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ABSTRACT

This report investigates the effectiveness of a metacognitive strategy in reducing anger behavior and/or aggressive acts in elementary and secondary-aged students placed in special education classes. Three separate studies were conducted with three elementary, three middle, and three high school students who were placed in special education resource or self-contained classrooms. The metacognitive strategy consisted of interviews with individual students concerning the consequences of the student's behaviors; student commitment to participate in the strategy; teaching of the ZIPPER strategy (zip your mouth, identify the problem, pause, put yourself in charge, explore choices, and reset); role play; verbal rehearsal and practice; and commitment to generalize. Overall results indicated that students used the metacognitive strategies taught to reduce anger acts and aggressive behavior. (PB)

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Steven W. Smith

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NOTES

FERC NOTES ON THIS BULLETIN

The evidence that there are more angry students in school today than ever before can be documented by just the increased number of weapons brought to schools by students. Not only are there more, the depth of anger seems to be greater. Many, if not most, students of human behavior classify anger as a secondary emotion with other underlying causes. Dr. Smith's research findings can be very helpful to schools having this problem. FERC is pleased to publish this bulletin for school practitioners as well as other interested parties.

Charlie T. Council
Executive Director

Executive Summary

Problem and Purpose

This project was conducted to investigate the effectiveness of a metacognitive strategy (i.e., a systematic cognitive technique to assist students in recognizing, planning, implementing, and monitoring solutions to problems) in reducing anger behavior and/or aggressive acts in elementary and secondary-aged students who are placed in special education classes. Students who are in special education classes and who have major difficulty with managing anger and developing alternatives to aggressive behavior are most at risk for school failure because they are not likely to be integrated back into the general mainstream of education and they are most at risk for terminating their educational opportunity before graduation.

Subjects

Three separate studies were conducted with three elementary, three middle, and three high school students who were placed in special education resource or self contained classes. Each student was selected to participate in the study due to frequent aggressive behavior and/or inability to control anger.

Methodology

Three multiple baseline designs across subjects (three students in each study) were used. The independent variable in this study was the metacognitive strategy utilized by students to control their own behavior through problem-solving techniques. The response measure in this investigation was the occurrence of anger behavior (i.e., uncooperative and persistent noncompliance, blaming others, negativism and defiance, stealing without victim confrontation) and/or aggressive acts (e.g., bullying of peers, petty extortion, threatening peers and/or teachers, verbal assault, thefts involving confrontation with the victim, destruction of property).

Results

Overall results indicated that the students used the strategy to reduce anger acts and aggressive behavior. By analyzing the data, the three elementary students learned and utilized the strategy to reduce their inappropriate behavior. Two middle school students were able to reduce their anger and aggressive acts. One middle school student chose not to participate in the intervention. The three high school students seemed to reduce their maladaptive behavior, yet they indicated that they did not utilize the strategy to help themselves when feeling angry or aggressive. Because of some inconsistent and variable data, some of the reductions in behavior cannot be attributed solely to the intervention.

Conclusion

Much study needs to be conducted in the area of providing students with a metacognitive strategy to reduce their anger behavior and aggressive acts. For students in special education who have significant problems with their behavior, strategy instruction that is designed to assist them with their maladaptive behavior is needed for placement back into the mainstream. For regular and special education teachers, the metacognitive strategy designed to reduce inappropriate behavior in this study is promising and worthy of more investigation.

INTRODUCTION

The process of child development is an arena for the mastery of appropriate social skills. Acquisition of age-appropriate pro-social behaviors was long ago thought of as a natural occurrence during the maturation process. Yet, the ideal socialization process does not work for many students and deficits are especially evident in students with mild disabilities. The most common problem stemming from social skill deficits is antisocial, aggressive behavior. For students with mild disabilities, exhibiting aggressive behaviors is one of the primary reasons for recommending that special education students be excluded from regular education (Knapczyk, 1988).

Recent data suggests that the incidence of aggressive, uncontrolled behavior has increased dramatically during the past few decades and that childhood aggression accounts for a disproportionate number of referrals to special education (Kauffman. 1989). Retention in regular education settings requires that special education students display competence in social interactions. Competence is determined by a student's ability to interact with others in a manner that conforms to the standards for acceptable performance in the setting (Knapczyk, 1988). A student's possession and use of prosocial behaviors directly impacts the student's ability to profit from academic education. Inappropriate and negative social and emotional responses to situations may interfere with task completion and mastery of academic subject matter. Further, inappropriate reactions to social situations may interrupt the learning process for the student, but it may also disrupt the learning process for other students sharing the same educational setting.

A major component of the goals and responsibilities of special education is to promote the transition back to the mainstream of education. Returning to the mainstream can be made possible only if students with mild disabilities develop skills in problem solving as a component of a social skills training program. Research in the area of behavior management approaches has recently included cognitive-behavioral techniques (e.g., Etscheidt, 1991; Ager, C. L., & Cole, C. L. (1991)). The cognitive-behavioral model engages a relationship between internal cognitive events and overt behavior change by teaching strategies to guide task performance and reduce inappropriate behavior. The approach has been used with a variety of clinical populations, between therapist and patient. The overwhelming success in clinical settings foreshadowed the need to research cognitive-behavioral techniques in nonclinical, educational settings (Manning, 1988). Cognitive-behavioral techniques have been implemented in the educational field, but research is limited to highly academic areas such as mathematics, science, and reading.

Education, especially special education, is in critical need of cognitive-behavioral techniques that can be used to teach students to control anger and aggression. Current literature lacks vital information and empirical data that could demonstrate the effectiveness of cognitive-behavioral techniques as a method of teaching students to control anger and aggression. This study may provide information that would enable teachers to use a cognitive-behavioral intervention to improve control over anger and aggression in students with mild disabilities.

Statement of the Problem

The problem investigated in the study was to determine the effectiveness of a metacognitive strategy in reducing anger behavior and aggressive acts in

elementary and secondary-aged students who are placed in special education classes. The study consisted of three separate studies conducted with elementary, middle school, and high school students. Two questions were asked:

1) Will the students be able to learn the metacognitive strategy techniques?

2) Will the metacognitive training reduce anger behavior and aggressive acts of school-aged students?

The questions under examination in this study are important because children and youth who lack the necessary repertoire of skills to control anger and aggressive acts are most at risk for school failure. Students in special education who do not develop alternatives to anger and aggression are not likely to be integrated into the general mainstream of education, and they are most at risk for terminating their education prior to high school graduation (Asher, Oden, & Gottman, 1977). The importance of this study will be the reduction of anger behavior and aggressive acts by students placed in special education classes. A metacognitive strategy may increase appropriate behaviors and may lead to positive social interactions with peers and authority figures. Students will then have a greater chance of being integrated into general education programs and are more likely to experience success in the mainstream.

METHODOLOGY

Three separate studies were conducted that included three elementary, three middle-school, and three high school students. Each student was selected because of repeated episodes of anger and aggression that was judged to be significant by the student's special education teacher, mainstream teacher, school psychologists, parent, and/or student teacher. Each study utilized the same research methodology

and procedures, however, some procedures were varied to facilitate age-appropriate activities.

Before any data could be collected, a proposal for each of the three studies was submitted for approval to the University Institutional Review Board and the appropriate school board. A signed parent permission slip was obtained prior to initiating the study. Each student was then informed as to the activities of the study and their permission to participate was obtained. The names used in this report have been changed to insure confidentiality.

Experiment 1 (Elementary)

Subjects

The sample consisted of 3 fourth grade students attending a north central Florida elementary school. All of the students were enrolled in special education and attended a varying exceptionalities (VE) resource room part-time (6-12 hours per week). The 3 students received instruction in the resource room at the same time, and were also mainstreamed into fourth grade regular education classes.

Arsenio

Arsenio was a 10 year old black male in the fourth grade. Arsenio has been identified as meeting the criteria for a part-time program for specific learning disabilities. Arsenio was chosen for this study because of the display of aggressive behavior when angered. The resource room teacher and the mainstream teacher witnessed Arsenio teasing and hitting other students. Both teachers have also reported that Arsenio reacts inappropriately with anger in some situations and displays a poor attitude when confronted about inappropriate behaviors.

Martha

Martha was a 10 year old black female in fourth grade. Martha has been identified as meeting the criteria for a part-time program for specific learning disabilities. Martha was chosen for this study because of consistent disregard for the classroom rules. The resource room teacher and the mainstream teacher have witnessed Martha fighting, fussing, and pouting. Both teachers have also reported that when Martha gets angry, her reactions are inappropriate because she becomes sullen and uncooperative.

Travis

Travis was an 11 year old white male in the fourth grade. Travis has been identified as meeting the criteria for a part-time program for students with behavior disorders. Travis was chosen for this study because of displays of aggressive behavior, particularly when there is a disagreement with assigned daily tasks and teacher directions. The resource room teacher and the mainstream teacher have witnessed Travis blaming others for his misbehavior, and often becoming defensive. Both teachers have also reported Travis as arguing with the teacher when angered.

Setting

The metacognitive anger control strategy training and data collection was conducted in a VE resource room. The training was administered to each student individually. In the classroom, there was one fulltime special education teacher, one full-time paraprofessional, one part-time paraprofessional, one foster grandmother, one intern, and one practicum student. There were 20 students present in the classroom at the time of data collection, and the students were divided

into reading groups with one adult per group. The seating arrangement for each of the students varied daily. The classroom had desks in parallel rows, rectangular shaped tables, and a round table. No alterations were made to the setting for this study nor as a result of this study.

Research Materials

The investigator used two research materials including interval recording sheets and anger control score sheets. The interval recording sheet consisted of 110 intervals; each interval indicating a 15 second time period. A tally mark was placed in the appropriate interval if a target behavior occurred. If a target behavior did not occur, the interval was not marked. The interval recording sheet was used to tabulate the number of intervals the behavior occurred and then to calculate the percentage of intervals with behavior occurrence. The anger control score sheets were used by the investigator to tally the student's use of the strategy steps during role-play scenarios. The score sheet was also used to calculate the total number of appropriate behaviors during role-play scenarios.

Procedures

Baseline

Baseline data were collected on each of the 3 students while they were in the VE resource room. Baseline data were taken daily for a 30 minute period from 10:30 to 1100 A.M. Data were gathered on the number of anger behaviors and aggressive acts exhibited. The investigator sat in the rear of the classroom and recorded the occurrence or nonoccurrence of the target behaviors during each interval. Each student's behaviors were recorded separately and the totals remained as individual counts. No intervention was implemented during the baseline phase.

Intervention

The intervention consisted of 6 consecutive days of metacognitive strategy training for 30 minutes each day. The intervention was introduced to each of the 3 students in the VE resource room from 11:00 to 11:30 A.M. The metacognitive strategy training was provided by the investigator. Each day of intervention began with a question and answer session between the investigator and the student. The questions were related to the students use of the strategy when the investigator was not present.

Day 1 of the intervention consisted of interview, rationale, and commitment. The interview took place privately between the investigator and the student. The investigator provided the student with a situation and asked the student for their reaction to the situation. An example of a situation was, "During reading group someone laughs at you when you make a mistake. What would you do? What would happen if you did that?" The interview was followed by a confidential dialogue that elaborated on how uncontrolled anger and aggression can at times lead to undesired outcomes with authorities, peers, family members, and others. Using examples from the interview, the consequences of the student's existing set of behaviors was discussed. The rationale was developed to ensure the student's active participation in the strategy. Finally, the student signed a written commitment to participate in a strategy to control anger and aggression.

Day 2 of the intervention consisted of describe and model. During the describe step, ZIPPER was explained to the student. ZIPPER is a mnemonic that stands for zip your mouth, identify the problem, pause, put yourself in charge, explore choices, and reset. The ZIPPER strategy incorporates self-instruction, first

overt then covert, into roleplays of anger situations. During describe, each step of ZIPPER with its associated self-instruction strategy was described. Potential outcomes for using the strategy were elicited from the students and elaborated by the investigator. A cue sheet outlining the steps of ZIPPER was distributed. During the model stage, the investigator distributed a second cue sheet. The cue sheet contained self-statements and physical self-cues appropriate for the steps of the strategy. The investigator modeled the self-statements and physical self-cues so that the student was able to see the appropriate technique.

Role-play began during the model stage. The investigator presented an anger situation. An example of an anger situation was, "Someone teased you." The investigator and the student then role-played this situation using the ZIPPER mnemonic. In the first role-play, the investigator played the part of the student who was being teased. During the role play, the investigator modeled ZIPPER aloud, using self-statements and physical self-cues. Once the student saw ZIPPER used in a role-play scenario, the roles were reversed. The student then played the part of the person being teased while going through the steps of ZIPPER. Upon conclusion of the role-play, the investigator discussed the scenario with the student and provided corrective feedback.

Day 3 consisted of verbal rehearsal and practice. During verbal rehearsal the student verbally practiced the ZIPPER steps, rationale for each step, and appropriate self-instruction for each step. Cue sheets were initially used, but reliance on cue sheets was gradually faded. The investigator played a game with the student during this step. The investigator and student tossed a bean bag back and forth, reciting the next step of the strategy. Practice took place next and

involved role-playing similar to Day 2. The student role-played various scenarios presented by the investigator. The investigator provided themes such as: "Somebody started fighting with me", "Somebody did something I didn't like", and "My Mom would not buy me a new Nintendo game".

The investigator used the anger control score sheet to score the student's performance based on following the steps of the strategy. The score sheet was divided according to the steps of ZIPPER. The investigator tallied in the appropriate row when the student exhibited correct self-statements and physical self cues. After the role-play, discussion took place between the investigator and the student and corrective feedback was given.

Days 4 and 5 continued the practice component, repeating what the student had done during practice on Day 3. The investigator provided various scenarios for the student to role-play. Again, discussion and corrective feedback took place, and the investigator used the anger control score sheet to evaluate the student's performance of the role-play scenarios.

Day 6 consisted of commitment to generalize. During this stage, the investigator again provided a rationale for use of the strategy and reviewed the previous intervention components. A verbal commitment to generalize was obtained by discussing with the student possible situations where ZIPPER could be applied. The student was also commended for dedication and hard work during intervention. The investigator encouraged the student to remember the strategy and use it when applicable.

Maintenance

Continuous data were collected for each student upon completion of the intervention phase in order to determine the maintenance of the trained behaviors. During 30 minute observation sessions in the VE resource room, the investigator collected data on the percentage of intervals where each student exhibited aggressive acts and anger behavior.

Response Measure

The investigator's attempt was to determine whether the students were able to learn the metacognitive strategy and if the strategy would reduce aggressive acts and anger behavior. Data were taken daily during intervention to determine if the students were utilizing the strategy. This data consisted of the frequency of self statements and the use of physical self cues indicating the use of the ZIPPER strategy.

The investigator also attempted to demonstrate the effect of metacognitive strategy training upon the frequency of anger behavior and aggressive acts. The response measure in this study was the percent interval of aggressive acts and anger behavior. Aggressive acts were defined as bullying of peers, petty extortion, threatening peers and teachers, verbal assault, thefts involving confrontation with the victim, and destruction. Anger behavior was defined as uncooperative and persistent noncompliance, blaming others, negativism and defiance, and stealing without victim confrontation.

Research Design

To address whether the students were able to learn the strategy, the investigator used the anger control score sheet. Tallies of self-statements and

physical self cues were totaled in a systematic form enabling the investigator to determine whether the students learned and utilized the strategy. To address whether strategy training was effective in reducing the frequency of aggressive acts and anger behavior, the investigator used a multiple baseline design across subjects (Tawney & Gast, 1984). The condition sequence was as follows: initial baseline (A) were taken on all 3 students in the VE resource room, intervention (B) was implemented on Student 1 after at least 3 continuous days of data collection that showed the response measure to be stable or with an increasing trend.

As Student 1's performance reached an acceptable criterion level, continuous data collection was being conducted measuring Student 2 and 3's preintervention (baseline) performance. Student 2's baseline data collection was conducted until data showed the response measure to be stable or with an increasing trend. Following baseline, the intervention was introduced to Student 2. As Student 2's performance reached an acceptable criterion level, continuous data collection was being conducted measuring Student 3's preintervention (baseline) performance. Student 3's baseline data collection was conducted until data showed the response measure was stable or was increasing in trend. Following baseline, the intervention was introduced to Student 3. Continuous maintenance data were collected for each student upon completion of the intervention phase.

Results

The 3 students in the study exhibited increases during the intervention of appropriate self-statements and physical self cues. Data from the response measure were used to determine the students ability to learn the strategy. The 3 students in the study exhibited decreases during the intervention in the frequency of aggressive

acts and anger behavior. There was a decrease or stabilization in the percent of intervals of the target behaviors from the initial baseline phase to the intervention phase, and there was a decrease in the percent of intervals of the target behaviors from the baseline phase to the maintenance phase. During the maintenance phase, there was minimal increase in the percent of intervals of the target behaviors; however, the frequency of occurrence of target behaviors was substantially lower than during baseline.

A visual analysis of the data that represents reduction of the frequency of aggressive acts and anger behavior is displayed in Figure 1. The figures display the percent intervals of aggressive acts and anger behaviors. Baseline data were collected for Student 1 for 6 consecutive days during which no intervention was implemented. Baseline data were collected for Student 2 for 10 days (In School Suspension [ISS] 1 day) during which no intervention was implemented. Baseline data were collected for Student 3 for 15 days (absent [abs] 1 day) during which no intervention was implemented. Metacognitive strategy training occurred during a 6 day intervention phase. Maintenance data were collected for Student 1 for 14 consecutive days. Maintenance data were collected for Student 2 for 9 consecutive days. Maintenance data were collected for Student 3 for 4 consecutive days.

Arsenio

Data collected from the anger control score sheet ranged from a low of 12 to a high of 20 during the six day intervention period. The mean of the data was 15.3.

Figure 1 shows Arsenio's percent intervals of aggressive acts and anger behavior. During baseline, the percent intervals ranged from a low of 1 to a high of 21 with a mean of 12.6. During the intervention phase, percent intervals of

aggressive acts and anger behavior ranged from a low of 0 to a high of 6 with a mean of 2.2. Finally, during the maintenance phase, the percent intervals of aggressive acts and anger behavior ranged from a low of 0 to a high of 2 with a mean of 1.2.

Martha

Data collected from the anger control score sheet ranged from a low of 16 to a high of 20. The mean of the data was 18.

Figure 1 shows Martha's percent intervals of aggressive acts and anger behavior. During baseline, the percent intervals ranged from a low of 2 to a high of 20 with a mean of 10.1. During the intervention phase, percent intervals of aggressive acts and anger behavior ranged from a low of 0 to a high of 6 with a mean of 3.3. Finally, during the maintenance phase, the percent interval of aggressive acts and anger behavior ranged from a low of 0 to a high of 2 with a mean of .77.

Travis

Data collected from the anger control score sheet ranged from a low of 12 to a high of 16. The mean of the data was 14.

Figure 1 shows Travis' percent interval of aggressive acts and anger behavior. During baseline, the percent interval ranged from a low of 2 to a high of 15 with a mean of 9.8. During the intervention phase, percent intervals of aggressive acts and anger behavior ranged from a low of 0 to a high of 5 with a mean of 2.7. Finally, during the maintenance phase, the percent intervals of aggressive acts and anger behavior ranged from a low of 2 to a high of 4 with a mean of 3.3.

Interrater Reliability

Interrater reliability was calculated by comparing the findings of the investigator with those of a research assistant who was trained by the primary investigator. The research assistant sat approximately 15 feet from the primary investigator and collected data on the target behaviors using the recording form prepared by the primary investigator. The research assistant collected data during approximately 20% of the days during each phase (i.e., baseline, intervention, and maintenance) for each student . Overall interrater reliability was .995. Reliability was calculated by dividing the number of observer agreements by the number of agreements and disagreements X 100.

Conclusion

The data from Experiment 1 point out that the student's were able to learn and use the ZIPPER strategy. High frequency data taken during the six days of instruction in the use of the strategy indicated that students used self statements and physical self cues to remember and use the strategy.

The students were also able to reduce their aggressive acts and anger behavior. During baseline, all of the students exhibited high percent intervals of aggressive acts and anger behavior. During metacognitive strategy instruction intervention, all 3 students showed a decrease in the targeted behaviors. Finally, during maintenance, the students showed a decrease in the targeted behaviors compared to baseline data. During the baseline phase, Arsenio's frequency of aggressive acts and anger behavior was relatively high, except for Day 3, where 1 target behavior was observed. That particular data point was taken on an atypical day when Arsenio was receiving one-to-one instruction with the paraprofessional.

Arsenio's substantial decrease in the targeted behaviors on the first day of intervention may have been due to the attention given by the investigator. During maintenance, the percent interval of aggressive acts and anger behavior remained at a stabilized reduced percentage as compared to both baseline and intervention. Arsenio reported that he enjoyed the metacognitive strategy instruction, a factor that may have played a significant role in the reduction of the targeted behaviors.

At the onset of baseline data collection, Martha's frequencies of aggressive acts and anger behavior were unstable. On the second day of data collection, the VE resource teacher was absent and the teacher's absence may have influenced Martha's display of the targeted behaviors. On Day 8, Martha was not in the classroom for baseline data collection because she was sent to in-school suspension (ISS). The day of ISS may have influenced the next day of data collection because Martha displayed an increase in aggressive acts and anger behavior.

On the first day of metacognitive strategy intervention training, Martha's display of the targeted behaviors decreased and by the last day of intervention data Martha showed a substantial decrease in frequency of aggressive acts and anger behavior. Maintenance data were relatively stable as Martha continued to exhibit a decreased percent interval of aggressive acts and anger behavior.

Travis' frequency of aggressive acts and anger behavior became relatively stable by Day 15 of baseline data collection and remained stable until the metacognitive strategy training intervention was introduced. By the fourth day of intervention, Travis exhibited significant decreases in the targeted behaviors. During the latter part of the metacognitive strategy instruction, Travis was eager to participate in role play scenarios and openly discussed situations in which the

strategy could be used to reduce self anger and aggression. The increased participation and outside thinking about the strategy may account for the stable decrease in target behaviors. During maintenance, the mean frequency was not as low as intervention, however, the frequencies were significantly lower than during baseline. In general, all 3 of the students' percent intervals of aggressive acts and anger behavior may not have decreased on each day of data collection. Yet, during the 37 day time period, the percent intervals revealed a substantial decreased trend from baseline.

Problems and limitations that were encountered in the process of implementing this study should be considered when interpreting these data or attempting to replicate this investigation. When the investigator was collecting data, it was observed that there where instances in which the students would turn their heads to look at the investigator before and after reacting to a situation. On one occasion, a student covered his mouth and said "Oh, I wasn't supposed to do that" after the investigator had observed a situation where the student became angry. Because the investigator had developed good rapport in a prior relationship with the students in this study, the students may have been inclined to behave in ways not representative of behaviors that occur when the investigator was not present. The investigator believes that students with mild disabilities oftentimes do not maintain trained behavior over time. Long-term maintenance data would need to be collected in order to assure the effectiveness of the metacognitive strategy training.

The need for metacognitive strategy training for the purpose of decreasing the occurrence of aggressive acts and anger behavior was examined in the present study. The data suggest that the students were able to learn and use the

metacognitive strategy techniques. Further, the results indicate that metacognitive strategy training can decrease the frequency of aggressive acts and anger behavior in elementary-aged students.

Future studies may demonstrate not only that metacognitive strategy training programs are effective in reducing aggressive acts and anger behavior, but using them may assist students in controlling their behavior in mainstream settings. Research on the use of cognitive and metacognitive strategies for students with mild disabilities is abundant. A specific strategy, however, for reducing aggressive acts and anger behavior was not identified upon review of the literature. The most serious limitation of current literature is the lack of research concerning maintenance and generalization effects of metacognitive strategy training programs.

Experiment 2 (Middle School)

Subjects

The data for this study were obtained from 3 seventh-grade students attending a middle school located in north central Florida. All of the students were enrolled in special education classes and attended a varying exceptionalities (VE) resource room for 12-25 hours a week. The students were mainstreamed for physical education and elective classes (art, music, typing, home economics). The 3 students received instruction in reading, mathematics, language arts, science, and social studies in the VE resource room. All of the students were of low socioeconomic status, as determined by their eligibility for free or reduced-price meals.

Robert

Robert was a 13 year old oriental male student in the seventh grade. Robert had previously been identified as meeting the criteria for a fulltime program for students with behavior disorders. Robert was chosen for this study because his VE teacher had reported that he exhibited high rates of aggressive acts or anger behavior or both. Robert often acted aggressively, bullying or threatening peers and verbally assaulting them. Robert demonstrated anger behavior by blaming others or by being negative or defiant. Specifically, Robert was observed mumbling curses under his breath when reprimanded or not awarded bonus points that other students had received.

Kelly

Kelly was a 14 year old black female in the seventh grade. Kelly was identified as meeting the criteria for a fulltime program for students with behavior disorders. Kelly had demonstrated similar behavioral characteristics as Robert's.

Carl

Carl had been identified as meeting the criteria for a fulltime program for students with behavior disorders. Carl commonly defied all classroom rules as well as displayed uncooperative and non compliant behavior. Often a whole class period would go by without Carl accomplishing anything. Often Carl's papers would be found crumpled up on the floor beside his desk. Occasionally, he would simply walk out of class without permission. Carl would regularly try to manipulate his way out of doing most classroom tasks.

Setting

All 3 students received part-time instruction in a VE classroom with 18 other children with disabilities. A full-time special education teacher, a full time intern, and one part time aide were employed in the classroom. For the purposes of this study, all one-on-one instruction was conducted outside of the library on a bench. No one except the investigator or the research assistant and one of the subjects was present during instruction.

Research Materials

The investigators of this study utilized materials similar to those used in Experiment 1. Other materials included a handout defining the metacognitive strategy, a handout to test for recognition of the steps in the metacognitive strategy, and a handout providing prompts to facilitate the steps in the strategy.

Procedures

Baseline

Baseline data were collected during academic instruction for a minimum of three days for each student. The baseline data were taken during the 5th period (12:53 p.m-1:36 p.m). The normal classroom schedule for that period comprised of group or one-on-one academic instruction with academic games. An electronic timer was used by the investigator to mark the end of each interval when the target behaviors would be recorded.

Intervention

During the intervention, each student selected for the study was presented with a metacognitive strategy to reduce aggressive acts and anger behavior. The elements of the strategy included : (a) a commitment step with active involvement of the student via rationale and participation, (b) modeling and self instruction training of the intervention, (c) practice (i.e., role-playing sessions and self-statements for anger and aggression control interventions) and feedback, and (d) teaching for generalization. The metacognitive strategy training took place for one class period daily for 5 days. Training took place during the students' seventh period social studies and social awareness class which began at 2:27 p.m and ended at 3:10 p.m.

On the first day, the instructor read the child consent script to the subject and also had the student read the script aloud. Then the instructor spent approximately 10 minutes providing a rationale to the student to encourage the student to participate in the study. The instructor explained to the student that a behavior change could help the student succeed in the mainstream. Long-term goals included the student graduating from high-school and potentially going to

college. After the rationale was provided, the instructor presented the metacognitive mnemonic strategy to the students. The ZIPPER strategy was introduced through a handout and the instructor read the statements associated with each step aloud to the students. Each step of the strategy corresponded to a specific motion so as to help the subjects develop some visual imagery associated with the strategy. Step one, "Zip your lips" corresponded to a motion of the thumb and the index finger, tips touching, across the lips. Step two, "identify the problem " was matched with placing the right index finger to the right temple indicating the thinking process. Step three, "put yourself on hold" was demonstrated by pushing the right index finger down on an imaginary telephone hold button. Step four "put yourself in charge" was expressed by moving the extended right thumb towards oneself. Step five, "explore other responses", was matched with placing the left index finger on the left temple again to denote the thinking process. Finally, step six, "restart an activity", was paired with the student moving about in an active manner. The students used these motions to help facilitate the memorization of the strategy by using different perceptual routes. The method of associating motions with steps was intended to assist the students in the transference of the verbal commands into short-term memory by associating them with easy-to-remember signs.

After the student demonstrated an ability to recite the steps of ZIPPER, the instructor proceeded with a series of questions to stimulate discussions supporting the use of the ZIPPER strategy. Such questions included: When would be a good time to use the ZIPPER strategy? Could you use ZIPPER at home? At school? At play? Has anything happened recently that you think you could have dealt with by using ZIPPER? The first session ended with the instructor describing a scenario

and modeling it. First, the scenario was acted out, executing the steps of ZIPPER in order to demonstrate the positive effects the strategy can have on one's behavior. The session ended with a discussion about the potential of the strategy, if used, to aid the student in returning to the mainstream.

Day 2 began with the instructor reading the ZIPPER handout to the student and acting out the motions that accompanied each statement. Next, the student was asked to fill in the blank handout with the steps of the strategy. The student was asked the reasons for using ZIPPER and the instructor provided feedback. The instructor then went through each step of the strategy prompting the student to state the advantages that each statement may provide to the user of the strategy. The instructor then asked the student to recite all of the steps of the strategy also using the motions that correspond to each step. The instructor requested instances where the student was in trouble and how the use of ZIPPER could have had assisted the student. The instructor then used a scenario to demonstrate the positive effects of the strategy by acting out the steps overtly for the student. Questions asked were: How did the confrontation develop? When was the right time to begin using ZIPPER? What could your goals be in that situation? Together the instructor and the student would set some goals that the student would be interested in pursuing when in a situation involving provocation.

Day 3 began with the instructor having the student fill in the blank handout with the steps of the ZIPPER strategy. A new handout was introduced with the title "Prompt yourself to use ZIPPER". The instructor read the entire sheet out loud for the student interrupting on each step to provide explanation and emphasis where necessary. Role plays for day three were introduced, and the investigator and

student took turns taking the role of the person who needed to use ZIPPER. The session ended with the instructor asking whether the student had been able to use ZIPPER in the past 3 days. Then the student filled out another blank handout with ZIPPER statements.

Day 4 began with the student filling out the handout. The particular activity of filling out the handout was always included at the beginning and end of each session to help the student maintain the steps of the strategy in memory . Role plays for day 4 were introduced, and the instructor and the student took turns acting them out. The first two scenarios were practiced verbally. The third role-play was acted out first overtly (by saying each statement out loud) and then covertly (saying the statements internally) to facilitate generalization and maintenance of the strategy. The session ended with simple practice of the steps with the accompanying motions and filling the blank handout sheet with the steps.

Day 5 began with a wrap up discussion about the rationale for using ZIPPER and the experience the student has had during the intervention. The blank handout was filled in by the student. The student acted out the steps with the motions. Scenarios for day 5 were generated from the student's experience. The first was done overtly, and four more scenarios were acted out using the steps covertly. The student was encouraged to use the ZIPPER strategy in all situations, anytime, or any place.

Maintenance.

Post-intervention data collection was conducted to determine the effects of the treatment over time. Data were collected on the 3 students' anger behavior and aggressive acts during academic instruction in the regular academic instructional

setting. No intervention was implemented during the follow-up period. An electronic timer was used to note the end of each interval when the occurrence or nonoccurrence of the aberrant behaviors would be recorded.

Response Measure and Research Design

The response measure and experimental design for Experiment 2 were the same as delineated in Experiment 1.

Results

During the intervention, students were required to fill out a blank handout with the steps of the mnemonic strategy. At the start of the session the students were allowed to look at a list of the steps. However, at the end of the session students were to fill out the steps without looking at the completed sheet. Robert and Kelly both filled in the sheets correctly at the end of each session indicating that they had indeed learned the steps of the mnemonic strategy. Robert and Kelly could both recite the steps of the strategy with the corresponding motions without assistance. Thus, it was determined that the students were able to remember the strategy.

Robert

Initial baseline figures ranged from a low of 0% to a high of 35% of intervals where anger behavior and aggressive acts were recorded with a mean frequency of 14.4% and a median of 10.5% of intervals. The range of data was 35% and the standard deviation was 11. Initial baseline for Robert was conducted for 9 days, however, one of the days' results were not calculated in the statistical analysis (day 9) due to Robert's absence. The specific data point for this day was included in Figure 2.

Robert was exposed to a 5-day instructional program where the ZIPPER metacognitive strategy was introduced, for about 30-40 minutes a day. Frequencies of aggressive acts or anger behavior or both during that period ranged from a low of 2% to a high of 3%. The mean percent was 1.6, the median was 2% of intervals, and the data range was 3% with a standard deviation of 1.4.

The maintenance phase was 10 days in length and followed the pattern of the initial baseline. However, one of the day's results was not included in the calculation of the statistical measures as Robert was taken out of the classroom by a staff member before the end of the observation session for reasons unrelated to the scope of this study (day 10). Data from two other days were also not included because Robert was sent to time out (days 6 and 8). Percent of aggressive acts and anger behavior for Robert ranged from a low of 0% to a high of 5% of intervals with a mean of 1.6 % and a median of 1% . The data range was 5% and the standard deviation was 1.7. Graphic representation of all the data, including the ones disqualified, are found in Figure 2.

Kelly

Initial baseline figures for Kelly ranged from a low of 0% to a high of 15% of intervals marked by an occurrence of anger behavior or aggressive acts or both, with a mean of 4.3% and a median of 2.5%. The data range was 15% with a standard deviation of 4.1. Initial baseline was conducted for 12 days during which period no intervention in the form of instruction was introduced. Two data points were included in the graphic representation for this student, but were excluded from any statistical calculations due to Kelly's absence (days 5 and 9).

Kelly was introduced to a 5-day instructional program presenting the ZIPPER metacognitive strategy. Frequency of occurrences of anger behavior or aggressive acts or both during that time ranged from a low of 0% to a high of 10% of the intervals. The mean frequency was 4.2% and the median rate was 3% for the 5 days of the condition. The data range was 10% and the standard deviation was 4.1. Kelly was accurate in the reproduction of the ZIPPER metacognitive strategy, verbally or in written from. For all 5 days the student was able to fill in the statements for each step, verbally reproduce them as well as able to perform the motions associated with each step.

The maintenance phase was 7 days in length. The datum from one observation session was disqualified because Kelly was frequently in and out of the classroom helping the teacher prepare popcorn for the class. No instruction was offered to Kelly during this 7-day condition. Frequency of anger behavior and aggressive acts ranged from a low of 0% to a high of 8% of intervals marked by anger behavior or aggressive acts or both with a mean of 6.3% and a median of 3%. The data range was 8% with a standard deviation of 2.8. Graphic representation of the data is found in Figure 2.

Carl

The investigator followed the same process with Carl. After the end of the initial baseline which lasted for 18 days, the investigator attempted to introduce the strategy to Carl. Carl refused to cooperate. For two days in a row, the investigator presented the strategy to Carl and went through each step but Carl was not willing to submit the effort required to learn the strategy, even though he had consented to the study in the beginning. Carl's behavior during these two days was sufficiently

uncooperative for the investigator to decide not to continue the effort as the instructional procedures used with the previous 2 subjects could not be replicated. Further efforts to gain Carl's cooperation would have compromised the experimental validity of the study.

Six of the days, during which data were collected (days 2,4,5,6,7, and 17), were excluded from the calculation of statistical measures, even though included in the graphic display. The statistical measures for Carl were: low 1%, high 51%, mean 13.3% and median of 10% of intervals with an occurrence of anger behavior and aggressive acts. The data range was 50% and the standard deviation was 11.1. Despite Carl's intransigence, his behavior was recorded until the end of the observation sessions for the purpose of providing an additional control condition with which to compare the levels of behavior of the 2 other subjects. A graphic display of Carl's behavior can be found in Figure 2.

Interrater Reliability

Interrater reliability measures were employed during all three phases of the study. Interrater reliability probes were conducted at random. Reliability data were collected by a research assistant during days randomly chosen by the investigator. The research assistant collected data 20% of the days in each phase for each student. The research assistant sat at a distance of approximately 5 feet from the investigator and counted occurrences of anger behavior and aggressive acts on a data-gathering sheet provided by the investigator. Reliability scores were calculated directly following the session in which the probes were conducted. The interrater reliability scores were calculated by dividing the number of agreements between the two observers by the number of agreements plus disagreements. The resulting

number was then multiplied by a hundred to yield a percentage score. The overall reliability score was 96%.

Conclusion

Robert's initial baseline behavior was high as well as unstable. His behavior follows an upward trend during initial baseline. Upon introduction of intervention Robert's levels of behavior decreased between initial baseline and intervention phases. Despite this decrease in Robert's behavior levels, the trend during the intervention phase was still upward as opposed to a downward learning curve trend that one would expect to appear if the strategy were learned. Further, his behavior continued to be unstable albeit, less unstable than during the initial baseline phase.

The dilation manifested in the levels of Robert's behavior, particularly during initial baseline, and less emphatically during intervention and maintenance casts doubts as to whether a condition of experimental control was achieved for Robert. The behaviors observed dropped in numbers significantly from baseline to intervention and remained the same during maintenance along with becoming more stable. The data patterns suggest that a functional relationship exists between the dependent and independent variables, however, not stable enough to allow the investigator to induce a sound causal relationship. The functional relationship could be attributed to an experimental effect wherein a student's performance changes because they were aware or anxious about being measured, or students alter their performance to please the investigator.

The effect could also be that the students were responding to novelty rather than the strategy. A way to combat the latter effect would be to implement a longer intervention period during which one would expect the novelty to diminish;

however, time restrictions prevented the investigator from doing so. Variability in Robert's case would be attributed to some other extraneous event, temporary or permanent, or may reflect a change in the independent variable, a hypothesis which appears credible, however, not assessable within the scope of this study due to the multicomponent nature of the treatment package. Finally, it is important to note that Robert was suspended at the end of this study for getting into a fight with another student. It is also relevant to note that the fight occurred in a classroom other than the one where Robert was observed. This event suggests that if Robert had learned the strategy might have been able to utilize it outside of the specific classroom, where training took place.

Kelly's behavior levels were quite unstable during baseline though not as unstable as Robert's. The behavior levels of Kelly during initial baseline were not very high. During intervention her behavior levels dropped slightly but did not stabilize any further. The trend during baseline was slightly upward while it ascended during the intervention phase. The trend escalated again during maintenance, an event that argues against explaining the intervention trend as a learning one. Data patterns stabilized during maintenance. Kelly's data patterns appear less erratic than Robert's, however, there is still great variability in her behavior levels, particularly during the baseline and intervention phases. The fact that the mean data values and standard deviation indicate a decrease in the mean value and a stabilization of data values is not adequate to overcome the weakness of the experimental control conditions, as manifested by the erratic data patterns, particularly during initial baseline. As noted earlier, Kelly did learn the strategy as evidenced by her performance in the written and oral pre and post-instructional

tests. One may assume that there is evidence of a functional relationship among the dependent and independent variables despite the difficulties posed by the inadequacies of the experimental control conditions.

It is tenuous, however, to assume that there is a clear causal relationship between the dependent and independent variables. Extraneous events may have caused the variability in Kelly's behavior patterns and, as hypothesized in Robert's case, the different treatment components may have exerted an effect on Kelly's behavior but it is quite difficult to assess the impact that each component may have exerted. As shown in Figure 2, Carl's behavior as well as a statistical analysis show the behavior levels to be highly variable. As noted earlier, his behavior was recorded despite his failure to cooperate with the investigator

The data from this study indicate that there is a functional relationship between the dependent and independent variables. The introduction of the intervention in Robert's case reduced his anger behavior and aggressive acts demonstrating a functional relationship, but the variability during baseline and intervention phases, and the upward trend during intervention render an assumption of a cause and effect relationship rather weak. In Kelly's case, there is enough evidence to support the conclusion that there is a functional relationship between the dependent and independent variables. However, Kelly's levels of behavior were quite low as well as unstable during baseline and intervention. Further, a downward trend during the intervention phase became upward during maintenance; thus, the assumption that it was the metacognitive strategy that caused the effect on Kelly's behavior and not some other extraneous factor was undermined.

Experiment 3 (Secondary)

Subjects

The sample consisted of 3 students enrolled in special education classes at a high school in north central Florida. The participants for this study were selected from a total population of 40 students receiving special education services. The students were selected because of frequent noncompliant behavior and frequent suspensions for aggressive behavior and inability to control anger.

Rob

Rob was a 15 year old white male from a lower middle socioeconomic area. Rob had been identified as meeting the criteria for placement in a program for students with behavior disorders. Rob was chosen for the study because of his inability to control his anger and because of his frequent outbursts in class. Rob had been suspended three times during the school year.

Anna.

Anna was a 14 year old white female placed in a program for students with behavior disorders. Anna had difficulty with controlling her temper and frequently engaged in aggressive behavior with other students. Anna had been suspended two times during the school year.

Jeff

Jeff was a 16 year old white male from a lower-middle socioeconomic area. Jeff was receiving special education services because he frequently engaged in aggressive behavior resulting in three suspension during the school year.

Setting

The metacognitive anger control strategy training was conducted in a room next to the student's self-contained classroom. The training was administered to each student individually. Data were collected in the classroom were there was one fulltime special education teacher, one fulltime paraprofessional, and one practicum student. There were 14 students present in the classroom at the time of data collection.

Research Materials

The research materials utilized in the study included an anger behavior and aggressive acts recording data sheet (similar to the instruments utilized in Experiments 1 and 2), a daily log sheet, researcher collection sheet, and a teacher evaluation sheet.

The daily log sheet consisted of seven questions that required the participant to report a conflict situation and the participants subsequent reactions. The participant completed the questionnaire with either a verbal or written response. If the participant chose a verbal response, the answers were recorded verbatim. There are several possible answers per question, including a blank space for responses not available in the list of answers. The evaluation sheet was filled out by the teacher to monitor progress of each participant. The evaluations were completed on a weekly basis.

Procedures

Baseline

Baseline data were collected over a 5 day period in one class during the school day. The observation period was selected by the student's teacher as a

period where aggressive acts and anger behavior have been frequent and problematic.

Intervention

The intervention in the present study involved a problem solving strategy to assist the student in developing a repertoire of appropriate responses to provocations. The strategy included the mnemonic ZIPPER which stands for zip your mouth, investigate the problem, put off what you want to do, put yourself in charge, explore other solutions, return to what you are doing. Implementation of the strategy and of its effectiveness was carried out in several stages: pretest and commitment step, modeling step, practice step, and feedback.

The pretest and commitment step followed a referral by the teacher for an anger control incident. In addition to the referral, baseline for the strategy was established, and the student was asked to read and sign a commitment to learn the strategy. The consent form contained a short explanation for the strategy and rules required during training with the investigator.

After the student signed the consent form, an interview followed using incidents that have resulted in referral for the student. If no specific situation was identified, the interview was conducted in general terms, using provocative situations suggested by the investigator. The student attempted to answer the questions, "What triggered the problem? What was your response?" and "What were the consequences?" The investigator attempted to identify the repertoire of responses the student used in conflict situations and then later (after strategy instruction) used when evaluating effectiveness of the strategy.

In order to "sell" the strategy to the participant and obtain a commitment to participate, a confidential discussion was necessary with the student. A confidential exchange prevented embarrassment to the student and provided the opportunity to present the rationale that will help ensure the student's active participation in the strategy. The dialogue consisted of how uncontrolled anger and aggression can at times lead to undesired outcomes with authorities, peers, family, and with others. as well as how such behaviors will effect the participants' self concept. Using examples from the student's evaluation, the consequences of the participant's existing set of behaviors were discussed.

A student log developed as a checklist was used daily to record reactions to conflict situations. In the checklist, the student was asked to select the response to be applied to the conflict situation. The student rated how the situation was handled on a scale from 1 (poorly) to 5 (great), and how angry the student felt as measured on a scale from 1 (burning mad) to 5 (not angry at all). Daily logs were discussed by student and investigator at each session.

Once the consent form was signed and student log was introduced, the investigator reviewed the ZIPPER method and model. Modeling by the investigator included provocation by the student (role play was prepared by the investigator) and response by the investigator using overt verbalization of the strategy. Each step of ZIPPER with its appropriate self instruction was modeled.

Role play sessions were followed by discussion and corrective feedback sessions. The purpose for the roleplay activity was to actively involve the student from an early stage that increased motivation. Special emphasis was placed upon appropriate self-instruction by the investigator. Various provocative role-play

situations were used throughout the strategy. A variety of role-plays assisted the student to integrate elements of the strategy. and later apply it to different situational demands.

ZIPPER was explained to the student, emphasizing how this strategy will help in postponing undesirable responses in order to increase a more desirable response. A cue sheet was distributed to each participant outlining the steps of the mnemonic. The initial model stage requires the assistance of a second investigator or of a student who has rehearsed the role-play situation with the investigator. The model stage was necessary so that students could see components of a successful role-play session. A provocative theme was introduced (e.g.,"someone hit me").

The investigator modeled the techniques verbally, cooperatively developing the provocative situation into a role-play skit, as well as developing appropriate responses. Following the verbal development. the players modeled the strategy. The investigator as the protagonist used self statements and physical cues to model ZIPPER verbally.

The participant verbally practiced each of the following: the steps in ZIPPER, the rationale behind each step, and the appropriate self-instruction for each step. Initially the cue sheet was used, though reliance on a cue sheet was faded gradually.

The practice stage involved role-playing. The central themes were: "somebody teased me," "somebody took something of mine," "somebody told me to do something," "somebody was doing something I didn't like," "somebody started fighting with me," "I did something wrong," and "somebody called me a name." At the beginning of each thematic session, the investigator discussed the

topic, briefly remodeled appropriate use of the strategy in a given hypothetical situation, and provided potential outcomes based on the model. The participants then formed peer pairs, evolved their skits, and presented them to the investigator.

On occasion, it was necessary for the investigator to prompt students not to "break role" during role-play sessions. If the students diverged too much from the appropriate use of the strategy, the investigator stopped the role-play, provided feedback, and then reactivated the role-play. Students presented their skits followed by a discussion with peers and corrective feedback by the investigator.

After each student explored all suggested themes, the investigator took post-treatment data on the number of aggressive acts and anger behaviors. The students' teachers were given an evaluation form to rate student improvement.

Response Measure and Research Design

The response measure and experimental design for Experiment 3 were the same as delineated in Experiments 1 and 2.

Results

Each of the three students was able to learn the steps of the mnemonic device ZIPPER within days of intervention, however, the students reported on daily log sheets that the strategy was not being used in conflict situations. Data from the daily log sheets illustrated in 9 out of 12 conflict situations (75% of the time), students did not use the metacognitive strategy to control inappropriate responses. Rob and Jeff were able to recite and utilize the steps after two days of training with the research assistant. Anna, showed acquisition of the mnemonic after one day of intervention training. Each student was required to individually discuss and commit to the strategy on day one of intervention. Students were asked

to communicate reasons this strategy was important for them to learn and use in order to achieve the commitment step. The investigator and student discussed situations together modeling inappropriate reactions to the problem. Next, the student was asked to walk through the problem by using ZIPPER and demonstrate appropriate problem solving skills. Each of the three students successfully completed the commitment, modeling, and practice steps of the strategy.

According to data collection and teacher evaluation forms, each student was successful at decreasing inappropriate behavior in both regular and special education settings for all three students.

Rob had baseline data ranging from 14 to 39% with a mean of 25% for the 6 days of data collection as shown in Figure 3. The median score during baseline was 24%. After 5 consecutive days of intervention Rob's data ranged from 2 to 12% with a mean of 8.4% and a median of 10%. During maintenance for Rob a range from 2 to 5% and a mean of 3.6% was found. The median score during the last phase was 3%.

After baseline data collection, Anna's behavior ranged from 5 to 28% with a mean of 15.2%. As pictured in Figure 3, Anna showed improvement during intervention with a range from 3 to 10% with a mean of 6.7% and median of 7%. Maintenance for Anna ranged from 1 to 4% with a mean of 2.2% and a median score of 2%.

Jeff had a range of 10 to 29% during baseline data collection. The mean was 18.5% and the median was found to be 17%. Intervention data, as shown in Figure 3, ranged from 2 to 4% with a mean of 3% and median of 3%. Maintenance

for Jeff was recorded and a range of 2 to 3% was found with a mean score of 2.3% and median of 2.1%.

Interrater Reliability

Interrater reliability measures were employed during all three phases of the study. Interrater reliability probes were conducted at random. Reliability data were collected by a research assistant during days randomly chosen by the investigator. The research assistant collected data 20% of the days in each phase for each student. The research assistant sat at a distance of approximately 5 feet from the investigator and counted occurrences of anger behavior and aggressive acts on a data-gathering sheet provided by the investigator. Reliability scores were calculated directly following the session in which the probes were conducted. The interrater reliability scores were calculated by dividing the number of agreements between the two observers by the number of agreements plus disagreements. The resulting number was then multiplied by a hundred to yield a percentage score. The overall reliability score was 88%.

Conclusion

From the beginning, all three students were motivated to participate in the study due to the fact that they would be taken out of class. In order to stay in the study, students learned quickly that maintaining high rates of inappropriate behavior were necessary. Additionally, student performance in this study may have been affected by the setting in which the data collection was taken. During intervention, the students were reinforced by the one-on-one attention each received from the investigator. During observation after an intervention session, students were aware of their performance in front of investigator, and at times, performed solely for the

investigator. After students responded to a conflict situation within the observation period, they would look to the investigator for feedback or reinforcement.

It was evident to the investigator that students were not receiving reinforcement from the classroom teacher. In addition to the lack of reinforcement, students were lead into confrontations or conflict situations by the teacher. The difference in learning styles of the students and the teaching style of the teacher created confusion, frustration, and a negative environment.

Rob, having the highest number of confrontations with the teacher, was the first student to receive intervention. Rob was taught specific strategies in role play situations to circumvent a confrontation with a specific teacher. During the initial stages of discussion about the purpose of the study, Rob demonstrated an inability to elicit appropriate alternatives to conflict situations or even reasons why other alternatives are viable. After discussions, modeling, and practice, Rob was made aware of his own anger behavior. This increased awareness along with previously discussed circumstances contributed to the reduction of Rob's aggressive acts and anger behavior.

Anna possessed her own strategies to control her anger behavior but needed guidance in using the strategies effectively. The guidance included discussions of her motivation for exhibiting aggressive acts and anger behavior (i.e., peer pressure and the reinforcement of being the class clown). These circumstances discussed above contribute to the reduction of the inappropriate behavior.

Jeff, like Anna, was motivated to behave according to peer reinforcement. When Jeff was not exhibiting aggressive acts and anger behavior, he proceeded to the extreme opposite, becoming withdrawn and lethargic. During these times, the

investigator did not record the episodes even though the behavior can be classified as noncompliant.

The findings of the study can be applied by teachers for use in special education classrooms to deal with difficult to manage behavior. The findings from the study suggest that empowering teachers with the knowledge of the metacognitive strategy to use in their classroom, paired with immediate reinforcement of the use of the strategy, and a shorter mnemonic, would show to decrease aggressive acts and anger behavior. It is suggested that one-to-one instruction of the metacognitive strategy should be paired with informal counseling to find the root of the anger and the motivation to exhibit the behavior.

The data from the current study suggest that a decrease in inappropriate behavior occurred as a result of the total interaction between the investigator and the students. In settings with students with mild disabilities, it is important to give students a strategy to control their emotions before the problems become more severe. In teaching students with severe behavioral disorders, controlling their anger and reducing aggressive acts is the major focus. It is also suggested that this metacognitive strategy be added to the social-personal or occupational skills curriculum since controlling anger behavior is an essential part of these areas.

One suggested research topic includes having students participate in the creation of the mnemonic strategy. Another interesting research avenue would be to investigate if the use of a shorter (possibly a three letter) mnemonic would make a difference in the utilization of the strategy.

A different approach to researching this topic can be the use of this metacognitive strategy in a group or classroom setting with instruction provided by

the teacher. Along with this suggestion, it may be beneficial to have students monitor their own behavior.

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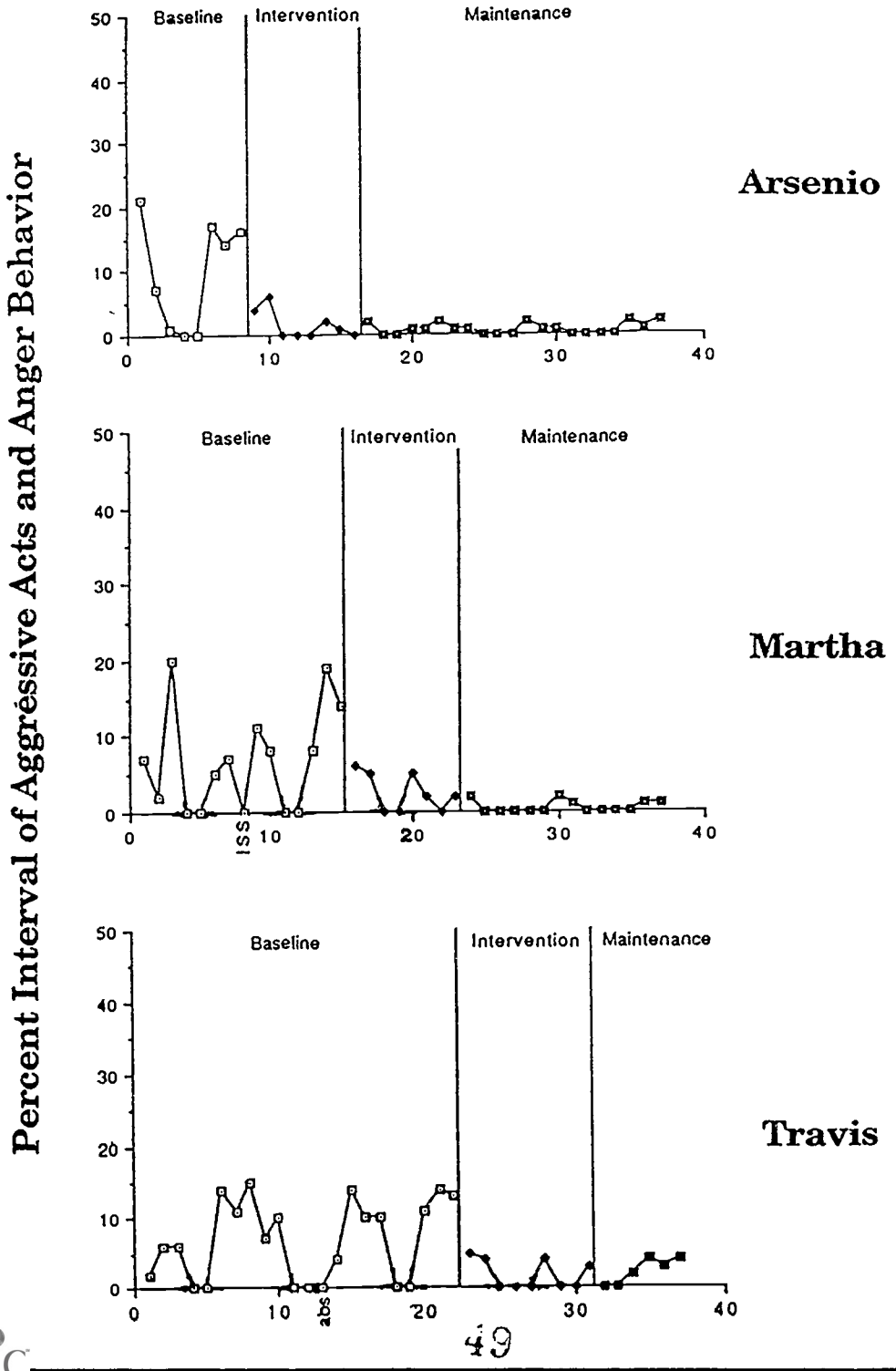
Figure 1


Percent Interval of Aggressive Acts and Anger Behavior
Baseline
Intervention
Maintenance
Arsenio
Martha
Travis
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10
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30
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50
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abs

Figure 2

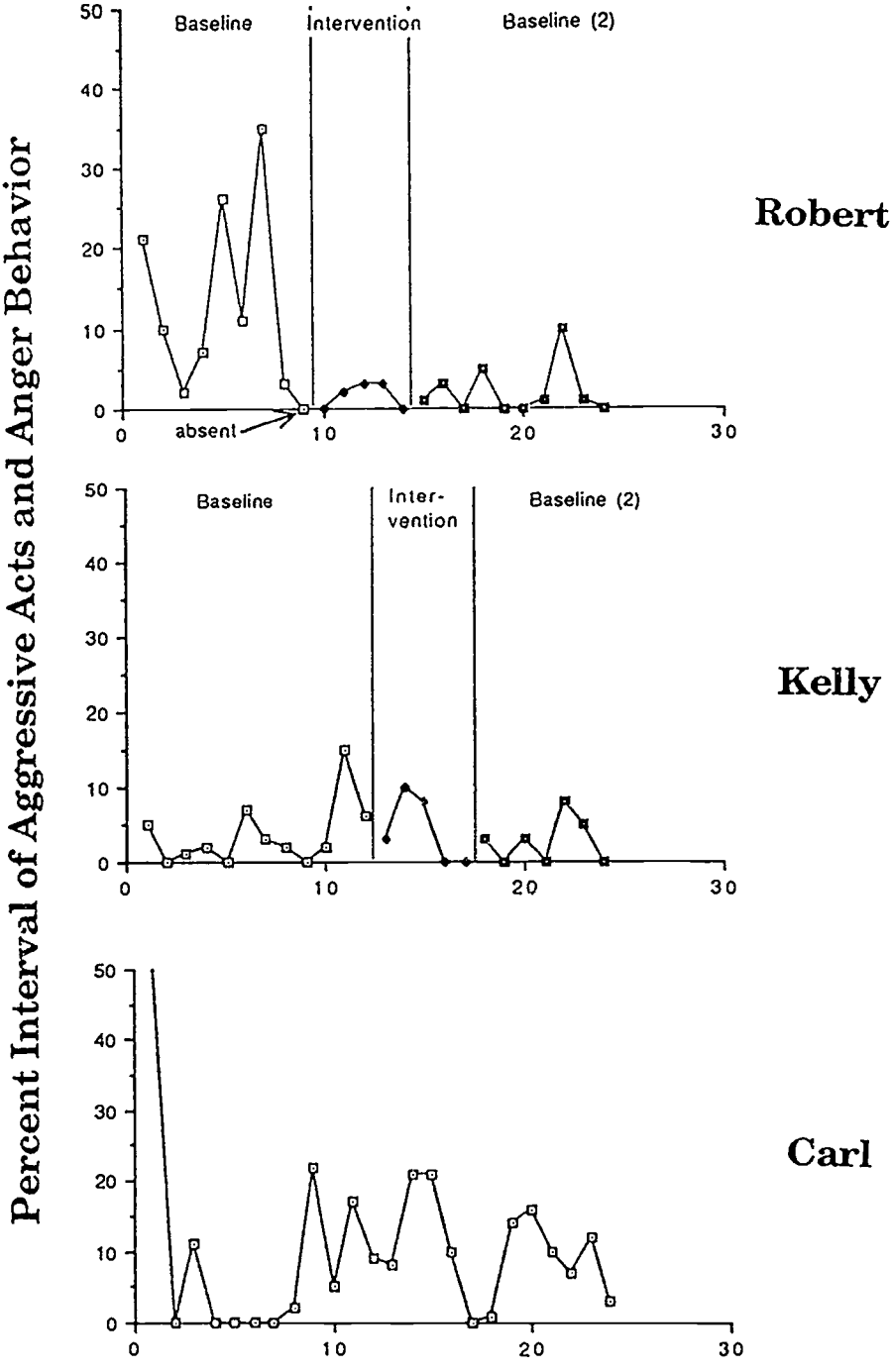
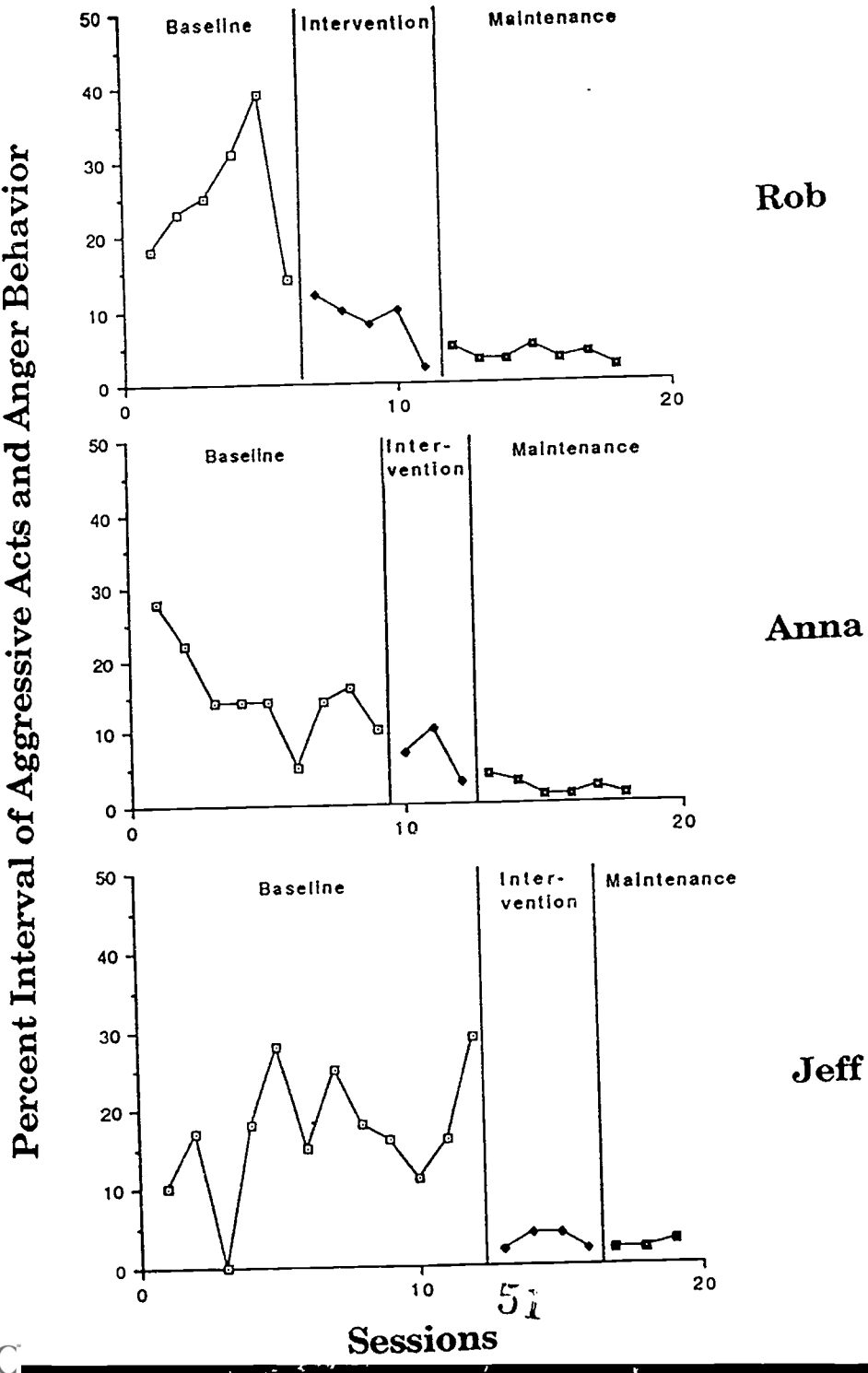

Percent Interval of Aggressive Acts and Anger Behavior
Baseline
Intervention
Baseline (2)
absent
Robert
Baseline
Inter-
vention
Baseline (2)
Kelly
Carl
0
10
20
30
40
50
Sessions

Figure 3


Percent Interval of Aggressive Acts and Anger Behavior
Baseline
Intervention
Maintenance
Rob
Baseline
Inter-
vention
Maintenance
Anna
Baseline
Inter-
vention
Maintenance
Jeff
0
10
20
30
40
50
Sessions

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