of the research findings, and (c) external validity of the procedures. Because comparisons across the treatment groups cannot be made with single subject, multiple baseline research design employed in this study, the results of each treatment are discussed separately.

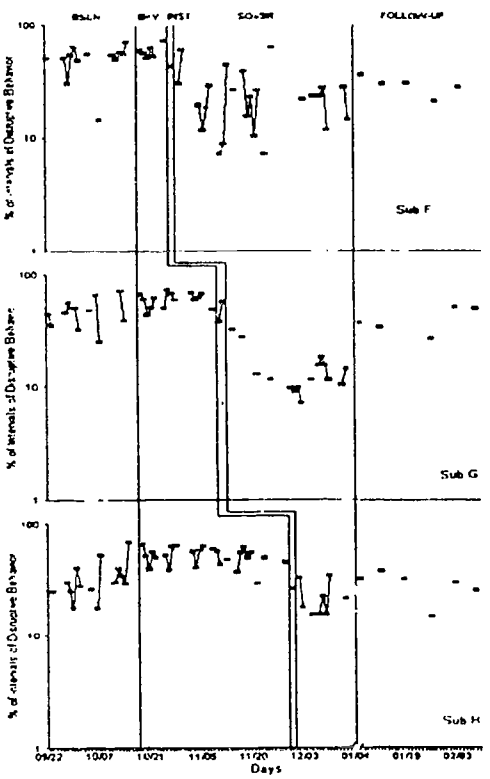
Effect of Self-Evaluation

The results of the self-evaluation study show that the self-evaluation intervention alone was ineffective in decreasing students' disruptive behaviors in class. The ineffectiveness of self-evaluation in this study can be attributed to two factors which are significantly different from previously successful studies. First, in this study, the self-evaluation intervention was implemented alone, while past successful studies used a combination of treatment pro-



BSLN = Baseline
INST = Instruction
B+V = Baseline with Videocamera
SO+SR = Self-Observation plus Self-Recording

Figure 5. Percentage of intervals in which diruptive behaviors occurred across baselines and self-observa tion plus self-recording conditions (Primary Level).



BSLN = Baseline
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SO+SR = Self-Observation plus self-Recording

Figure 6. Percentage of intervals in which diruptive behaviors occurred across baselines and self-observa tion plus self-recording conditions (Intermediate Level).

Table 8. Percentage of Intervals of Disruptive Behavior (Primary Level/Self-Observation plus Self-Recording)

Phase	Median	Range	Trend	Variability
Subject Five				
Baseline	49.07	16.67–70.80	no change	high
B+Video*	59.52	30.43–87.88	increasing	high
Instruction	82.00	75.67–87.89	decreasing	low
SO+SR:**	34.05	13.51–64.29	slightly increasing	high
Follow–up	51.45	29.73–58.14	decreasing	low
Subject Six				
Baseline	42.22	16.67–55.26	slightly decreasing	high
B+Video:*	56.52	30.00–91.43	slightly increasing	high
Instruction	60.00	one data point	–	–
SO+SR:**	37.50	10.00-63.64	no change	high
Follow–up	56.92	47.73–76.19	decreasing	low
Subject Seven				
Baseline	48.65	31.25–66.67	increasing	high
B+Video:*	54.45	35.48–90.48	decreasing	high
Instruction	35.89	one data point	–	–
SO+SR**	32.24	14.00–46.00	increasing	high
Follow–up	60.53	39.29–67.86	decreasing	low

* Baseline with videotaping; ** Self-Observation plus Self-Recording.

cedures that included external reinforcement, token economy, modeling, and/or matching with teacher's evaluation as well as self-evaluation (Rhode, Morgan, & Young, 1983; Smith, Young, West, Morgan, & Rhode, 1988; Sweeney, Salva, Cooper, & Talbert-Johnson, 1993). Such results suggest that various self-evaluation procedures should be incorporated into a packaged treatment.

A second difference between previous successful studies and the current one was the provision of criteria for self-evaluation. In this study, when the investigator asked subjects to mark the picture on their self-evaluation cards, specific criteria were not given to the subjects; only the self-evaluation card was provided. In other studies using self-evaluation, however, students were given specific criteria whenever they made their own judgements about their behavior or performance (Hughes, Ruhl, & Peterson, 1988). The failure of the self-evaluation intervention in this study may be related to subjects experiencing difficulty with what and how to evaluate their behaviors.

Effect of Self-Observation

The results of the self-observation study are inconclusive and equivocal. Contrasting results were found between the primary and intermediate level students. The introduction of the self-observation intervention did not

result in a change in the occurrence of the primary level students' disruptive behaviors; however, decreases were seen in the disruptive behaviors of the intermediate level students.

A possible reason for this difference may be related to factors, such as, subjects' age, academic and social learning history, and intelligence. While the primary level subjects in this study were 6-year-old and 9-year-old children diagnosed as having emotional and behavioral disorders and/or learning disabilities, the intermediate level subjects in this study were 10 to 11 years old who did not have such labels and had average intelligence. The ineffectiveness of the self-observation intervention for primary level students supports the study of Clark, Kehle, Jenson, and Beck (1992) who concluded that younger children may be at a disadvantage to achieve behavioral benefits from self-observation. Primary level subjects in this study may not have learned the discrimination between appropriate and inappropriate behaviors while viewing videotapes. Additional research is needed to discover what type of children can benefit from the self-observation intervention.

In addition to the age factor, the mixed results in the self-observation study can be attributed to two more factors. First, students'

Table 9. Percentage of Intervals of Disruptive Behavior (Intermediate Level/Self-Observation plus Self-Recording)

Phase	Median	Range	Trend	Variability
Subject F				
Baseline	52.94	14.29–69.35	slightly increasing	high
B+Video*	57.17	50.00–71.43	increasing	low
Instruction	42.31	one data point	–	–
SO+SR:**	22.90	7.14–61.54	no change	high
Follow-up	29.41	20.59–35.29	decreasing	low
Subject G				
Baseline	46.42	25.00–70.45	slightly decreasing	high
B+Video:*	60.35	43.33–73.08	slightly increasing	high
Instruction	48.00	37.50–56.52	–	–
SO+SR:**	12.90	7.14–32.14	no change	high
Follow-up	36.67	26.47-50.00	decreasing	low
Subject H				
Baseline:	29.41	17.65-67.74	increasing	high
Overall				
B+Video:*	52.38	29.41–65.85	no change	high
Instruction	26.47	one data point	–	–
SO+SR**	19.65	15.38–34.29	increasing	low
Follow-up	31.91	14.71–37.50	slightly decreasing	low

* Baseline with videotaping; ** Self-Observation plus Self-Recording.

behaviors were videotaped daily. Then, immediately after math class, students viewed the last five minutes of the unedited videotape from their class. The assumption was that watching inappropriate behaviors in unedited tape would teach students to discriminate between their appropriate and inappropriate behaviors. The results of the study with intermediate level students supported this hypothesis. Previous studies using unedited tape also showed improved student behaviors (Booth & Fairbank, 1984; Esveldt, Dawson, & Forness, 1974; Schwarz & Hawkins, 1970; Walther & Beare, 1991). In past studies, however, an edited tape of the subjects' appropriate behaviors was shown repeatedly under the assumption that occurrences of behavior would change from repeated observations of oneself displaying desired behaviors (Davis, 1979; Kehle, Clark, Jenson, & Wampold, 1986; McCurdy & Shapiro, 1988; Woltersdorf, 1992). Further research is needed to clarify the distinct effects of using edited and unedited tape in self-observation interventions.

The second factor was using a "pure" self-observation intervention in this study. The results with intermediate level students in this study are consistent with those of previous studies using the self-observation intervention, in that self-observation itself was effective in increasing students' appropriate behavior (Dowrick, 1978; Esveldt, Dawson, & Forness, 1974; Woltersdorf, 1992). In contrast, other studies suggest that self-observation, in its "purest form" may not be sufficient (Booth, & Fairbank, 1984; Clark, Kehle, Jenson, & Beck, 1992; Davis, 1979; Fouts, 1974; Greelis & Kazaoka, 1979; Kehle, Clark, Jenson, & Wampold, 1986; McCurdy & Shapiro, 1988; Schwarz & Hawkins, 1970; Walther & Beare, 1991). However, those studies employed self-observation in conjunction with in-class group contingencies and/or other self-management strategies, or used prompts (e.g., "behave well while videotaping") and/or instruction. Future research is needed to examine the relative effects of individual variables when self-observation is combined with other strategies.

Effect of Self-Observation Plus Self-Recording

Results from this study showed that the self-observation plus self-recording intervention was effective in decreasing the occurrence of students' disruptive behaviors in class. All six primary and intermediate level subjects decreased their rates of disruptive behaviors concurrently with each implementation of the self-observation plus self-recording intervention within a multiple baseline design.

This finding is congruent with findings from previous research using self-observation plus self-recording interventions to improve students' behavior (Booth & Fairbank, 1984; Schwarz & Hawkins, 1970; Walther & Beare, 1991). Distinctively, however, this study did not include experimenter (or teacher) discussions with subjects while they were viewing videotapes, and the results suggested that discussions with the teacher and social reinforcement were not necessary to improve students' behavior in class. Such results indicated that students can discriminate between their appropriate and inappropriate behaviors without external help while viewing unedited tape.

The self-observation plus self-recording intervention was designed under the basic assumption that the effects might be enhanced if the strengths of self-observation and self-recording are combined. The major strength of self-observation is that it gives students more accurate feedback about their behavior than other procedures, that is, self-observation improves accuracy of self-perception (Booth & Fairbank, 1984; Fuller & Manning, 1973; Griffith, 1974; Walther & Beare, 1991). By watching their own behaviors, students can see what is and what is not appropriate, the conditions under which these behaviors are occurring, and the possible positive and negative consequences and benefits associated with these behaviors. In addition, self-recording

has therapeutic reactive effects in that behavior change is observed during self-recording without specific programming of the consequences (Kirby, Fowler, & Baer, 1991; Lipinski & Nelson, 1974). The self-recording procedure accentuates the relationship between the self-recorded behavior and its consequences, which ultimately control the frequency of the behavior (i.e., by providing reinforcement or punishment) (Mace & Kratochwill, 1985). In this study, self-recording of inappropriate behavior can increase the salience of the relationship between disruptive behavior and its delayed aversive consequences (i.e., viewing and recording inappropriate behavior), as well as naturally occurring consequences (i.e., negative consequences given when videotaped in the class). The results of this study suggest that the combination of self-observation and self-recording is effective in decreasing the occurrence of students' disruptive behavior in class.

Data collected during one month follow-up periods indicated that self-observation plus self-recording effects did not maintain for all subjects after terminating the intervention. The results suggested that maintenance does not occur automatically after terminating the intervention simply because behavior change (i.e., subjects' decreasing disruptive behavior) is accomplished during the intervention period (Stokes & Baer, 1977). Therefore, specific programming for maintenance should be developed.

To facilitate maintenance of students' appropriate behavior, teachers should give appropriate feedback (e.g., kind and schedule of reinforcement) when target students display appropriate behavior in class (e.g., raising hand instead of talking-out) (Stokes & Baer, 1977; Wolery, Bailey, & Sugai, 1988). In the discussion of generalization guidelines, Wolery, Bailey, and Sugai (1988) suggested that "after the behavior has been reinforced purposefully a few times in the natural environment, the naturally occurring contingencies can be used" (p.324).

Fading procedures also have been suggested as a way to achieve response maintenance (Woltersdorf, 1992). Instead of abrupt termination of the intervention, reducing the frequency of self-observation or implementing an alternate self-recording procedure may facilitate maintenance of appropriate behavior.

Suggestions for Future Study

Several suggestions for future research were noted in this investigation. First, future research is needed to determine what effects these self-manageme t procedures would have with other students who might vary in age, grade, learning history, behavior problems, etc. Results from this study suggested that differential effects are possible between primary and intermediate grade students.

Second, future research is needed to determine which specific procedural components of the self-management interventions are necessary to produce durable results for children displaying highly disruptive behavior in class. Based on the results of this study and review of previous studies, further research is needed to (a) examine the necessity of an externally provided criterion and a cuing procedure for self-evaluation performance; (b) clarify the distinct effects of using an edited tape versus unedited tapes in the self-observation intervention; (c) identify the specific effects of self-observation and the conditions under which these effects are observed; (d) examine the differential effectiveness of self-observation plus self-recording with and without teacher feedback; and (e) determine the effects of the immediacy, frequency, and length of viewing videotape in self-observation and self-observation plus self-recording interventions.

Third, future research is needed to ascertain whether teachers can use these intervention strategies effectively. In the current study, intervention procedures were implemented by the experimenter. To examine the feasibil-

ity of this intervention in the classroom setting, future research should involved trained teachers who would use this intervention in their classrooms.

An additional suggestion for future study is the investigation of treatment effects outside the treatment condition (response generalization). That is, future replications and extensions of this study should investigate whether students who were trained to use a self-observation plus self-recording intervention under one set of stimulus conditions would use it in another condition (e.g., different class settings), and if treatment effects observed in one setting are observed in another.

Finally, future studies should consider the usefulness of self-observation plus self-recording interventions on facilitating academic performance as well as classroom social behavior. In addition, future studies should attempt to control for the occurrences and effects of changes in instructional practices and classroom routines.

Conclusions

The results of this study provide promising support for the use of self-management strategies in the classroom. Students can be taught to watch and record their own behaviors, and their classroom behaviors can be improved. The results of this study also suggested that the self-observation plus self-recording intervention may be a viable alternative for teachers who would like to make use of existing equipment as a behavior management tool. The intervention procedure can be used with minimal classroom teacher supervision time in any classroom which has access to videotaping equipment. This intervention is relatively simple to use, requires little time to implement, and is unobtrusive. Another advantage of using this intervention in the classroom is that teachers also can watch or listen to their own classroom behavior to determine whether they gave appropriate and consistent reinforcement, instruction, and corrections.

Because satisfactory maintenance effects were not obtained, perhaps the most promising feature of self-observation plus self-recording will be its use as a procedure for initiating desirable levels of appropriate behavior to a point where the teacher can more easily reinforce the desired behavior. In other words, specific programming for maintenance should be developed.

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