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EFFECTS OF SELF-MANAGEMENT TRAINING AND REINFORCEMENT ON THE TRANSFER OF IMPROVED CONDUCT IN THE ABSENCE OF SUPERVISION

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The instruction, maintenance, and transfer of training of social skills of 3 seriously emotionally disturbed adolescents were accomplished by a self-management training and reinforcement package. During baseline sessions these students, who were covertly filmed in their classroom, averaged over 90% off-task or socially inappropriate behavior while their teacher was out of the room. They showed similar behaviors when walking between classes, unattended by their teacher. Treatment was introduced in the classroom and consisted of social skills and self-management training and reinforcement. Treatment procedures included instruction, modeling, and role playing of social skills, as well as self-assessment, self-recording, and self-reinforcement for correct approximations of these skills. After 5 weeks of training, all subjects demonstrated substantial improvements in the classroom during the teacher's absence and when distracted by other students; however, transfer of social skills did not occur to the between-class setting until students were given explicit instruction to initiate self-managing procedures in this setting.

DESCRIPTORS: social skills, instructional control, self-management, self-monitoring, self-recording

A classroom is a setting in which concurrent contingencies of reinforcement are in effect. Ideally, most student behavior is under the control of instructional contingencies. When instructional contingencies fail, however, "conduct" problems may arise; alternative contingencies may compete and support off-task or disruptive behavior. Chronic and serious conduct problems may result in the diagnostic label of serious emotional disturbance (U.S. Department of Education, 1985). Effective methods of teaching prosocial behavior to such students are needed (Argyle, Trower, & Bryant, 1974). A variety of social skills curricula have been developed to meet this need (e.g., Crane & Reynolds, 1983).

Even when antisocial behavior has been eliminated in special classrooms, undesirable conduct often recurs when students matriculate to less structured classes (Hughes, Ruhl, & Misra, 1989; O'Leary & Dubey, 1979; Wilson, 1984). This is particularly true in situations in which students, exposed to social distraction or provocation, have no socializing agent available to intervene. Self-management skills may be needed to insure prosocial behaviors in the teacher's absence.

Skinner (1953) provided a conceptual analysis of the relations between *controlling* (managing) behavior and *controlled* (managed) behavior when both repertoires belong to the same individual. Newly acquired prosocial behavior requires continued teacher support for children who have not yet acquired self-managing skills. When the teacher is absent, those contingencies maintaining prosocial behavior are absent, and concurrent contingencies for antisocial behavior may cue and sustain undesirable behavior.

Fortunately, technology designed to establish self-

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managing skills has been the focus of applied research (Fowler, 1984; O'Leary & Dubey, 1979; Rosenbaum & Drabman, 1979). Most researchers use variations of component skills enumerated by Glynn and Thomas (1974): self-recording of behavior, self-assessment, self-specification of reinforcement, and self-administration of reinforcement. However, other self-management descriptors have evolved in the literature. Self-monitoring suggests that the student concurrently assess and record the occurrence of a target behavior. In self-evaluation a student compares his behavior to an external criterion (Hughes et al., 1989; Young et al., 1987). Self-instruction requires a student to learn a verbal instruction and repeat the instruction as a prompt in the process of completing a task (Baer, 1984).

These procedures have been found effective across a range of populations and behavior problems. For instance, self-recording has improved academic skills (e.g., Knapczyk & Livingston, 1973; McLaughlin & Truhlicka, 1983), decreased talking out (Broden, Hall, & Mitts, 1971), and increased on-task behavior (Glynn, Thomas, & Shee, 1973) of students. Self-assessment, in conjunction with self-recording and self-evaluation, has resulted in transfer of student on-task behavior across settings (Rhode, Morgan, & Young, 1983) when each setting included the presence of teachers.

The extent to which direct supervision of self-managed behaviors is necessary is still in question. Self-monitoring by staff in a residential setting resulted in improved staff performance even without supervisory monitoring during evening hours (Richman, Riordan, Reiss, Pyles, & Bailey, 1988). However, self-monitoring and self-evaluation procedures were found to be ineffective in transferring a reduction in off-task/disruptive behaviors of junior-high adolescents from resource classes to regular education classes (Smith, Young, West, Morgan, & Rhode, 1988). Acquisition of self-managing behavior may not be a sufficient condition for some populations to behave successfully outside a training setting. In fact, review of self-management procedures as applied to behaviorally disordered students indicates that transfer of newly acquired improved behaviors via self-management has not been adequately demonstrated and that more research in this area is needed (Hughes et al., 1989; Wilson, 1984).

This study sought to assess a method of inducing transfer of self-managing behavior in behaviorally disordered adolescents. Transfer was attempted here by bringing the controlling behavior (e.g., self-assessment and self-recording) under previously established instructional control.

METHOD

Subjects and Setting

Subjects were 3 males in a self-contained special education classroom serving 8 junior high school youths with serious emotional disturbances. All classes for these students were scheduled initially in a single classroom with one teacher and an aide. A school psychologist was also on location.

Parents of the 8 students gave informed consent for their children's participation in the study and for covert filming of their children. Parents were assured that their children would not be deprived of services if they did not permit the covert filming. Three of the 8 students were randomly selected for purposes of data collection. Subjects were 14 to 15 years of age and of average intelligence. All 3 had been identified as "seriously emotionally disturbed" according to the regulations provided by the Texas State Board of Education and PL 94-142. Subject 3 had previously been diagnosed at a medical facility as manic depressive (DSM-III-R, Axis 1, 296.6 Bipolar Disorder, Mixed). He received a stable dosage of lithium throughout all conditions of the present study, including baseline. The youths had been in both resource and self-contained special education classes for almost all of their academic history.

During 20 min of the third period of the school day (10:00 a.m.), and an average of 2.7 min between classes at lunch time (12:25 p.m.), students in the class were videotaped by a camera hidden behind a two-way mirror. Filming in the between-class setting was conducted from behind a shaded window of a portable building located adjacent to the sidewalk on which these students traveled be-

tween classes. The students showed no awareness of the camera's location throughout the study.

Dependent Variables

Measurement procedures closely replicated the dependent variable described by Smith et al. (1988). Ten-second interval recording was used to measure off-task and socially inappropriate behavior. Off-task behavior included being out of seat, touching another student, playing with school supplies, talking to another student or aloud to oneself, and "dawdling" (staring off into space for more than 5 s). Socially inappropriate behavior included running, fighting, fondling, spitting, throwing objects, jumping, or inappropriate language (cursing, yelling, or obscene gesturing). Off-task and socially inappropriate behaviors were scored as a single category because they almost always occurred concurrently.

On-task and socially appropriate behavior was defined as performing an academic task while sitting quietly or moving directly from one location to the next (between classes) without creating a disruption or disturbance. Scoring of off-task and socially inappropriate behavior took precedence over on-task and socially appropriate behavior (i.e., off-task or socially inappropriate behaviors that occurred during any portion of an interval resulted in the entire interval being scored as off task or socially inappropriate). These categories were mutually exclusive. Data were collected by observers from the videotapes. The camera was stopped after each 10-s interval for observers to record data on prepared data sheets.

Percentage of off-task and socially inappropriate behavior was calculated by dividing the number of intervals during which the target behaviors occurred by the total number of observed intervals for each session and multiplying by 100.

Interobserver Reliability

A prebaseline videotape of the subjects was used to train and calibrate observers prior to scoring the baseline and subsequent conditions. Observers were trained until they reached 90% reliability. Overall occurrence and nonoccurrence percentages of agreement were calculated for each subject by dividing the number of agreements by the total number of observed intervals per session (in their respective categories) and multiplying by 100. Reliability measures were taken for three baseline sessions and four separate equally spaced experimental sessions for each subject. Overall reliabilities ranged from 90% to 100% per subject. Likewise, all occurrence and nonoccurrence reliabilities were at or above 90%.

Design and Training

A multiple baseline design across settings was employed. After baseline measures were taken, self-management training occurred in the classroom for 5 weeks. Four subsequent experimental conditions followed in that setting: instructed self-management in the absence of supervision, instructed self-management under distraction in the absence of supervision, and two uninstructed self-management probes (with and without distraction). An abbreviated intervention (instruct to self-manage) occurred in the second setting (the between-class passage) 42 days after the end of baseline in the classroom setting. This second intervention was abbreviated because students had acquired self-management skills in the classroom.

Baseline. Target subjects were observed and recorded for 20 min on each of 4 consecutive days at the beginning of the fall semester. All members of the class were present during the filming. The teacher instructed the students to complete an assignment while he and the aide attended to a matter outside the classroom. The teacher and aide stayed out of the classroom during the entire 20 min of each recorded session. Before leaving, the teacher told the students they would be "on self-management." No point system or specific classroom management system existed during the 4 days of in-class baseline observations. Baseline data were also obtained in a second setting as students walked, unattended by teachers or staff, between classes at lunchtime. Baseline observations occurred twice in this between-class setting during the 4 days of the in-class baseline. Students were not observed in this setting during 5 weeks of self-management training

Table 1

Self-Management Skills and Contingencies for Use of Self-Management and Behavior Changes, Trained in the 5 Weeks after In-Class Baseline Observations

Social skills (controlled behavior)

1. Academic engagement (posture, hand raising, eye contact, polite talking). Weeks 1 and 2.
2. Avoiding distractions from students. Weeks 2, 3, 4, and 5.
3. Dealing with difficult academics (e.g., materials above skill level). Weeks 3, 4, and 5.
4. Accepting corrections from the teacher in a positive manner. Weeks 3, 4, and 5.

Self-management skills (controlling behavior)

1. Self-instruct (e.g., "I'm going to keep doing my work."). Weeks 1, 2, 3, and 4.
2. Self-assess (Likert scale of 1 to 4). Weeks 1, 2, 3, 4, and 5.
3. Match self-assessment with teacher (bonus point for matches within 1 point at bottom two levels of social pyramid and exact matches required for bonus point at top two levels).
4. At top two levels, students self-assessed without teacher matches during selected intervals throughout the day.

Contingencies

1. Point system exchangeable for rewards and activities. Points earned through teacher assessment (1–4 Likert scale) and matching self-assessment with teacher assessment.
2. Students worked through four levels and self-assessed throughout the entire school day:

   Red: assessed three times per class period at 20-min intervals. 100 points available. Criterion for next level reached after 4 weeks of 90% point attainment.

   Orange: assessed two times per class at 30-min intervals. 70 points available. Criterion for next level reached after 4 weeks of 95% point attainment.

   Green: assessed once per class at 60-min intervals. 40 points available. Criterion for next level reached after 4 weeks of 97% point attainment.

   Blue: assessed once per class at 60-min intervals. 40 points available. No criterion beyond this level.

Deprivation and reinforcement by level

1. Red: spends break working at desk, must sit in assigned seat during lunch, walks in quiet/supervised line to restroom, lunch, etc., no access to special privileges available at upper levels.
2. Orange: may walk alone to restroom during breaks, chooses seating location for lunch, may go on field trips.
3. Green: may walk alone during passing period, is issued a locker, may use computer games, placement in one regular or resource class.
4. Blue: additional regular or resource classes provided.

Training procedures

1. Instruction, modeling, role playing. Weeks 1, 2, 3, and 4.
2. Unsupervised rehearsal. Weeks 1, 2, 3, 4, and 5.
3. Red flags. Weeks 4 and 5.

in the classroom setting. Baseline recording between classes resumed when the experimental conditions began in the classroom setting and continued for six more consecutive sessions.

Social skills training. During the 5-week period following baseline, students were given formal instruction, modeling, and role playing of social skills and self-management training 1 hr per day; however, self-management of these newly learned skills continued throughout the entire school day, as outlined in Table 1.

Skills pertaining to academic engagement, correct posture while working, proper hand raising for questions, polite modes of talking to teachers and students, good eye contact during discussions, and avoiding distractions of other students were instructed, modeled, and role played with verbal reinforcement from the teacher and psychologist. Students rehearsed overt statements such as, "I'm not going to let him or her bother me. I'm going to keep doing my work," while others played the role of distractors. Students practiced avoiding eye contact with those who annoyed them. Overt vocalizations of these self-instructions were gradually reduced to subvocal statements during role playing. Students practiced overcoming simulated distractions from other students by use of a gesture (palm open, small wave) while avoiding eye contact.

Dealing with situations that were academically strenuous but presented no external distraction was also instructed, modeled, and rehearsed as part of the social skills training. In these daily simulations, students worked on materials that were up to one grade level above their level of functioning, with the objective of teaching students to persist in trying to solve problems or read challenging materials.

Self-management training. Self-assessment as a management technique was also formally taught daily for 1 hr. Students practiced assessing their own on-task and socially appropriate performance during each rehearsal session. Using a Likert scale ranging from 1 to 4, they graded themselves; teachers and other students provided performance feedback. A score of 4 indicated an excellent performance; lower scores represented less adequate demonstrations. A bonus point was awarded on any occasion in which a student's self-assessment was within 1 point of the teacher's assessment.

This self-assessment system was introduced as part of self-management training (immediately after in-class baseline) and was thereafter extended

throughout the entire school day, including during lunch. Consistent with self-management procedures developed by Young et al. (1987), students were provided more opportunities to self-assess during the initial stages of their training. All students were introduced to the program at the bottom of the social reinforcement pyramid (red level) and self-assessed every 20 min during the school day. Points for improved social skills and self-management earned students access to higher levels of the reinforcement system where they were required to self-assess fewer times per hour (Table 1). Bonus points earned for matching teacher assessments were added to these points.

Social reinforcement. As part of the daily 1-hr training, a social reinforcement pyramid was introduced to run concurrently with the social skills and self-management training. This system allowed the self-management program to be practiced immediately and reinforced throughout the entire school day. Following the same self-assessment format as used during the daily 1-hr self-management training, points earned by way of self-assessment cumulated throughout the school day. A daily point sheet was kept at each student's desk.

Unsupervised rehearsal. Following each day's scheduled instruction, modeling, and role playing of social skills, a 20-min unsupervised rehearsal took place. The teacher and other staff members instructed the students to role play the above simulations (e.g., staying on task while being distracted by other students or continuing to work on challenging material) in the absence of supervision. The teacher and all staff members left the classroom and observed the students' behavior through a two-way mirror. Students assessed themselves upon the teacher's return. Because the teacher was not on location during the unsupervised rehearsal, no teacher-matching assessments were possible; however, to maintain a constant number of available daily points per self-assessment interval, 1 extra noncontingent point was added to each student's self-recording during unsupervised rehearsals. This system of providing 1 noncontingent bonus point was maintained during all subsequent unsupervised self-assessment conditions.

As students gained proficiency in their new skills, the teacher and the psychologist arranged subtle tests, using difficult conditions that might be found occasionally in mainstream education. These difficult situations, or "red flags" (McGinnis, 1984), occurred randomly throughout the school day to each student in the class. For example, students were assigned excessively difficult work, distracted by classmates when the teacher was out of the room, and even unfairly corrected by the teacher. About 5 min after a red flag test, the teacher informed a student that he had been red flagged and asked him to assess and record his response to the stressful condition. As in other self-management training, a student assessment that matched the teacher's assessment earned a bonus point. On occasions when the teacher was unavailable to observe a given red flag, a bonus point was provided noncontingently.

During the 5 weeks of self-management training, data regarding on-task and socially appropriate behaviors were collected only on consecutive Fridays, when the training session replicated baseline conditions. The teacher and aide simply left the classroom and told the students to use the self-management procedures they had practiced during the previous days of that week.

Posttraining Experimental Conditions

After 5 weeks, social skills and self-management training were discontinued and a series of experimental conditions was conducted. These conditions were designed to assess student performance in the absence of a teacher; there was no comparison of self- and teacher assessments during these probes.

Instructed self-management without supervision. Students were left alone for 20 min in the classroom with instructions to self-manage, including assessing and recording their own behavior. When the teacher returned, each student graded his or her own performance; a bonus point was given to each student noncontingently.

Instructed self-management without supervision under distraction. Selected students were provoked and distracted by other students during daily 20-min unsupervised periods of instructed self-

management. Students self-assessed, and bonus points were noncontingent.

Probe 1: Uninstructed self-management without supervision. To probe student behavior in the absence of explicit instructions to self-manage and in the absence of the teacher, four probes were conducted on consecutive days following the previously described conditions. On the first 2 consecutive days, the teacher gave no indication that the students were to self-manage when he and the aide left the classroom for 20 to 30 min. The students had no particular academic work prepared on these occasions but had previously been instructed to "find work" when none was available.

Probe 2: Uninstructed self-management without supervision and with distraction. On the next 2 consecutive days, the teacher and aide again left the classroom with no instructions to self-manage. During these sessions, a student confederate tried, in various ways, to draw students off task.

Self-management between classes. On Day 46 of the study, students were introduced to a second, abbreviated, treatment. They were instructed to self-assess and self-record their socially appropriate and on-task behavior as they walked along a 70-yard breezeway between classes. Students were told they were to include this time as part of the last self-assessment interval of the previous period (lunchtime). This brought the behavior of walking along the sidewalk within the range of point acquisition for the reinforcement system. Because no teacher was present, bonus points were noncontingent. This followed the same pattern as existed during previous unsupervised conditions.

The "task" was described to students as performing socially appropriate behaviors as they returned from lunch and assessing that performance. These behaviors included walking directly to the classroom in a forward position without creating a disruption, running, rough or lewd touching of other students, or making obscene gestures. Conversation, handshaking, or appropriate gestures were all described as within the bounds of on-task and socially appropriate behaviors.

This condition served to assess the extent to which the instructions to initiate self-management procedures would transfer to a new setting with only abbreviated instructions to self-manage. As before, the students were videotaped on the breezeway with a hidden camera.

RESULTS

In-class behavior of all 3 subjects improved during the course of the 5-week self-management training (Figure 1). Off-task and socially inappropriate behavior in the classroom during baseline averaged 92%, 95%, and 76% for Subjects 1, 2, and 3, respectively. An immediate and dramatic reduction in off-task and socially inappropriate behavior of Subject 1 was accompanied by a more gradual decline for the other 2 subjects.

Subject 1 was so steadfast in his performance that, during training, he did not even look up when hit squarely in the head with a large wad of paper by a confederate when the teacher was out of the room. Subject 2 made a slower transition from baseline performance. In the first 2 weeks of training, he was extremely resistant to rehearsal of self-management procedures, making only perfunctory efforts at self-assessment and self-recording. By the end of the 3rd week of training, however, Subject 2 began to demonstrate involvement in the daily regimen of rehearsal with social reinforcement for participation.

The change in performance of Subject 3 was somewhat less clear than that of the other 2 subjects. He averaged moderate rates of undesirable behavior throughout baseline. Although Subject 3 was not immediately affected, improvement was apparent by the 4th week of training.

In the breezeway between classes (first 45 days), off-task and socially inappropriate behavior remained high even as these same students demonstrated remarkable changes in the experimental conditions in the classroom. During the original baseline in the between-class setting (first 4 days), Subject 1 was off task or socially inappropriate during 100% of the intervals observed between classes. When baseline observations resumed after self-management training ceased, his 89.2% off-task or socially inappropriate behavior indicated little change between classes, despite an in-class performance of only 3.3% off-task or socially inappropriate inter-

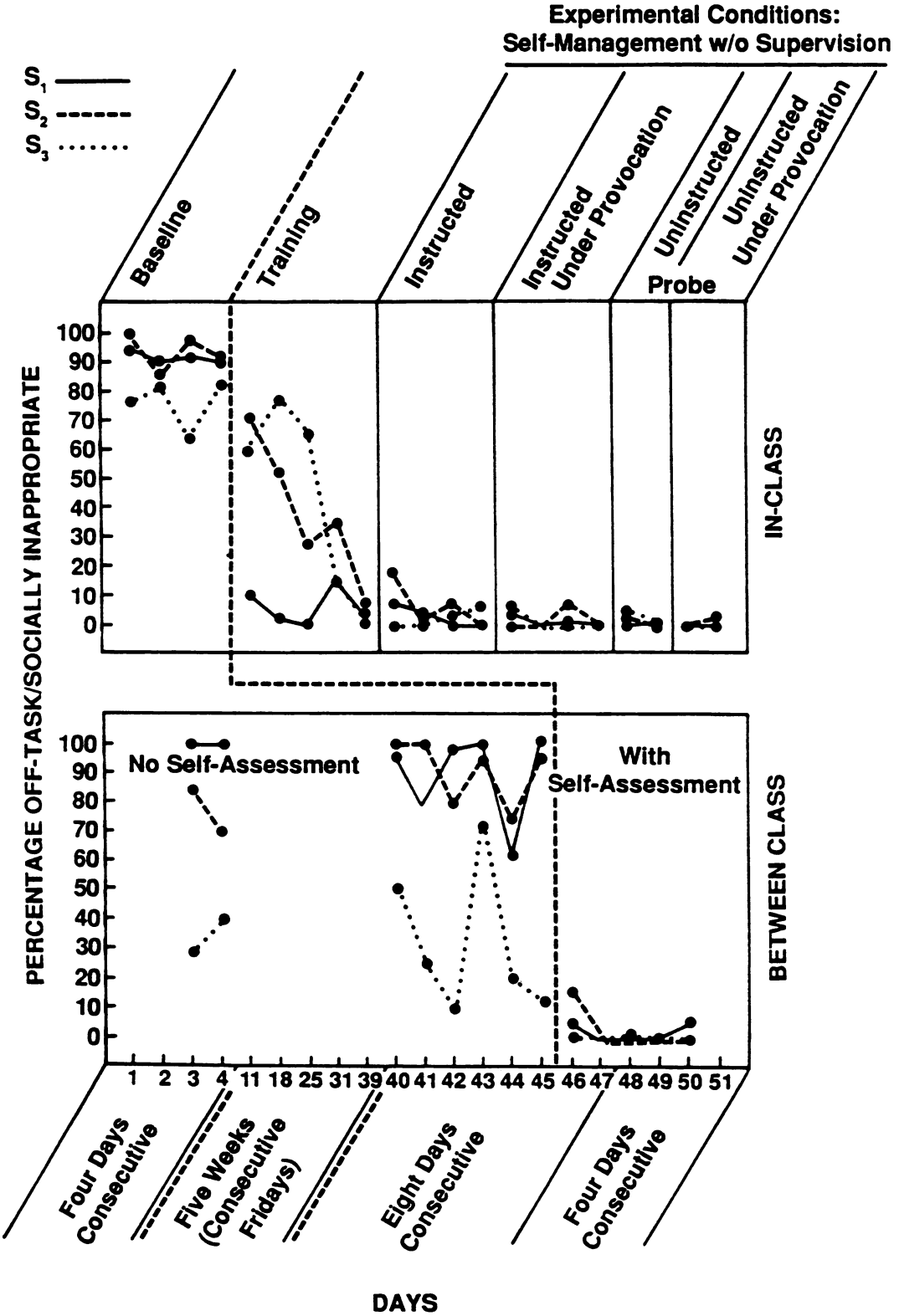

Figure 1. Percentage of off-task and socially inappropriate behavior across conditions of the study.

vals. Similarly, Subject 2 averaged 77.5% off-task or socially inappropriate behavior during the initial between-class baseline observations; his average off-task or socially inappropriate behavior increased to 90.8% between classes when these observations resumed. In the classroom, he was off task or socially inappropriate during only 6.3% of the observed intervals.

Subject 3 averaged 35% off-task or socially inappropriate behavior on the breezeway during the initial baseline sessions. In the latter part of the extended baseline, he averaged 31.6% socially inappropriate behavior between classes. His classroom behavior during this same period averaged 1.8%.

When the 3 subjects were explicitly told to self-assess and self-record their out-of-class behavior according to the criteria for on-task and socially appropriate behaviors practiced in the classroom and that the points they earned from such self-assessment would be added to their daily point sheets, there was an immediate and dramatic improvement in their on-task and socially appropriate behavior in the between-class setting. Although their self-assessment of between-class behavior was combined with their last in-class interval, there was no one to challenge the accuracy of their self-assessment of between-class behavior. Observations of five between-class sessions established near-zero socially inappropriate behavior after self-assessment contingencies were invoked. That is, while walking between classes, the students behaved and assessed themselves appropriately in the absence of supervision.

In the in-class setting a similar outcome was obtained. Although the four posttraining experimental conditions were arranged such that there were increasingly difficult circumstances in which the students self-managed in the classroom, there was no evidence of increased disruption. All 3 subjects demonstrated near-zero off-task or socially inappropriate behavior during successive days in which they were placed in the following four conditions: left alone in the classroom but instructed to self-manage, left alone in the classroom with instructions to self-manage while other students intentionally distracted them, spontaneously abandoned by the teacher with no instructions to self-manage, and left unsupervised with no instructions to self-manage while other students intentionally distracted them. In all of these provocative classroom circumstances, the 3 subjects demonstrated continued ability to remain on task and socially appropriate.

DISCUSSION

The present study describes an intervention package that facilitated transfer of newly acquired self-managing and self-managed repertoires to a setting in which no social agent was present to maintain contingencies for accurate self-assessment or for on-task and socially appropriate behavior. The results extend the research conducted by Smith et al. (1988) by demonstrating that the prosocial behavior of emotionally disturbed adolescents can successfully transfer from the training setting. It goes further in obtaining such transfer in the absence of any authority figure who could monitor the behavior.

Infrequent reliability assessments are, however, a limitation of this study. Also, the improved behaviors in both settings could be attributable solely to the social reinforcement system or to the self-management system, or to the combination of these procedures (Baer, 1984). Independent manipulation of each component is necessary to isolate the critical component(s).

The point system probably contributed significantly to the maintenance of both self-managing and self-managed behavior. Why both of these repertoires transferred to a setting in which no teacher monitoring had ever occurred, and in which false reports were ostensibly undetectable, may only be surmised. We suspect that the acquisition of a second repertoire under instructional control, the self-managing repertoire, added a new set of contingencies to the students' environment. The self-managing repertoire included self-instructions regarding how to behave. It also included the monitoring and recording that constitute "self-assessment." Because accurate self-assessment (correspondence between dimensions of conduct and the score given) historically produced reinforcement (points), a match between the behavior assessed

and the assessing behavior may have become a conditioned reinforcer (as a result of the students having earned points for correct matching). Likewise, a mismatch may have become an aversive condition, associated historically with failure to earn points. Instructions to include their between-class time in their self-assessing intervals put the students in a situation in which they could both obtain points and avoid the aversive mismatch. They could do this by behaving appropriately and recording their behavior accurately. Even though they could have continued behaving disruptively between classes while giving themselves high points, this would have produced a mismatch. Thus, maintenance of a self-managing repertoire by a point system may allow control of student behavior by even fewer direct-acting contingencies (Malott, 1989) than those represented by contingency management in the classroom. However, continuation of the behavior may depend on maintaining inaccurate self-assessment as an aversive condition. It is entirely possible that alternative peer-mediated contingencies would assert control over disruptive behavior if the condition were extended beyond 5 days. Whether such lapses would be accurately reported is unknown.

Both laboratory research and field research are likely to contribute to an adequate analysis of the behavioral processes involved in the acquisition and maintenance of interlocking repertoires of self-managed and self-managing behavior. Such an analysis appears to offer potential solutions to a variety of social problems associated with what is typically called "lack of self-control."

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