1982

Self-instruction as a treatment for hyperactivity : an assessment of response generalization

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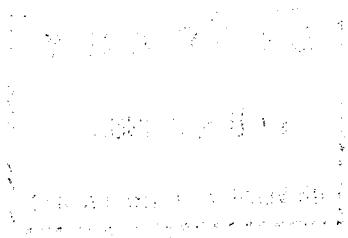
Self-Instruction as a Treatment for Hyperactivity: An Assessment of Response Generalization

A Thesis

Presented to

the Graduate Faculty of the

University of the Pacific



In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Paul J. Thinesen

June, 1982

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Dated 4/16/82

Acknowledgements

Whenever a project of this magnitude is undertaken and completed, there are a great many people who contributed and need to be recognized. It is impossible to thank everyone, and I hope they will forgive me if they are not mentioned herein. First, I want to thank the teachers and parents of the participants for their time and willingness to give self-instruction a chance. I especially want to recognize the efforts of the participants, without whom of course, there would have been no thesis.

I would like to point out the efforts of my observers, especially Rus Scheer and Gayle Elkins, who did the often thankless and tedious work of classroom observation. We had our ups and downs but they brought in the data.

I want to recognize and say thanks for the unique contributions of my thesis committee, Roger C. Katz, chairperson, Kenneth L. Beauchamp, and Esther Cohen. Esther's humor and knowledge of children as well as her criticisms of the manuscript were invaluable. Ken was able to help and always was available on a moment's notice for the thesis' "crisis" moments. I hope a part of his knowledge of writing styles and editorial prowess were passed on to me.

I especially want to point out Roger's contributions to this thesis, to my professional development, and to my personal life. Roger has gone well beyond what anyone could have expected him to do. Certainly, Roger was the epitome of a teacher. I thank him for that.

I also wish to thank my friends, especially Jill and Gordon, who made my life away from school exciting, refreshing, and fun. I also wish to point out the contributions of my parents, Phil and Inez, who have supported my efforts not only during my Masters work but throughout my life.

Finally, without the support, caring, energy, and love given to me by Colleen, none of this would have been possible. Colleen stood by me, comforted me when needed, and has made and will continue to make my life a full one.

Abstract

Three hyperactive boys were treated with a self-instruction treatment package utilizing a case study design with a 2 week follow-up. Generalization measures were made to the participants' classroom using the modified Stony Brook observation code. Adjunct measures included three rating scales (completed by the participants' teachers and mothers) and participant performance on the Matching Familiar Figures Test. Treatment session measures and social validity measures were also taken. Following treatment, all participants' level of appropriate behavior increased over baseline levels and was maintained during a 2 week follow-up. These results indicate that self-instruction training resulted in response generalization, a significant addition to self-instruction research. However, results from the rating scales and MFFT showed no change in behavior after treatment and in some cases indicated that the participants' behavior worsened. Participants' grades also did not improve. These contradictory results are discussed and suggestions for further research are made.

Prevalence rates of hyperactivity have been estimated at between 5 and 10% (Wender, 1971) which makes this one of the most common forms of child behavior disorders. Although no single treatment has produced consistently favorable results, one common approach has been the use of stimulant drugs (Douglas, 1975; Krippner, Silverman, Cavallo, & Healey, 1973; O'Leary, 1980; Wender, 1971). Indeed, in the United States today as many as 200,000 children may be receiving stimulants to control their hyperactive behavior (Krippner et al., 1973). Unfortunately, recent research on stimulant drug therapy has raised serious questions about its effectiveness.

For example, negative side effects such as increased heart rate and blood pressure (Cohen, Douglas, & Morganstern, 1971) as well as growth supression (Safer & Allen, 1975) have been reported. Although stimulants have been shown to decrease gross motor activity (Sroufe, 1975) there is evidence that these medications may also interfere with academic performance (Ayllon, Hayman, & Kandel, 1975). Moreover, medications may only mask behavioral deficits and cannot be considered a long-term treatment modality (Cantwell, 1974; Douglas, 1975; O'Leary, 1980; O'Leary, Pelham, Rosenbaum, & Price, 1976). Estimates also indicate that between 30 and 50% of hyperactive children are unaffected by stimulants, either behaviorally, socially, or academically (Fish, 1971; Wender, 1971). As a result of these drawbacks, researchers have sought alternative methods to

treat hyperactivity. In this regard, they have investigated the use of behavior therapy, either as a single mode of therapy or in combination with stimulant drugs.

This paper will review recent studies using behavior therapy for the treatment of hyperactivity. The studies have been grouped under the following sub-headings: (a) drug and behavior therapy studies, (b) operant approaches in the classroom and in the home, and (c) self-instruction strategies. First however, problems associated with diagnosing hyperactivity will be briefly discussed.

Definition problems

No universally accepted definition of the hyperactive syndrome has evolved, nor is there a consensus regarding the etiology of hyperactivity. Some critics contend that hyperactivity is not a diagnostic category (Freeman, 1976). However, the majority of researchers agree that hyperactive children display various inappropriate behaviors and lack both social and academic skills. Delineating the essential features of hyperactivity is further complicated by the various labels given to hyperactive children such as minimal brain dysfunction, hyperkinesis, and impulsivity (Weiss & Hechtman, 1979). Obviously, some type of consistent diagnostic criteria must be adopted in order to compare results of one study to those of another.

The American Psychiatric Association's Diagnostic and Statistical Manual (DSM III, 1978) lists hyperactivity as a

subcategory of Attention Deficit Disorder (ADD). For children to be diagnosed as hyperactive, they must exhibit a wide range of behaviors and these behaviors must have been present from an early developmental stage. Some of these behaviors include short attention span, impulsivity, (i.e., non-goal directed behavior), excessive gross motor activity, and non-compliance (Chermak, Stein, & Abelson, 1973; DSM III, 1978; O'Leary, 1980; Whalen & Henker, 1980).

Most researchers diagnose hyperactivity via direct behavioral observations. For example, Abikoff, Gittelman-Klein, & Klein (1977; 1980) advocate matching the hyperactive child with a normal peer to determine if the behavior of the hyperactive child deviates from the norm. Other researchers have used a global rating sysytem, such as the Conners Teacher Rating Scale (CTRS, Conners, 1969). The CTRS consists of 39 items in three major areas: (a) classroom behavior, (b) group participation, and (c) attitude toward authority. Each item is rated on a four point scale from "not at all" which is scored as 1, to "very much" which is scored as 4. Two studies, Kupietz, Bailer, and Winsberg (1972) and Sprague, Christensen, and Werry (1974) have produced data that support the efficacy of this scale for diagnosing and assessing hyperactive children.

However, the global rating scale is open to criticism. For example, no behavioral descriptions are provided with the

items, which means the hyperactive child's behavior must be interpreted subjectively by the respondent. Thus, Item 1 on the CTRS, "constant fidgeting," may mean fidgeting during the entire school day or just during math class. The absence of clear operational definitions detracts from the reliability of this type of measure. Items also overlap such as Items 7 and 8, "inattentive, easily distracted," and "fails to finish things he starts, short attention span." The response choices, such as "pretty much," are also ambiguous.

Other diagnostic criteria include referral to a pediatrician, and whether or not the child was previously on stimulant medication. In addition, recent factor analytic studies (Abikoff et al., 1977; 1980; Lahey, Green, & Forehand, 1980) have found classes of behavior that clearly differentiate hyperactive children from normal peers. These include greater impulsivity, inattentiveness, gross motor activity, non-compliance, and poor social or academic skills.

The task of diagnosing and measuring hyperactivity (i.e., operationally defining "inappropriate behavior") is not easy. For example, the characteristics of the hyperactive child change with age, so that 5-year-old hyperactive children may exhibit behaviors much different from 12-year-olds. Clearly, delineating dependent measures and demographic data on hyperactive children should help to circumvent this problem and allow for better replications of treatment techniques. In

addition, multiple measures should be taken on each participant, such as academic prowess, attention span, gross motor activity, and social behaviors. In this way, researchers can show that by training hyperactive children to "slow down," these children can then develop pro-social and academic skills (O'Leary, 1972; Twardosz & Sajwaj, 1972; Winett & Winkler, 1972).

Another recommendation to ease definition and measurement problems is to use a matched pair observation system (e.g., Abikoff, et al., 1977; 1980). The matched pair observation allows a comparison of the hyperactive child's behavior with a normal peer's (as rated by a teacher on a rating scale, i.e., CTRS). By obtaining data from normal peers, researchers will be better able to analyze results in terms of how the hyperactive children should behave, or what is considered acceptable in the child's social and academic environment. Matched pair observations can also provide valuable diagnostic information by clearly differentiating hyperactive and non-hyperactive children (Abikoff, et al., 1977; 1980).

Further, the use of a global rating scale (e.g., CTRS) as an ancillary diagnostic tool should help to standardize diagnostic criteria across studies. The CTRS has been demonstrated to be reliable across respondents for assessing hyperactivity in at least three studies (Conners, 1969; Kupietz et al., 1972; Sprague et al., 1974). Finally, special attention should be given to the DSM III (1978), especially in regard to how each

participant's behavioral history (i.e., developmental stages) and present behavior compares with the DSM III diagnostic criterion for Attention Deficit Disorder with hyperactivity.

Treatment Strategies

Drug and Behavior Therapy Comparative Studies

The relative efficacy of stimulant drug therapy (primarily methylphenidate) and behavioral treatments for hyperactivity have been compared in several studies. In one study (Christensen & Sprague, 1973), 12 participants were assigned to either a placebo or drug group with 6 in each group. Both groups received reinforcers for sitting still which was measured by a seat device in a specially equipped trailer. Although the mean rate of activity declined in both groups, the drug group had a lower rate of activity across all conditions, including a condition where no reinforcers were given.

The effects of different levels of stimulants were compared to a reinforcement treatment in two case studies (Stableford, Butz, Hasazi, Leitenberg, & Peyser, 1976). Baseline measures of both inappropriate and appropriate behaviors were first taken. For the first participant, measures were taken in his classroom using a 15 sec interval recording method. For the second participant, measures were taken in the home and school settings. Measures in the school were conducted as in the previous case. How measures were taken in the home was not specified. In both participants the amount

of stimulant medication was gradually reduced. Only when both the stimulant medication and placebos which replaced them were completely removed did the rate of inappropriate behavior rise substantially. This would suggest that taking of pills caused behavior change whether or not the pill was an active drug. The results show that a reinforcement treatment was effective in decreasing the amount of inappropriate behavior when the participants were not taking either placebos or stimulant drugs. Further, the reinforcement treatment (points for appropriate behavior) was functionally equivalent to 25 mg of Ritalin in terms of the level of appropriate behavior it produced.

Ayllon et al. (1975) measured both appropriate behavior and academic performance during a drug condition and a condition that included reinforcement but no drugs. Participants were two males, ages 9 and 10, and one female, age 8. They were observed during two 45 min class periods using a 25 sec interval recording system. The token reinforcement condition was implemented sequentially in a multiple baseline across participants design. The reinforcement condition was superior in increasing academic performance across all three participants, and equivalent to the drug condition in reducing inappropriate behaviors. It was also shown that drugs alone reduced both hyperactive behavior and academic performance. Unfortunately, no follow-up data were obtained, nor was the token reinforcement condition removed to determine if favor-

able results would persist in its absence.

Pelham (1977) treated an overmedicated hyperactive child using a single subject design. A behavioral intervention consisting of parent and teacher training plus the use of a daily report card decreased hyperactive behavior. A global rating system was used to assess treatment effects. Conversely, there was no reduction under two dosage levels of Ritalin. Unfortunately, the results must be interpreted cautiously because of the lack of reliable and on-going behavioral measures.

O'Leary and Pelham (1978) matched seven hyperactive boys with a control group and measured on-task behavior during medication and behavior therapy interventions. Behavior therapy consisted of parent and teacher training in behavior management, and home based reinforcement of school behavior. Teacher and parent ratings were taken during each phase of the study. Classroom observations were also conducted. Each student's target behaviors, intervention strategy, and the rate at which the medications were withdrawn, were individualized. Results showed behavior therapy equal to medication in terms of controlling on-task behavior. These gains were maintained at a 4 week follow-up. Teacher ratings on the CTRS during the medication and reinforcement conditions showed no differences; however, parent ratings showed a significant effect during the reinforcement condition. On-task behavior across all participants improved an average of 48% during the medication con-

dition, and 33% during the reinforcement condition.

Shafto and Sulzbacher (1977) compared the relative efficacy of an edible reinforcer plus contingent praise for appropriate behavior against varying doses of Ritalin for controlling the behavior of a hyperactive preschool boy. Measures were taken during a 20 min free play period. Results showed behavior therapy to be as effective as medication in controlling on-task behavior. A follow-up probe one year later found the participant's behavior had deteriorated. An appropriate level was regained after contingent teacher attention, and later, peer administered contingencies were instigated.

Wulbert and Dries (1977) compared medication to medication plus behavior therapy in a single case study. Measures were taken of ritualistic behavior, aggressive behavior, and recall tasks in a clinical setting, and on ritualistic and aggressive behavior in the child's home. The participant was reinforced for appropriate "hands down" behavior and correct answers to visual and auditory recall tasks while alternating between placebo and Ritalin conditions. At home, the participant received points for appropriate behavior, exchangable for previously agreed upon prizes. A 2 min timeout was contingent on aggressive behavior. Drug and placebo conditions were of equal effectiveness, but the reinforcement condition was superior to both. However, a significant drug effect was found in the home. Ritalin was superior to the placebo in control-

ling a ritualistic hand behavior and aggressive behavior. No reliability data were taken in the home, so the accuracy of measures taken there is suspect. In addition, the specific reinforced behavior did not generalize to other settings or behaviors.

Pelham, Schnedler, Bologna, and Contreras (1980) treated eight hyperactive children (7 boys, 1 girl) with behavior therapy. The therapy consisted of teacher and parent training. Before therapy, at 3 weeks, and at 13 weeks into therapy, the participants received either a placebo, .25 mg, or .75 mg of methylphenidate in 3 week probe conditions. However, only when the higher dose was administered did the behavior of the participants approach that of a no treatment control group of normal peers. These results suggest that stimulant and behavior therapy together may be superior to either alone.

Steinfeld (Note 1) and Gittelman-Klein, Spitzer, and Cantwell (1978) contend that the effects of medications for controlling the behavior of hyperactive children cannot be predicted prior to an actual empirical assessment (for each individual child). Gittelman-Klein et al. also point out that some measures such as global ratings, are inadequate to assess the effects of medications because they lack the specificity to identify small changes in behavior and may be subject to "halo" effects. That is, changes in one behavior may cause the respondent to score the participant as better on several in-

dices in the global rating tool. Further, the use of large samples to assess drug effects often masks individual differences.

Taken together, these studies indicate that behavior therapy is either equal to or more effective than drug therapy when each treatment is administered independent of the other. However, Pelham et al. (1980) found that behavior therapy and medications in combination may be superior to either alone. Ayllon et al. (1975) and Ayllon and Rainwater (1976) also report that parents were pleased that their child's previous dependence on Ritalin had ended. On the other hand, Stableford et al. (1976) suggest that some parents may chose drug therapy over behavioral approaches because it is easier to administer. In some ways, the choice of which method to use, drugs or behavior therapy, may boil down to a choice between ease of application versus the risk of possible side effects in the context of a specific family and specific child.

Operant Approaches

In the home. Wiltz and Gordon (1974) treated a 9-year-old hyperactive boy and his parents in an experimental apartment setting. The apartment was equipped with two-way mirrors, microphones, and videotape equipment. The parents recorded the frequency of inappropriate behavior throughout all phases of the study. Prior to the treatment condition, the parents read and discussed Living with Children (Patterson & Guillion,

1971). Other parent training techniques included role playing, modeling, and feedback (via videotape). After two days of baseline, procedures for reinforcing appropriate behaviors were outlined. Points for compliance and appropriate behaviors were awarded on a variable interval schedule. Noncompliance and minor deviant behaviors were consequated by a 5 min timeout. Major deviant acts were consequated by 1 to 5 hrs in timeout. Significant decreases in non-compliant and inappropriate behavior occurred within 5 days and these levels were maintained after the family returned to their home. Follow-up contacts and training were conducted via telephone rather than using the measures employed earlier in the study.

Daniels (1973) successfully treated a 6-year-old hyperactive boy with ulcerative colitis. His parents were trained to ignore inappropriate behavior and to socially reinforce appropriate behavior at least once an hour. The specific methods used for parent training were not reported. The parents reportedly exhibited many "hyperactive" behavior (e.g., constant fidgeting and the inability to focus on one activity for a sufficient length of time as to be able to complete it). Thus, the parents may have served as a model for some of their child's problems. The parents were asked to relax and were required to take data on the number of times they reinforced their child. The father estimated that the

boy's inappropriate behavior had declined by 75% and the number of bowel movements had fallen from a pretreatment level of 30 times to 5 times daily. Thirteen months after the termination of formal contacts, both the number of bowel movements and the level of inappropriate behaviors were reported as normal by the parents. Unfortunately, the boy was never seen by the author and no reliability checks were conducted.

Frazier and Schneider (1975) treated a hyperactive retarded boy using a single subject design. For a pretraining assessment, the authors went to the home to gather observational data. They treated inappropriate behaviors sequentially, first during meal time and then after the meal. The time periods were arranged sequentially according to a multiple baseline design. The parents were taught how to attend to appropriate behavior and to place the child in a darkened room, seatbelted to a chair for 3 consecutive min of quiet time for inappropriate behavior. The inappropriate behaviors decreased quickly and remained at a low or zero rate for the duration of the treatment.

Murry (1977) reported the use of a "black book" in public settings for controlling disruptive and non-social behaviors. When the child misbehaved, the parent would take out the black book and write down the behavior. The behavior was consequated at home although some parents reported that taking out the black book was sufficient to control their

children's public behavior. Unfortunately, little information is provided as to how the parents were trained to use the book, no reliability checks were reported, and operational definitions of inappropriate behaviors were lacking. Further, it is unknown if the changes in behavior resulting from the black book, which presumably served as a conditioned aversive stimulus, persisted when the book was withdrawn.

The training of parents to control the behavior of their hyperactive children is an important area of research. The literature is not conclusive in this area but several parent training procedures seem useful. The use of a training manual (e.g., Living with Children) appears useful (Wiltz & Gordon, 1974). Roleplaying, modeling, and the use of immediate feedback should also be helpful (Johnson & Katz, 1973).

In the classroom. Several authors (Ayllon & Rainwater, 1976; Cantwell, 1974; Chermak et al., 1973; Ross & Ross, 1976) point out that although hyperactivity dissipates with age, the loss of academic and social skills may not be recoverable. Although little data is available, Ross and Ross (1976) estimate that as many as one-third of hyperactive children will suffer from personality disorders as adults. Wender and Wender (1978) report that during the early school years, the hyperactive child often requires more "structure" and may suffer from perceptual difficulties. In addition, they point out that the inattentiveness and impulsivity that character-

izes hyperactivity greatly interferes with the hyperactive child's academic development. Unsuccessful academic experiences may in turn help to foster poor social skills. Thus, hyperactive children are often described as aggressive and unpopular with their peers.

Developing effective classroom strategies to assist hyperactive children to learn social and academic behaviors is a much needed undertaking. Behavior therapists have developed several techniques to help teachers cope with special needs populations (O'Leary & O'Leary, 1980). Some of these techniques have been used with hyperactive subjects with promising results.

For example, Wasserman, Brown, and Reschly (1974) treated two hyperactive boys in a classroom for the emotionally disturbed in a two phase experiment. During Phase 1, the target behavior for one participant was tantrums, and for the other participant it was the completion of math problems. After obtaining baseline data, the participants were asked to mark on an index card (taped to their desks) the intervals of time (for Participant 1) free of tantrums and (for Participant 2) the ratio of completed assignments to the number assigned. The participants were reinforced by earning free time.

During Phase 2, the participants could earn access to a "regular" classroom for part of each day. This privilege was earned by displaying appropriate behaviors in both classrooms.

Results across both phases showed that the participants were able to increase their appropriate behaviors. Unfortunately, no reliability data were reported and no contingencies were used for inaccurate self reports.

Shores, Apolloni, and Norman (1976) investigated the effects of group and individual contingencies for increasing on-task behavior. Lights attached to the participants' desks signaled either individual or group conditions. During the individual condition, participants earned points for themselves. During the group condition, all participants had to be on-task for any participant to earn points. In addition to measuring on-task behavior, verbalizations between peers were recorded. Tokens were awarded for on-task behavior and were exchangable for a variety of items at the end of the day. The results showed that although both contingencies were associated with significant increases in on-task behavior, the group contingency was superior. The authors also report that peer verbalizations changed from "threats" to social praise and prompts during the group contingency condition.

Rosenbaum, O'Leary, and Jacob (1975) also compared group and individual rewards. Ten participants were divided into two groups, an individual reward group (IR) and a group reward group (GR). Target behaviors were individualized for each participant. The participants were reinforced four times daily with index cards which were exchangable for candy at the

end of the day. Group reward participants earned reinforcers for the entire class and IR participants earned reinforcers for themselves only. The dependent measures were the CTRS which was completed four times during the study, and the Problem Behavior Report (PBR), completed each week. Both groups improved on both measures but there was no difference between them. Ratings on a posttreatment questionnaire revealed that GR teachers made significantly more positive statements about the procedure than did teachers in the IR group. Unfortunately, no on-going observations were conducted, thus it is difficult to assess if some behaviors were more susceptible to change than others (i.e., which resulted in the improved PBR and CTRS scores).

Drabman, Spitalnik, and O'Leary (1974) were able to successfully treat several disruptive students using self-control procedures. The participants of this study were not diagnosed as hyperactive. However, the reported behavior patterns were similar to many hyperactive children. The study was divided into eight phases. In the first phase, the participants were asked to match their ratings with the teacher's ratings of their behavior. Bonus points were awarded for correct matching. The checking of the students' ratings was faded across phases. Measures were taken of disruptive behavior during a 1 hour period each day. In addition, reading scores were assessed pre- and posttreatment. The average number of disrup-

tive behaviors dropped significantly across all phases and during control and treatment conditions. In addition, reading scores increased. The onus of responsibility for measuring and consequating behavior was gradually shifted from the teacher to the disruptive students so that treatment was eventually self-administered. It is important to note that although the participants had the opportunity to lie, thereby maximizing reinforcement, they remained honest; that is, cheating was never detected when student ratings were compared to teacher ratings across phases.

O'Leary et al. (1976) used a daily report card to reinforce targeted school behaviors. Reinforcers were delivered in the home. Academic and social skills served as target behaviors. Home reinforcers were individualized for each participant. The major dependent measures were the PBR and CTRS. Control (n = 7) and treatment (n = 9) groups differed significantly on posttreatment measures, with the treatment group showing more improvement.

Twardosz and Sajwaj (1972) increased sitting behavior in a retarded hyperactive 4-year-old. The procedure consisted of prompting and reinforcing sitting at a table. Checkmarks served as tokens. As sitting behavior increased, so did toy play and social interaction (defined as being near peers). Excessive gross motor activity decreased. A reversal design helped to establish experimental control. No

data were kept on the teacher's behavior and follow-up data were unavailable. No generalization probes were conducted. However, the data clearly suggest that by reinforcing one behavior (i.e., sitting still) an increase in other desirable behaviors may occur.

Munro (1977) used the Patterson work box to gain stimulus control over two hyperactive boys in a normal classroom. The Patterson work box (Patterson, Jones, Whittiew, & Wright, 1965) is a mechanical box device that records a desirable target behavior thus allowing the participant to see that he is going to be reinforced. The work box allowed the experimenter to immediately reinforce appropriate behavior. The first participant was an 8-year-old. Inappropriate behaviors decreased from 2.5 to .3 per min after 3 weeks of treatment. The work box was gradually faded out. The participant's classmates were reinforced for not attending to his inappropriate behavior.

While treating his second participant, Munro introduced generalization probes during periods when the box was not being used. Similar results were obtained with this participant. Non-attending, out-of-seat, and inappropriate talking all decreased. However, baseline measures were taken during an afternoon session and treatment occurred during a morning session, therefore, treatment effects were confounded with the time of day during which measures were taken.

In summary, operant approaches have proven to be very effective with hyperactive students. Reduction in inappropriate motor activity and other disruptive classroom behavior have been the most common target behaviors. Unfortunately, concomittant increases in academic and pro-social behaviors have not always been assessed and/or reported. Further research is needed to determine if increases in on-task behavior generalize to other behaviors and settings. If not, steps must be taken to ensure these goals are achieved. Long range studies (e.g., "end of this year" to the "beginning of next year") are also needed to examine the long term effects of behavioral interventions in the classroom.

Self-Instruction Strategies

One strategy for effecting long-term generalizable changes in the behavior of hyperactive children is self-instruction training (also referred to as self-control and cognitive self-instruction). Hyperactivity has been conceptualized as the inability of the child to inhibit impulsivity with covert thoughts, or verbalizations (Douglas, 1972; Kendall & Finch, 1978; Meichenbaum & Goodman, 1969; 1971). In this respect, self-instruction training is designed to help the child acquire appropriate self-verbalizations which can be used to keep impulsivity in check. Self-instruction training can thus be viewed as a way of assisting the hyperactive child to develop an inhibitory cognitive mechanism or problem solving

strategy (Pressley, 1979), which encourages the child to "stop, look, and listen" (Douglas, 1972) before rushing into action.

The self-instruction training described by Padawer, Zupan, and Kendall (Note 2) consists of training the child to perform tasks while verbalizing instructions, first overtly and then covertly. In this sense, Padawer et al. procedure closely resembles Meichenbaum and Goodman's (1969; 1971). Both of these studies describe self-instruction as a generalizable skill.

With that in mind, Kendall and colleagues (e.g., Kendall & Finch, 1978) sought to train their participants not only to perform academic skills, but to conduct their social lives more appropriately by using self-instruction (problem solving) in social interactions with peers and authority figures. Theoretically, self-instruction strategies should generalize to all facets of the hyperactive child's life. Therefore, instead of having to specifically train for each stimulus situation, as has generally been the case with external, contingency management procedures with disruptive children (e.g., Wahler, 1969), self-instruction training is designed to provide the child with a generalizable, cognitive-behavioral problem solving tool. Several studies have incorporated cognitive self-instruction as a strategy to treat hyperactivity.

Meichenbaum and Goodman (1971) investigated the effects

of modeling and modeling plus self-instruction against an attention control group. They divided 15 participants, ages 7 to 9, into three groups. The modeling group watched the experimenter model tasks and were then asked to imitate the experimenter. The attention control group was asked to perform the task without specific treatment. The third group watched a model perform the task and received specific training which was given in four ½ hour sessions across 2 weeks. It went as follows: (a) the experimenter modeled the task and verbalized the instructions overtly, (b) the participant performed the task while the experimenter verbalized the instructions overtly, (c) the participant performed the task and verbalized overtly, (d) the participant performed the task while whispering, and (e) the participant performed the task while covertly instructing. An error was included in this procedure to introduce coping responses. For example, the experimenter would make an error and say, "Oh darn, I made a mistake. I'll have to slow down and get the right answer." Finally, the participants were reinforced for correctly self-instructing.

Psychometric measures were taken on three occasions, at pre- and posttreatment, as well as at a 1 month follow-up. The self-instruction group performed significantly better at the post measure than the modeling or attention control group. These results were maintained at the 1 month follow-up. Generalization to the classroom did not occur in any of the

groups, suggesting that treatment effects were specific to the treatment setting.

Palkes, Steward, and Freedman (1972) investigated the effects of covert and overt instructions on Porteus Maze performance. Thirty hyperactive participants, ages 7 to 13, were divided into three groups: (a) a verbal training (VT) group, (b) a silent reading (SR) group, and (c) a no training (NT) group. The VT group performed the Porteus Maze while verbalizing the instructions overtly. The SR group performed the Porteus Maze and had access to instruction printed on a card taped to their desks, while the NT group performed the Porteus Maze after receiving the manual instructions. Results showed that the VT group performed significantly better than the SR or NT group. The experimenters conclude that self-instruction is superior to silent reading of the same instructions. No follow-up or generalization measures were taken.

In a unique study involving modeling and self-instruction techniques, four hyperactive boys in a mental health unit were taught alternative responses to aggression when confronted with an aversive situation (Goodwin & Mahoney, 1975). First, the participants watched a videotape of a peer model making verbal coping statements (e.g., "I won't get mad.") while the model was confronted with taunts from other persons. Next, the participants performed the taunting. One partici-

pant stood in a center circle while the other participants stood around in an outer circle and issued taunts. The participant in the center circle could terminate the session at any time. Measures of coping and non-coping responses were taken. Coping responses included such statements as, "I'm not going to let them get me," and I won't get mad." Non-coping responses included leaving, talking back, crying, and physical aggression.

In the second session, the participants watched the videotape after which the experimenter led the participants in a discussion of the specific coping behaviors used by the peer model. A taunting session followed, and coping and non-coping measures were again taken. In a posttreatment session, only the taunting exercise was conducted. A significant decrease in non-coping responses was found across sessions as well as in generalization probes in the participants' classroom.

Bornstein and Quevillon (1976) used the cognitive self-instruction techniques of Meichenbaum and Goodman (1969; 1971) to treat three preschool boys in a multiple baseline design. Measures of on-task behavior were taken using an interval recording method in the preschool classroom. All participants dramatically increased their on-task behaviors and maintained their gains 22.5 weeks after baseline was started. Elaborate controls for observer drift and bias

added credibility to their results. The self-instruction training was completed in a single 2 hour training block. Reinforcement was given to the participants contingent on performing the self-instructions.

Friedling and O'Leary (1979) replicated Bornstein's and Quevillon's (1976) procedure with seven 8 and 9-year-old hyperactive participants but failed to obtain similar results. Friedling and O'Leary used on-going measures of on-task behavior as well as measures of math and reading scores. The different results may be attributed to age differences in the participants or to differences in teacher attention, which was controlled in their study but not in Bornstein and Quevillon. After the failure of the self-instruction strategy, a differential reinforcement of other (DRO) behavioral procedure was used to successfully treat the participants' inappropriate behaviors.

Kendall and Finch (1978) also treated 20 hyperactive children using Meichenbaum and Goodman's (1969; 1971) procedure. The children were divided into two groups, a treatment group and an attention control group. Treatment consisted of six sessions of verbal self-instruction training plus contingent response cost for errors. Measures included performance on the Matching Familiar Figure Test (MFFT, errors and latency to first response), two self-report measures, and two teacher rating scales. No differences between groups

were evident on the self-report measures or on one teacher rating scale. However, the treatment group had a longer latency and fewer errors on the MFFT. The longer latency and fewer errors would be predicted by the response cost component where loss of reinforcement is contingent upon errors. However, the response cost was not in effect when the MFFT was administered. Research is needed to establish whether or not the improved behavior is due to the self-instruction training as a treatment package or to the response cost procedure. Results were maintained at a 2 month follow-up.

Moore and Cole (1978) used six advanced undergraduate students to train self-instruction skills to hyperactive children. All training took place in six ½ hour sessions. The children were prompted and reinforced for imitating the trainer's behavior. The trained participants were matched with an attention control and a no treatment group. Seven different pre- and posttreatment measures were taken, including the MFFT, the Children's Embedded Figures Test (CEFT), and the CTRS. Several of the post measures were significantly higher for the cognitive self-instruction group, including the MFFT latencies and performances on the CEFT. However, treatment effects were not evident, either behaviorally or academically, in generalization measures in the classroom (based on CTRS scores). No follow-up measures were taken.

The use of psychometric and global ratings as outcome

measures remains problematic in research involving hyperactivity. Although used as an adjunctive measure to normative data in many of the operant studies, psychometric and global ratings have been the primary outcome measures of much of the self-instruction literature (Cole & Kazdin, 1980; Douglas, 1975; Kendall & Finch, 1978; Meichenbaum & Goodman, 1971; Moore & Cole, 1978; Palkes, et al., 1972). Recent research has produced evidence that these types of outcome measures may be unreliable for assessing treatment effects (e.g., Wahler & Leske, 1973).

For example, the reliability of the MFFT, developed by Kagan, Rosman, Day, Albert, & Philips (1964) has recently been questioned. Ault, Mitchell, & Hartmann (1976) report that the MFFT has low test-retest reliability. Three specific concerns include the misclassification of fast-accurate children as impulsive, regression toward the mean, and inaccurate statistical analysis due to small sample sizes, and the low number of items (12) on the MFFT. They report that some of these concerns could be corrected by using control groups, increasing sample size, and by increasing the number of items on the MFFT.

Global measures may also be unreliable for assessing treatment effects. As noted earlier, one of the most popular global measures is the CTRS. Sprague et al. (1974) reported data that showed the CTRS as valid and reliable across respondents for identifying the presence or absence of hyper-

activity. However, changes in one or two behaviors may result in "halo" effects (Abikoff et al., 1977; Guilford, 1954). For example, if the child became less defiant (corresponding to Item 31) respondents may change their overall subjective attitude towards him/her and score the child as less hyperactive despite the lack of a real change in behavior. The opposite is also possible. A study by Wahler and Leske (1973) showed that global or summary ratings may fail to accurately reflect changes in behavior if those changes are gradual across time. Certainly, the efficacy of the CTRS and other global rating scales for assessing treatment effects is questionable.

Several methodological problems with research involving self-instruction as an independent variable have been discussed by Cole and Kazdin (1980). In their analysis of self-instruction training for children, they point out that a limited number of normative outcome measures have been used. As a result, the clinical significance of observed changes are difficult to ascertain. Cole and Kazdin's other concerns include the lack of sufficient criteria to identify hyperactive populations and the failure to incorporate findings from the child development literature such as age related differences in the ability to use verbalizations to control motor reponses, resist temptation, delay gratification, and verbal mediation of learning.

The paucity of empirical data demonstrating the use-

fulness of self-instruction as a generalizable skill is surprising in light of claims made by its adherants (Kendall, 1977; Kendall & Finch, 1978; Kendall & Wilcox, 1980; Meichenbaum & Goodman, 1969; 1971; Padawer et al., Note 2). Mahoney (1974) and Meichenbaum (1977) argue that the acquisition of a problem solving skill should theoretically generalize to new situations. Kendall and Finch (1978) reported evidence of generalization from the training sessions to the classroom by participants trained to decrease their rate of responding. However, the evidence consisted of teacher ratings of impulsivity and not normative or on-going behavioral measures.

Goodwin and Mahoney (1975) found evidence of generalization from the training sessions to the classroom. Their procedure, however, involved more extensive modeling components than the traditional self-instruction strategies. The generalization measures were conducted via probes and may have capitalized on chance because only a short time period was sampled. Further, due to the lack of experimental control such as a multiple baseline, other possible variables (e.g., practice, teacher attention, temporal changes, etc.) could not be discounted as causes for the participants' behavior change.

Bornstein and Quevillon (1976) reported that their preschool participants improved on-task behavior as a result of

self-instruction training. However, Friedling and O'Leary (1979) failed to obtain similar results with 8 and 9-year-old children. One reason for these contradictory data is that preschool children may be expected to increase their on-task behavior due to maturation factors. Further, Friedling and O'Leary (1979) controlled for teacher expectation wheras Bornstein and Quevillon (1976) did not. Finally, Moore and Cole (1978) found no evidence of classroom generalization of self-instruction training.

The lack of generalization data may reflect several factors. First, the measures used to assess generalization may be insensitive to treatment effects, especially where global measures are concerned. Second, self-instruction training may actually be an ineffective treatment so that performance on analog tasks such as the MFFT or CEFT may not reflect the classroom and social contingencies the child is returned to.

Analyzed in another way, the majority of studies in this area appear to fall in either Stokes and Baer's (1977) "train and hope" category, or they may be classified as "introduction to natural maintaining contingencies." The "train and hope" category is defined as assessing generalization but not specifically training for it. "Introduction to natural maintaing contingencies" includes studies in which behaviro changes in one setting are later maintained by natural or normal contingencies in another. Baer and Wolf (1970)

refer to this as "trapping." For example, a withdrawn child may be trained to interact with peers via a reinforcement procedures. After the reinforcers are withdrawn, peer interaction is maintained by the reinforcers provided in peer to peer interaction. It may be theorized that by using self-instruction strategies to treat hyperactive children, the children may exhibit new behaviors that elicit reinforcing teacher and peer attention which in turn maintain or "trap" the behavior change. Unfortunately, no data have been produced to show this has occurred in research involving the use of self-instruction.

In summary, several problems must be resolved in order to better understand the efficacy of self-instruction strategies in treating hyperactive children. First, on-going in vivo observations must be used to evaluate treatment effects. The adapted Stony Brook observation code (Abikoff et al., 1977; 1980) has recently been validated and may be a valuable assessment tool for this purpose. Using trained observers, Abikoff and colleagues (Abikoff et al., 1977; 1980) compared several classroom behaviors of 121 normal and 121 hyperactive children. The results of these two studies evolved into a code that accurately differentiated between children diagnosed as hyperactive and children labeled as normal.

Second, as previously discussed, more rigorous and clear delineation of clinical populations must be made (Cole &

Kazdin, 1980; O'Leary, 1980), especially in light of the child development literature which shows that the ability to use verbal skill as a mediating tool is age related (e.g., Flavell, Beach, & Chinsky, 1966; Kingsley & Hagen, 1969). Further, older hyperactive children exhibit different presenting problems than their younger counterparts. This difference is reflected in the DSM III (1978) diagnostic criteria. Older hyperactive children may have better developed verbal faculties with which to use self-instructions. Finally, generalization measures to the school and home environments must be made using normative assessment tools and longer time periods.

The utility of self-instruction for treating hyperactivity rests largely in the assumption that it is a generalizable skill. However, few researchers have assessed response or stimulus generalization in this area. The present study consisted of assessing the response generalization of self-instruction training for treating hyperactivity to the classroom. The question was, will hyperactive children trained to self-instruct while performing tasks in a clinical setting display more appropriate behavior in their classroom? Generalization was mainly assessed by on-going behavioral observations in the participants' classrooms using the modified Stony Brook observation code (Abikoff et al., 1977; 1980). Additional measures included scores on three rating scales and MFFT performance. The self-instruction training

was described by Padawer et al. (Note 2). Teacher, parent, and participant satisfaction with the treatment program was also assessed, thus providing an index of social validity (Wolf, 1978). The results of this study will add to the research in this area by providing generalization data from on-going behavioral observations.

Method

Participants

Participants were solicited via letters sent to Pediatricians and Psychologists in and around Stockton, California. Seven children were referred. Two children were not accepted because their behavior was adequately controlled by stimulant medication and the parents did not want to remove the medications. One participant's parents decided not to participate after the treatment program was described to them. A fourth participant exhibited several disabilities such as not being able to read or count and was referred elsewhere for treatment. Three referrals were accepted and treated.

The participants' parents were contacted in person by the trainer and the treatment program was explained to them. Briefly, they were told that their child would be taught how to say instructions to himself that should help him to "stop, look, and listen" before acting. Permission forms were then signed (see Appendix A) and appointments for the treatment sessions were made.

Eric, 12-years-old, James and Anthony, 11-years-old, all

had previously been on stimulant medication. All three were also in special education classrooms because of behavior problems. Anthony and James were in the same classroom. Each of the participants had been diagnosed as hyperactive by a pediatrician. Anothony was also seeing a counselor during treatment and had been for the previous 15 months. Interviews with the teachers and parents indicated that these children were very active, difficult to keep on task, and often non-compliant. All participants were reportedly of normal intelligence but only Anthony was doing schoolwork at age level based on teacher reports.

Setting

All treatment sessions were conducted in an observation room in the Psychology Department at the University of the Pacific in the early evening. The room was equipped with a table, two chairs, a two-way mirror, and task related materials. All training sessions were videotapped through the two-way mirror.

On-going observations were taken in the participants' classrooms. Each of the participants' classrooms were staffed by a Master of Arts level teacher and aide. Eric's class had six other children. Anthony and James' classroom contained 12 children, including them.

Dependent Measures

Observations. The major dependent measure was the amount of appropriate behavior the children displayed in the class-

room as well as during the training sessions. Measures in the both situations were conducted with the modified Stony Brook observation code (Abikoff et al., 1977; 1980; Note 3). This code allowed the observers to score the participants' behavior across 11 and 12 categories of behavior in the training sessions and classrooms respectively. The categories were not mutually exclusive except for category "AB," which was called the "absence of negative behavior," or the presence of appropriate behavior. Thus if "AB" was coded, the participant could not be engaged in hyperactive behavior. Participants were scored as hyperactive (any category except "AB") or appropriate (only "AB"). The categories were:

1) Interference. This category measured general disruptiveness. Examples were calling out, interrupting, and clowning, coded as "I."
2) Solicitation. This measured how many times the participant sought attention from the teacher, coded as "S."
3) Off-task. This measured the amount of time the participant was engaged in non-task related activities. Examples included pencil tapping, foot shuffling, talking to neighbors, coded as "X."
4) Minor motor movement. This involved buttocks movement, body and chair rocking movements, coded as "MM."
5) Gross motor movement, standing. This consisted of getting up without permission, coded as "GMs."

6) Non-compliance. Failure to comply with teacher requests, coded as "NC."

7) Gross motor movement, vigorous. This included running, jumping, and crawling in class, coded as "GMv."

8) Out of chair. This measured how long the participant was out of his seat without permission, coded as "OC."

9) Physical aggression. This included hitting, pushing, or kicking of objects or persons, coded as "A."

10) Threat or verbal aggression toward peers. This measured abusive or threatening verbalizations and physical gestures toward peers, coded as "AC."

11) Threat or verbal aggression toward teacher. As above, directed toward the teacher or trainer, coded as "AT."

12) Absence of negative behavior. This category was coded when the participant was not engaged in any of the behaviors described above, thus behaving appropriately, coded as "AB."

These categories are described further in Abikoff et al. (1977; 1980) and in the Modified Stony Brook Observation Code Manual (Note 3).

School measures. Classroom observations were conducted for 32 min approximately 3 days per week in the early morning. Observers were rotated across participants to avoid a systematic observer by child interaction, thus each observer observed a different participant daily. The first two days of of classroom observations were used to allow the observers to

habituate to the classroom and were not included in the data analysis. Some initial baseline measures were taken on consecutive days. The teachers introduced the observers as "people who are interested in how to become teachers." The teachers also asked their classes not to talk to the observers. The observers stood to the side, and about 6 ft. (1.82 m) behind the participants.

As described by Abikoff et al. (1977; 1980) and the Modified Stony Brook Observation Code Manual (Note 3) the participant and a matched peer, who served as a non-random yoke control and was rated as non-hyperactive by the teachers, were observed for alternating 4 min periods. Each 4 min period was divided into 15 sec intervals signalled by a stopwatch attached to the observers' clipboards. As previously noted, the matched peer provided a reference point against which to compare treatment effects of the hyperactive participant as well as a control for maturation and local history effects. The same control served for Anthony and James, who were in the same classroom. The matched peer was the same sex and approximate age as the participants. Finally, grades were obtained to compare differences in classwork pre- and posttreatment.

Training session measures. Observers scored the training session videotapes randomly (i.e., non-sequentially) following the end of treatment using the modified Stony Brook observation code (Abikoff et al., 1977; 1980). Category 10,

aggression toward children, was not scored since there was no opportunity for it to occur. No baseline measures were taken for the following reasons. First, the main purpose of the training session measures was to assess the amount of time the participants were displaying appropriate behavior (AB) during the treatment session. It was theorized that in order for the participants to learn self-instruction they must display appropriate behavior while being trained. Therefore, the assessment of the level of AB during the training sessions should serve as a control for whether or not the participants obtained the ability to self-instruct while performing tasks. Further, the length of each treatment session and number of response cost episodes (explained below) were recorded.

Pre and posttreatment measures. The participants were administered the Matching Familiar Figures Test (MFFT, Kagan et al., 1964) prior to baseline, following treatment, and at a 2 week follow-up. James was administered the MFFT one additional time, that following the first seven treatment sessions and prior to the 2 week winter holiday break. Eric did not receive the follow-up MFFT because he had withdrawn from treatment at that time. The MFFT consisted of 12 items. The participant was shown a stimulus drawing (e.g., a lamp) and asked to choose from six similar drawings the one that matched. The mean latency to the first response and the number of errors were measured. Hyperactivity was reflected

in the MFFT by short latency times and a high number of errors.

Three rating scales were also used, (a) the Conners' Teacher Rating Scale (CTRS, Conners, 1969), (b) the Davids' Scale of Hyperactivity (Davids, 1971), and (c) the Self-Control Rating Scale (Kendall & Wilcox, 1979). The scales were completed by the participants' mothers and teachers pre- and posttreatment for all participants, at follow-up for Anthony and James but not Eric, and after seven treatment sessions (directly before the winter holiday break) for James.

The CTRS was previously described on page 27. Scores on the CTRS could range from 39 to 156. A score of 85 or higher indicated hyperactivity. The Davids' scale was a seven item questionnaire with a six point likert scale ranging from "much less than most children," scored as 1, to "much more than most children," scored as 6. Scores could range from 7 to 42 with a score of 24 or more indicating hyperactivity. The SCRS was a 33 item questionnaire with a 7 point likert scale. Scores could range from 33 to 271. Kendall and Wilcox (1979) reported norms obtained from third, fourth, fifth, and sixth grade hyperactive males as 118.8, 122.1, 118.8, and 106.9 respectively.

Consumer satisfaction measures. The teacher, parent, and participant were asked to respond to several questions regarding the effects of self-instruction training following the termination of training. Specifically they were asked,

(a) How do you feel about the participant's behavior now?

(b) Does the participant use self-instruction while working on academic tasks? How can you tell?

(c) Does the participant get better grades at school now?

(d) Does he have fewer problems getting along with peers, teachers, or parents?

(e) Was the training worth your time and effort?

The parents were also asked if they wanted further help with their child's behavior.

Observer training and reliability. The observers were two advanced undergraduate psychology students who received course credits in exchange for observing. They were trained by reading and discussing the Modified Stony Brook Observation Manual (Note 3). The observers were then verbally quizzed by the trainer. The observers knew the participants were receiving treatment for their behavior problems. Reliability was assessed by having the observers observe the same participant simultaneously but situated far enough apart so they could not see what the other was checking. Reliability observations were taken ten times throughout the study, eight times in the classroom and two times in the training sessions. Inter-observer agreement was computed interval by interval by dividing the agreements by the agreements plus disagreements and multiplying by 100.

Procedure

Training sessions. The procedures used in this study

were based on those described by Padawer et al. (Note 2) and are outlined below. Padawer et al. procedures were used because they most closely resembled the self-instruction procedures used by Kendall and colleagues (e.g., Kendall & Finch, 1978) who have published most extensively in the area of self-instruction research with hyperactivity. Further, the Padawer et al. training manual appears to be the only one available at this time. Twelve treatment sessions, approximately 45 min long, were conducted with James. Eric received only the first six sessions and Anthony received only the first 8 sessions. There were approximately two sessions per week. In some instances, more than two or only one session were held weekly due to cancellations or holidays.

A response cost contingency was in effect during all sessions (as described by Padawer et al., Note 2; Kendall & Wilcox, 1980). The participants were given 20 tokens before each training session. One token was removed when the participant either, (a) went too fast (based on the trainer's perception), (b) did not use one or more of the five steps, or (c) made an incorrect response to one of the task questions. These contingencies were explained to the participants before the first session. Following the treatment session the participants were allowed to exchange their tokens for a back-up reinforcer such as pencils, ruler, notebooks, and other school related items (see Appendix B). The participants were required to purchase one reinforcer each session.

Participants were allowed to save tokens to purchase more expensive reinforcers later on.

The self-instruction focused on five key areas, (a) problem definition (e.g., "What am I supposed to do?"), (b) problem approach (e.g., "Let's see, what are my possibilities?"), (c) focusing of attention (e.g., "I have to pay attention."), (d) choosing an answer (e.g., "I think it's number four."), and (e) making either a self-reinforcing (if the choice was correct) or a coping statement (if the choice was incorrect). Examples were, "Alright, I did a great job!", and "Oh darn, I'll have to remember to slow down and do a better job next time."

In general, the trainer began each session by modeling the task particular to that session while using the five steps. Next, the participants, along with the trainer, performed the second task together using the five steps. When the trainer felt the participants had an adequate understanding of the tasks and the five steps, the participants were allowed to perform 3 or 4 tasks to the trainer's one. Further, the five steps were first spoken overtly, then whispered, and eventually "spoken" covertly as the participants demonstrated mastery across and within sessions (see session by session descriptions for a further explanation).

Finally, if the participants made an error, the trainer modeled the next task overtly, even if the participants had been saying the five steps covertly. The participants were

required to perform the next task overtly before resuming covert self-instruction. A session by session description is offered below. Sessions were discussed in terms of their purpose, methodology, tasks, and other idiosyncratic aspects (Note 4).

Session 1. After the participants were taken to the bathroom, the trainer greeted them and said,

> I understand that you have trouble concentrating on and completing school assignments. This sometimes gets you in trouble with your teachers. Over the next six weeks, I want to help you learn how to do your schoolwork better by using a little game I call the five steps. O.K.? Do you have any questions?

The trainer then answered any questions the participants may have had. Finally, the participants were told about the tokens, back-up reinforcers, and response cost contingency. For example,

> These tokens are to help you stay working on the self-instruction tasks. If you make a mistake, work too fast, or forget to use one of the five steps, you lose one token.

The tasks for the first session were simple and designed to provide the participants with a successful introduction to self-instruction. As preliminary academic tasks, they also provided the participants with an introduction to the fea-

sibility of using self-instruction for completing school work. The tasks consisted of an example of a picture of round and square beads in alternating sequences (e.g., round, square, square, round, round). The participants determined which shape bead would be next if the string was extended. There were a total of 68 tasks.

At the end of this session, the participants were told that they could earn an extra token by telling the trainer when they used or could have used the five steps in school or at home. Further, the participants were rated on a five point scale with a score of 1 associated with "fair" work and 5 with "super extra special" work. If the participants matched or were within one point of the trainer's rating, they could earn an extra token.

Session 2. One very important skill needed to perform school work was the ability to follow directions. Understanding directions was also a preliminary skill to performing the self-instructions. In this session, the participants were taught how to use the self-instructions to comprehend and follow written instructions.

The tasks were from the Following Directions (Note 5) books. There were a total of 50 tasks. The Following Directions books were developed for normal learners. There were eight books in this series designed for various abilities. Each task consisted of a written direction followed by three questions about it. As in the previous session, the trainer

began by modeling the overt self-instruction while working the first task such as,

> First I have to figure out what to do. (Read the instructions). Oh, I see, I have to point to the one that has a motor (problem definition). I have to remember to look at all the choices before I pick one (problem approach). I have to remember to concentrate as hard as I can (attention focusing). This is the right answer (choosing the answer). Alright, I got the right answer, I'm doing a great job (self-reinforcing statement).

During this session and after the participants have performed several tasks successfully, the trainer introduced the whispering of self-instructions. Whispering was the intermediate step between overt and covert self-instructing. The trainer began by saying,

> What would happen if you used the five steps in school and the teacher heard you talking out loud? (The participants generally guessed that they would get in trouble). That's right, what is a way we could use the five steps but not say them out loud? (Generally, after some prompting, the participants responded that they could say them quietly). That's right, let's try the next one while whisering the five steps. Watch and listen carefully. The trainer then performed the task while whispering

the five steps. The participants then performed the next task while whispering. If the participants forgot to whisper, they were reminded to do so but the response cost was not used.

Session 3. The tasks for this session were also from the Specific Skills Series and were called Detecting the Sequence (Note 5). The purpose of this session was to reinforce the use of self-instructions for academic tasks. The majority of tasks during this session were whispered.

Session 4. The purpose of Session 4 was to introduce the participants to doing math problems in a reflective manner requiring several steps. The ability appropriate math problems were provided by the Little Professor (Note 6) calculator. The participants and trainer read the directions together in order to make the Little Professor operable and to enhance the orderly fashion of performing tasks.

During this session, the rewording of the self-instructions was made by the trainer. For instance, instead of saying, "I have to remember to focus in," the trainer said, "I have to remember to work slowly." Further, between steps 3 and 4, an additional step was added. For example, before choosing an answer the trainer modeled the checking of the answer. The addition of steps and the rewording of others helped to prevent a mechanical and non-reflective use of the five steps.

Session 5. Included with the Little Professor was a

book of games (Fun With Math Facts) that were played by solving math problems on the Little Professor. The purpose of this session was to introduce the participants to using self-instructions in play and social situations. During this session, and after the participants demonstrated mastery of the tasks by completing several without an error, the steps were said silently for the first time in the training situation. The trainer introduced the covert manner of saying the steps by saying,

> O.K., we've been doing a good job whispering the five steps. What might be another way of saying the five steps? (All participants responded that the other way would be to say them quietly to themselves). That's right. O.K., I'll do the next task and say the steps silently to myself.

The trainer then performed the next task using gestures such as pointing to the possibilities or steps in working a problem. At this point it was impossible to use response cost for not using the five steps. However, the trainer could consequate incorrect or obviously fast work. Following a response cost the trainer modeled the next task overtly.

Session 6. The tasks for Session 6 required the participants to use self-instructions to solve abstract puzzles. The tasks consisted of putting together Tangrams (Note 7) by following a model. The Tangrams consisted of seven geometric

shapes, (a) five triangles of various sizes, (b) one square, and (c) one parallelogram. The participants were required to place the pieces in place in a reflective rather than a haphazard or "chance" fashion.

Session 7. The game of "checkers" was used as the task for this session. This type of task introduced and reinforced the use of self-instructions in social situations. This session was designed to help bridge the gap between using the five steps for academic as well as for interpersonal problem solving. During this session, the trainer inquired into the participants' interpersonal problems. For example, the trainer asked, "What gets you in trouble at school?"

By this session it was expected that the participants were familiar with using all components of the self-instruction strategy. As before, the fading to covert self-instruction was done as quickly as possible.

Session 8. Backgammon (Padawer et al. suggest "Cat and Mouse") was used as the task for Session 8. The use of Backgammon required the participants to learn new rules and procedures which was also the main reason for using "Cat and Mouse." As in Session 7, response cost was used when rules were broken as well as for not using the five steps, working too fast, or making a bad move. Session 8 also served to further the use of self-instructions in social situations (i.e., game playing). Finally, the many possibilities for moving the playing pieces provided the participants with

ample opportunity to consider several choices before acting and to experience a normal consequence (i.e., other than a response cost) for a poorly chosen answer.

Session 9. The purpose of this session was to train the participants to use self-instruction as a problem solving skill in interpersonal situations. It was theorized (by Padawer et al.) that before the participants could effectively problem solve by using the five steps in interpersonal situations where choices must be made, they have to be able to correctly label emotional stimuli. Further, they must be able to generate reasons as to why these emotions were present.

To this end, 15 sentences (accompanied by pictures) describing behavioral signs of emotions were used as tasks. The participants were required to identify "how the child feels" and then generate as many alternatives as possible as to "why" the child felt the way the participants had identified the child as feeling.

As in the previous sessions, the trainer began by modeling the first task using the five steps,

> First I have to make sure what I'm suppose to do. I'll read the instructions. I must consider all the possibilities and concentrate on what I'm doing. I think Sam is angry. Good, now why is he angry? Hey, I'm doing alright!

The trainer and participants then alternated tasks. Errors,

such as working too quickly, were consequated with the loss of a token. The trainer modeled the correct use of self-instructions. All self-instructions during this session were spoken overtly.

Session 10. This session required the participants to use self-instructions to generate alternative methods of dealing with hypothetical social situations. Thirty hypothetical social situations (including some developed from responses to questions asked during Sessions 7 and 8) were the tasks for this session. The trainer began by saying,

> We are going to be working on a "what would happen if" task today. All you have to do is pick a card from this pile, read the sentence on it, and use the five steps to tell "what you would do it" this happened to you. Watch while I show you how to do the first one.

The trainer modeled the first task and encouraged the participants to generate as many alternatives as possible. The self-instructions were mainly done overtly, however, the last few tasks were completed using a covert self-instruction style with only the chosen answer spoken out loud.

Session 11. Tasks for this session involved the same type of problems as Session 10 except that in this session the hypothetical social situations were role played by the trainer and participants. The trainer introduced these tasks by saying,

> We are going to work on a "let's pretend" task today. I think you'll like these a lot. What we do is act out the sentence written on the card you pick from the pile. Be sure to use the five steps while you're pretending.

The trainer and participants alternated roles. Self-instructions were said overtly, however, the last few tasks were done with a covert style.

Session 12. In this session, the participants were required to imagine how they would use self-instructions to solve interpersonal problems that they may be having at school or at home. The trainer introduced this session by saying,

> Today is our last meeting together and we are going to talk about things that happen to us at school and at home. We are going to use the five steps to think about how we can solve any problems we might have at home or at school.

The trainer then modeled the use of self-instructions by presenting a problem he was having and using self-instructions to solve it. For example, the trainer could use a problem such as not being able to find a typewriter ribbon to type his thesis with and using self-instructions to find an answer. Fading to covert verbalizations was done as quickly as possible.

At the end of each participant's final session, the

trainer thanked the participants for working hard and encouraged them to use the self-instructions as much as possible. The trainer also gave the participants a phone number where he could be reached if any problems came up. Finally, the participants were administered the MFFT and their mothers were asked to complete the rating scales.

Design Considerations

Eric. Following 7 days of baseline observations (October 14, 19, 21, 23, 26, 28, and November 2) Eric received the first six treatment sessions (November 3, 4, 11, 19, 24, and December 1). Treatment was terminated when Eric switched schools and the new teacher refused to allow observers into her classroom and his parents indicated a desire to stop treatment. There were no follow-up observations. Eric's experimental conditions were, (a) baseline, and (b) treatment.

James. Following 4 days of baseline observations (November 13, 16, 17, and 18) James received the first seven treatment sessions. These sessions were across 4 weeks (November 19, 31, December 1, 3, 8, 10, and 15). No training and no observations were conducted during the 2 week winter holiday break which began on December 16 and lasted until January 4. Baseline observations were taken when school resumed for 2 days (January 6 and 7). The final five treatment sessions were administered following the baseline observations (January 13, 17, 20, 21, and 24). Ten follow-up observations were taken across 4 weeks (January 28, 29, February 8, 9, 11, 16, 17, 18,

22, and 23). The experimental conditions for James were, (a) baseline, (b) treatment, (c) baseline, (d) treatment, and (e) follow-up.

Anthony. Following 5 days of baseline observation (January 8, 11, 12, 13, and 18) Anthony received the first eight training sessions. The training sessions were completed across 3 weeks (January 20, 25, 27, February 1, 3, 5, 8, and 10). On February 18, Anthony moved to his father's home and his father indicated that he was not interested in continuing treatment. However, follow-up observations were conducted on 10 days across 2½ weeks (February 16, 18, 19, 23, 24, 25, 26, March 1, 3, and 5). The experimental conditions for Anthony were, (a) baseline, (b) treatment, and (c) follow-up.

Results

Reliability

Inter-observer agreement was assessed 10 times during the study, twice during treatment sessions and eight times during classroom observations. Scores ranged from 74% to 96% with a mean of 88%.

Eric

Classroom observations. If self-instruction training was successful in alleviating Eric's hyperactivity, the rate of appropriate behavior (AB) would be expected to increase over baseline levels. As shown by Figure 1, the rate of AB increased during treatment over baseline levels. The mean rate of AB during baseline was 34% as compared to 82% during

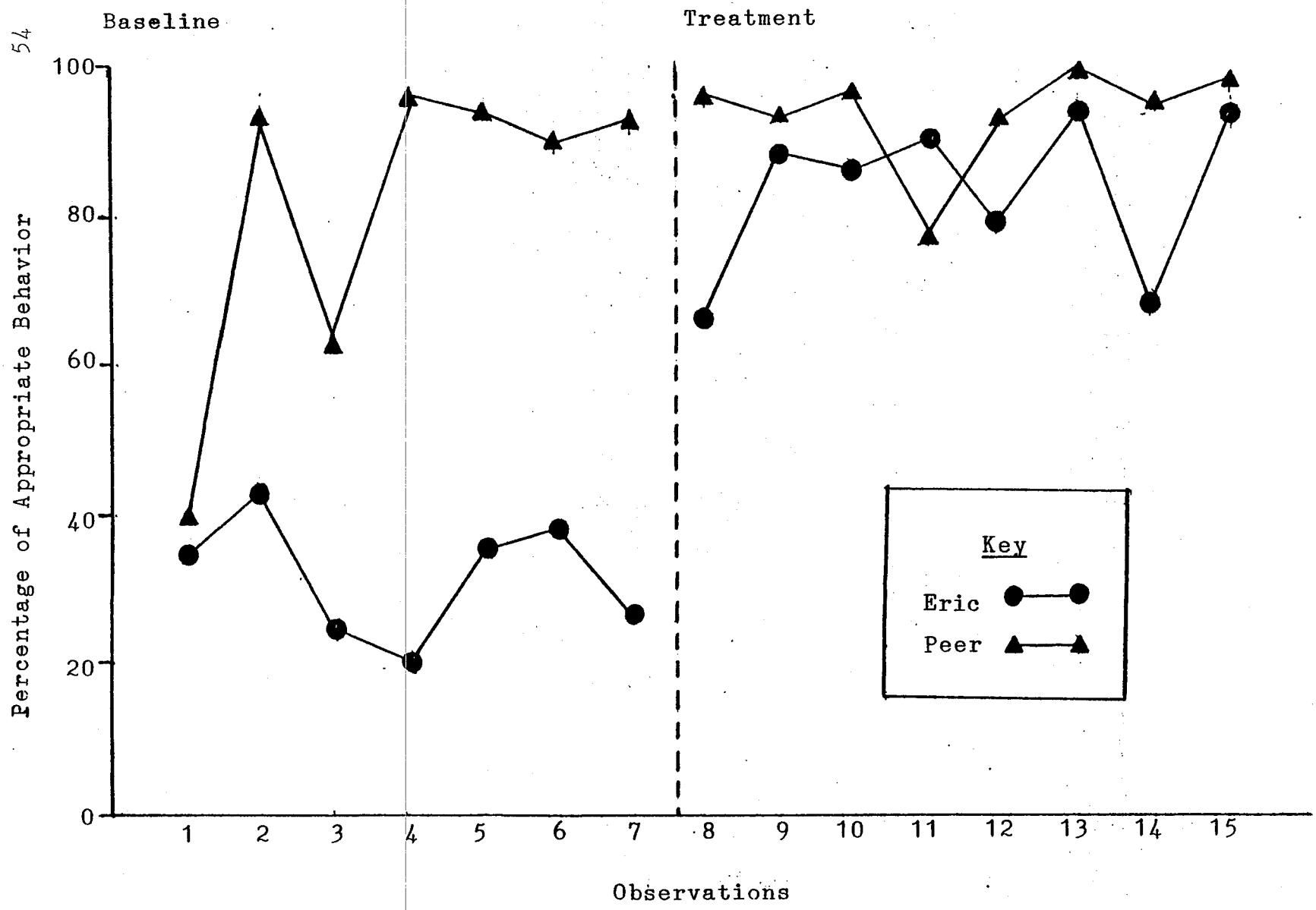

Figure 1. Percentage of appropriate behavior by Eric (●) and matched peer (▲).

treatment. There were no overlapping data points across baseline and treatment conditions providing strong evidence of positive treatment effects. Eric's rate of appropriate behavior during treatment did not match or surpass his matched peer except on Observation 11, which was the only day when a substitute teacher was assigned to Eric's class.

The examination of the frequencies of each category on the modified Stony Brook observation code revealed some interesting patterns (see Table 1). A direct comparison was possible because baseline (n = 7) and treatment observations (n = 8) were nearly equal. The largest decreases from baseline to treatment were, (a) minor motor movement (MM) which went from 230 to 25, (b) interference (I) from 65 to 18, and (c) non-compliance (NV) 43 to 13. However, off-task (X) did not change and the low frequency behavior, out of chair (OC), increased slightly.

Pre and posttreatment measures. There were four pre- and posttreatment measures for Eric. They were, (a) the MFFT (Kagan et al., 1964), mean latency to the first response and number of errors, (b) the CTRS (Conners, 1969), (c) the Davids' Scale of Hyperactivity (Davids, 1971), and (d) the SCRS (Kendall & Wilcox, 1979). Eric's mother and teacher scored the rating scales.

The results of the MFFT were presented in Table 2. If Eric's impulsivity was reduced by treatment the mean latency to the first response should increase and the number of er-

Table 1

Eric's Category Frequency of Classroom Observations[d]

Obs.[a]	Total[b]	I	X	NC	MM	GMs	OC	A	AC	AT	GMv	S	AB[c]
1	64	12	2	4	38	14							22/34%
2	64	12	6		28	8							30/46%
3	64	20		37	9								22/34%
4	64	6	8		41	4							15/23%
5	64	9	2		35	6							24/38%
6	64	3	5	2	32	7							25/39%
7[e]	64	3			47								16/25%
8	64	7			12	1							43/67%
9	64	4		6									55/86%
10	64	1	2	2	3	1	1						54/84%
11	64	5		2		2							57/89%
12	64	1		2	6	2							51/80%
13	64				4								60/93%
14	64	21	1										42/66%
15	64					4	4						60/93%
Baseline	448	65	23	43	230	39	0	0	0	0	0	0	154
Baseline[f]	47%	15%	5%	9%	51%	8.7%							34%
Treatment	512	18	23	13	25	10	5	0	0	0	0	0	422
Treatment[g]	53%	3%	4%	2.5%	5%	2%	1%						82%
Totals	960	83	46	56	255	49	5	0	0	0	0	0	576

Table 1 Continued

Eric's Category Frequency of Classroom Observations[d]

[a]These observations correspond to Figure 1

[b]Total number of intervals Eric was observed

[c]Percentage totals are graphed on Figure 1

[d]Categories are explained on pages 35 and 36.

[e]Final baseline observation. Observations 1 through 7 are baseline observations, treatment observations are 8 through 15.

[f]Percentage of intervals each category was scored during baseline observations.

[g]Percentage of intervals each category was scored during treatment observations.

Table 2

Eric's Matching Familiar Figure Test Scores

	Mean Latency	Errors
Pretreatment	7.7 sec	14
Posttreatment	6.75 sec	10

rors decrease (Kagan et al., 1964). However, the mean latency to the first response decreased to 6.75 sec from 7.7 sec indicating that Eric responded slightly more impulsively at posttreatment. Errors on the MFFT did decrease slightly to 10 from a pretreatment level of 14. Taken together, these results suggest that Eric responded more impulsively yet more accurately. For comparative purposes, Kendall and Wilcox (1980) report that similarly trained hyperactive participants obtained a mean latency of 8.9 sec on the first MFFT, 14.8 sec after treatment, and 12.4 sec at follow-up. The number of errors for the same participants were, 10.68, 8.4, and 7.2 across conditions. These scores would indicate that Eric's scores were "more hyperactive" than the mean scores of Kendall and Wilcox's (1980) participants.

In regard to the rating scales, if the treatment was effective in reducing Eric's hyperactivity, scores should have decreased at posttreatment (i.e., greater hyperactivity was indicated by higher scores). The possible range of scores on the CTRS was 39 to 156 with a score of 85 or greater indicating hyperactivity (Conners, 1969). Eric was rated by his mother as 90 at pretreatment and 106 at posttreatment, an increase of 16 points (Table 3).

Scores on the Davids scale could range from 7 to 42 with a score of 24 or greater indicating hyperactivity (Davids, 1971). Eric was rated by his mother as 36 at pretreatment and 32 at posttreatment, a slight decrease of 4 points (Table

Table 3

Eric's Rating Scale Scores

Scale	Pretreatment	Posttreatment
	Mother's Rating	
CTRS	90	106
Davids	36	32
SCRS	171	190
	Teacher's Rating	
CTRS	88	95
Davids	34	41
SCRS	192	195

3).

Scores on the SCRS could range from 33 to 271. Kendall and Wilcox (1979) report norms on third, fourth, fifth, and sixth grade hyperactive males as 118.8, 122.1, 118.8, and 106.9 respectively. Eric's mother rated Eric as 171 and 190 at pre and posttreatment assessments respectively, an increase of 19 points (Table 3).

Teacher ratings on Eric's behavior showed a similar pattern. Ratings on the CTRS went from 88 at pretreatment to 95 at posttreatment. Davids ratings were 34 at pre and 41 at posttreatment. SCRS scores showed virtually no change from pre to posttreatment, 192 to 195 (Table 3).

In summary, these ratings indicate that Eric's home and classroom behavior either did not change or worsened during treatment. Interestingly, these ratings were in the opposite direction of the results from the classroom observations.

The final measure from the school setting was Eric's grades. His grade point average was computed by assigning an "A" grade four points, a "B" grade three points, and so on. This raw score was divided by the number of grades (n = 5) and expressed as a mean score or grade point average. The first grading period ended on November 12 (after three treatment sessions) and the second on January 27 (two months after treatment was terminated). Eric's grade point averages on these two reports were 1.5 and 1.16. It should be noted that the majority of the second grade point was earned at a school

different than the first grade point average.

Treatment measures. Eric received the first six treatment sessions. The longest training session was 57 min and the shortest, 44 min (Table 4). The mean length for all sessions was 49 min. Table 4 also shows the number of response cost eipsodes (n = 12, mean = 2) and the percentage of appropriate behavior (AB).

Eric's mean percentage of AB was 85% with a range of 67% to 100%. It was interesting to note the interaction of the number of response cost episodes and the amount of AB. When Eric lost 3 and 4 tokens he also earned two of his three highest AB scores, 95% and 100% respectively (Table 4).

Consumer satisfaction measures. Following the final treatment session, Eric and his mother responded to several questions regarding their opinion of the self-instruction training (see page 40 for the questions). Eric's mother felt Eric's behavior had improved but still required further improvement. She was unable to say if Eric used self-instructions at home or school but didn't feel Eric's grades were improving. She did report that Eric seemed to get in less trouble with his teacher and peers. She felt that her investment of time and effort in the training was worth it.

Eric also reported that he felt he got in less trouble at home and school. He also reported that he enjoyed the training. He said he only used the five steps "sometimes" and that his grades hadn't improved.

Table 4

Eric's Training Session Measures

Session	Time	Number of Response Cost	Percentage AB[a]
1	48 min	0	73%
2	50 min	4	95%
3	49 min	1	67%
4	57 min	2	97%
5	44 min	2	81%
6	46 min	3	100%
Totals	294 min	12	*
Means	49 min	2	85%

[a]Percentage of time Eric was displaying appropriate behavior during the sessions.

Eric's teacher said that she hadn't noticed much change in Eric's behavior and that his grades were slightly improved. She said she had never observed Eric using the five steps but that Eric had told her he was going to use them on several occasions. She also reported that her investment of time and effort were not extensive and well worth it.

James

Classroom observations. James' level of AB was more variable than Eric's. The mean percentage of AB during the first baseline condition was 37%, 59% during the first treatment condition, 21% during the second baseline condition, 60% during the second treatment condition, and 79% during the follow-up condition (Table 5). The range of AB for the experimental conditions were, 23% to 53% and 13% to 37% for the two baseline conditions, 23% to 84% and 44% to 93% for the two treatment conditions, and 50% to 100% for the follow-up condition (Table 5). Observations 8 and 9 preceded and followed Thanksgiving break which may account for the very low level of AB on those days (Figure 2).

Although James' level of AB increased across experimental conditions, it did not exceed or equal the level of his matched peer's AB except on Observation 26 (Figure 2). The greatest changes for James in the classroom observations across conditions were interference (I), off-task (X), non-compliance (NC), and minor motor movement (MM) (Table 5). The percentage of interference was 13 in baseline, 9 during treatment, and

Table 2

James' Category Frequency of Classroom Observation[d]

Obs.[a]	Tot.[b]	I	X	NC	MM	GMs	OC	A	AC	AT	GMv	S	AB[c]
1	64	4	5		36								23/35%
2	64	10	44		6	2							15/23%
3	64	3	27	1	5								34/53%
4[e]	64	12	3		38								21/32%
5	48	4	9										35/73%
6	64	7	9		8								46/71%
7	64	1	24		2								37/58%
8	64	6	4	5	42	14							15/23%
9	64	19	44	2	17								18/28%
10	64	4	29	3	4		1						27/42%
11	64	4	16		1								48/75%
12	64	1	8		2								54/84%
13	64	2	18	5	2								39/60%
14[f]	64	4	13		2								51/80%
15	64	13	42	10	29	4					1		8/13%
16[g]	32	4			14	3					1		12/37%
17	64	12	9		12	7							28/44%
18	64	9	1		22								36/56%
19	64	2	24	2	16						1		29/45%
20[h]	64		2	1							1		60/93%
21	64	3			20	1							38/59%
22	64	1		1	17								45/70%
23	64				6								58/91%

Table 5 Continued

James' Category Frequency of Classroom Observation[d]

Obs.[a]	Tot.[b]	I	X	NC	MM	GMs	OC	A	AC	AT	GMv	S	AB[c]
24	64	2	7	6	6	2							53/83%
25	48				4								44/92%
26	64												64/100%
27	64		1		5								58/91%
28	48	1			8								40/83%
29	64	3	29			1							32/50%
30	64	4	5		4	1							51/80%
Baseline[i]	256	29	79	10	85	2							93
Percentage	73%	11%	31%	4%	33%	.7%							37%
Baseline[j]	96	17	42	1	43	7						2	20
Percentage	27%	18%	44%	1%	45%	7%						2%	21%
Total [i] & [j]	352	46	121	11	128	9						2	113
Percentage	19%	13%	34%	3%	36%	2%						.5%	32%
Treatment[k]	624	52	174	15	80	14	1						370
Percentage	71%	8%	28%	2%	13%	2%	.1%						59%
Treatment[l]	256	26	36	3	60	7						2	153
Percentage	29%	10%	14%	1%	23%	3%						.7%	60%
Total [k] & [l]	880	78	210	18	140	21	1					2	523
Percentage	48%	9&	24%	2%	16%	2%	.1%					.2%	59%
Follow-up	608	14	42	7	68	5							483
Percentage	33%	2%	7%	1%	11%	.8%							79%
Totals[m]	1840	138	373	36	336	32	1					4	1119
Percentage	100%	8%	20%	2%	18%	1%	.05%					.2%	61%

Table 5 Continued

James' Category Frequency of Classroom Observation[d]

[a]These observations correspond to the horizontal axis on Figure 2.

[b]Total number of 15 sec intervals James was observed.

[c]Percentage totals of AB were graphed on Figure 2.

[d]Categories were explained on pages 35 and 36.

[e]Observations 1 through 4 were the first baseline condition.

[f]Observations 5 through 14 were the first treatment condition.

[g]Observations 15 and 16 were the second baseline condition.

[h]Observations 17 through 20 were the second treatment condition. All other observations were during follow-up.

[i]Raw totals of first baseline condition, followed by their respective percentage.

[j]Raw totals of the second baseline condition, followed by their respective percentages.

[k] and [l]Raw totals of the first and second treatment conditions, followed by their respective percentages.

[m]Total raw and percentage scores of all observations.

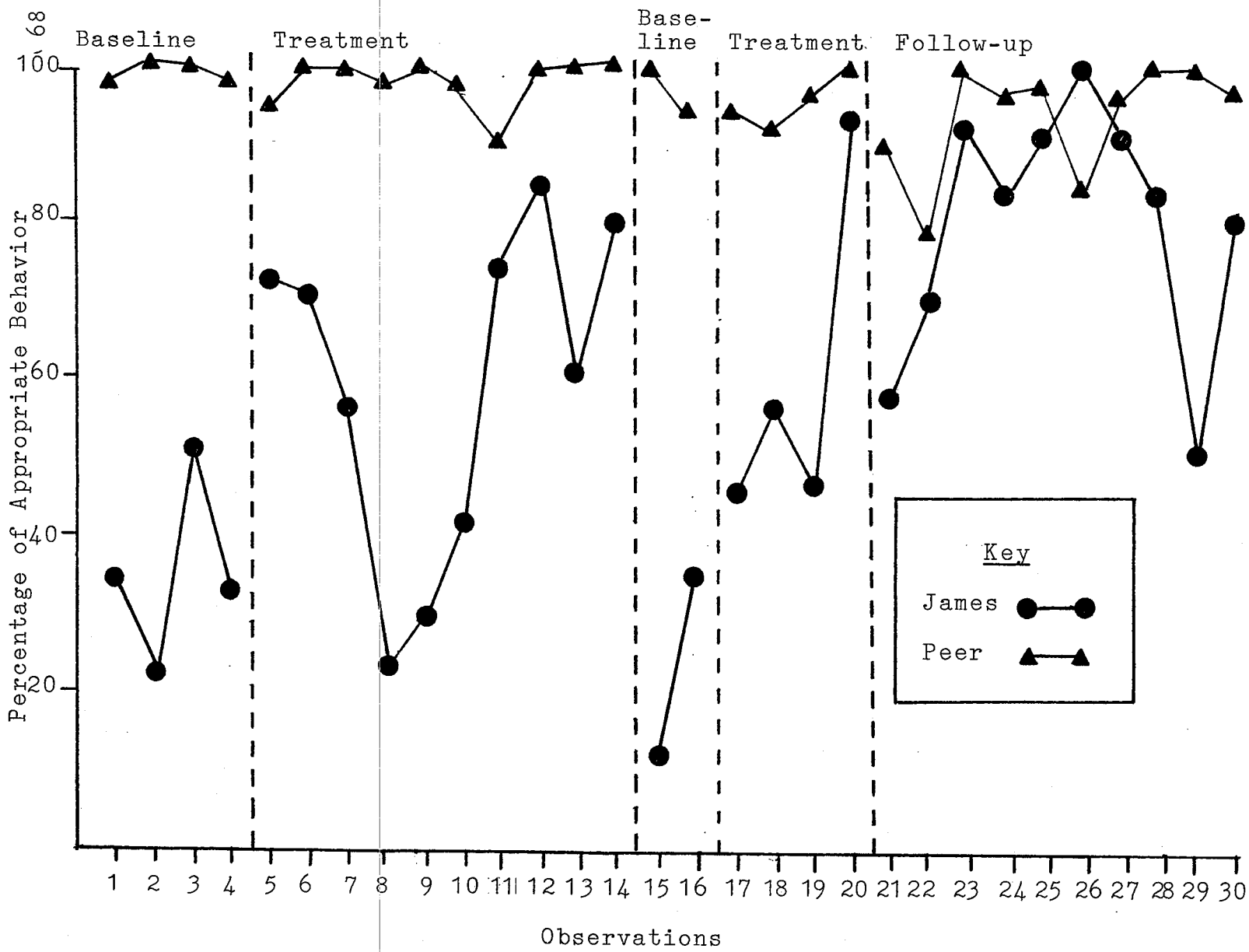

Figure 2. Percentage of appropriate behavior by James (●) and matched peer (▲).

only 2 during follow-up (the two baseline and treatment conditions were summed together). Similarly, off-task fell from 34% to 23% and finally to 6.9%. Minor motor movement decreased from 36% in baseline to 16% during treatment and 11% during follow-up. Only gross motor standing (GMs) increased in percentage across experimental conditions (besides AB of course). During baseline GMs was 1.1% and increased to 2.4% during treatment but fell to less than one percentage point at follow-up.

Pre and posttreatment measures. The results of the MFFT were presented in Table 6. James received the MFFT one more time than did Eric or Anthony (i.e., following the seventh treatment session and before the 2 week winter holiday, see posttreatment[a] on Table 6). Mean latency to the first response increased at posttreatment[b] to 12.16 sec over the 6.7 sec recorded at pretreatment and posttreatment[a]. The mean latency fell to 7.8 sec at follow-up however (Table 6). The errors on the MFFT decreased from 18 at pretreatment to 11 during follow-up. The increase in latency and decrease in errors indicated that James' level of impulsivity as measured by the MFFT decreased following treatment.

James' mother rated James' behavior on three rating scales (Table 7). The results indicated very little change until follow-up where James received ratings of 43 on the CTRS (23 below baseline), 16 on the Davids (5 below baseline), and 106 on the SCRS (26 below baseline). It should be noted

Table 6

James' Matching Familiar Figure Test Scores

	Mean Latency	Errors
Pretreatment	6.7 sec	18
Posttreatment[a]	6.7 sec	12
Posttreatment[b]	12.16 sec	11
Follow-up	7.8 sec	11

[a]MFFT administered prior to the 2 week winter holiday break.

[b]MFFT administered following the 12th treatment session.

Table 7

James' Rating Scale Scores

Scale	Pretreat	Posttreat[a]	Posttreat[b]	Follow-up
		Mother's Rating		
CTRS	66	61	50	43
Davids	21	20	20	16
SCRS	132	132	136	106
		Teacher's Rating		
CTRS	90	66	73	98
Davids	37	23	25	31
SCRS	182	128	118	170

[a]Scales were completed prior to the 2 week winter holiday break.

[b]Scales were completed following the twelfth treatment session.

that James was rated as hyperactive only on the SCRS at pretreatment, posttreatment[a], and posttreatment[b] by his mother. All other scores were below the level accepted as indicating hyperactivity across all scales and conditions (Table 7).

James' teacher rated James as much more hyperactive on the rating scales than his mother. At pretreatment James' scores were 90 on the CTRS, 37 on the Davids, and 182 on the SCRS (Table 7). At posttreatment[a] James' scores fell to 66, 23, and 128 respectively. Slight increases on the CTRS, to 73, and Davids, to 25, were recorded at posttreatment[b]. James' score on the SCRS fell to 118 at posttreatment[b] however. Interestingly, the teacher rated James almost as hyperactive at follow-up as at pretreatment despite the classroom observations showing James' level of AB at follow-up was greater than treatment and baseline levels (Figure 2).

In summary, James' scores on the rating scales were contradictory, especially when viewed in light of the classroom observations. James' mother was probably rating James on the basis of his home behavior and his teacher on the basis of his classroom behavior. Therefore, it might be expected that ratings by James' teacher would more closely correspond to the observed level of AB in the classroom than his mother's ratings. The results shown in Table 7 show just the opposite.

The final measures from the classroom setting were James' grades. James received grades on November 12 and January 27. His first report card was issued before treatment and showed

a grade point average of 1.07. The second report card was issued following the completion of treatment and before the follow-up condition. James' grade point average was 1.4, an increase of .33.

Treatment measures. James received all 12 treatment sessions. The longest training session was Session 8 which lasted 50 min and the shortest was Session 3, which lasted 41 min. The mean length for all sessions was 45.6 min (Table 8). Table 8 also shows the number of response cost episodes (n = 38, mean = 3.2) and the percentage of AB per session. James' mean percentage of AB was 77.8% with a range of 50% to 100%.

Consumer satisfaction measures. Following the final treatment session, James and his mother answered several questions about the self-instruction training (see page 40 for the questions). James' mother was very happy with James' behavior following treatment and said that her time and effort were well spent. She indicated that James had told her he was using the five steps, but she had not observed James using them. She also received less "bad" news from James' teacher.

James said that he used the five steps at school (he recited them at follow-up). James also said that he enjoyed the training (especially the "prizes"), he wanted to come back to UOP for more training, and that he felt that he got into less trouble at school.

James' teacher was asked the same questions at follow-up. She reported that James had greatly benefited from the self-

Table 8

James' Training Session Measures

Session	Time	Number of Response Cost	Percentage AB[a]
1	45 min	2	100%
2	45 min	6	78%
3	41 min	4	88%
4	45 min	6	88%
5	49 min	0	91%
6	45 min	6	89%
7	46 min	4	64%
8	50 min	3	76%
9	44 min	1	50%
10	45 min	3	53%
11	44 min	0	79%
12	48 min	1	78%
Totals	547 min	38	*
Means	45.6 min	3.2	77.8%

[a]Percentage of time James was displaying appropriate behavior during the sessions.

instruction training (this was interesting in light of her scores of James' behavior). She reported that James completed more of his assigned tasks and kept out of trouble more. She could not say if James was using the five steps, but did say that James had told her he was using them.

Anthony

Classroom observations. The level of appropriate behavior displayed by Anthony across experimental conditions is shown in Figure 3. Anthony displayed a high level of AB during baseline (mean = 43%) but showed a decreasing trend (Figure 3). The mean percentage of AB increased to 75% during treatment (range of 59% to 94%). During follow-up the level of AB increased still further (mean = 86%, range of 11% to 100%). Anthony scored 11% on Observation 22 (Figure 3), however, a substitute teacher conducted class that day. Although Anthony's level of AB increased across experimental conditions, it did not match or exceed the level of his matched peer's AB except on Observations 13 and 15 during the follow-up condition when both he and his matched peer scored 100% (Figure 3).

Changes in the frequencies of the classroom observation for each category were uniformly small. For example, interference (I) was 9% of the intervals during baseline, 5% during treatment, and 4% at follow-up (Table 9). Similarly, off-task (X) went from 10% at pretreatment to 6% at treatment and 1% at follow-up. Slight increases were noted

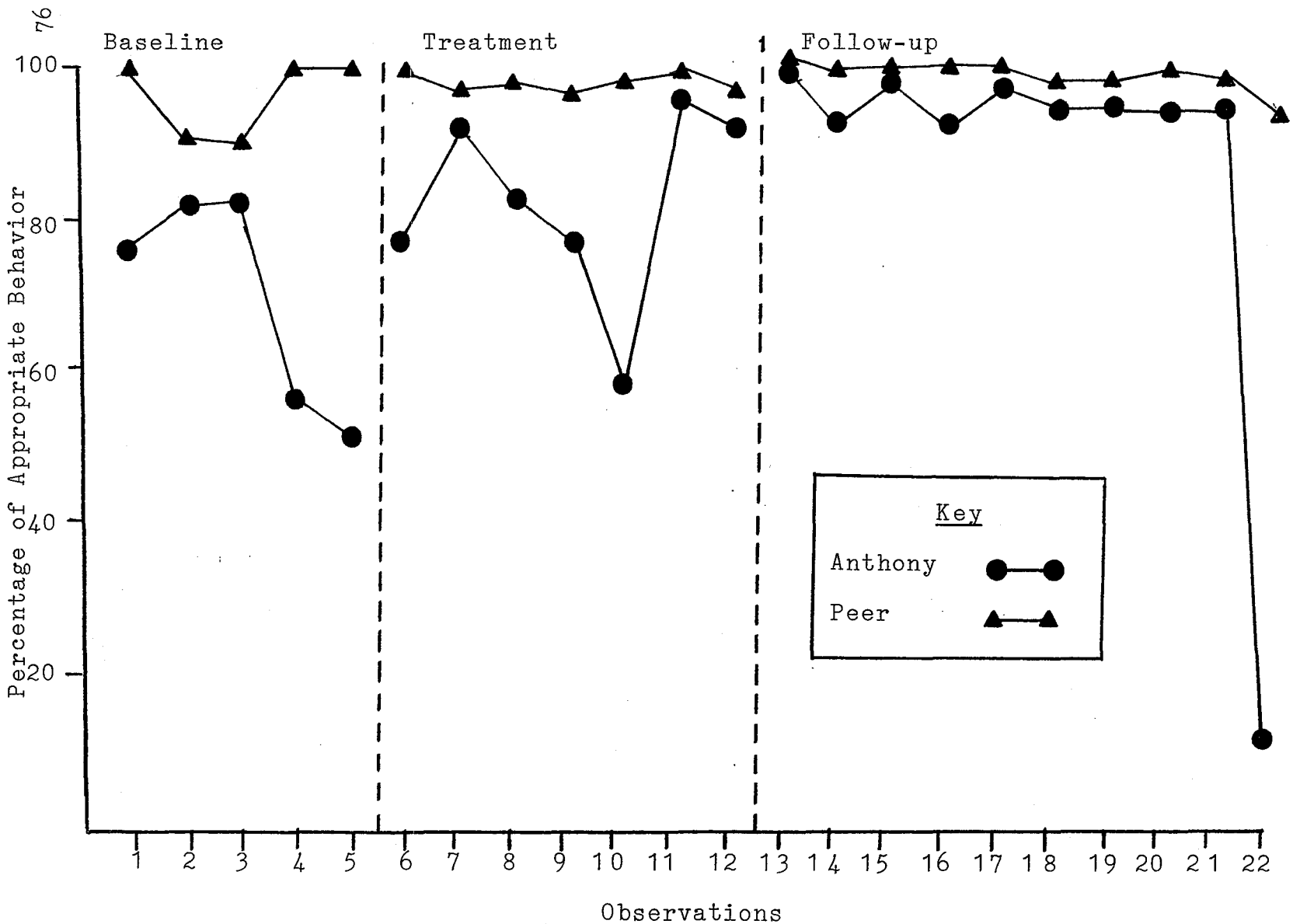

Figure 3. Percentage of appropriate behavior by Anthony (●) and matched peer (▲).

Table 9

Anthony's Category Frequency of Classroom Observation[d]

Obs.[a]	Tot.[b]	I	X	NC	MM	GMs	OC	A	AC	AT	GMv	S	AB[c]
1	64	6	10										49/77%
2	64	5	8										52/81%
3	64	4	6		1	1							52/81%
4	64	27	2	2	1		1						36/56%
5[e]	64	4	24		3	5							32/50%
6	64	3	7	1	5								50/78%
7	64	1	4		1								58/91%
8	62	3	4	2	1								52/82%
9	64	8	6		1								50/78%
10	64	8	4	3	3	13	5						38/59%
11	64	1				3							60/94%
12[f]	64		2			4							58/91%
13	48												48/100%
14	64		2		3								59/92%
15	48				1								47/98%
16	64					4	1						59/91%
17	64	1											63/98%
18	48	1			1		1						45/94%
19	58	1			2								55/95%
20	64	3	1										60/94%
21	64	3	1										60/94%
22	64	14	4	41	5	3			2				7/11%

Table 9 Continued

Anthony's Category Frequency of Classroom Observation[d]

Obs.[a]	Tot.[b]	I	X	NC	MM	GMs	OC	A	AC	AT	GMv	S	AB[c]
Baseline[g]	520	46	50	2	5	6	1						221
Percentage	34%	9%	10%	.4%	1%	1%	.2%						43%
Treatment	446	24	27	6	11	20	5						336
Percentage	29%	5%	6%	1%	2%	4%	1%						75%
Follow-up	586	23	8	41	11	7	2		2				503
Percentage	38%	4%	1%	7%	2%	1%	.3%		.3%				86%
Totals	1552	93	85	47	27	33	8		2				1060
Percentage	100%	6%	5%	3%	2%	2%	.5%		.1%				68%

[a]These observations correspond to the horizontal axis on Figure 3.

[b]Total number of 15 sec intervals Anthony was observed.

[c]Percentage totals of AB were graphed on Figure 3.

[d]Categories were explained on pages 35 and 36.

[e]Observations 1 through 5 are baseline observations.

[f]Observations 6 through 12 are treatment observations, 13 through 22 are follow-up observations.

[g]Raw scores of baseline, treatment, and follow-up conditions followed by their respective percentage scores. The total raw scores and percentage scores for all observations across conditions appears on the final two lines.

for non-compliance (NC) which went from less than one percentage point during baseline to 1.3% and 7% at treatment and follow-up respectively (Table 9).

Pre and posttreatment measures. The results of the MFFT are presented in Table 10. Anthony was administered the MFFT at pretreatment, posttreatment, and follow-up. The mean latnecy to the first response was 8.1 sec, 11 sec, and 9.5 sec across conditions (Table 10). Anthony's errors remained about the same across conditions, 9, 9, and 10 errors respectively (Table 10). Taken as a whole, these scores reflect little, if any change in Anthony's level of impulsivity.

Anthony's mother and teacher scored his behavior on the CTRS, David's, and SCRS at pre and posttreatment. Only his teacher completed the three scales at follow-up. Anthony was not living with his mother at follow-up. His mother's ratings on the CTRS and SCRS increased slightly after treatment but declined two points on the Davids scale (Table 11).

Anthony's teacher's ratings showed some variability across scales and conditions (Table 11). For example, scores on the SCRS were 182 at pretreatment, 202 at posttreatment, and 148 at follow-up. Scores on the CTRS and Davids were virtually unchanged across conditions (Table 11).

The final measure obtained from the school setting was Anthony's grades. Grade reports were issued on November 12 (prior to baseline), and January 27 (following the first three treatment sessions). Anthony's grade point average on these

Table 10

Anthony's Matching Familiar Figure Test Scores

	Mean Latency	Errors
Pretreatment	8.1 sec	9
Posttreatment	11 sec	9
Follow-up	9.5 sec	10

Table 11

Anthony's Rating Scale Scores

Scale	Pretreatment	Posttreatment	Follow-up
		Mother's Ratings	
CTRS	104	127	NA[a]
Davids	34	32	NA
SCRS	182	195	NA
		Teacher's Ratings	
CTRS	113	118	112
Davids	35	40	39
SCRS	182	202	148

[a]Since Anthony had left his mother's home following treatment, follow-up ratings were not obtained.

report cards were 1.6 and 2 respectively. The effect of treatment on the grade point average must be considered minimal because the majority of both grading periods were prior to treatment.

In summary, Anthony's scores on the MFFT and rating scales indicated no change in the level of hyperactive behavior. Conversely, classroom observations showed that Anthony's AB improved during treatment and further during follow-up. .

Treatment measures. Anthony received eight treatment sessions. The longest training session was Session 7 which lasted 56 min and the shortest session were Sessions 1 and 2, each 40 min long. The mean length for all treatment sessions was 45.9 min (Table 12). Table 12 also shows the number of response cost episodes (n = 12, mean = 1.5) and the percentage of AB per session. Anthony's mean percentage of AB was 89 with a range of 79% to 98%.

Consumer satisfaction measures. Following treatment, Anthony and his mother responded to several questions regarding their opinion of the self-instruction training (see page 40 for the questions). Anthony's mother did not feel that Anthony's behavior had improved and that it may be worse. She reported that Anthony was going to live with his father because she "couldn't handle it" anymore. She said she didn't mind bringing Anthony to training or completing the scales. She said she had never seen Anthony using the five steps nor was she getting any fewer reports of Anthony mis-

Table 12

Anthony's Training Session Measures

Session	Time	Response Cost	Percentage AB[a]
1	40 min	0	82
2	40 min	3	85
3	45 min	1	91
4	49 min	3	88
5	48 min	1	94
6	41 min	1	97
7	56 min	1	98
8	48 min	2	79
Totals	367 min	12	*
Mean	45.9 min	1.5	89

[a]Percentage of time Anthony displayed appropriate behavior during the training sessions.

behaving at school.

Anthony reported that not much had changed following treatment. He said he seldom used the five steps at school. He did say that he enjoyed the training. Anthony would not comment on whether or not he was getting better grades or if he was staying "out of trouble" at school.

Anthony's teacher responded to the same questions at follow-up. She did not feel that Anthony had benefited from the self-instruction training and she reported that she felt Anthony's behavior was actually worse. She also reported that she had not observed Anthony using the five steps.

Treatment costs

Assuming a cost of 20 dollars an hour for the trainer's time (actual treatment was free) the cost of the 12 treatment sessions would be about $240. Two other costs must also be considered. They were the cost of training materials and back-up reinforcers which would be about $300.

Discussion

Previous researchers (e.g., Cole & Kazdin, 1980; O'Leary, 1980; Pressley, 1979) have discussed the major weaknesses in the self-instruction research. Two specific concerns were the lack of clinically significant outcome data (based on time series observations) and the lack of generalization data. This study contributes to the literature in this area by providing observational data that reveals an increase in the level of appropriate behavior displayed by hyperactive males

in special education classrooms following self-instruction training. These results would also indicate positive response generalization (i.e., an increase in desired behavior concurrent with treatment but not specifically trained). However, the results are both encouraging and equivocal.

For instance, the obtained grade reports indicated very little or no improvement and the participants were still in special education classrooms following treatment. However, the classroom observations consistently revealed increases in the level of appropriate behavior across all participants from baseline to treatment and follow-up conditions. Conversely, teacher and parent ratings on the three rating scales as well as participant performance on the MFFT generally indicated either no change or changes in behavior opposite that from the classroom observations. The single exception was James' scores as rated by his mother and his MFFT performance.

There are several possible explanations for these contradictory results. First, there is the possibility of observer drift and/or bias. Second, the behaviors measured by the rating scales, MFFT, and classroom observations may be different and unrelated to each other. Third, factors involving the validity of global measures (i.e., rating scales) must be examined. Each of these concerns are discussed below following a delineation of the response and stimulus generalization aspects of this study.

As generally defined (e.g., Kendall, 1981), stimulus

generalization refers to a participant making a trained response across different settings or under different stimulus conditions. In this study, stimulus generalization would be evidenced by the participants using self-instructions (learned in the treatment sessions) in their respective schools and homes (different settings). On the other hand, response generalization refers to a change in behaviors or responses concurrent with treatment but not specifically trained. In the present study, this would be evidenced by changes in the behaviors represented on the observation code. Thus, response (i.e., behaviors measured by the observation code) and stimulus generalization (i.e., the use of self-instructions at school) were assessed in the present study.

Evidence that the participants used self-instructions at school or home is generally weak. It was impossible to determine whether or not the participants were saying the five steps as they did schoolwork or complied with parental requests. The participants reported that they used the five steps, but this is anecdotal data that must be interpreted cautiously.

Conversely, evidence for response generalization is quite strong and a more clinically desirable outcome. That is, the participants were referred for treatment because they failed to display appropriate behavior in the classroom, not because they failed to use the self-instructions.

The classroom observations showed that increased in ap-

propriate behavior corresponded to the onset of self-instruction training. It appears that self-instruction training in a clinical setting resulted in response generalization to the classroom. The level of appropriate behavior increased following the onset of treatment and remained above baseline levels during the entire study including the follow-up phase. However, as pointed out by Kendall (1981), there are several problems associated with assessing generalization in single subject designs. For instance, is the failure of the level of behavior to return to baseline levels following the termination of training a result of transfer of training or a lack of treatment effects (Kendall, 1981)? Kendall argues that researchers can alleviate this problem by assessing response rather than stimulus generalization. The design of the present study was not a reversal design but shared common characteristics such as an assessment phase following treatment.

Further problems with the results of this study were previously mentioned and must be discussed. The primary problem is the differing results as represented by the classroom observations and the rating scales. For instance, the observers were aware that the participants were undergoing treatment. Further, part of their course credit was an analysis of self-instruction and hyperactivity thus they were familiar with the purpose and rational of the present study. Therefore, it is certainly possible that their definition of appropriate behavior became more lenient as the study progressed. However,

if observer drift did occur, the reliability measures should have been low which they weren't. Unfortunately, the high reliability scores could also be explained by the observers drifting in the same direction. The possibility that both observers changed their definitions by conversing with one another and/or by chance remains possible.

Further, teacher attention was not controlled for in this study. Thus it is possible that the teachers attended to the participants' appropriate behaviors more frequently while the observers were present, thus inflating the appropriate behavior scores (providing teacher attention was reinforcing). If teacher attention spuriously increased the level of appropriate behavior it would be expected that the teachers would perceive more appropriate behavior, thus their ratings of the participants on the scales would reflect decreased hyperactivity, which was not the case. It then seems unlikely that observer drift, bias, or differential teacher attention caused the increase in appropriate behavior. It is recommended that further research in this area use a third observer who is blind to the experimental conditions for reliability observations. Keeping the teacher blind to the experimental conditions would also be desirable.

Another area of concern is the possibility that the behaviors measured by the classroom observations were different and unrelated to the behaviors assessed by the MFFT and the rating scales. It was assumed that all measures used in this study

assessed hyperactive behavior, however, that may not be the case. For instance, the behavior measured by the MFFT may only be MFFT performance and not impulsivity. Ault el al. (1976) produced data that questioned the reliability of the MFFT for assessing treatment outcomes. One specific concern was the low-test retest reliability (Ault et al., 1976). Thus it is possible that self-instruction training caused changes in the participants' classroom behavior but left MFFT performance unaffected.

Teacher and parent scale ratings may also reflect changes in behavior other than those measured by the classroom observations. For example, Wahler and Leske (1973) point out that the process of making a global rating (i.e., filling out a rating scale) is also a behavior subject to immediate environmental contingencies. They demonstrated that gradual changes in behavior over time was difficult for teachers to accurately discern unless they were taking frequency tallies (Wahler & Leske, 1973). Interestingly, their results showed that interobserver reliability among teachers making global ratings of a child's behavior could be quite high and highly inaccurate if the child's behavior was changing slowly.

The rating scale scores may be sensitive to transitory changes and thus reflect a daily or even hourly impression of the participant's behavior. The teachers were given the scales and asked to "rate the participant's behavior," no further instructions were given. For example, Anthony's fol-

low-up ratings by his teacher were completed the day after Anthony had his lowest level of appropriate behavior. Therefore, it is possible that the teacher was responding to the previous "rowdy" day (i.e., the most salient stimuli) rather than his behavior over the 2 week follow-up period.

Despite the fact that these ratings were inconsistent with the data from the classroom observations, they are not inconsistent with results from studies in this area. For instance, Kendall and Finch (1978) used several rating scales as dependent measures and significant changes were found on some scales but other scales showed no changes in the participants' behavior following treatment.

Parent ratings were also problematic. It is quite likely that the parents rated their children based on home behavior. Therefore, it is possible that the participants' home behavior did not improve following treatment and the parent ratings were accurate. The reasons why the self-instruction treatment of the present study would not generalize to the home environment were not assessed, however, there are several differences between the school and home situations. Finally, parents are also susceptible to the same problems as the teachers are for making global ratings (Wahler & Leske, 1973).

It would be interesting to take home observations to determine if there was any correspondence between the parents' ratings and the participants' home behavior. In the present study, home observations were conducted for Eric and James

but discontinued because the obtained data showed a high level of appropriate behavior (i.e., between 80% and 100%) before treatment, making the assessment of treatment effects difficult. Further research in this area should assess home behaviors with observational data.

In summary, the above discussion reflects the problematic issues involved with global measures (Abikoff et al., 1977; Wahler & Leske, 1973). These results indicate problems with research in the area of self-instruction that rely solely on global ratings as treatment outcome measures (Cole & Kazdin, 1980). However, it is possible that the classroom observations in the present study are not valid (due to observer drift or bias). In this case, the rating scale scores might accurately reflect the effects of treatment on the participants' behavior.

Several other issues must also be discussed. Even though Eric and Anthony received only six and eight treatment sessions respectively, gains were made in the level of appropriate behavior. This data is consistent with other research. For example, Kendall and Finch (1976; 1978) reported decreases in hyperactive behavior with six sessions of self-instruction training. Bornstein and Quevillon (1976) used 2 hours (in four ½ hour sessions) of self-instruction training with preschool hyperactive boys to obtain positive results. Obviously, research investigating the minimal amount of training needed to effect therapeutic change is important because

shortening the length of time to complete treatment may reduce participant attrition and be less costly. That is, if Eric and Anthony had completed treatment in three weeks (i.e., three sessions a week rather than the two suggested by Padawer et al., Note 2) both would have completed the 12 training sessions.

The efficacy of self-instruction training may be increased by combining it with a contingency management program at home and at school. As previously discussed (page 30) self-instruction training appears to fall into Stokes and Baer's (1977) "train and hope" category of generalization. Viewed in this fashion, self-instruction provides hyperactive children with a different set of responses to stimuli in their environment and "hopes" these responses are "trapped" by naturally occuring contingencies (Baer & Wolf, 1970). However, if teachers and parents fail to perceive and reinforce positive changes in their hyperactive child's behavior (as is suggested by Wahler & Leske, 1973) the positive behaviors may extinguish and drop out of the child's behavioral repertroire. Thus, the long term efficacy of self-instruction may be enhanced by combining it with contingency management procedures such as response cost, timeout, and token economies.

Another area of concern is that self-instruction may be ineffective for some hyperactive children. In the present study, one participant could not be treated (however, he was

referred elsewhere for help) because of severe learning or memory problems that prohibited him from being able to repeat five digits in sequence (let alone five statements). Reading disabilities are another factor that may limit the appropriateness of self-instruction as a treatment technique. However, Bornstein and Quevillon (1976) treated preschool hyperactive children with a self-instruction procedure. More research is needed to determine client characteristics that contribute to the effectiveness of self-instruction.

A final consideration is a need to investigate therapist behavior in self-instruction training. At present, it appears that the Padawer et al. (Note 2) training manual is the only one of its sort available. The trainer in the present study was self-trained. Therefore, he may not have been as effective as other trainers. Certainly, delineating the therapist behaviors most conductive to therapeutic change is important. Kendall and Wilcox (1980) investigated the participants' attitudes toward their therapists in order to control for this variable in analyzing their results. The results generally showed that the participants liked their therapists. This is of course not a measure of therapist competence. One specific suggestion is for researchers to make available video tapes of exemplar therapists.

Consumer satisfaction measures generally showed that the parents, participants, and teachers reacted favorably to the self-instruction training although one parent stated that her

child's behavior had not changed. Self-instruction training appears "painless" and relatively effortless for the consumer.

The "bottom line" in research in this area remains the amount of therapeutic change effected in the hyperactive child. Agras, Kazdin, and Wilson (1979) describe this as;

> Evaluating the clinical importance of behavior change. This criterion evaluates the magnitude of performance and the importance of this change for the individual's day-to-day functioning. The clinical importance of the change has been assessed by determining whether treatment alters how the client is viewed by others in his or her everyday environment and whether treatment brings the client's behavior within acceptable or normative levels of performance. Acceptable or normative levels of performance are defined empirically by observing individuals who are functioning adequately in the natural environment. (p. 276)

It appears that the present study satisfies several of the above considerations. The magnitude of change in the level of behavior in the classroom was encouraging. Further, this change was compared both across participant and across the participants' matched peers' behavior. The matched peers' behavior in the classroom was not surpassed by the participants' (except twice) but in most cases closely approximated. Unfortunately, the teachers apparently were unable to disern any change (as reflected by their ratings) in the participants'

behavior. Therefore, it appears that in the present study self-instruction training was not adequate to change the way the participants were viewed by others in their environment.

In summation, the results of the present study have added to the self-instruction literature by providing on-going observational measures demonstrating the response generalization of self-instruction training. Response generalization is a much desired therapeutic outcome of treatment with hyperactive children. Previously, outcome measures were generally global ratings. Further research needed to establish the efficacy of self-instruction training has been previously discussed and includes, (a) group comparison research utilizing observational data, (b) component analysis of self-instruction training, (c) research investigating therapist parameters, (d) research comparing global ratings and observational outcome measures, (e) research investigating the type of hyperactive children that may benefit from self-instruction training, and (f) an assessment of the effects of combining self-instruction training with contingency management procedures.

Reference Notes

1. Steinfeld, B. I. A multimethod approach to the assessment of the stimulant drug response in a hyperactive child. Unpublished manuscript, 1980. (Available from Bradley I. Steinfeld, Department of Psychology, West Virginia University, Morgantown, West Virginia, 26505).
2. Padawer, W., Zupan, B., & Kendall, P. C. Developing self-control in children: A manual of cognitive behavioral strategies. Unpublished manuscript, 1980. (Available from Philip C. Kendall, Department of Psychology, University of Minnesota, 75 E. River Road, Minneapolis, Minnesota, 55455. Cost, $10).
3. Abikoff, H., Gittelman-Klein, R., & Klein, D. F. The modified Stony Brook classroom observation code. Unpublished manuscript, 1980. (Available from Howard Abikoff, Long Island Jewish-Hillside Medical Center, P. O. Box 38, Glen Oaks, New York, 11004. Cost, $2).
4. The training sessions described in this thesis were summarized from Padawer et al. (Note 2). The reader is referred to Padawer et al. for a more through discussion of the self-instruction training.
5. Following Directions was part of the Specific Skills Series developed by Richard Boning. They are available from Barnell Loft, Ltd., Rockville Centre, New York, New York. They can also be found in educational libraries and elementary schools.

6. The Little Professor and Fun with Math Facts book are manufactored and copywrited trademarks of Texas Instruments, Inc. They are available wherever Texas Instrument products are sold.
7. Tangrams are made by American Teaching Aids, Covina, California, 91722. They are available in most educational supplies stores.

References

Abikoff, H., Gittelman-Klein, R., & Klein, D. F. Validation of a classroom observation code for hyperactive children. Journal of Consulting and Clinical Psychology, 1977, 45, 772-783.

Abikoff, H., Gittelman-Klein, R., & Klein, D. F. Classroom observation code for hyperactive children: A replication of validity. Journal of Consulting and Clinical Psychology, 1980, 48, 555-565.

Agras, W. S., Kazdin, A. E., & Wilson, G. T. Behavior therapy: Toward an applied clinical science. San Francisco: W. H. Freeman, 1979.

American Psychiatric Association, Task Force on Nomenclature and Statistics. Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, D. C.: American Psychiatric Association, 1978.

Ault, R. L., Mitchell, C., & Hartmann, D. P. Some methodological problems in reflection-impulsivity research. Child Development, 1976, 47, 227-231.

Ayllon, T., Hayman, D., & Kandel, H. A. A behavioral-educational alternative to drug control of hyperactive children. Journal of Applied Behavior Analysis, 1975, 8, 137-146.

Ayllon, T., & Rainwater, N. Behavioral alternatives to the drug control of hyperactive children in the classroom. School Psychology, 1976, 5, 33-39.

Baer, D. M., & Wolf, M. M. The entry into natural communities of reinforcement. In R. Ulrich, T. Stachnik, & J. Mabry (Eds.), Control of human behavior: Volume II. Glenview, Illinois: Scott, Foresman, 1970.

Bornstein, P., Quevillon, R. The effects of a self-instruction package on overactive preschool boys. Journal of Applied Behavior Analysis, 1976, 9, 179-188.

Cantwell, D. P. Early intervention with hyperactive children. Journal of Operational Psychiatry, 1974, 4, 56-67.

Chermak, S. A., Stein, F., & Abelson, C. Hyperactive children and an activity group therapy model. American Journal of Occupational Therapy, 1973, 26, 311-315.

Christensen, D. E., & Sprague, R. L. Reduction of hyperactive behavior by conditioning procedures alone and combined with methylphenidate. Behavior Research and Therapy, 1973, 16, 331-334.

Cohen, N., Douglas, V., & Morganstern, G. The effects of methylphenidate on attentive behavior and autonomic activity in hyperactive children. Psychopharmacologia, 1971, 22, 282-294.

Cole, P. M., & Kazdin, A. E. Critical issues in self-instruction training with children. Child Behavior Therapy, 1980, 2, 1-21.

Conners, C. A. A teacher rating scale for use in drug studies in children. American Journal of Psychiatry, 1969, 126, 884-888.

Daniels, F. K. Parental treatment of hyperactivity in a child with ulcerative colitis. Journal of Behavior Therapy and Experimental Psychiatry, 1973, 4, 183-185.

Davids, A. An objective instrument for assessing hyperkinesis in children. Journal of Learning Disabilities, 1971, 4, 35-37.

Douglas, V. I. Stop, look, and listen: The problem of sustained attention and impulse control in hyperactive and normal children. Canadian Journal of Behavioral Science, 1972, 4, 259-281.

Douglas, V. I. Are drugs enough? To treat or train the hyperactive child. International Journal of Mental Health, 1975, 4, 199-212.

Drabman, R. S., Spitalnik, R., & O'Leary, K. D. Teaching self-control to disruptive children. Journal of Abnormal Psychology, 1974, 82, 10-16.

Fish, B. The "one child, one drug" myth of stimulants in hyperkinesis. Archives of General Psychiatry, 1971, 25, 193-199.

Flavell, J. H., Beach, D. R., & Chinsky, J. M. Spontaneous verbal rehearsal in a memory task as a function of age. Child Development, 1966, 37, 283-299.

Frazier, J. R., & Schneider, H. Parental management of inappropriate hyperactivity in a young retarded boy. Journal of Behavior Therapy and Experimental Psychiatry, 1975, 6, 246-247.

Freeman, R. D. Minimal brain dysfunction, hyperactivity, and learning disorders: Epidemic or episode? In J. J. Bosco & S. S. Robin (Eds.), The hyperactive child and stimulant drugs. Chicago: University of Chicago Press, 1976.

Freidling, C., & O'Leary, S. G. Effects of self-instruction training on second and third-grade hyperactive children: A failure to replicate. Journal of Applied Behavior Analysis, 1979, 12, 211-219.

Gittelman-Klein, R., Spitzer, R. L., & Cantwell, D. P. Diagnostic classifications and psychopharmacological indications. In J. S. Werry (Ed.), Pediatric psychopharmacology: The use of behavior modifying drugs in children. New York: Mazel, 1978.

Goodwin, S. E., & Mahoney, M. J. Modification of aggression through modeling: An experimental probe. Journal of Behavior Therapy and Experimental Psychiatry, 1975, 6, 200-202.

Guilford, J. P. Psychometric methods (2nd ed.). New York: McGraw Hill, 1954.

Johnson, C. A., & Katz, R. C. Using parents as change agents for their children: A review. Journal of Child Psychology, 1973, 14, 181-200.

Kagan, J., Rosman, B. L., Day, D., Albert, J., & Philips, W. Information processing in the child: Significance of analytic and reflective attitudes. Psychological Monographs, 1964, 78. (1 Whole No. 578).

Kendall, P. C. On the efficacious use of verbal self-instruction procedures with children. Cognitive Therapy and Research, 1977, 1, 331-341.

Kendall, P. C. Assessing generalization and the single subject design. Behavior Modification, 1981, 3, 307-319.

Kendall, P. C., & Finch, A. J. A cognitive-behavioral treatment for impulse control: A case study. Journal of Consulting and Clinical Psychology, 1976, 44, 852-857.

Kendall, P. C., & Finch, A. J. A cognitive-behavioral treatment for impulsivity: A group comparison study. Journal of Consulting and Clinical Psychology, 1978, 46, 110-118.

Kendall, P. C., & Wilcox, L. E. Self-control in children: Development of a rating scale. Journal of Consulting and Clinical Psychology, 1979, 47, 1020-1029.

Kendall, P. C., & Wilcox, L. E. Cognitive-behavioral treatment for impulsivity: Concrete versus conceptual training in non-self-controlled problem children. Journal of Consulting and Clinical Psychology, 1980, 48, 80-91.

Kingsley, P. R., & Hagan, J. W. Induced versus spontaneous rehearsal in short term memory in nursery school children. Developmental Psychology, 1969, 1, 40-46.

Krippner, S., Silverman, R., Cavallo, M., & Healy, M. A study of hyperkinetic children receiving stimulant drugs. Academic Therapy, 1973, 8, 261-269.

Kupietz, S., Bailer, I., & Winsberg, B. G. A behavior rating

scale for assessing improvement in behaviorally deviant children: A preliminary investigation. American Journal of Psychiatry, 1972, 128, 116-120.

Lahey, B. B., Green, K. D., & Forehand, R. On the independence of ratings of hyperactivity, conduct problems, and attention deficits in children: A multiple regression analysis. Journal of Consulting and Clinical Psychology, 1980, 48, 566-574.

Mahoney, M. J. Cognition and behavior modification. Cambridge, Mass.: Ballinger Publishing, 1974.

Meichenbaum, D. Cognitive-behavior modification. New York: Plenum, 1977.

Meichenbaum, D., & Goodman, J. Reflection-impulsivity and verbal control of motor behavior. Child Development, 1969, 40, 785-797.

Meichenbaum, D., & Goodman, J. Training impulsive children to talk to themselves: A means of developing self-control. Journal of Abnormal Psychology, 1971, 77, 115-129.

Moore, S. G., & Cole, S. O. Cognitive self-mediation training with hyperkinetic children. Bulletin of the Psychonomic Society, 1978, 12, 18-20.

Munro, B. C. Control of disruptive behavior in an elementary classroom: Two case studies. Canadian Counsellor, 1974, 8, 257-271.

Murray, M. E. The use of concrete cues in controlling inappropriate behavior in public places. Behavior Therapy,

1977, 8, 755-756.

O'Leary, K. D. Behavior modification in the classroom: A rejoinder to Winett and Winkler. Journal of Applied Behavior Analysis, 1972, 5, 505-510.

O'Leary, K. D. Pills or skills for hyperactive children. Journal of Applied Behavior Analysis, 1980, 13, 191-204.

O'Leary, K. D., & O'Leary, S. G. Behavioral treatment for hyperactive children. In R. M. Knights & D. J. Bakker (Eds.), Treatment of hyperactive and learning disordered children. Baltimore: University Park Press, 1980.

O'Leary, K. D., Pelham, W. E., Rosenbaum, A., & Price, G. W. Behavioral treatment of hyperkinetic children: An experimental evaluation of its usefulness. Clinical Pediatrics, 1976, 15, 275-279.

O'Leary, S. G., & Pelham, W. E. Behavioral therapy and withdrawal of stimulant medication with hyperactive children. Pediatrics, 1978, 61, 211-217.

Palkes, H., Steward, M., & Freedman, J. Improvement in maze performance of hyperactive boys as a function of verbal training procedures. Journal of Special Education, 1972, 5, 337-342.

Patterson, G. R., & Guillion, M. E. Living with children: New methods for parents and teachers. Champaign, Ill.: Research Press, 1971.

Patterson, G. R., Jones, R., Whittiew, J., & Wright, M. A. A behavior modification technique for the hyperactive child.

Behavior Research and Therapy, 1965, 2, 217-226.

Pelham, W. E. Withdrawal of a stimulant drug and concurrent behavioral intervention in the treatment of a hyperactive child. Behavior Therapy, 1977, 8, 473-479.

Pelham, W. E., Schnedler, R. W., Bologna, N. C., & Contreras, J. A. Behavior and stimulant treatment of hyperactive children: A therapy study with methylphenidate probes in a within subjects design. Journal of Applied Behavior Analysis, 1980, 13, 221-236.

Pressley, M. Increasing children's self-control through cognitive interventions. Review of Educational Research, 1979, 49, 319-370.

Rosenbaum, A., O'Leary, K. D., & Jacob, R. G. Behavioral intervention with hyperactive children: Group consequences as a supplement to individual contingencies. Behavior Therapy, 1975, 6, 315-323.

Ross, D. M., & Ross, S. A. Hyperactivity: Research, theory, and action. New York: Wiley, 1976.

Safer, D. H., & Allen, R. P. Side effects from long-term use of stimulants in children. International Journal of Mental Health, 1975, 4, 105-118.

Shafto, F., & Sulzbacher, S. Comparing treatment tactics with a hyperactive preschool child: Stimulant medication and programmed teacher intervention. Journal of Applied Behavior Analysis, 1977, 10, 13-20.

Shores, R. E., Appolloni, T., & Norman, C. W. Changes in peer verbalizations accompanying individual and group contingencies to modify on-task behavior. Perceptual and Motor Skills, 1976, 43, 1155-1162.

Sprague, R. L., Christensen, D. E., & Werry, J. S. Experimental psychology and stimulant drugs. In C. K. Conners (Ed.), Clinical use of stimulant drugs in children. The Hague: Excerpta Medica, 1974.

Sroufe, L. A. Drug treatment of children with behavior problems. In F. Horowitz (Ed.), Review of child development research, IV. Chicago: University of Chicago Press, 1975.

Stableford, W., Butz, R., Hasazi, S., Leitenberg, H., & Peyser, J. Sequential withdrawal of stimulant drugs and use of behavior therapy with two hyperactive boys. American Journal of Orthopsychiatry, 1976, 46, 302-312.

Stokes, T. F., & Baer, D. M. An implicit technology of generalization. Journal of Applied Behavior Analysis, 1977, 10, 349-368.

Twardosz, S., & Sajwaj, T. Multiple effects of a procedure to increase sitting in a hyperactive, retarded boy. Journal of Applied Behavior Analysis, 1972, 5, 73-78.

Wahler, R. G. Setting generality: Some specific effects of child behavior therapy. Journal of Applied Behavior Analysis, 1969, 2, 239-246.

Wahler, R. G., & Leske, G. Accurate and inaccurate observer summary reports. The Journal of Nervous and Mental Disease,

1973, 156, 386-394.

Wasserman, H., Brown, D., & Reschly, D. Application of self-management procedures for the modification of academic and classroom behaviors of two hyperactive children. SALT: School Applications of Learning Theory, 1974, 6, 17-24.

Weiss, G., & Hechtman, L. The hyperactive child syndrome. Science, 1979, 205, 1348-1354.

Wender, P. H. Minimal brain dysfunction in children. New York: Wiley & Sons, 1971.

Wender, P. H., & Wender, E. H. The hyperactive child and the learning disabled child: A handbook for parents. New York: Crown Publishers Inc., 1978.

Whalen, C. K., & Henker, B. Hyperactive children: The social ecology of identification and treatment. New York: Academic Press, 1980.

Wiltz, N. A., & Gordon, S. B. Parental modification of a child's behavior in an experimental residence. Journal of Behavior Therapy and Experimental Psychiatry, 1974, 5, 107-109.

Winett, R. A., & Winkler, R. C. Current behavior modification in the classroom: Be still, be quiet, be docile. Journal of Applied Behavior Analysis, 1972, 5, 499-504.

Wolf, M. M. Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. Journal of Applied Behavior Analysis, 1978, 11, 203-214.

Wulbert, M., & Dries, R. The relative efficacy of methylphenidate (Ritalin) and behavior modification techniques in the treatment of a hyperactive child. Journal of Applied Behavior Analysis, 1977, 10, 21-31.

Appendix A

Parental Consent Form

We, the undersigned, understand that our child will be taking part in a research project that is being conducted by Paul J. Thinesen under the supervision of Dr. Roger C. Katz, a licensed Clinical Psychologist, in partial fulfillment of the requirements for Paul J. Thinesen's Master of Arts degree in Psychology. We understand the purpose of this project is to train our child in an effective nonpunitive means of controlling his behavior. The training involves teaching your child to self-verbalize ("stop, look, and listen") before acting. We understand that these techniques will be fully explained to us before they are taught to our child, and that we will be expected to bring our child to the University of the Pacific twice weekly at agreed upon times and answer a questionnaire at the beginning and end of the project.

We understand that one or two research assistants of Mr. Thinesen's will observe our child in his school 32 minutes daily for approximately 3 months. We understand that our child will be exclusively trained at UOP by Mr. Thinesen.

We understand that by signing this form we are not legally obligated to remain in this project. We may withdraw our child from training at any time. We will try to have our child complete the training, it now appears that he will

be able to.

We, therefore, give our informed consent to all of the training as explained to us in this form and in more detail by Mr. Thinesen.

Mother's signature_____

Father's signature_____

Date_____

Appendix B

Reward List

Sticker books	100
Spiral car notebook	100
Portfolio	85
Red binder notebook	80
Stapler	75
Ring binder index cards	70
Coil cards	60
Sharpie fine point marker	50
Large scratch pad	40
Small scratch pad	30
Pencil sharpener	25
Goodyear eraser	20
Ruler	15
1 Page of stickers	10
Large paper clip	10
Metal letter holder	10
Peanuts pencil	8
Star student certificate	7
Pencil	5
Small paper clip	4
Pencil eraser	3