THE EFFECTS OF COGNITIVE CAPACITY ON THE EFFICACY OF SELF-INSTRUCTIONAL TRAINING WITH EMOTIONALLY DISTURBED CHILDREN

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Abstract

The present study was conducted to examine the efficacy of self-instructional training with a clinical population and to test the hypothesis that cognitive capabilities interact with training effects. Twenty 7 to 14 year-old males in a residential psychiatric treatment setting were assigned to two cognitive groups based upon their performance on cognitive measures. The measures assessed capabilities believed to be prerequisite for the acquisition of self-instructional procedures. Half of the subjects in each cognitive group were assigned to a treatment group and received self-instructional training based on Kendall & Braswell's (1985) procedures. The other subjects, assigned to an attention-control group, completed the training tasks without self-instructional training. The application of self-instructional training produced limited within session and generalization effects. The hypothesized interaction between cognitive capacity and treatment effects was not revealed, however, the results indicate that cognitive capacity is an important factor to consider in the design of future self-instructional training programs.

The Effects of Cognitive Capacity on the Efficacy of Self-Instructional Training with Emotionally Disturbed Children

A recent survey, designed to determine the characteristics of children who were placed in residential treatment programs, found that prepubertal children were referred most frequently for treatment of problems associated with aggression, non-compliance, hyperactivity, and academic difficulties (Wurtele, Wilson & Prentice-Dunn, 1983). Work in the field of cognitive behavior therapy has focused upon the development of procedures for controlling such inappropriate behaviors (Cohen & Meyers, 1984; Kendall, 1985; Lahey & Strauss, 1982). Most investigations addressed problems associated with deficits in self-control. Poorly self-controlled children typically lack the ability to think about their own behavior, to consider potential actions, and to make decisions (Meichenbaum & Asarnow, 1979). Thus, the goal of cognitive behavioral therapy has been to teach children to employ mediating self-statements as a general strategy for controlling their behavior across a variety of situations (Hobbs, Moguin, Tyroler & Lahey, 1980).

The method most commonly used to teach self-control is Meichenbaum and Goodman's (1971) self-instructional training method. This method relies upon modeling to teach children to use mediating self-statements. It has been employed primarily with nonclinical

populations of children to modify hyperactivity (Douglas, Parry, Marton & Garson, 1976; Moore & Cole, 1978), impulsivity (Eastman & Rasbury, 1981; Meichenbaum & Goodman, 1969; Swanson, 1983), aggression (Camp, Blom, Herbert & Doornick, 1977; Coats, 1979; Forman, 1980; Kettlewell & Kausch, 1983), and behavior defined as non-self-controlled (Kendall & Braswell, 1982). It has also been used to modify impulsivity with clinical populations (Andersson, 1981; Bell, Mundy & Quay, 1983; Finch, Wilkinson, Nelson & Montgomery, 1975; Kendall & Finch, 1978; Kendall & Wilcox, 1980). Of the few researchers who conducted investigations with clinical populations, only Kendall and his colleagues have assessed clinically relevant behavior changes following selfinstructional training. Kendall and Finch (1978), for example, found significant improvements on teacher ratings of impulsive classroom behavior following self-instructional training with a clinic population of emotionally disturbed children.

Although many authors reported positive results using self-instructional procedures to modify problematic behaviors, others reported negative or minimal results (Dick, 1982; Ellis, 1976; Margolis, 1979; Varni & Henker, 1979). Several explanations have been offered for the inconsistent findings. One explanation is related to methodological inadequacies (Craighead, Wilcoxon-Craighead & Meyers, 1978; Hobbs et al., 1980; Kendall & Finch, 1979; Lahey & Strauss, 1982). Previous investigations have been criticized for failure to assess clinically important changes in behavior, to train for

generalization of effects, to use adequate controls, and to report sufficient details about training tasks and procedures.

Another explanation for the inconsistent findings is the failure of previous investigators to consider individual differences, such as cognitive developmental capacity, when designing self-instructional procedures (Cohen & Schlesser, 1984; Morris & Cohen, 1982; Schlesser & Thackwray, 1982). Similar training procedures have been applied across a wide range of age groups. Kendall (1984) noted, however, that many of the studies which reported negative or minimal results included children under six years of age, who would not be expected to have the cognitive skills necessary for mastery of the training.

A number of recent studies offer support for the use of a child's Piagetian stage of cognitive development to predict the efficacy of self-instructional training and to enhance generalization of treatment effects (Cohen, Schlesser & Meyers, 1981; Nichol, Cohen, Meyers & Schlesser, 1982; Schlesser, Cohen, Meyers & Rodick, 1984; Schlesser, Meyers & Cohen, 1981). These studies compared treatment outcomes for groups of same-aged preoperational and concrete operational children. Cognitive developmental level was found to interact with training condition. Trained concrete operational children offered significantly more correct responses than trained preoperational children and untrained children (Cohen et al., 1981).

Although the evidence suggests that Piagetian level is a good predictor of treatment efficacy, there are two potential limitations to the findings. First, previous investigations which included measures of cognitive level failed to examine clinically relevant behavioral changes in clinical populations. Only changes in the cognitive and perspective-taking task performances of nonclinical populations were assessed. Secondly, they defined cognitive level by performance on Piagetian tasks. There is a growing literature which suggests that Piagetian classifications may be too global and do not provide enough informaton to precisely identify the kinds of processes involved in the acquisition of cognitive strategies (Halford, 1982). In order to identify the processes needed for strategy acquisition, Halford recommends conducting task analyses of the structural components and prerequisite knowledge necessary for successful completion of a task. To date, the relationship between the demand characteristics of self-instructional procedures and information processing limitations of children at various ages has not been investigated (Whalen, Henker & Hinshaw, 1985). Further research is needed, therefore, to identify the cognitive subprocesses that govern task performance (Bandura, 1977; Brown & DeLoache, 1978). Further research is also required to demonstrate the clinical utility of selfinstructional procedures (Hobbs et al., 1980; Kendall, 1984; Lahey & Strauss, 1982). It is currently difficult to evaluate the clinical utility of these procedures, because investigations have been conducted primarily

with nonclinical samples of children, and have included a wide age range of children (Gresham, 1985).

The purpose of the present investigation was to further explore the effectiveness of self-instructional training with a population of emotionally disturbed children in a residential treatment setting; and to examine the interaction between cognitive capabilities and treatment effects. A 2 x 2 factorial design with two levels of cognitive ability (high vs low) and two levels of treatment (treatment vs. attention-control) was used to evaluate self-instructional training effects and the interaction of training effects with cognitive level. Multiple outcome measures were obtained. They included: performance on training tasks, behavior rating scales, behavioral observations, and standard measures of academic achievement. Subjects were classified in terms of their cognitive capabilities and participated in a baseline and eight self-instructional training sessions.

During the first training session, treatment subjects were provided with concrete examples of the usefulness of various simple strategies. This type of "metacognitive" pre-training has been found to increase motivation and to facilitate the acquisition of strategies needed to complete tasks (Borkowski, Levers & Gruenenfelder, 1976; Ladd & Mize, 1982; Lodico, Ghatala, Levin, Pressley & Bell, 1983; Reeve & Brown, 1985).

The training procedures were based upon Meichenbaum and Goodman's (1971) methods for teaching children to use self-

instructions through modeling. These procedures involve an interactive process between the investigator and subject, in which the investigator models the verbalization and application of five problem solving steps as he/she performs a variety of tasks. Initially, the verbalizations are modeled by the investigator. Then they are gradually faded from an audible level, to a whisper, and finally to an inaudible level.

The content of the self-instructional problemsolving steps and the types of training tasks were modeled after Kendall and Braswell's (1985) training program for impulsive children, and included a number of psycho-educational tasks, affective educational tasks, interpersonal problem-solving tasks, and role plays. The rationale for the inclusion of each type of task will be considered in turn. Psycho-educational tasks were included to provide subjects with an opportunity to learn and practice self-instructional problem-solving steps with familiar, impersonal types of tasks. Affective educational tasks were included because they have been hypothesized to be a necessary step for improved interpersonal problem-solving (Kendall & Braswell, 1985). Interpersonal problem-solving tasks were included because evidence suggests that there is a direct relationship between improved cognitive interpersonal problem-solving and improved behavioral adjustment (Kendall & Urbain, 1980; Kneedler, 1980; Platt, Spivack, Altman, Altman & Peizer, 1974; Shure & Spivack, 1972; Shure & Spivack, 1978; Shure & Spivack, 1980; Shure, Spivack &

Jaeger, 1971). Finally, the role plays of interpersonal problem-solving were included because they provide an opportunity to practice self-instructional skills while dealing with social situations which may be emotionally arousing (Kendall & Braswell, 1985). In this way, generalization effects to real-life social situations may be enhanced.

The acquisition of self-instructional skills within training sessions was assessed in several ways. First, each subject's recall of the self-instructional steps was obtained to directly assess knowledge of the problem-solving steps and to provide a measure of the rate of acquisition. Second, a baseline measure of each type of task was obtained and was compared to task performances during training sessions.

Generalization of training effects to classroom and residential treatment settings was assessed by examining changes in the behavior ratings of teachers and milieu staff on the Self-Control Rating Scale (SCRS, Kendall & Wilcox, 1979), classroom behavioral observations, and standard academic achievement test scores. Ratings on the SCRS and classroom observations were obtained twice prior to the training sessions to provide a baseline measure and to permit evaluation of time related changes in behavior independent of treatment (Cook & Campbell, 1979). These measures were repeated immediately following completion of training and one month later to assess maintenance of treatment effects.

As mentioned previously, the second purpose of this investigation was to test the hypothesis that there are interaction effects between cognitive capability and training condition. In the present investigation, cognitive level was defined by performance on tasks which measure skills hypothesized to be prerequisite for the acquisition of self-instructional training. A task analysis was completed to determine which cognitive processes were likely to be required by the training procedures. Modeling comprised a major component of the self-instructional training and thus was included as a major component of the task analysis.

Three cognitive processes involved in the acquisition of strategies via modeling have been outlined (Bandura, 1977). These include attention, retention, and motor reproduction processes. According to Bandura, a child must be able to attend to significant features of the modeled behavior, represent the response patterns in memory, and convert them into appropriate actions. Each subject's performance was assessed, therefore, on tasks designed to measure selective attention and short term memory capacity. It was assumed that all subjects would have the physical ability and skills to convert response patterns into actions, thus measures of motor reproduction processes were not included.

Hagen's (1967) incidental learning task was used to measure selective attention. It has frequently been used in research investigating the development of attention (Lane & Pearson, 1982).

In this task, subjects are tested for recall of both central and incidental information. It is assumed that the more a child is able to focus on relevant aspects of a stimulus, the less he/she will remember about the irrelevant aspects (Odom, 1982).

Case, Kurland, and Goldberg's (1982) counting span task was used as an estimate of each subject's "M" space or the capacity for operation and recall of information in short term memory (Case et al., 1982; Pascual-Leone, 1970). Case et al., (1982) reported that developmentally, there is an increase in "M" space due to improved efficiency in the use of strategies and reduced demands on attentional capacity. Measures of "M" space have been found to correspond well with other estimates of short term memory storage capacity (Case et al., 1982).

In addition to the abilities necessary for the acquisition of strategies through modeling, the ability to complete the interpersonal problem-solving tasks was hypothesized to be a major component of the selfinstructional training procedures. The completion of these tasks depends upon the ability to comprehend, interpret and organize information related to social situations. The Picture Arrangement subtest of the Wechsler Intelligence Scale for Children-Revised (WISC-R), was used as a measure of planning ability and comprehension of social situations (Kaufman, 1979; Wechsler, 1974). This subtest measures the ability to comprehend, interpret and organize a social situation (Sattler, 1982).

In this investigation, significant cognitive level by training condition interaction effects on all dependent variables were hypothesized. First, subjects in the high cognitive treatment group were expected to learn the self-instructional steps faster than those in the less cognitively sophisticated group. Second, it was predicted that the performance of the high cognitive treatment group on within session measures (e.g., psycho-educational, affective, interpersonal problem-solving tasks) would improve relative to the other groups. The prediction that error rates on psycho-educational tasks would decrease for the high cognitive treatment group relative to the error rates for the other experimental groups was based on findings of improved performance on cognitive tasks following self-instructional training (Kendall & Zupan, 1981; Meichenbaum, 1977; Meichenbaum & Goodman, 1971; Palkes, Stewart & Freedman, 1972). Further, it has been found that these improvements are moderated by cognitive capabilities (Schlesser et al., 1984).

The prediction that the performance of the high cognitive treatment group on the affective tasks would improve relative to other groups was based on findings of low to moderate correlations between traditional measures of intelligence and social cognitive skills (Shantz, 1975). Although the effects of self-instructional training procedures upon affective task performance have not been reported in the literature, it was hypothesized that subjects in the high cognitive treatment group would develop a more reflective cognitive

style that would enable them to improve their ability to identify various emotions relative to other groups.

Finally, the prediction that interpersonal problemsolving strategies would improve significantly for the high cognitive treatment group was based upon research findings that developmental level and problem-solving training influence the types of strategies used by children (McGillicuddy-DeLisi, 1980; Ridely & Vaughn, 1982; Sharp, 1981; Spivack & Shure, 1974). McGillicuddy-DeLisi (1980), for example, found that in conflict situations, older children were less likely to propose aggressive strategies and were more likely to offer participatory strategies involving the cooperation of another person. Thus, subjects in the high cognitive group were expected to produce more participative and fewer aggressive strategies than the other groups.

In addition to influencing performance within the training sessions, it was hypothesized that cognitive level and self-instructional training would interact to influence performance in the generalization settings. First, it was hypothesized that SCRS ratings by teachers and milieu staff would decrease significantly to reflect improved self-control for the high cognitive treatment group relative to all other groups. The SCRS has been reported to be sensitive to changes following selfinstructional training (Kendall & Wilcox, 1980). Second, it was hypothesized that the self-instructional training would generalize to classroom behaviors. The incidence of negative physical

(e.g., pushing, hitting) and negative verbal behaviors (e.g., insulting, hostile teasing) in the classroom was expected to decrease for the higher cognitive treatment group relative to all other groups. The predictions regarding the incidence of positive physical (e.g., sharing, taking turns) and positive verbal behaviors (e.g., praising) were less clear because these behaviors are not directly addressed in the training procedures. Thus, these behaviors may not change significantly as a result of self-instructional training. Third, it was hypothesized that the high cognitive treatment group would exhibit the greatest improvements in measures of academic achievement relative to the other experimental groups. These changes were expected to be most pronounced on measures similar to those used as training tasks. Thus, it was expected that math scores would improve more than measures of reading skills, as they comprised a greater component of the selfinstructional procedures.

Method

Subjects

The subjects were twenty-two male (mean age =10 yrs., range = 7-14 yrs.) residents at a psychiatric inpatient treatment facility for emotionally disturbed children in central Oklahoma. All met the state of Oklahoma'a legal criteria for requiring psychiatric treatment and a residential placement. These criteria specify that a child is in need of treatment if he/she is "afflicted with a substantial disorder of the emotional processes, thought, or cognition which grossly impairs

judgment, behavior or capacity to recognize reality, or ability to meet the ordinary demands of life appropriate to the age of the child." Children diagnosed as psychotic were excluded from participation. Several diagnostic categories from The Diagnostic and Statistical Manual of mental disorders (DSM III; American Psychiatric Association, 1980) were represented in the subject population. These included: Attention Deficit Disorder with and without hyperactivity, Oppositional Disorder, Conduct Disorder with Undersocialized, Aggressive and Socialized, Aggressive types, Adjustment Disorder with Mixed Disturbance of Emotions and Conduct, and Generalized Anxiety Disorder. Two subjects were discharged from the treatment facility prior to completion of the training, leaving 20 subjects in the experiment. Of these 20, 4 were Black and the remaining 16 were White. The subject's WISC-R Full Scale Intelligence scores ranged from 52 to 109, with a mean score of 82.5.

Subjects were assigned to two cognitive groups based upon their performance on assessments of selective attention, memory and comprehension of social stimuli. The group assignments were made by a psychology undergraduate research assistant unfamiliar with the subjects and blind to their performances on behavior rating scales or classroom observations. It was initially planned to use a median-split procedure across all of the cognitive measures to assign subjects to sophisticated (i.e., high) and less sophisticated (i.e., low) cognitive groups. However, subject performances on the selective attention

and memory tasks were significantly related (r = .58, $p<.001$), while performance on the social comprehension task was not significantly related to the performances on the selective attention and memory tasks (r = .28, r = .26, $p>.05$). For this reason, it was decided to assign those subjects with scores equal to or greater than the median scores on the selective attention and memory tasks to the high cognitive group. One subject who scored above the median on the selective attention measure only was assigned to this group. Subjects scoring below the median scores for the two tasks were assigned to the low cognitive group. This criterion was also adopted because, of the three measures, the selective attention and memory tasks were believed to measure the skills most critical for acquisition of the self-instructional procedures.

Half of the subjects in each cognitive group were then assigned to a treatment group and the other half to an attentional-control group. Assignment to treatment and control groups was random with the following constraints: (a) equating groups on mean pretest scores for IQ, (b) equating groups on mean age, and (c) equating as much as possible on DSM III diagnosis. This resulted in five subjects in each of four experimental groups: high cognitive treatment, low cognitive treatment, high cognitive attention-control, and low cognitive attention-control. The mean ages in the treatment and attention-control groups were 10.4 and 9.4 years respectively. Independent t-tests indicated that this difference was not significant

($t(18) = 1.19$, $p > .05$). Table 1 presents the distribution of DSM III diagnoses within the groups.

Insert Table 1 about here

The mean full scale WISC-R intelligence scores were 80.8 for the treatment group and 84.2 for the attentioncontrol group. Again, t-tests indicated that the average intellectual level of the treatment and attention-control groups did not differ significantly ($t(16) = 0.49$, $p > .05$). Preliminary analyses of cognitive measures indicated that subjects assigned to the treatment and attention-control groups did not differ significantly on the measures of selective attention (i.e., central memory, incidental memory), "M" space, or Picture Arrangement (largest $t(18) = .61$, $p > .05$). The mean central memory, incidental memory, "M" space, and Picture Arrangement scores are displayed in Table 2.

Insert Table 2 about here

Research Staff

Six undergraduate students assisted the principal investigator. The undergraduate students were all juniors attending Oklahoma State University. All were psychology majors and participated voluntarily. One of the undergraduates assisted the principal investigator by

administering the cognitive assessments, assigning subjects to cognitive groups and treatment groups, and scoring training and academic data. This permitted the principal investigator to be blind to the cognitive level of subjects and thus reduced the likelihood of experimenter bias. The remaining five undergraduates served as observers for the classroom behavioral observations. All assistants were unaware of the design and hypothesized results of the study until completion of their involvement in the project, at which time debriefing was conducted.

Assessment Materials and Procedures

Cognitive Assessment. The materials for Hagen's (1967) incidental memory task consisted of ten white 12 x 24 cm. cards, each depicting two pictures, one of an animal and one of a household object. Three of these cards were used only in a practice trial. There were also seven 12 x 12 cm. cards which depicted each of the household objects and seven 12 x 24 cm. cards with each of the animal pictures. These cards served as testing probes. The two-picture cards were presented in arrays of four to six cards. Each array of a given length was presented an equal number of times. The order of the cards within each array was randomly assigned with the restriction that the test picture not appear consecutively in the same location. Subjects were instructed to remember the location of the animal pictures (i.e., central information) for 12 trials. They were allowed to view the array for 20 seconds. Then, for each trial,

the pictures were covered with a blank panel, and the subjects were asked to recall the location of a specified animal. Following the presentation of 12 trials, subjects were tested for recall of incidental information by requiring them to match the pictures of the household objects with the animal pictures they appeared with on the two-picture cards. Testing probe cards depicting each of the animals were given to the subject one at a time to match with the possible household object pictures. The household object pictures were returned to the pool of possible choices until all the animal pictures had been matched. There was no time limit. The central memory score consisted of the number of correctly recalled animal locations. The incidental memory score was the number of correctly matched animal and household object pictures.

Case et al.'s (1982) counting span task was used as an estimate of each subject's "M" space or short term memory capacity. The task materials consisted of 46 white 32 x 47 cm. cards. One was a practice card, and the other 45 were grouped into 15 sets. The number of cards in each set varied from one to five. There were three sets containing each number of cards. Thus, the first three sets contained one card, the next three had two, and so on with a maximum set size of five cards. Within the sets, each card contained a total of 18 yellow and green dots 2.6 cm. in diameter. The number of green dots on each card varied from two to ten, with each number of dots represented a total of five times. The 45 cards were

randomly distributed into the sets with two restrictions. First, the same number of green dots could not occur on a card more than once in each set. Second, the number of green dots on cards presented sequentially within a set could not be consecutive (e.g. 2, 3, 4). As the cards from each set were presented, subjects were asked to count the green dots on each card aloud. They were also instructed to touch each dot as they counted it. After the last card in each set was counted and removed, the subject was asked to sequentially recall the number of green dots on each of the cards. Testing continued until the subject missed all the trials within any set of a given size. The estimate of each subject's "M" space was the maximum set size he/she could accurately recall for two of the three trials of a given set size. In other words, if a subject correctly recalled the sequence of numbers on two trials within the set of three cards their "M" space score would be three. If any additional sets at a higher level, for example four cards, were recalled an additional third of a point was added to their score.

The Picture Arrangement subtest of the WISC-R was used as a measure of planning ability and comprehension of social stimuli (Wechsler, 1974). This subtest consisted of cards with drawings which could be arranged to form a story or series similar to a comic strip (Sattler, 1982). It was administered and scored according to the standard procedures outlined in the WISC-R manual. If a subject had been tested with the WISC-R in the past six months the former

subtest score was used. This served to prevent improved scores due to practice effects (Sattler, 1982).

Behavioral Assessment. The behavioral assessment consisted of the completion of behavior rating scales by teachers and milieu staff, and observation of classroom behaviors.

The SCRS was used to rate each subject's level of self-control. The SCRS is a 33-item, seven point scale designed to assess cognitive and behavioral self-control (Kendall & Wilcox, 1979). It includes items descriptive of impulsivity (e.g., "does the child have to have everything right away?"), and of self-control (e.g., "can the child deliberately calm down when he/she is excited or all wound up?"). The seven-point scale ranges from extremes such as always and never, with four points designated as the level at which the average child would fall on each item. Thus, a point assignment of one, two, or three would represent a rating better than the average child on a particular item. The point values are added to yield a total score. Higher scores indicate a greater lack of self-control. Kendall and Braswell (1985) report that the mean SCRS score often approximates 100. There are no reported statistics regarding interrater reliability and due to staffing constraints interrater reliability data was not obtained. The SCRS is presented in Appendix B.

Classroom observations were conducted to directly assess positive and negative behaviors of all subjects. A tape recorder,

tape with prerecorded timed intervals, and headphones were used to standardize the observation of classroom behaviors. Classroom behaviors were classified as verbal or physical and also as positive or negative. Positive verbal behavior was defined as verbalizations expressing praise, approval, encouragement, offers of assistance, positive feelings, or invitations to cooperate. Negative verbal behaviors were defined as verbally aggressive or harmful behaviors, for example, hostile teasing, insults, shouting, use of profanity, verbal refusals, and arguing in an angry way. Positive physical behavior was defined as positive nonverbal expressions such as sharing, taking turns, smiling, and affectionate physical gestures or contact. Hitting, kicking, pushing, and throwing objects at someone were defined as negative physical behavior. Similarly, any behavior potentially harmful or destructive to material objects (e.g., tearing, pushing, throwing) was recorded as negative physical behavior. The classroom observations were conducted by research assistants at varying times during the school day. A modified time sampling procedure in which each child was observed sequentially for 5 minutes until all had been observed for 15 minutes was used. The order in which each child was observed was predetermined by the principal investigator. Within the 5 minute periods, the occurrence of the specified behaviors was recorded at 20 second intervals. To provide time for recording, 5 second recording intervals were interspersed between the observation intervals. The principal

investigator served as a second observer and independently recorded behaviors for 49% of the total observation time. The number of occurrences of each type of behavior was summed and divided by the number of intervals to yield a percentage score for each of the behavioral categories. Interobserver reliability was assessed by comparing the frequencies of each type of behavior recorded by the observer and independent observer on an interval by interval basis. The percentage of interobserver agreement was determined by dividing the number of agreements by the number of agreements plus disagreements for ratings of both the occurrence and nonoccurrence of behaviors. The interobserver reliability was 87% agreement on occurrence of behaviors and 98% agreement on nonoccurrence of behaviors.

Academic Assessment. Academic performance was initially assessed by recording the mean percentage of correct responses on daily classroom assignments. During the course of the investigation, however, several subjects were assigned to different classrooms and the teachers provided different amounts of assistance on daily assignments. As a result of the differing methods in each classroom, the daily classroom assignments were felt to be invalid measures of academic performance. Therefore, standardized achievement test scores from each subject's educational records were used as a baseline measure of academic achievement. Fourteen of the 20 subjects had records of their performance on the Woodcock-Johnson

Psycho-Educational Battery administered within the past year (Woodcock & Johnson, 1977) and the remaining six subjects had records of their performance on the Peabody Individualized Achievement Test (PIAT, Dunn & Markwardt, 1970). The Woodcock-Johnson achievement subtests that had been administered were: letter-word identification, word attack, passage comprehension, mathematic calculations, and mathematic applied problems. During the period between the final training session and the follow-up assessment, the five achievement subtests from the Woodcock-Johnson were administered by the principal investigator to the appropriate subjects. Standard procedures outlined in the manual (Woodcock & Johnson, 1977) were followed. The PIAT was administered to only two of the six subjects with previous PIAT scores because the other four subjects had been discharged from the treatment setting prior to completion of the post training assessment. Again, the PIAT was administered by the principal investigator according to the standard procedures outlined in the manual (Dunn & Markwardt, 1970).

General Procedure. Research assistants were trained extensively on test administration procedures and classroom observations. The cognitive testing procedures were practiced with a pilot subject. Classroom observations were conducted until interobserver reliability reached 80% agreement on occurences and nonoccurences for each of the specified behavior categories.

The battery of cognitive tests was individually administered to

the subjects to assess their current level of cognitive functioning. All of the tests were administered in a single session in the following order: Hagen's incidental learning task, Case et al.'s counting span task, and the WISC-R Picture Arrangement subtest.

Following the administration of the cognitive test battery, classroom teachers and milieu staff were asked to complete the SCRS for each subject. They were instructed to rate each subject's behavior during the past four weeks. At the time of the initial assessments, subjects had been in school and the treatment center for at least one month, thus giving the staff the opportunity to acquire knowledge of each subject's typical behavior. Also during this initial assessment period, the research staff conducted classroom observations. Two weeks later, the second pre-training or baseline, SCRS ratings and classroom observations were completed. Teachers and staff were instructed to rate the subject's behavior for the previous two weeks.

Training Materials and Procedures

Training Materials. A variety of psycho-educational, affective educational, and interpersonal problem-solving tasks were included in the baseline and training materials (See Appendix C for sample tasks). All subjects completed similar tasks appropriate to their grade-level and skills. Classroom teachers were consulted to determine each subject's grade-level performance for the various types of tasks. Parallel forms of the tasks were used in the baseline

and training sessions. The same materials were used in the baseline and training sessions with the exception of the strategy training materials which were excluded from the baseline materials. All sessions were conducted in a small testing room located in the treatment facility. The room was 2.7 x 3.3 x 2.7 meters and was furnished with a small table and two chairs.

The materials for the first training session consisted of strategy training materials from Lodico et al., (1983) and mazes published by Educational Insights (Spillman & Spillman, 1977). The strategy training materials used to demonstrate the usefulness of strategies included a jar lid, a sheet of blank paper, and a list of the letters comprising the child's name in mixed order. The maze tasks were used to introduce the self-instructional steps. Error rates were scored with errors defined as a false start, selection of an incorrect path, or crossing path lines.

Materials for the second and third sessions included tasks from the "Following Directions" series (Gruber, 1980) and arithmetic problems from the School Zone Publishing Company series of workbooks (Bannister, 1979). Failure to follow directions correctly and incorrect calculations were scored as errors.

The tasks presented in the fourth and fifth training sessions were from the "Ready-Set-Grow" and "Improving Interactions" series (McElmurry, 1981; Pincus, 1983; Wilt, 1979). These materials shifted the focus of the sessions from psycho-educational tasks to affective

educational tasks. They included a number of tasks requiring the subject to identify emotions and to identify the relationships between emotions and specific situations. The identification of specific emotions tasks were scored on the basis of: (a) whether subjects admitted experiencing specific emotions, and (b) if they recognized having these emotions in their recent experience. Subjects who admitted experiencing a specific emotion were defined as "aware" and a nominal value of 1 was assigned. If subjects denied experiencing the emotion, a point value of 2 was assigned. The "recency" of their experience was scored as follows: 0 = never, 1 = more than a year ago, 2 = within the past year, 3 = within the past month, and 4 = within the past week.

The sixth session involved the presentation of materials from the "Improving Interactions" series (Pincus, 1983) and materials adopted from Kendall & Braswell's (1985) training program. These materials consisted of hypothetical interpersonal problem situations. Responses were scored qualitatively using solution categories similar to those reported by McGillicuddy-DeLisi (1980). These categories included: aggression, directive, engagement, withdrawal, authority intervention, participation, idiosyncratic, and emotional. Aggression was scored whenever the strategy involved forceful or hostile verbal or physical attacks (e.g., "cuss at them" or "hit him"). Directive strategies involved commands or attempts to direct a response from the other individual without any reciprocal interchange (e.g., "tell

him to give it to me" or "make them wait for me"). Engagement strategies included attempts to gain favorable attention without explicit attempts to interact or actively elicit a response from the other person (e.g., "ask nicely" or "say please"). Withdrawal was scored whenever the strategy involved leaving the problem, delaying the solution, or becoming involved in some other activity (e.g., "wait until he was done" or "go to my room"). Authority intervention strategies involved active attempts to seek help or support from someone considered an authority or expert (e.g., "tell the teacher" or "tell a dorm aide"). Participation strategies were those involving an immediate, active interchange between two persons (e.g., "we could take turns" or "make a deal"). Idiosyncratic solutions included responses that were unrelated to the problem presented or contradicted the presented situation (e.g., "I like this" or "I would just think hard"). Failures to provide any strategy were also scored as idiosyncratic (e.g., "I don't know" or "no fair"). Emotional strategies were defined as strategies that involved a response which expressed an emotion without offering a solution or attempting to draw a response from another person (e.g., "get mad" or "cry").

In the seventh and eighth sessions, role play situations were presented. The role play situations consisted of common interpersonal problem situations that occurred frequently in the treatment facility and had been observed by the principal investigator. The responses to these situations were scored using

the same categories described for the responses in session six. All of the responses for the baseline and role play sessions were scored by two independent raters. Interrater reliability was calculated by computing the number of agreements and disagreements on a response by response basis and dividing by the total number of responses. The percentage of interrater agreement was 94%.

General Procedure. An initial baseline session with all of the tasks was conducted to assess each subject's performance on the different types of tasks. Thus, subjects were presented with the mazes, following directions, arithmetic, affective educational, interpersonal problem-solving tasks, and role plays. The baseline session was followed by eight individual 20-30 minute training sessions conducted twice a week. All subjects participated in a total of nine sessions. Treatment and attention-control subjects performed the same tasks. However, treatment group subjects received self-instructional training during performance of training tasks while attention-control groups performed the tasks without self-instructional training. The final task presented in each session served as a test and was parallel in form to the tasks presented in the baseline session. (See Appendix D for instructions).

Behavioral contingencies were applied for all subjects. Treatment groups were reinforced with tokens contingent upon correct recall of self-instructional problem-solving steps prior to each session, and for correct application of the steps during the task

performance within the session. Specifically, treatment subjects received a token for recalling all five steps at the beginning of each session, and they also received a token during the sessions for each of the five steps they could verbalize while slowly performing a given task. Attention-control subjects received tokens for completion of tasks. The tokens were exchanged for reinforcements such as stickers, pencils, folders, and toys at the end of each session. Subjects were allowed to accumulate tokens across sessions if they desired to do so. A sample reinforcement menu is presented in Appendix E.

Immediately following completion of the final training session, the SCRS ratings, classroom observations, and academic assessments were repeated. Four weeks later, follow-up SCRS and classroom observation assessments were conducted. Table 3 presents the therapy flow chart.

Insert Table 3 about here

Training Session Procedure. Each of the various types of training materials was administered during the initial baseline session. The purpose of the first training session was to build rapport with each subject. Also, for the treatment groups, this session was used to demonstrate the usefulness of learning strategies and to introduce the five self-instructional steps. Following Lodico et al.'s (1983)

procedures for demonstrating the purpose of strategies, the investigator explained that there were many ways to play games and some were better than others. Subjects were told that in order to do well they must often choose the methods that allow them to do their best. Two examples were demonstrated. First, subjects were asked to draw a circle freehand and then by tracing a jar lid. They were asked which method they would select to draw another circle. They were then asked to justify their choice. The second example required subjects to recall a list of letters. They were then asked to rearrange the letters to spell their names (the appropriate letters were used for each list). They were asked to compare their recall on both occasions and to select the method they would use to remember another list. Again, the subjects were asked to justify their choices. The investigator explained that the purpose of the future sessions was to learn a special method or strategy to do many things better. Then, the five steps were presented and modeled by the investigator as a maze task was completed.

The treatment group received training in verbal self-instructions as they completed the training tasks. This training was based on Meichenbaum and Goodman's (1971) procedures for teaching problem-solving through modeling and fading from overt to covert selfinstruction. The sequence for fading the instructions involved alternating task performances between the investigator and subject. First, the investigator performed the task while talking aloud and the

subject performed the task as the investigator instructed him. Next the subject instructed himself aloud. Then the investigator faded the instructions to a whisper and the subject whispered the self-instructions. In the final phase, the subject performed the task using covert selfinstruction. This fading procedure was used throughout the training sessions.

Subjects were trained through these modeling procedures to use a five step procedure adapted from Kendall and Braswell's (1985) self-instructional program. The five steps consisted of: problem definition, problem approach, focusing attention, answer selection, coping statements and self-reinforcement. Table 4 presents the problem-solving statements which were modeled.

Insert Table 4 about here

At the beginning of each of the training sessions, the investigator asked treatment subjects if they remembered the five self-instructional steps. If all five steps were correctly recalled the subject received a bonus token; if the steps were not correctly recalled, they were repeated until they were accurately recalled. The investigator then modeled the application of the steps and fading procedures while performing the training session tasks. The subject and investigator alternated performance of the tasks. During the sessions, the investigator occasionally made erors and modeled the

coping statement (e.g., "I guess I made a mistake, I'll correct it now and go slower next time"). Table 5 presents the tasks and procedures for each of the training sessions.

Insert Table 5 about here

Results

The analyses of the data were guided by three central questions (a) Was the self-instructional training effectively learned and applied within the training sessions? (b) Were there training effects which generalized to behavior in the natural environment? and (c) What were the effects of cognitive level on training effectiveness?.

To address the first question, the efficacy of self-instructional training within sessions was measured in two ways. First, the rate of acquisition of the five training steps served as a measure of how well the steps were learned. Second, comparison of performance on baseline and training session tasks served as a measure of the application of self-instructional steps across the three types of tasks (i.e., psycho-educational, affective educational, and interpersonal problem-solving).

The second question regarding the generalization of treatment effects to the natural environment, was addressed by examining several outcome measures believed to assess clinically relevant

behaviors. These included the behavior rating scales, classroom behavioral observations, and academic achievement test scores. Separate statistical analyses were conducted for each of these measures. To further explore the effects of selfinstructional training on the behavior rating scales and classroom behavioral observations, individual subject data were examined.

Finally, to address the third question regarding the effects of cognitive level on training effectiveness, the data were subjected to multivariate analyses of variance, when appropriate, with two levels of treatment (treatment and attention-control) and two levels of cognitive development (high and low) and either two (pre and post) or four (baseline 1, baseline 2, immediate post, and follow-up) levels of time. Thus, the analyses permitted examination of the effects of cognitive level on each of the dependent measures, and examination of possible interactions with treatment effects.

Within Session Effects

Rate of Acquisition. The rate of acquisition for treatment groups was defined as the number of sessions required to reach a criterion level of recall. The criterion level was defined as correct recall of all five self-instructional steps for at least two consecutive sessions. This was assumed to represent consistent knowledge of all five of the steps. Figure 1 presents the number of steps recalled across sessions by treatment subjects in the high and low cognitive groups. As depicted in Figure 1, four of five subjects in the high

cognitive treatment group were able to reach the criterion in four or fewer sessions, whereas only two of the five subjects in the low cognitive group reached the criterion in four sessions. Further, two of the subjects in the low cognitive group were unable to maintain the criterion level of recall in a consistent manner.

Fisher's exact probability test was used to compare the rate of acquisition of the self-instructional steps for high and low cognitive treatment subjects (Siegal, 1956). To provide dichotomous data for the exact probability test, subjects unable to recall the five steps consistently for at least five sessions were labeled as inconsistent. Those able to recall the five steps for five sessions were labeled as consistent. Fisher's test indicated that the difference between these patterns of performance in each cognitive group was not significant ($df = 3$, $p = .42$).

Insert Figure 1 about here

Psycho-Educational Tasks. The number of errors on baseline and session tests were scored. This resulted in three sets of error scores for each subject: mazes, following directions, and arithmetic tasks. To test the hypothesis that subjects in the high cognitive treatment group would make fewer errors following selfinstructional training, the error rates were submitted to a 2 x 2 x 2 (treatment x cognitive x time) multivariate analysis of variance (MANOVA). The

mean error rates are presented in Table 6. No significant interaction effects were revealed. A significant overall cognitive group effect was revealed ($F(3,14) = 7.15$, $p<.004$). Contrary to expectations, all mean error rates were lower for subjects in the low cognitive group. Follow-up univariate analyses for each of the tasks, however, did not reveal significant cognitive level effects.

Insert Table 6 about here

Affective Educational Tasks. The affective educational baseline and training session tasks were scored on the basis of subject "awareness" of specific emotions and the reported "recency" of experiencing these emotions. The two types of affective educational scores were submitted to a 2 x 2 x 2 (treatment x cognitive x time) MANOVA. No significant effects on the measures of awareness and recency were revealed. Table 7 presents the mean scores.

Insert Table 7 about here

Interpersonal Problem-Solving Tasks. Eight categories of responses to the interpersonal problemsolving baseline and training session tasks were scored. They included aggression, directive, engagement, withdrawal, authority intervention, participation, idiosyncratic, and emotional responses. A percentage score for each

of the eight categories was calculated for each subject by dividing the number of times a strategy was offered in the session by the total number of strategies offered. The percentage scores for the two role play sessions were combined and a mean score was calculated. Thus, for each category there was a baseline and a session score. Tables 8 and 9 present the mean baseline and session percentage scores for treatment and attention-control groups, and high and low cognitive groups, respectively.

Insert Tables 8 and 9 about here

Separate tests of proportion were conducted to investigate the hypotheses that the proportions of aggression and participation responsese would differ between the experimental groups at each time of testing (Kirk, 1978). These tests were used because they are appropriate for frequency data in which observations are not independent, and because the number of variables relative to the number of subjects precluded the use of a MANOVA. In order to provide adequate group sizes to conduct the tests of proportion, data were first collapsed across treatment groups and then across cognitive groups. Comparisons at each time period were then made between treatment and attention-control groups and between high and low cognitive groups. Thus, separate tests were conducted for the baseline and sessions scores. This resulted in eight tests of

proportion, four for each type of response (i.e., aggression and participation). In addition to making comparisons between the treatment and attention-control and between the high and low cognitive groups, comparisons were made between the baseline and session performances within each group. Again, this resulted in eight tests of proportion. Four tests were conducted for each of the types of response to compare the baseline and session performances within the treatment, attention-control, high cognitive, and low cognitive groups. None of these tests reached statistical significance at the .05 level (largest z = 1.16).

Generalization of Treatment Effects

Behavior Rating Scales. SCRS behavior rating scales were completed by classroom teachers and milieu treatment staff on four occasions; thus there were eight scores for each subject. To test the hypothesis that subjects in the high cognitive treatment group would exhibit significant decreases in SCRS scores relative to all other groups, a 2 x 2 x 4 (treatment x cognitive x time) repeated measures MANOVA was conducted. The results yielded a significant overall treatment group by time interaction ($F(6,82) = 2.21$, $p<.049$).

Examination of the means presented in Table 10 indicated differences between the teacher and milieu staff ratings. The mean teacher ratings for the treatment group revealed an upward trend which began in the baseline periods and continued throughout training suggesting less self-control across time. This was

contrasted by milieu staff ratings which revealed a general downward trend for treatment group subjects suggesting increased self-control across time. The correlation between teacher and milieu staff ratings was relatively low (r = .48) and could be indicative of either differences in subject behavior in the classroom and milieu settings, or poor reliability between teacher and milieu staff ratings. To further explore these differences in SCRS ratings, separate univariate analyses were conducted for the teacher and milieu staff ratings and individual subject data were examined.

Insert Table 10 about here

Univariate analyses of the teacher ratings revealed a significant treatment group by time interaction ($F(3,43) = 3.62$, $p < .02$). Follow-up simple effects tests revealed a significant difference between the treatment and attention-control groups at the time of the follow-up assessment ($F(1,62) = 6.57$, $p < .05$). The difference between the means suggested that the treatment group was less self-controlled. Follow-up simple effects tests also revealed a significant overall time effect for the treatment group only ($F(3,43) = 7.41$, $p < .001$). Tukey's tests ($HSD = 29.65$, $p < .01$) indicated a significant difference between the first baseline and the follow-up on teacher SCRS ratings of the treatment groups. Thus, these means were significantly different from each other and suggested less self-control

across time.

The milieu staff behavior ratings were also submitted to a 2 x 2 x 4 (treatment x cognitive x time) univariate analysis of variance (ANOVA). Again, a significant treatment group by time interaction was revealed ($F(3,46) = 3.10$, $p \leq .04$). Follow-up simple effects tests did not reveal significant differences between the treatment and attention-control groups at any of the times of assessment. However, follow-up simple effects tests did reveal a significant overall time effect for the control group only ($F(3,26) = 7.16$, $p < .001$), but none of the individual pairs of means were significantly different at the .05 level (Tukey's HSD(52) = 21.95).

Figures 2 - 5 present the individual subject data. There was a good deal of variability in the individual scores, however it was noted that for nine of the ten treatment group subjects, teacher ratings reflected an initial upward trend. This was followed by decreased ratings for eight of the subjects following selfinstructional training. The remaining two treatment subjects exhibited a continuing upward trend with one of them becoming much less self-controlled. This initial upward trend during the baseline period was not revealed in the milieu staff ratings. Rather, staff ratings showed decreases between the first and second baseline periods for eight of the ten treatment subjects.

Behavioral Observations. The generalization of training effects was also assessed through classroom behavior observations.

Insert Figures 2 - 5 about here

Behaviors were classified as positive verbal, negative verbal, positive physical, and negative physical. The percentage of each type of behavior was calculated by dividing the number of intervals the behavior was observed to occur by the total number of intervals for each observation period.

To test the hypothesis that subjects in the high cognitive treatment group would show significant decreases in the percentages of negative behaviors, all percentage scores were submitted to a 2 x 2 x 4 (treatment x cognitive x time) repeated measures MANOVA. The results indicated a main effect for cognitive level which approached significance ($F(4,13) = 3.08$, $p > .054$). There was also an overall time effect which approached significance ($F(12,119) = 1.81$, $p > .054$).

Individual subject data was also examined to further investigate the cognitive level and time effects. Figures 6 - 9 present the individual subject data. Subjects in the low cognitive groups generally exhibited higher levels of positive physical behavior, however, there was one subject in the low cognitive treatment group who exhibited extremely high rates of these behaviors and may have influenced the group mean. Similarly, subjects in the low cognitive group tended to exhibit higher rates of negative physical behavior

than subjects in the high cognitive group. There relatively high rates of physical behavior tended to decrease across time for most of the subjects.

Insert Figures 6 - 9 about here

Academic Test Scores. Finally, to assess the generalization of training effects to academic performance, the standard academic achievement scores were examined. The standardized scores from the five achievement subtests of the Woodcock-Johnson were obtained for fourteen of the subjects. The number of dependent variables relative to the number of subjects per cell precluded the use of a MANOVA, therefore, the scores from the five achievement subtests were submitted to separate univariate analyses of variance. The results indicated that there were no significant changes in academic performance for these subjects on any of the subtests. Table 11 presents the mean subtest scores. Examination of Table 11 revealed variability within subjects' mean subtest performances with increases on some subtests and decreases on others.

Insert Table 11 about here

Discussion

In general, the results of the present investigation did not

support the original hypothesis that there would be a significant interaction between cognitive level and self-instructional training effects. Measures of within session effects suggested that the acquisition and application of self-instructional procedures was inconsistent. Assessments of generalization effects also failed to support the original predictions that cognitive level and self-instructional procedures would impact upon behavioral adjustment and academic performance. Although the original hypotheses regarding interactions between cognitive level and self-instructional training effects were not supported, there were a number of important findings. These will be discussed with respect to the within session and generalization results.

Within session results indicated that recall of the self-instructional steps was inconsistent and that the subjects in the high cognitive group tended to learn the steps more quickly. These findings suggest the need to train subjects to a criterion level of acquisition and to provide practice with each type of task prior to assessing outcome measures of generalization. Further, results from the present investigation suggest that subjects with less sophisticated cognitive capabilities may require additional training sessions to reach a criterion level of acquisition.

Within session results also failed to reveal changes in psycho-educational, affective educational, and interpersonal problem-solving task performance as a result of the application of self-instructional

procedures. It is likely that the application of the self-instructional procedures to these tasks was limited by the inconsistent learning of the self-instructional steps. Clearly, further empirical data is needed to identify the effective components of self-instructional training tasks and procedures. The results for the interpersonal problem-solving tasks did not support McGillicuddy-DeLisi's (1980) findings that older children, who might be more cognitively sophisticated, offer qualitatively different solutions to hypothetical conflict situations than younger children, who might be less cognitively sophisticated. The present investigation differed from McGillicuddy-DeLisi's in that subjects were classified by cognitive skills rather than age, and they generated possible solutions to conflict situations during role play exercises rather than generating such solutions to verbally presented hypothetical situations.

Assessments of generalization effects failed to support the hypothesis that self-instructional procedures would impact upon observed behaviors and academic performance for subjects in the high cognitive treatment group. Again, the inconsistent learning of the self-instructional steps may have limited their application to the generalization settings. The results of the behavior ratings, behavioral observations, and academic assessments will be discussed in turn.

The SCRS teacher ratings revealed a significant difference between the treatment and attention-control groups at the time of the

follow-up assessment, with the treatment group rated as less self-controlled. This finding is difficult to interpret and could be due to either iatrogenic effects of training, or the general trend of decreased self-control within the treatment group across time. SCRS teacher ratings revealed a significant increase between the first baseline and follow-up ratings for the treatment group and examination of the individual data also indicated a general trend of increasing teacher ratings that began during the baseline period. Given the possibilitiy of an initial upward trend in the treatment group ratings, it is not possible to determine whether the difference between treatment and attention-control group ratings at the follow-up was a result of the self-instructional training. Further research which includes a stable baseline assessment and continuous measures of behavior is necessary to answer this question.

The SCRS teacher ratings were problematic for several other reasons. First, more than half of the subjects (11) changed classrooms during the course of the study. Consequently, different teachers were completing the ratings for these subjects. Because there are no data describing the interrater reliability of the SCRS, low interrater reliability may have been a problem in the current investigation. Another problem related to the use of the SCRS in the present investigation, is that there are differences between the present subject population and the population on which the scale was validated. Subjects in the present investigation were from a clinical

population of emotionally disturbed children, had a lower mean IQ than the validation sample (M = 82.5 vs. M = 106), and were not from primarily white middle class socio-economic backgrounds. Additionally, Whalen et al., (1985) have criticized the SCRS for assessing global areas of misbehavior and inattention rather than assessing more specific cognitive self-regulation problems such as deficits in cognitive structures (e.g., personal prototypes), cognitive processes (e.g., storage or retrieval), or cognitive products (e.g., attributions or internal dialogue). There is, clearly, a need for further research assessing the reliability and validity of this measure with more diverse, clinical populations. Nevertheless, the findings of an increase between baseline assessments emphasize the importance of incorporating multiple baseline measures into experimental designs.

The results of the classroom behavioral observations did not reveal the predicted decreases in negative verbal or negative physical behaviors for the high cognitive treatment group subjects. Individual subject data indicated that subjects in the low cognitive group exhibited a greater percentage of physical behaviors. It is possible that the subjects in the low cognitive group had more difficulty remaining on-task and consequently had more time to exhibit these behaviors. These findings indicate the importance of assessing physical behavior categories as well as verbal behavior categories. Additionally, it was noted that the observed behavior categories typically occurred at relatively low rates (i.e., less than

20% of the observation time). During classroom observations, subjects were often engaged in a variety of off-task behaviors and were not interacting with other students. Thus, it is recommended that future assessments of the effects of self-instructional training on classroom behaviors include measures of on-task and off-task behaviors.

The variability in academic achievement test scores, limited number of subjects, and possible impact of classroom changes makes it difficult to interpret the academic performance results. The results of this investigation appear to support the findings of Varni and Heneker (1979) that self-instructional training had no impact on academic achievement. However, further research is necessary to adress this question.

In summary, the results of the present investigation indicate that the application of self-instructional procedures with inpatient psychiatric populations produced limited within session and generalization effects. Perhaps the inconsistent acquisition and application of self-instructional steps served to limit subjects' abilities to generalize training effects to behaviors outside of the training sessions. Future investigations with clinical populations need to ensure adequate acquisition of self-instructional procedures. The effects of cognitive level on the behavioral observation measures approached significance and suggests that cognitive level may be an important factor to be considered in the design of future self-

instructional training programs. In addition, the variability in subject data and presence of pre-training trends suggested the need for multiple baseline measures. Clearly, additional research is needed to validate the clinical utility of self-instructional procedures with emotionally disturbed clinical populations.

References

American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, D C: Author.

Andersson, K. E. (1981). The effect of cognitive- behavioral group intervention on academic task performance. Dissertation Abstracts International, 42, 3814B.

Bandura, A. (1977). Social Learning Theory. Englewood Cliffs, NJ: Prentice-Hall, Inc..

Bannister, R. (1979). Math. Grand Haven, MI: School Zone Publishing Company.

Bell, C. R., Mundy, P. & Quay, H. C. (1983). Modifying impulsive responding in conduct-disordered institutionalized boys. Psychological Reports, 52, 307-310.

Borkowski, J. G., Levers, S., & Gruenenfelder, T. M. (1976). Transfer of mediational strategies in children: The role of activity and awareness during strategy acquisition. Child Development, 47, 779-786.

Brown, A. L. & DeLoache, J. S. (1978). Skills, plans and self-regulation. In R. S. Siegler (Ed.), Children's thinking: What develops? (pp. 3-37). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Camp, B. W., Blom, G. E., Hebert, F. & van Doorninck, W. J. (1977). "Think aloud": a program for developing self-control in

young aggressive boys. Journal of Abnormal Child Psychology, 5 (2), 157-169.

Case, R., Kurland, D. M. & Goldberg, J. (1982). Operational efficiency and the growth of short-term memory span. Journal of Experimental Child Psychology, 33, 386-404.

Coats, K. I. (1979). Cognitive self-instructional training approach for reducing disruptive behavior of young children. Psychological Reports, 44, 127-134.

Cohen, R. & Meyers, A. W. (1984). The generalization of self-instructions. In B. Gholson & T. L. Rosenthal (Eds.), Applications of cognitive-developmental theory (pp. 95-112). New York: Academic Press.

Cohen, R. & Schlesser, R. (1984). Cognitive development and clinical interventions. In A. W. Meyer and W. E. Craighead (Eds.), Cognitive behavior therapy with children (pp. 45-65). New York: Plenum Press.

Cohen, R., Schlesser, R. & Meyers, A. W. (1981). Self-instructions: effect of cognitive level and active rehersal. Journal of Experimental Child Psychology, 32, 65-76.

Cook, T. D. & Campbell, D. T. (1979). Quasi- Experimentation design and analysis issues for field settings. Chicago: Rand McNally College Publishing Company.

Craighead, W. E., Wilcoxon-Craighead, L. & Meyers, A. W. (1978). New directions in behavior modification with children. In M.

Hersen, R. M. Eisler & P. M. Miller (Eds.), Progress in behavior modification, (Vol. 6, pp. 159-201). New York: Academic Press.

Dick, A. (1982). The effects of training in social- problem solving and verbal self-instruction on behavioral adjustment, social problem-solving cognition, and cognitive tempo in socially impulsive kindergarten children. Dissertation Abstracts International, 43, 540B.

Douglas, V. I., Parry, P., Marton, P. & Garson, C. (1976). Assessment of a cognitive training program for hyperactive children. Journal of Abnormal Child Psychology, 4(4), 389-413.

Dunn, L. M. & Markwardt, F. C. (1970). Peabody Individual Achievement Test. Circle Pines, Minn.: American Guidance Service.

Eastman, B. G. & Rasbury, W. C. (1981). Cognitive self-instruction for the control of impulsive classroom behavior: ensuring the treatment package. Journal of Abnormal Child Psychology, 9, (3), 381-387.

Ellis, D. E. (1976). The assessment of self-instructional training in developing self-control of aggressive behavior in impulsive-aggressive boys. Dissertation Abstracts International, 37, 3070B.

Finch, A. J., Wilkinson, M. D., Nelson, W. M. & Montgomery, L. E (1975). Modification of an impulsive cognitive tempo in emotionally disturbed boys. Journal of Abnormal Child

Psychology, 3, (1), 49-52.

Forman, S. G. (1980). A comparison of cognitive training and response cost procedures in modifying aggressive behavior of elementary school children. Behavior Therapy, 11, 594-600.

Gresham, F. M. (1985). Utility of cognitive-behavioral procedures for social skills training with children: A critical review. Journal of Abnormal Child Psychology, 13 (3), 411-423.

Gruber, B. (1980). Following Directions. Rancho Palos Verdeo, CA: Frank Schaffer Publications, Inc..

Hagen, J. W. (1967). The effect of distraction on selective attention. Child Development, 38, (2), 685-693.

Halford, G. S. (1982). The development of thought. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Hobbs, S. A., Moguin, L. E., Tyroler, M. & Lahey, B. B. (1980). Cognitive behavior therapy with children: Has clinical utility been demonstrated? Psychological Bulletin, 87, (1), 147-165.

Kaufman, A. S. (1979). Intelligent testing with the WISC-R. New York: John Wiley & Sons.

Kendall, P. C. (1984). Social cognition and problem solving: A developmental and child-clinical interface. In B. Gholson & T. L. Rosenthal (Eds.), Applications of cognitive-developmental theory, (pp. 115-145). New York: Academic Press.

Kendall, P. C. (1985). Toward a cognitive-behavioral model of child psychopathology and a critique of related interventions. Journal

of Abnormal Child Psychology, 13 (3), 357-372.

Kendall, P. C. & Braswell, L. (1982). Cognitive- behavioral self-control therapy for children: A components analysis. Journal of Consulting and Clinical Psychology, 50, 672-689.

Kendall, P. C. & Braswell, L. (1985). Cognitive-Behavior therapy for impulsive children. New York: The Guilford Press.

Kendall, P. C. & Finch, A. J. (1978). A cognitive- behavioral treatment for impulsivity: A group comparison study. Journal of Consulting and Clinical Psychology, 46, (1), 110-118.

Kendall, P. C. & Finch, A. J. (1979) Developing nonimpulsive behavior in children: Cognitive- behavioral strategies for self-control. In P. C. Kendall & S. D. Hollon (Eds.), Cognitive-Behavioral interventions: Theory, research, and procedures (pp. 37-79). New York: Academic Press.

Kendall, P. C. & Wilcox, L. E. (1979). Self-control in children: Development of a rating scale. Journal of Consulting and Clinical Psychology, 47, (6), 1020-1029

Kendall, P. C. & Wilcox, L. E. (1980). Cognitive- behavioral treatment for impulsivity: Concrete versus conceptual training in non-self-controlled problem children. Journal of Consulting and Clinical Psychology, 48, (1), 80-91.

Kendall, P. C. & Urbain, E. S. (1980). Review of social- cognitive problem-solving interventions with children. Psychological Bulletin, 88, 109-143.

Kendall, P. C. & Zupan, B. A. (1981). Individual versus group application of cognitive-behavioral self-control procedures with children. Behavior Therapy, 12, 344-359.

Kettlewell, P. W. & Kausch, D. F. (1983). The generalization of the effects of a cognitive- behavioral treatment program for aggressive children. Journal of Abnormal Child Psychology, 11, (1), 101-114.

Kirk, R. E. (1978). Introductory Statistics. Monterey, Calif: Brooks/Cole Publishing Company.

Kneedler, R. D. (1980). The use of cognitive training to change social behaviors. Exceptional Education Quarterly, 1, (1), 65-73.

Ladd, G. W. & Mize, J. (1982). A cognitive-social learning model of social-skill training. Psychological Review, 90, (2), 127-157.

Lahey, B. B. & Strauss, C. C. (1982). Some considerations in evaluating the clinical utility of cognitive behavior therapy with children. School Psychology Review, 11, (1), 67-81.

Lane, D. M. & Pearson, D. A. (1982). The development of selective attention. Merrill-Palmer Quarterly, 28, (3), 317-337.

Lodico, M. G., Ghatala, E. S., Levin, J. R., Pressley, M. & Bell, J. A. (1983). The effects of strategy- montioring training on children's selection of effective memory strategies. Journal of Experimental Child Psychology, 35, 263-277.

Margolis, D. (1979). Cognitive-behavior modification: A technique for establishing increased academic performance and response

generalization. Dissertation Abstracts International, 40, 3950B.

McElmurry, M. A. (1981). Feelings. Carthage, IL: Good Apple, Inc..

McGillicuddy-DeLisi, A. V. (1980). Predicted strategies and success in children's resolution of interpersonal problems. Journal of Applied Developmental Psychology, 1, 175-187.

Meichenbaum, D. (1977). Teaching children self-control. In B. B. Lahey & A. E. Kazdin (Eds.), Advances in clinical child psychology, (Vol. 2, pp. 1-33). New York: Plenum Press.

Meichenbaum, D. & Asarnow, J. (1979). Cognitive- behavioral modification and metacognitive development: Implications for the classroom. In P. C. Kendall & S. D. Hollon (Eds.), Cognitive-Behavioral Interventions: theory, research and procedures (pp. 11-35). New York: Academic Press.

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

Meichenbaum, D. H. & Goodman, J. (1971). Training impulsive children to talk to themselves: A means of developing self-control. Journal of Abnormal Psychology, 77, (2), 115-126.

Moore, S. F. & Cole, S. O. (1978). Cognitive self-mediation training with hyperkinetic children. Bulletin of the Psychonomic Society, 12, (1), 18-20.

Morris, C. W. & Cohen, R. (1982). Cognitive considerations in

cognitive behavior modification. School Psychology Review, 11(1), 14-20.

Nichol, G., Cohen, R., Meyers, A. & Schlesser, R. (1982). Generalization of self-instruction training. Journal of Applied Developmental Psychology, 3, 205-215.

Odom, R. D. (1982). Lane and Pearson's inattention to relevant information: A need for the theoretical specification of task information in developmental research. Merrill-Palmer Quarterly, 28, (3), 339-345.

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

Pascual-Leone, J. (1970). A mathematical model for the transitive rule in Piaget's developmental stages. Acta Psychologica, 32, 301-345.

Pincus, D. (1983). Sharing: Improving Interaction Skills and Increasing Awareness. Carthage, IL: Good Apple, Inc..

Platt, J. J., Spivack, G., Altman, N., Altman, D., & Peizer, S. B.. (1974). Adolescent problem-solving thinking. Journal of Consulting and Clinical Psychology, 42, 787-793.

Reeve, R. A. & Brown, A. L. (1985). Metacognition reconsidered: Implications for intervention research. Journal of Abnormal Child Psychology 13, (3), 343-356.

Ridley, C. A. & Vaughn, S. R. (1982). Interpersonal problem solving: An intervention program for preschool children. Journal of Applied Developmental Psychology, 3, 177-190.

Sattler, J. M. (1982). Assessment of children's intelligence and special abilities, 2nd Ed. Boston: Allyon and Bacon, Inc.

Schleser, R., Meyers, A. W. & Cohen, R. (1981). Generalization of self-instructions: Effects of general versus specific content, active rehersal, and cognitive level. Child Development, 52, 335-340.

Schleser, R., Cohen, R., Meyers, A. W. & Rodick, J. D. (1984). The effects of cognitive level and training procedures on the generalization of self-instructions. Cognitive Therapy and Research, 8, (2), 187-200.

Schleser, R. & Thackwray, D. (1982). Impulsivity: A clinical-developmental perspective. School Psychology Review, 11(1), 42-46.

Shantz, C. U. (1975). The development of social cognition. In E. M. Hetherington (Ed.), Review of child development research (Vol 5, pp. 257-323). Chicago: University of Chicago Press.

Sharp, K. C. (1981). Impact of interpersonal problem-solving training on preschooler's social competency. Journal of Applied Developmental Psychology, 2, 175-187.

Shure, M. B. & Spivack, G. (1972). Means-end thinking, adjustment, and social class among elementary school-aged

children. Journal of Consulting and Clinical Psychology, 38, 348-353.

Shure, M. B. & Spivack, G. (1978). Problem-Solving techniques in childrearing. San Francisco: Jossey-Bass.

Shure, M. B. & Spivack, G. (1980). Interpersonal cognitive problem solving as a mediator of behavioral adjustment in preschool and kindergarten children. Journal of Applied Developmental Psychology, 1, 29-44.

Shure, M. B., Spivack, G. & Jaeger, M. (1971). Problem- solving thinking and adjustment among disadvantaged preschool children. Child Development, 42, 1791-1803.

Siegal, S. (1956). Nonparametric statistics for the behavioral sciences. New York: McGraw-Hill Book Company.

Spillman, S. & Spillman, S. (1977). Mazes and Puzzles. Compton, CA: Educational Insights.

Spivack, G. & Shure, M. B. (1974). Social adjustment of young children: A cognitive approach to solving real-life problems. San Francisco: Jossey-Bass.

Swanson, A. J. (1983). Modifying impulsive social behaivor in young children: An evaluation of a cognitive-behavioral treatment strategy. Dissertation Abstracts International, 44, 3208-3209.

Varni, J. W. & Henker, B. (1979). A self-regulation approach to the treatment of three hyperactive boys. Child Behavior Therapy, 1, 171-191.

Wechsler, D. (1974). Manual for the Wechsler Intelligence Scale for Children-Revised. New York: Psychological Corporation.

Whalen, C. K., Henker, B. & Hinshaw, S. P. (1985). Cognitive-behavioral therapies for hyperactive children: premises, problems, and prospects. Journal of Abnormal Child Psychology, 13 (3), 391-410.

Wilt, J. (1979). Handling Your Ups and Downs. Waco, TX: Word Incorporated.

Woodcock, R. W. & Johnson, M. B. (1977). Woodcock-Johnson Psycho-Educational Battery. Hingham, Mass.: Teaching Resources Corporation.

Wurtele, S. K., Wilson, D. R. & Prentice-Dunn, S. (1983). Characteristics of children in residential treatment programs: Findings and clinical implications. Journal of Clinical Child Psychology, 12, (2), 137-144.

Table 1

Frequency of DSM III Diagnostic Categories Within the Experimental Groups

Group	Number	Diagnostic Category
Treatment		
High Cognitive	1	Adjustment Disorder (309.40)
	3	Attention Deficit Disorder (314.00) (314.01)
	1	Generalized Anxiety Disorder (300.02)
Low Cognitive	2	Attention Deficit Disorder (314.01)
	3	Conduct Disorder (312.00)
Control		
High Cognitive	2	Adjustment Disorder (309.40)
	1	Attention Deficit Disorder (314.01)
	1	Conduct Disorder (312.00)
	1	Oppositional Disorder (313.81)
Low Cognitive	1	Adjustment Disorder (309.40)
	1	Attention Deficit Disorder (314.01)
	3	Conduct Disorder (312.00) (312.23)

Table 2

Mean Cognitive Task Performances of Experimental Groups

Group	Cognitive Tasks			
	Central Memory	Incidental Memory	M Space	Picture Arrangement
Treatment				
High Cognitive	7.6	5.4	3.4	10.4
Low Cognitive	5.8	4.6	2.3	7.4
Control				
High Cognitive	8.4	5.0	4.0	9.6
Low Cognitive	4.4	3.8	2.2	8.4

Table 3

Therapy Flow Chart

Cognitive Assessment	Administer in order, Hagen's task, Case's task and Picture Arrangement task.
Behavior Rating Scales	Teachers and staff complete SCRS for behavior during past month. Administer a second time in two weeks for recent behavior.
Behavioral Observations	Conduct concurrent with SCRS.
Baseline Session	All tasks presented.
Training Sessions	Eight 20-30 minute sessions, with tasks presented in the following order: mazes, following directions, arithmetic, identifying emotions, hypothetical situations and role plays.
Behavior Rating Scales	Administer following completion of training and at 1 month follow-up period.
Behavioral Observations	Administer concurrent with SCRS.
Academic Assessment	Administer concurrent with SCRS.

Table 4

Content of Self-Instructional Procedures

(Adapted from Kendall & Braswell, 1985)

Purpose	Self-Statement
Problem definition	"Find out what I'm supposed to do."
Problem approach	"I have to look at all the possibilities."
Focusing of attention	"I better concentrate and focus in and think only of what I'm doing now."
Answer Selection	"I think this is it. . I need to find an answer and check it."
Self-Reinforcement -or- Coping Statment	"I did a pretty good job." "I made a mistake. Next time I'll go slower and be more careful."

Table 5

Training Session Procedures

Session	Task	Procedures
1	Mazes	The purpose of this session is to demonstrate the usefulness of strategies and introduce the 5 SI steps. Begins with simple tasks to facilitate learning of SI steps.
2	Following Directions	Review SI steps. Model overt use of steps and alternate task performance with subject.
3	Arithmetic	Review SI steps. Continue alternating task performance and begin fading procedures. Model appropriate planning and use of coping statements.
4	Identifying Emotions	First session to shift focus to affective educational tasks. Continue fading from whispered to covert SI.
5	Identifying Emotions	Begin to associate specific emotions with antecedent events.
6	Hypothetical Situations	First session directly related to interpersonal problem situations.
7	Role-Playing	Role-playing of hypothetical social situations. Modify SI steps to include consideration of consequences and selection of the best solution.
8	Role-Playing	Role-playing of common social problem situations.

Table 6

Mean Baseline and Session "Test" Errors on Psycho-Educational Tasks

	Groups			
Type of Task	Treatment		Control	
Time	High Cognitive	Low Cognitive	High Cognitive	Low Cognitive
Mazes				
Baseline	10.4	7.4	9.2	8.0
Training	11.4	8.8	9.5	9.0
Following Directions				
Baseline	3.4	2.3	3.9	2.0
Training	3.1	2.1	3.6	1.7
Arithmetic				
Baseline	8.2	5.8	8.2	4.0
Training	7.0	6.8	8.2	5.0

Table 7

Mean Scores for Affective Educational Tasks Across Time for Experimental Groups

	Groups			
Task	Treatment		Control	
Time	High Cognitive	Low Cognitive	High Cognitive	Low Cognitive
Awareness				
Baseline	1.25	1.40	1.40	1.25
Training	1.20	1.00	1.00	1.20
Recency				
Baseline	3.50	2.40	1.40	1.00
Training	4.00	2.80	4.00	2.60

Table 8

Mean Percentage of Strategy Types Offered by Treatment and Control Subjects Across Time

Strategies	Group	
Time	Treatment	Control
Aggression		
Baseline	5.0	6.3
Role Play	20.9	24.5
Directive		
Baseline	13.3	15.6
Role Play	13.2	13.6
Engagement		
Baseline	0.0	10.4
Role Play	5.5	7.3
Withdrawal		
Baseline	29.1	12.5
Role Play	11.3	14.6
Authority		
Baseline	14.9	9.4
Role Play	27.7	32.0
Participation		
Baseline	13.2	16.6
Role Play	11.2	7.8
Idiosyncratic		
Baseline	16.6	25.0
Role Play	4.3	3.8
Emotional		
Baseline	7.5	4.1
Role Play	7.0	4.6

Table 9

Mean Percentages of Strategy Types Offered by High and Low Cognitive Groups Across Time

Strategies	Group	
Time	High Cognitive	Low Cognitive
Aggression		
Baseline	2.8	8.3
Role Play	20.2	25.2
Directive		
Baseline	17.6	11.1
Role Play	14.3	12.5
Engagement		
Baseline	0.0	9.2
Role Play	6.2	6.6
Withdrawal		
Baseline	35.1	8.3
Role Play	16.0	9.8
Authority		
Baseline	12.0	12.9
Role Play	22.8	26.0
Participation		
Baseline	18.4	11.0
Role Play	11.5	7.5
Idiosyncratic		
Baseline	11.1	29.6
Role Play	4.6	5.5
Emotional		
Baseline	2.8	9.2
Role Play	4.2	7.3

Table 10

Mean SCRS Teacher and Staff Ratings Across Time for Experimental Groups

Time	Groups			
	Treatment		Control	
	High Cognitive	Low Cognitive	High Cognitive	Low Cognitive
		Teacher		
Baseline 1	144.0_a	157.0_b	131.2	168.8
Baseline 2	176.0	167.0	155.0	172.2
Posttest	167.6	177.4	146.6	179.4
Follow-Up	177.3_a	191.3_b	135.7	148.0
		Staff		
Baseline 1	173.2	177.2	159.2	199.2
Baseline 2	150.6	175.2	157.2	197.8
Posttest	154.6	163.2	124.0	171.0
Follow-up	169.0	173.5	134.3	153.0

Note. Means having the same subscript differ significantly at $p < .05$.

Table 11

Mean Woodcock-Johnson Pre and Posttest Subtest Scores for Experimental Groups

	Groups			
Subtest	Treatment		Control	
Time	High Cognitive	Low Cognitive	High Cogntive	Low Cognitive
Word Recognition				
Pre-Training	4.74	2.80	3.98	1.00
Post-Training	6.24	1.40	4.10	2.25
Word Attack				
Pre-Training	6.82	1.95	3.58	0.70
Post-Training	7.38	1.85	6.30	1.35
Reading				
Pre-Training	4.80	2.55	3.66	1.35
Post-Training	5.82	1.05	4.60	1.30
Calculation				
Pre-Training	4.26	0.50	2.34	1.80
Post-Training	4.62	2.20	3.85	1.65
Applied Arithmetic				
Pre-Training	4.06	0.50	4.00	1.65
Post-Training	4.02	1.10	4.85	1.15

Figure Captions

Figure 1. Number of self-instructional steps recalled by treatment group subjects.

Figure 2. Teacher SCRS ratings for treatment groups across time

Figure 3. Teacher SCRS ratings for attention-control groups across time

Figure 4. Milieu staff SCRS ratings for treatment groups across time

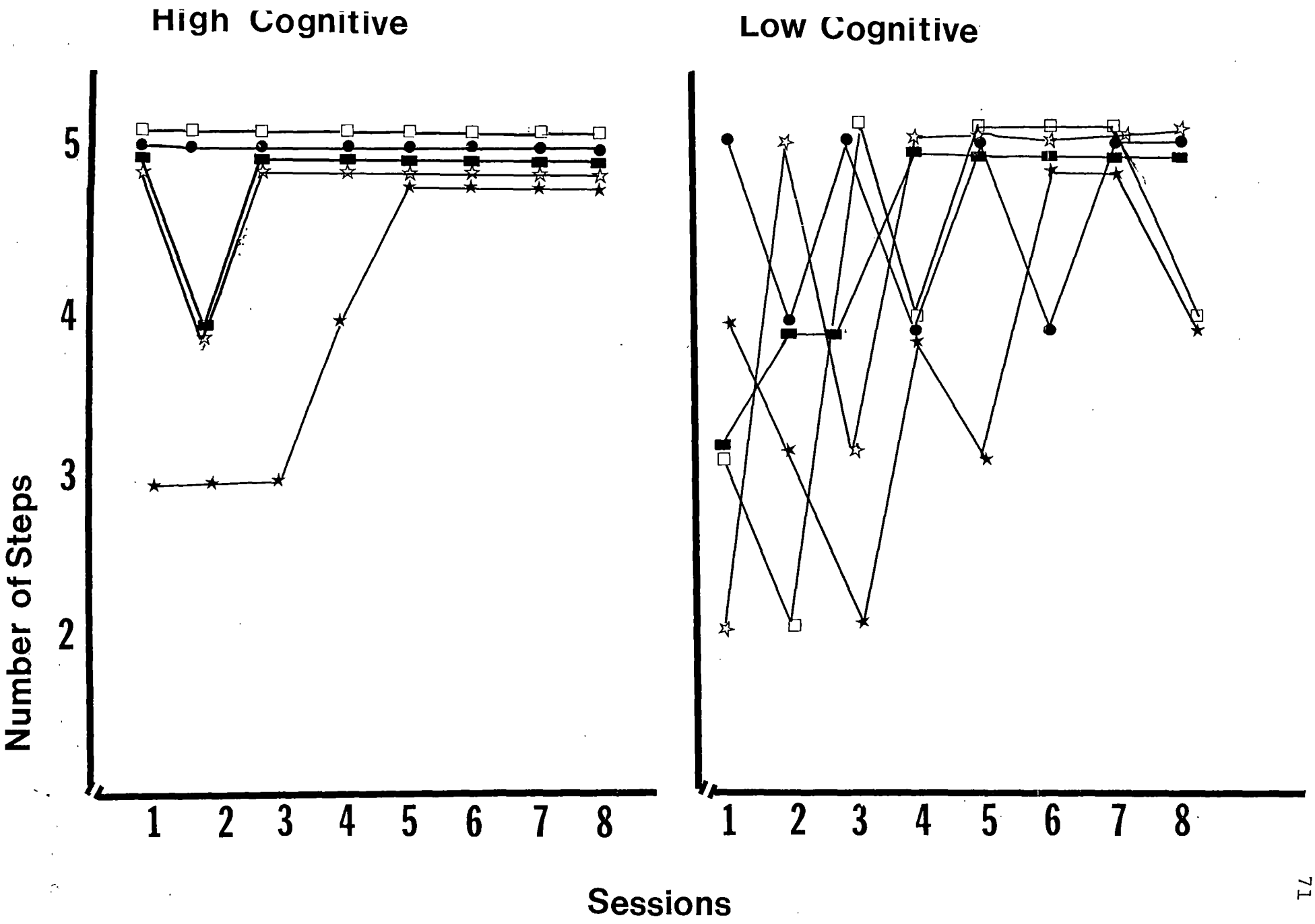
Figure 5. Milieu staff SCRS ratings for attention-control groups across time

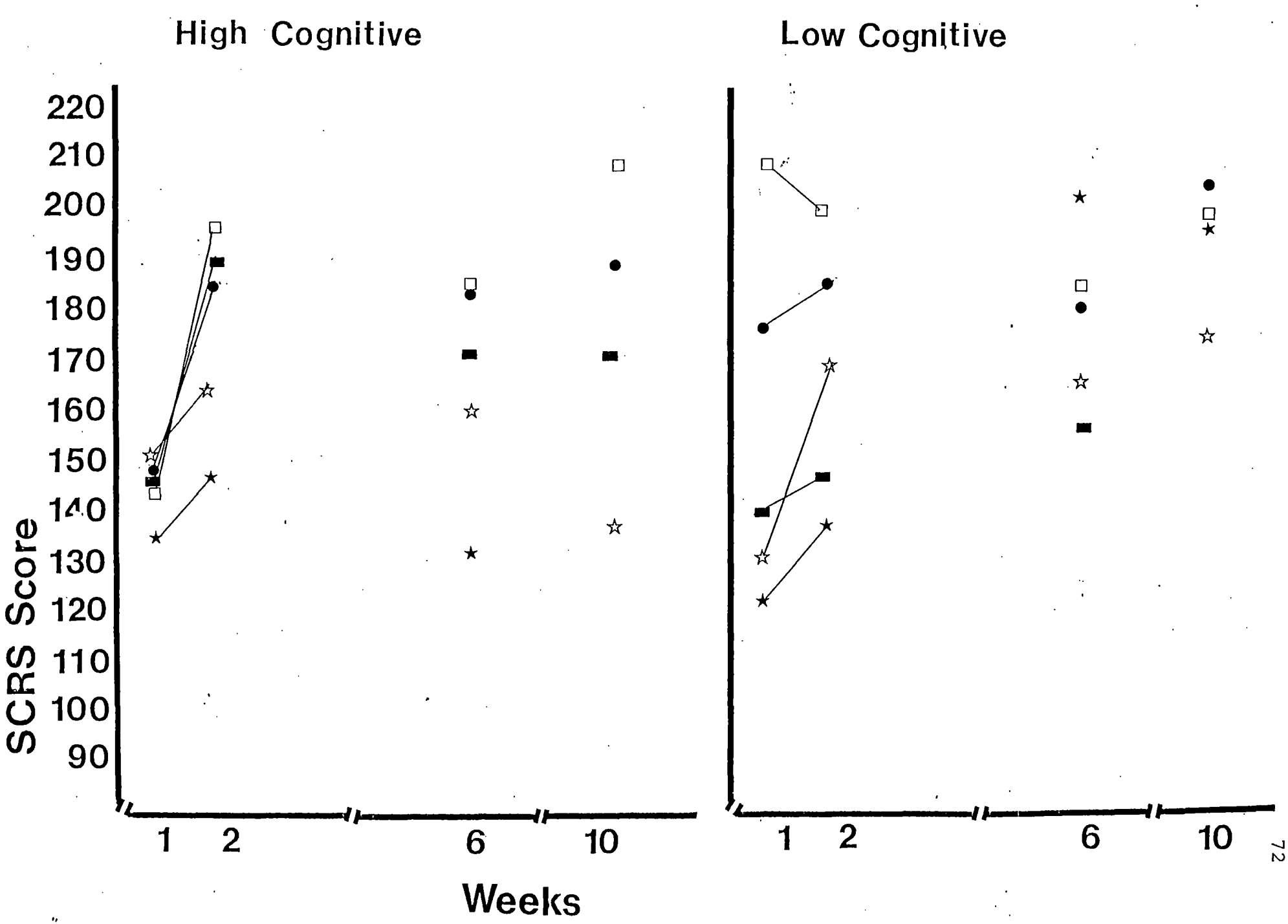
Figure 6. Percent occurrence of positive physical behaviors for treatment groups across time

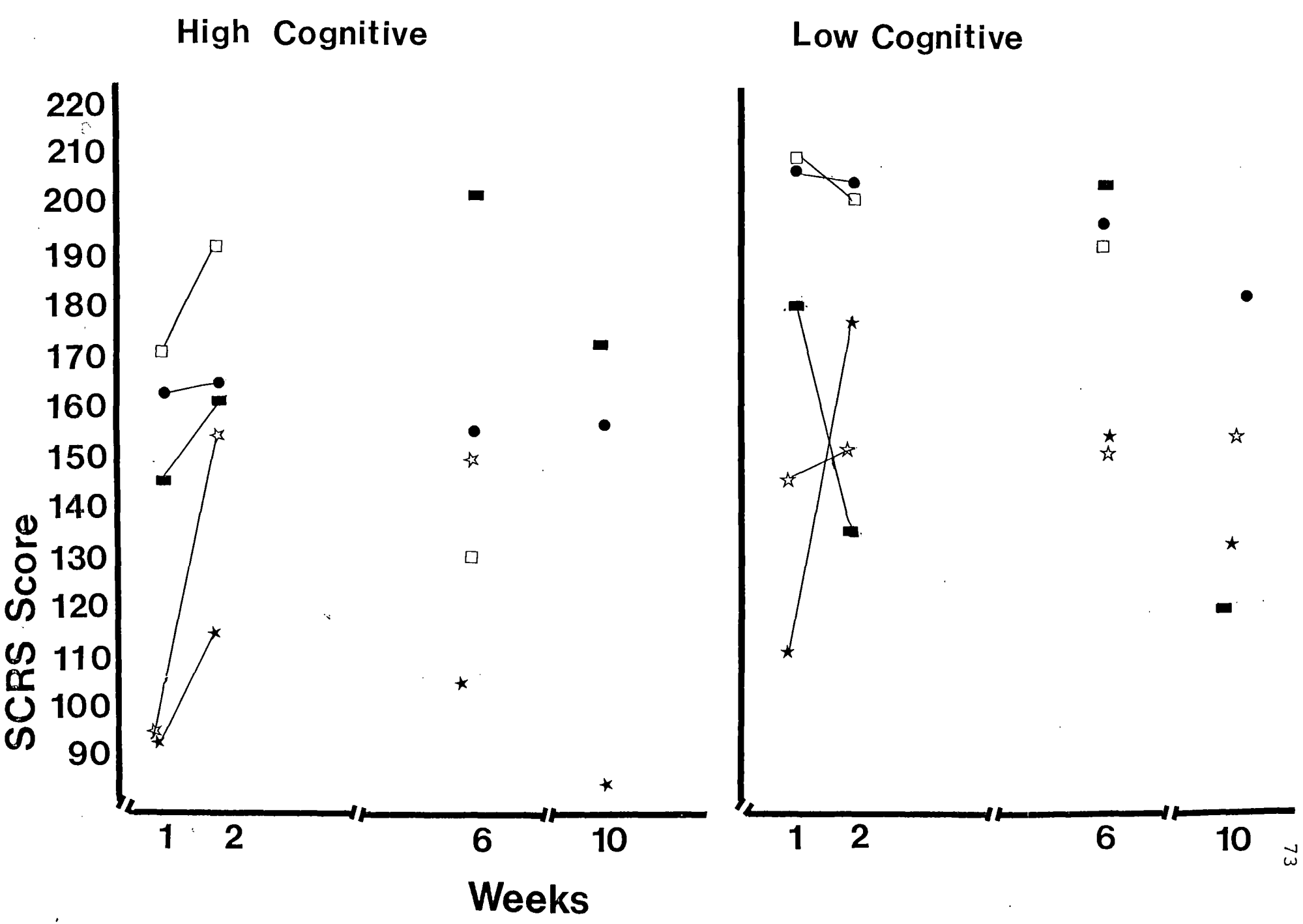
Figure 7. Percent occurrence of positive physical behaviors for attention-control groups across time.

Figure 8. Percent occurrence of negative physical behaviors for treatment groups across time.

Figure 9. Percent occurrence of negative physical behaviors for attention-control groups across time.


High Cognitive
Low Cognitive
Number of Steps
5
4
3
2
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
Sessions


High Cognitive
Low Cognitive
SCRS Score
220
210
200
190
180
170
160
150
140
130
120
110
100
90
1
2
6
10
Weeks


High Cognitive
Low Cognitive
SCRS Score
220
210
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170
160
150
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130
120
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100
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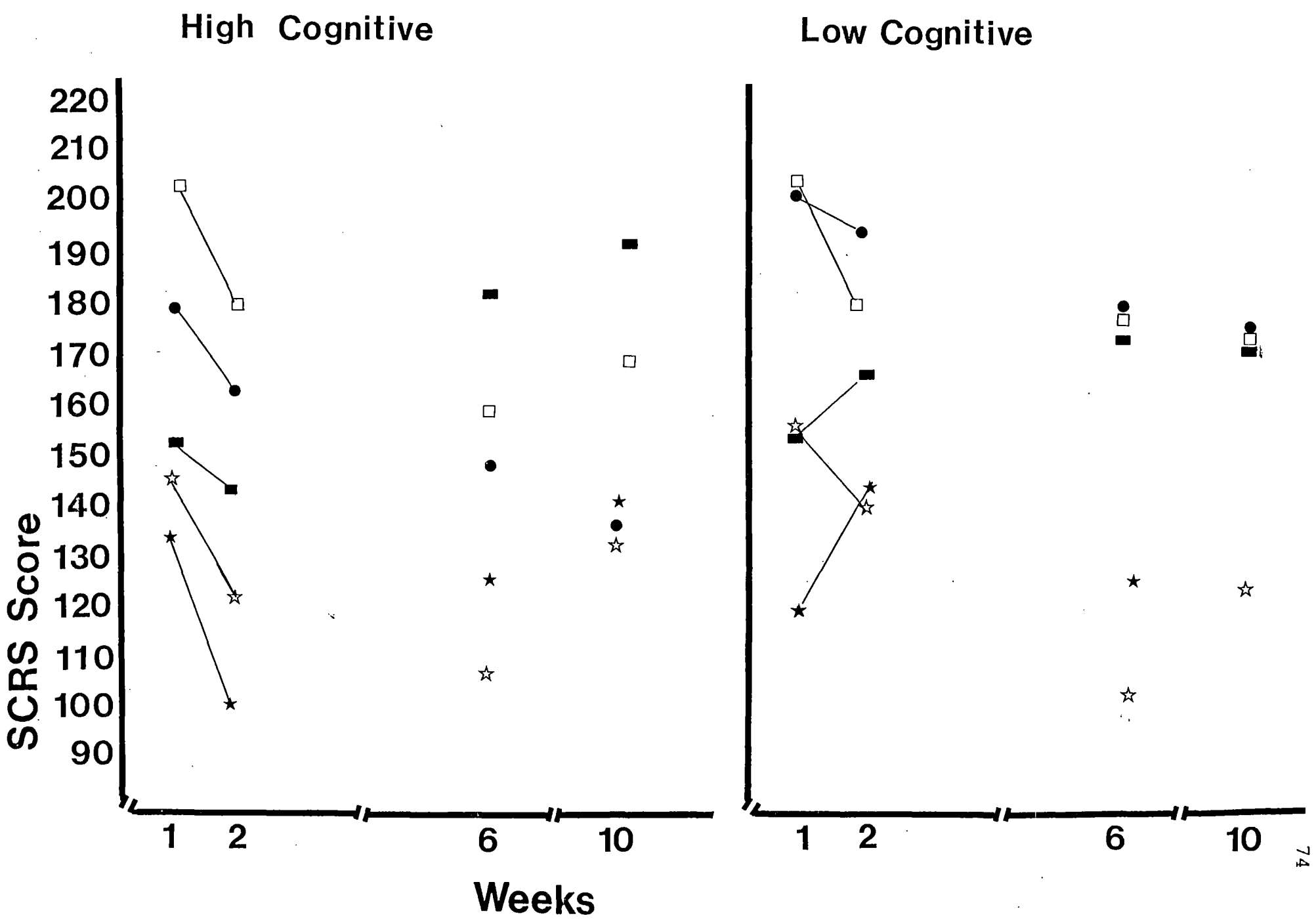
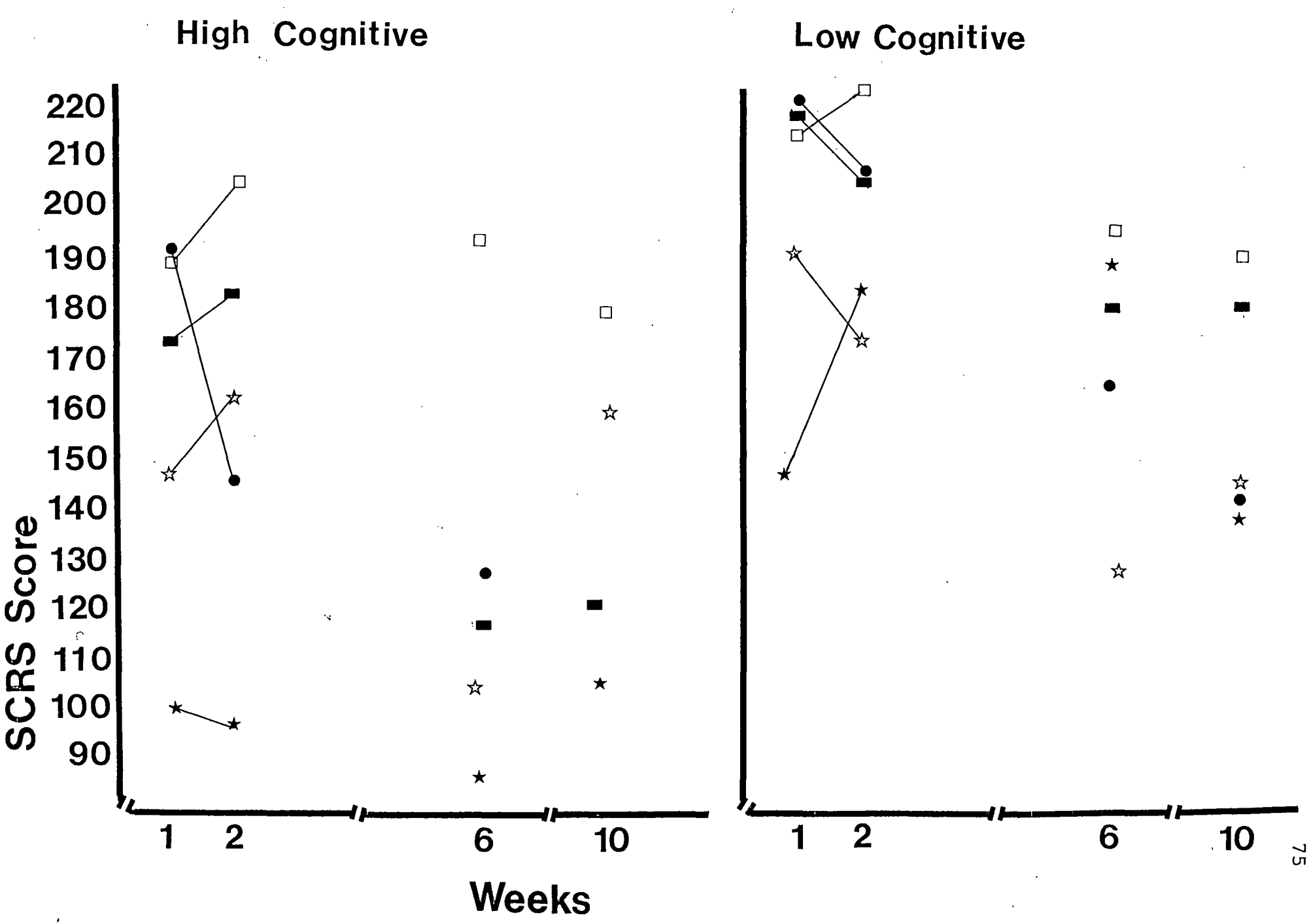
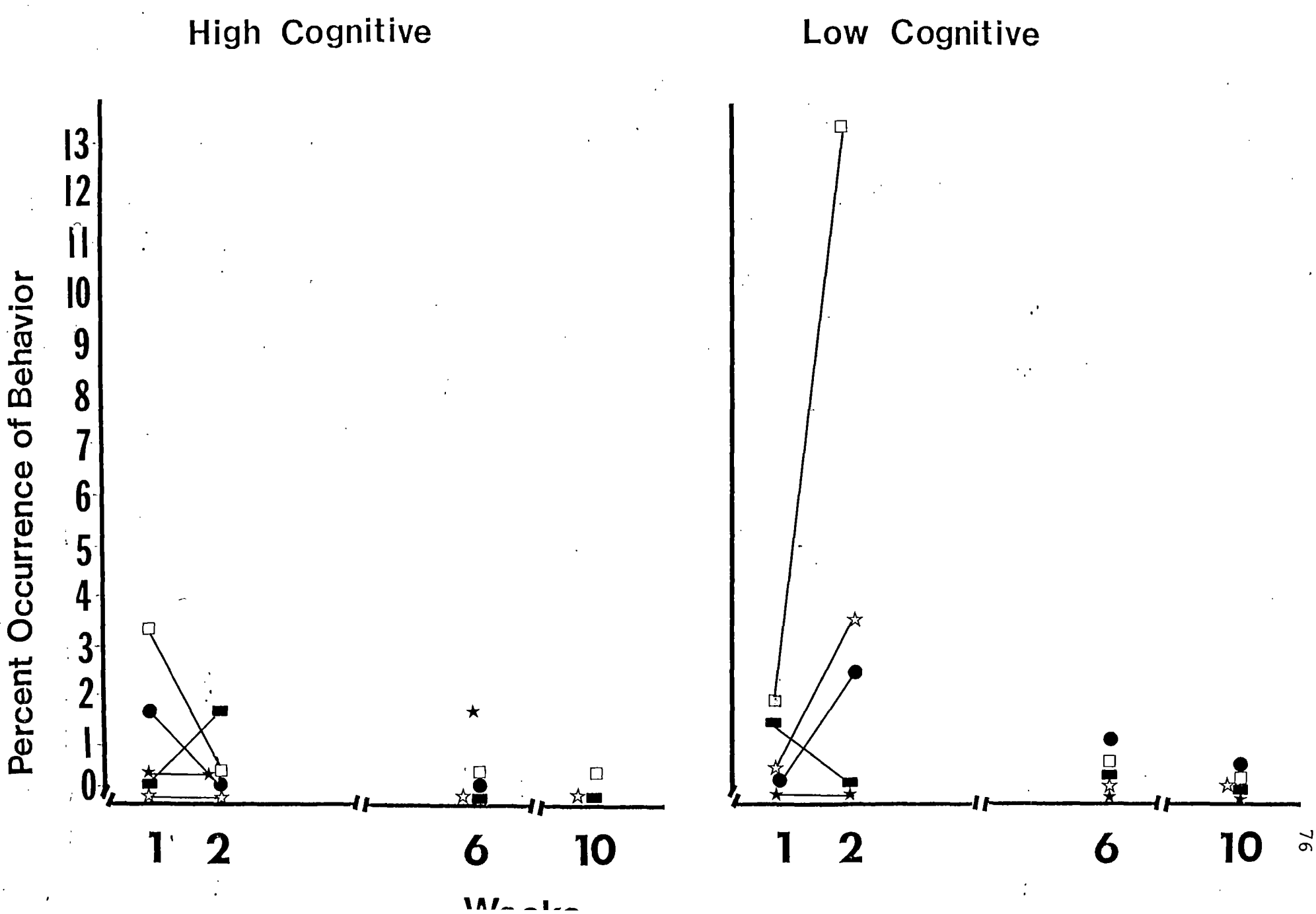
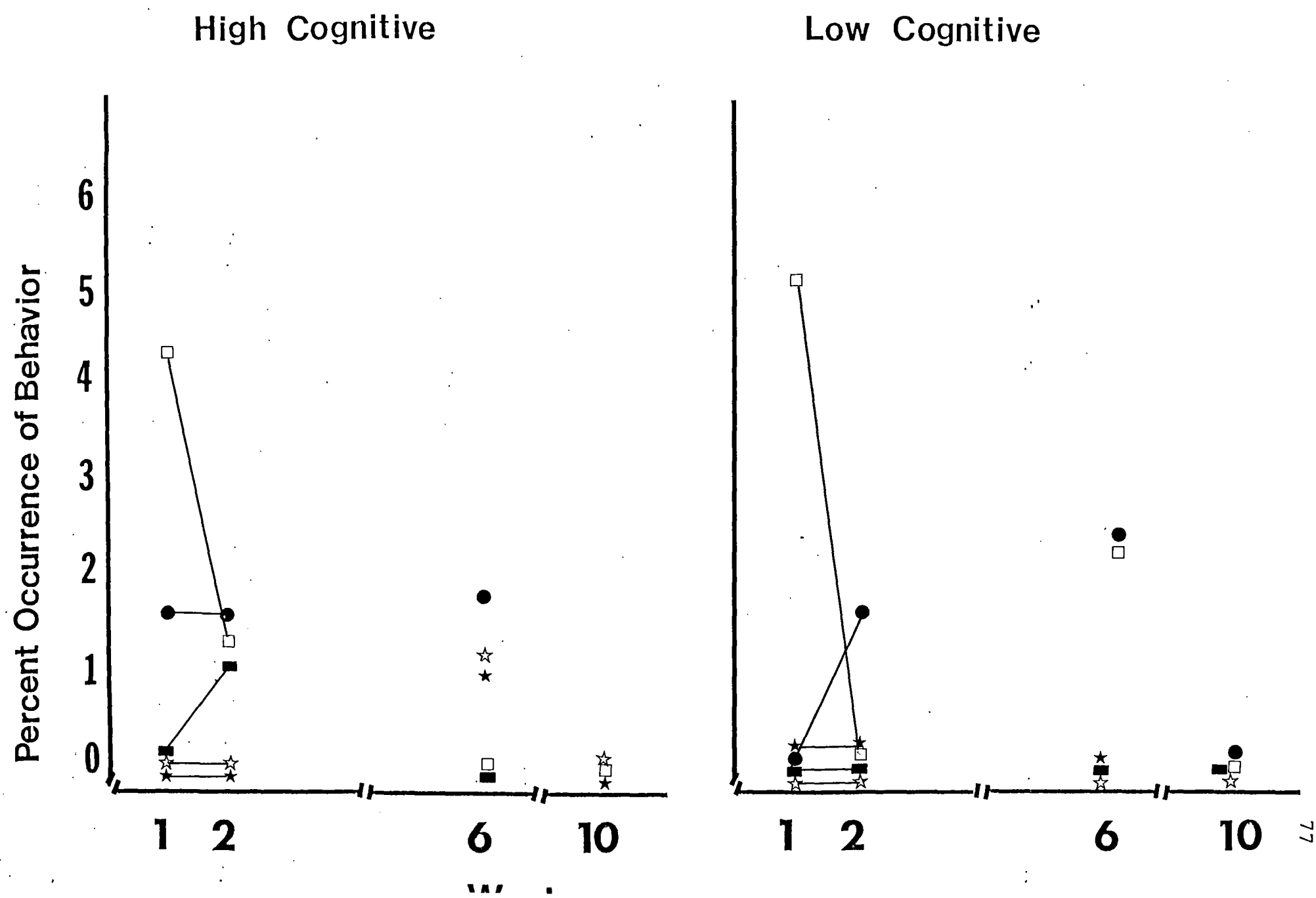
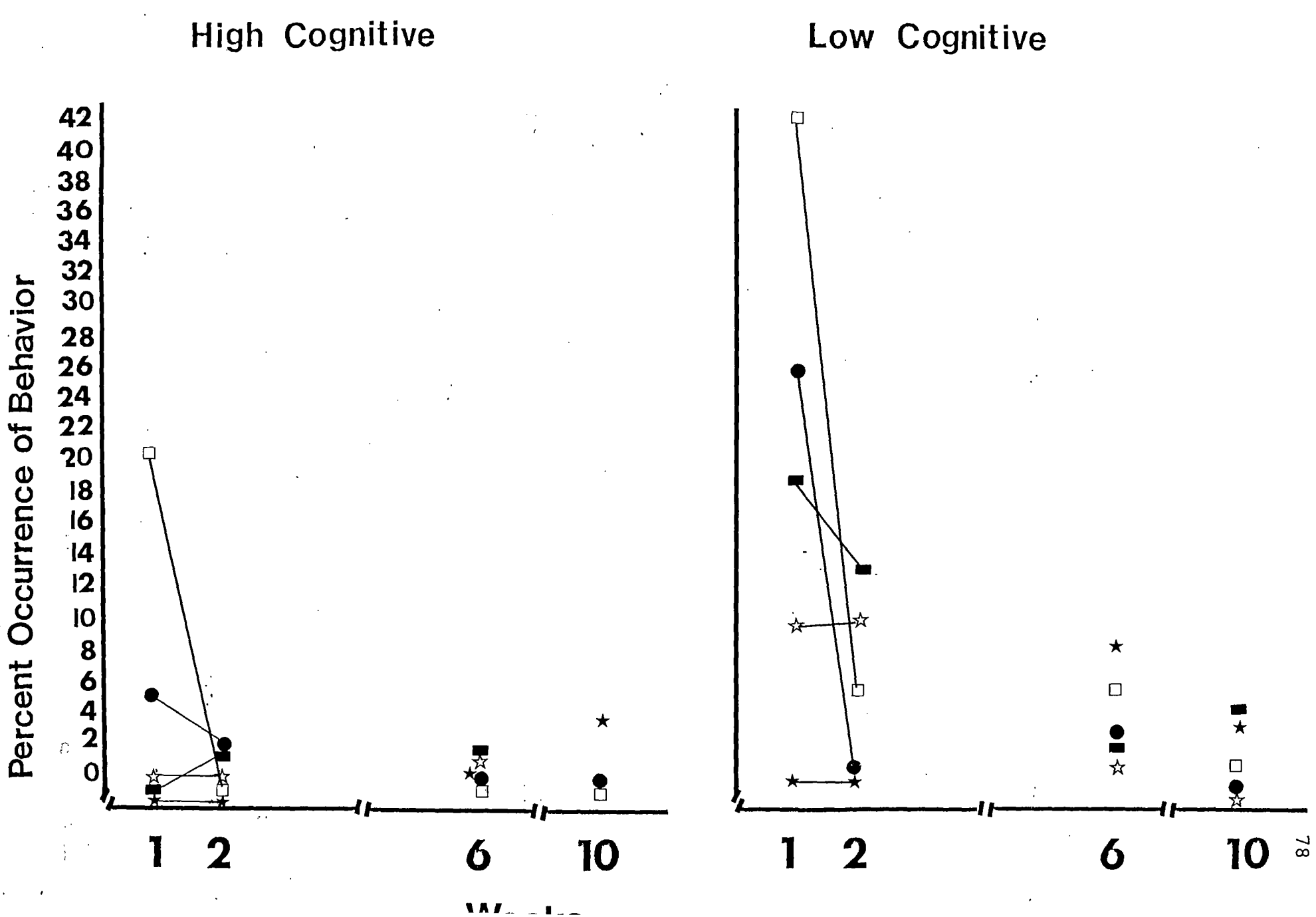
1
2
6
10
Weeks

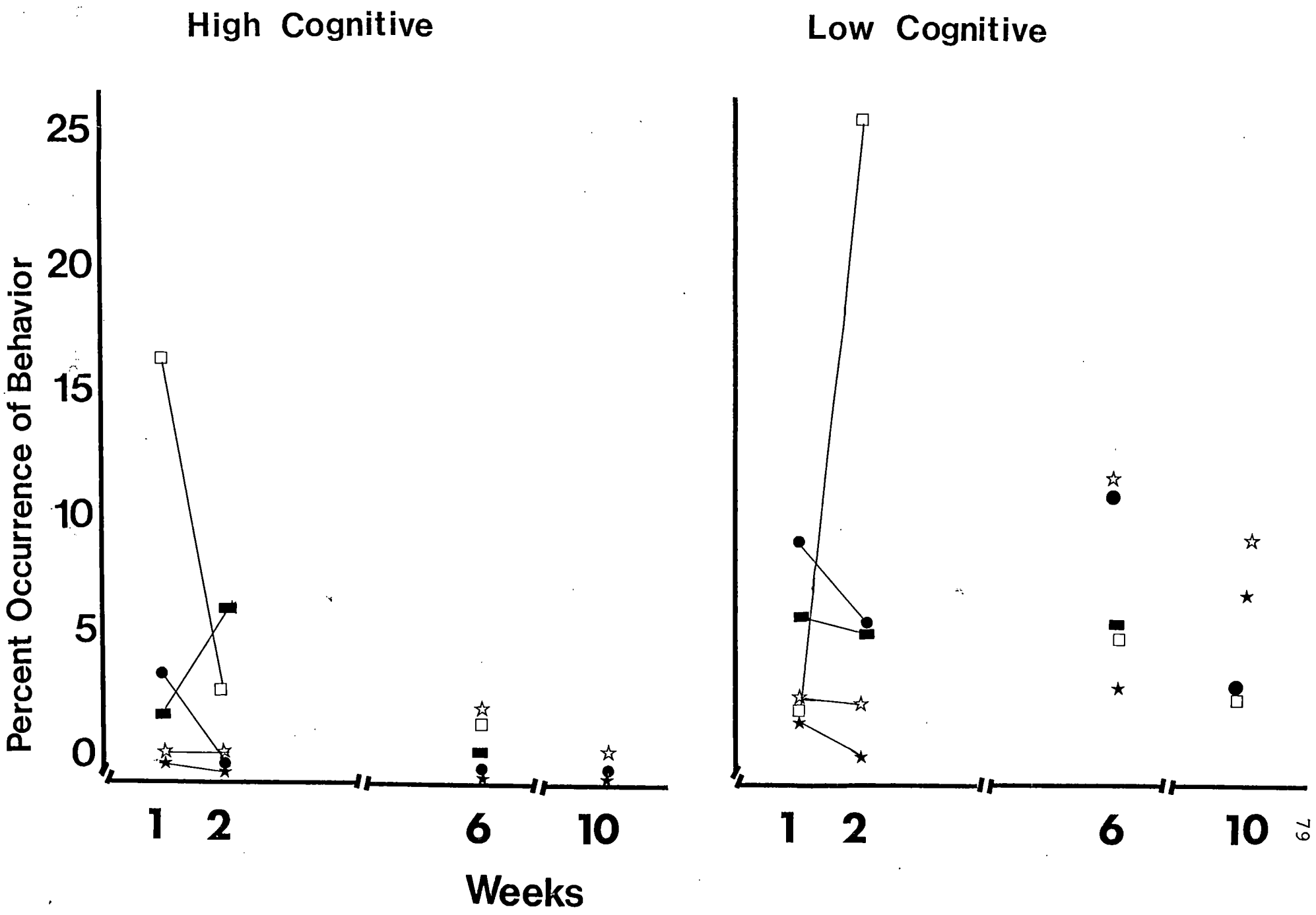

High Cognitive
Low Cognitive
220
210
200
190
180
170
160
150
140
130
120
110
100
90
SCRS Score
1
2
6
10
Weeks


High Cognitive
Low Cognitive
SCRS Score
220
210
200
190
180
170
160
150
140
130
120
110
100
90
1
2
6
10
Weeks


High Cognitive
Low Cognitive
Percent Occurrence of Behavior
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
2
6
10
1
2
6
10
Weeks


High Cognitive
Low Cognitive
Percent Occurrence of Behavior
0
1
2
3
4
5
6
1
2
6
10
1
2
6
10


High Cognitive
Low Cognitive
Percent Occurrence of Behavior
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1
2
6
10
1
2
6
10


High Cognitive
Low Cognitive
Percent Occurrence of Behavior
25
20
15
10
5
0
1
2
6
10
Weeks

Appendixes

Appendix A

Informed Consent Form

the phil smalley
children's center

312 12th ave. ne
p.o. box 1008
norman, oklahoma 73070
(405) 364-9004

I, Mick Jepsen, give my consent for the residents of Phil Smalley Children's Center to participate in the research project "Efficiency of Self-Instructional Training as a Function of Cognitive Level" conducted by Anne Campbell Hancock. I understand that particpation in the project will involve the administration of cognitive assessments, behavioral ratings and self-instructional training. I fully understand the procedures and potential risks involved for participants.

Mick Jepsen, Ph.D., Acting Director

Witness

10/29/84
Date

Appendix B

The Self-Control Rating Scale (SCRS)

BEHAVIOR RATING SCALE FOR CHILDREN

Name of Child_____ Grade_____

Rater_____

Please rate this child according to the descriptions below by circling the appropriate number. The underlined 4 in the center of each row represents where the average child would fall on this item. Please do not hesitate to use the entire range of possible ratings.

1.	When the child promises to do something, can you count on him or her to do it?	1 2 3 4 5 6 7 always never
2.	Does the child butt into games or activities even when he or she hasn't been invited?	1 2 3 4 5 6 7 Never often
3.	Can the child deliberately calm down when he or she is excited or all wound up?	1 2 3 4 5 6 7 yes no
4.	Is the quality of the child's work all about the same or does it vary a lot?	1 2 3 4 5 6 7 same varies
5.	Does the child work for long-range goals?	1 2 3 4 5 6 7 yes no
6.	When the child asks a question, does he or she wait for an answer, or jump to something else (e.g., a new question) before waiting for an answer?	1 2 3 4 5 6 7 waits jumps
7.	Does the child interrupt inappropriately in conversations with peers, or wait his or her turn to speak?	1 2 3 4 5 6 7 waits interrupts
8.	Does the child stick to what he or she is doing until he or she is finished with it?	1 2 3 4 5 6 7 yes no
9.	Does the child follow the instructions of responsible adults?	1 2 3 4 5 6 7 always never
10.	Does the child have to have everything right away?	1 2 3 4 5 6 7 no yes
11.	When the child has to wait in line, does he or she do so patiently?	1 2 3 4 5 6 7 yes no
12.	Does the child sit still?	1 2 3 4 5 6 7 yes no
13.	Can the child follow suggestions of others in group projects, or does he or she insist on imposing his or her own ideas?	1 2 3 4 5 6 7 able to follow imposes
14.	Does the child have to be reminded several times to do something before he or she does it?	1 2 3 4 5 6 7 never always
15.	When reprimanded, does the child answer back inappropriately?	1 2 3 4 5 6 7 never always

16. Is the child accident prone?
1 2 3 4 5 6 7
no yes

17. Does the child neglect or forget regular chores or tasks?
1 2 3 4 5 6 7
never always

18. Are there days when the child seems incapable of settling down to work?
1 2 3 4 5 6 7
never often

19. Would the child more likely grab a smaller toy today or wait for a larger toy tomorrow, if given the choice?
1 2 3 4 5 6 7
wait grab

20. Does the child grab for the belongings of others?
1 2 3 4 5 6 7
never often

21. Does the child bother others when they're trying to do things?
1 2 3 4 5 6 7
no yes

22. Does the child break basic rules?
1 2 3 4 5 6 7
never always

23. Does the child watch where he or she is going?
1 2 3 4 5 6 7
always never

24. In answering questions, does the child give one thoughtful answer, or blurt out several answers all at once?
1 2 3 4 5 6 7
one answer several

25. Is the child easily distracted from his or her work or chores?
1 2 3 4 5 6 7
no yes

26. Would you describe this child more as careful or careless?
1 2 3 4 5 6 7
careful careless

27. Does the child play well with peers (follows rules, waits turn, cooperates)?
1 2 3 4 5 6 7
yes no

28. Does the child jump or switch from activity to activity rather than sticking to one thing at a time?
1 2 3 4 5 6 7
sticks to one switches

29. If a task is at first too difficult for the child, will he or she get frustrated and quit, or first seek help with the problem?
1 2 3 4 5 6 7
seek help quit

30. Does the child disrupt games?
1 2 3 4 5 6 7
never often

31. Does the child think before he or she acts?
1 2 3 4 5 6 7
always never

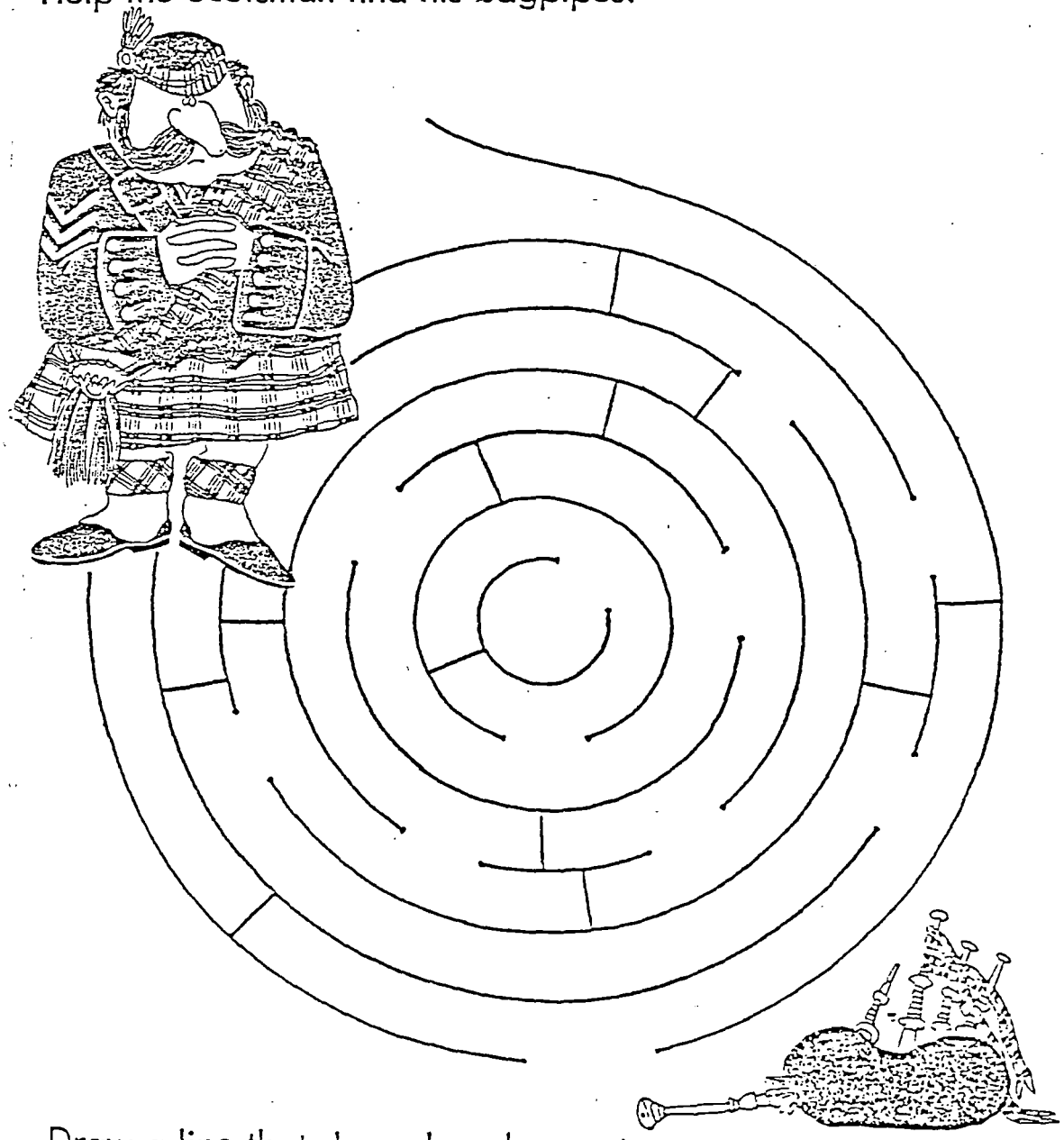
32. If the child paid more attention to his or her work, do you think he or she would do much better than at present?
1 2 3 4 5 6 7
no yes

33. Does the child do too many things at once, or does he or she concentrate on one thing at a time?
1 2 3 4 5 6 7
one thing too many

Appendix C

Sample Training Materials

Help the Scotsman find his bagpipes.



Draw a line that shows how he must go.

Directions:

- ☐ Use a letter from the box to complete each word.
- ☐ Cross out the letter that you used.
- ☐ On the ____ write a word with the three letters you have left.
- ☐ In the ☐ draw a picture to go with the word.

b_i_ke

shi____

ro____e

co____e

ska____e

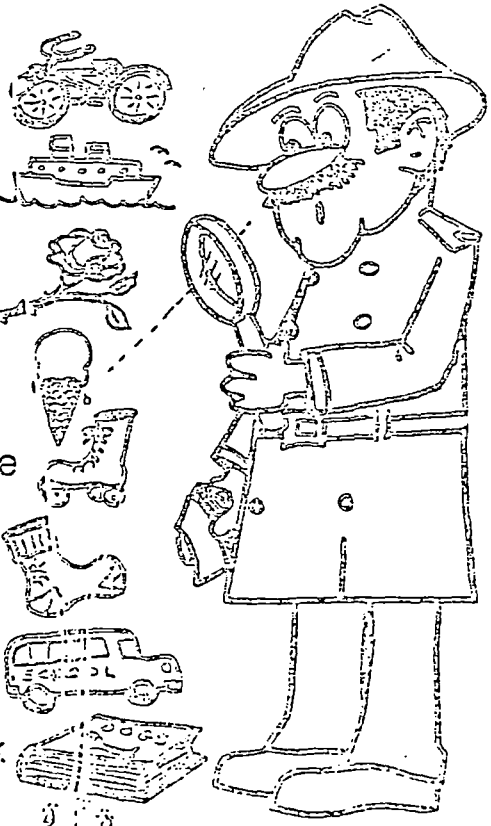
s____ck

b____s

____ook

____ake

____ ____ ____



t	i
u	b
n	c
p	s
n	c
u	s

☐

DOT TO DOT

Find the sum.
Start with number 1.
What is the shape?
Have fun coloring it.

1. 1 + 3 =
2. 4 + 1 =
3. 4 + 2 =
4. 5 + 2 =
5. 5 + 3 =
6. 5 + 4 =
7. 7 + 3 =
8. 8 + 3 =
9. 6 + 6 =
10. 6 + 7 =

Tic-Tac-Toe Feelings

Put an X in a box if the situation written would make you feel most ANGRY, JEALOUS, SAD or DISAPPOINTED. Put an O in a box if the situation written would make you feel most HAPPY, EXCITED SURPRISED, SCARED or RELIEVED.

Your TV set is broken and you are told to catch up on some reading.	Your parents do not want you seeing your closest friend anymore since they feel she has had a bad influence on you.	You will be asked to stay home alone tonight, since your parents will be out.
Your family has to move to another state and you will be attending a new school.	Your allowance will be raised to $3.00 and your older brother's/sister's will be raised to $4.00.	You receive an offer to go to a school in another country for one year. It will mean leaving your family and friends.
Your parents come home 2 hours later than you expected. You finally hear the car pull up.	Your parents plan to send you to sleep-away camp for the summer instead of taking you with them to Europe.	Your parents ask you to take on a new household responsibility because they feel that you are dependable and capable.

1. How many tic-tac-toes did you get (horizontal, vertical, diagonal)?

---

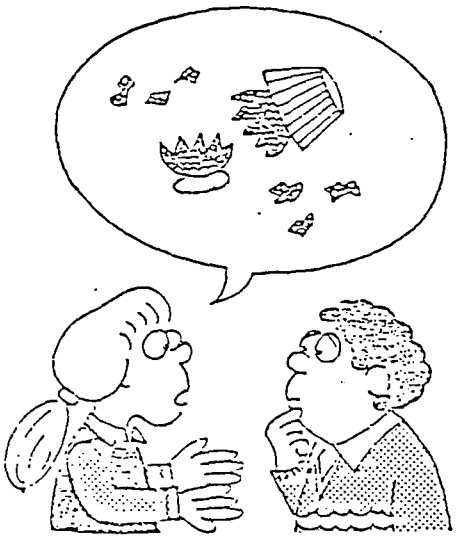
2. How do you behave when you feel angry, jealous, sad, disappointed, happy, excited, surprised, scared or relieved? Discuss your reactions with your family. Discuss some of the consequences of your behavior. Remember that there are no right or wrong answers when it comes to your feelings!

Working It Out

Solve the following dilemmas. Tell what you would do if you were faced with the following situations:

1. You promised your best friend that you would help her clean her room and set up for her birthday party. You had forgotten that you had also promised your mom that you would baby-sit for your brother while she did her afternoon errands. They are all depending on you! Your solution: _____

2. Your brother tells you that he broke your parents' favorite lamp. He is very upset and makes you promise not to tell on him. Your parents come home and blame you for the broken lamp. They yell at you and tell you that you are grounded for the week with no TV privileges. You don't know whether to go against the promise you made to your brother and tell on him or take the blame yourself. Your solution: _____



Role Play Situations

(Adapted from Kendall & Braswell, 1985)

1. You tear your pants during break and someone teases you.
2. During the holidays, your Aunt comes to visit. She brings a big toy for your brother (name) and a small one for you.
3. You are watching t.v. and your little brother/ sister changes the channel.
4. You are playing checkers and your opponent is cheating.
5. You are working on your schoolwork and your friend starts talking to you.
6. You are having trouble with your schoolwork and your friend has already finished.
7. You promised your friend something, but later you cannot give it to him/her.

Role Play Situations for Final Training Session

1. Another child on your dorm breaks something that is yours.
2. Someone takes your shoe from your room and you do not know who took it.
3. You signed out a bicycle but someone else says it is theirs.
4. Another child is bothering you in school and your teacher doesn't notice.
5. You want to be the first child to go on an outing with a counselor, but the other children also want to go first.
6. One of the children on your dorm calls you a name and cusses at you.
7. Another child is upset and hits you.
8. You have a brand new toy and someone takes it from you.

Appendix C

Sample Training Materials

Cue Card

1. Find out what I'm supposed to do.
2. Look at all the possibilities or choices.
3. Focus in.
4. Check my answer.
5. I did a good job.

   or

   I made a mistake.

   I can be more careful next time.

Appendix D

Training Instructions

Instructions for Cognitive Tasks

Hagen's Selective Attention Task.

We're going to play a memory game with pictures on cards (show sample cards). Can you tell me what animal you see on each card? I want you to remember where the animals are. For example, which animal is first, which is in the middle, and which is last. I will lay the cards out for you to look at. Pay close attention to where each animal is. Then, I will cover them up and ask you where a certain animal is. Do you have any questions? Let's try one. This is just for practice (Lay out cards). Look at each one and remember where each animal is (allow 1 minute to observe). Your time is up. Now I will cover them up. Now point to the card with the (name of animal) It doesn't have to be the exact placement, just the card. (Uncover cards).

Can you tell me what this animal is (show each card)? Lets try some more. Look at these carefully before I cover them up (time 1 minute, cover, test, uncover). Now point to the card with the (name of animal).

Now I'd like you to match each animal with the picture it was next to. (Lay out household object single pictures). Every animal had a certain picture that it was always next to. I will show you one animal picture at a time and you point to the picture it goes with. Here is the (name of animal). What picture goes with it? Put

household picture back among others) Now here is the (name of animal). Find the picture it goes with. That was fine.

Case et al.'s "M" Space Task

Now we'll play a different game. In this game I want you to count out loud the number of green dots on a card like this (show practice card). Touch each dot with your finger as you count it. After you count all the green dots, I will put the card down and ask you how many dots there were.

Sometimes there will be many cards that you will count. I want to know the number of green dots on each of the cards. Remember to touch each dot when you count it and to start counting 1, 2, 3, and so on with each new card. Try to remember how many green dots you counted on each card. Wait until I ask you before you tell me the numbers.

Baseline Session Instructions

I have some different kinds of tasks for you to do today. Some are mazes, some are puzzles, some are arithmetic and some are like story problems. I would like you to read the directions and complete each type of task as quickly and correctly as you can. If you cannot read, I will read the directions to you. When you are finished, I want to know how you figured out your solutions.

Here is the first one. (Wait for child to complete task) How did you figure this out? Administer successively higher levels until the child makes an error

Training Session Instructions for Treatment Subjects

My name is Anne and we'll be working together for eight sessions. We'll meet twice a week and do different tasks together. I will show you a "strategy" to help you do your best. We're going to try and go slowly and do a good job on the tasks using the "strategy". There are many ways to play games or work on tasks and some are better than others. In order to do well you must choose the method that allows you to do your best. I'll show you an example of a strategy. Draw a circle by hand. Now draw one using this (provide jar lid). Which way would you choose to draw another circle? Why? Here is another example of a strategy. Remember this list of letters (allow child to view for 30 seconds). What were the letters? Now rearrange them to spell your name. Lets try to remember the list again (allow child to view for 30 seconds). What were the letters? Which way helped you to do your best?

The reason we will meet is to learn a special strategy to do many things better. We will be working together for 4 weeks to do different tasks together. When we do each task we're going to talk out loud and say five steps every time we do a task. I'll do the five steps with you in a minute. See these chips? When we meet together you can earn chips by working slowly and saying each of the five steps out loud while you finish each task. At the end of our meeting you'll have some chips which can be used to buy a prize with. There are lots of prizes and they cost different amounts of

chips (show menu). The chips you earn are yours to spend as you like as long as you say the steps and go slowly while you complete each task. You may also save your chips if you like and earn the more expensive prizes.

Lets do a few tasks to practice the five steps. I'll do the first one. Listen carefully so you'll be able to do the next task using the five steps. Watch how when I say the first step, I then do the first step. If we would only say the five steps and not do them, they wouldn't help us with the tasks as much as saying and doing the steps together will. The first step is "Find out what I'm supposed to do". (Look at task). Second, I need to "Look at all the possibilities, or all the different choices". Next I have to "Focus in" and think only about what I'm doing right now. (Complete task). Ok, I think this is the answer. Fourth, I check and this is the answer. Fifth, "I did a pretty good job". Lets do another one together. Do you remember the first step? Lets repeat it together "I have to find out what I'm supposed to do". Second, I need to "look at all the possibilities. Third I need to "focus in". Fourth I need to "check my answer". Fifth, "I did a good job", or if I were to make a mistake, "I'll have to remember to go slower and think harder next time".

Your turn now. It doesn't matter if you use the exact same words I did. But I want you to say five steps that mean the same thing. Before we finish I'm going to show you how to earn extra

bonus chips. Next session, if you can tell me all five steps you will earn a bonus chip. Also, if you can tell me about one time during the week that it would be wise to use the steps, you will earn one extra chip. Try not to forget the steps and try to remember at least one time when using the steps might be a good idea so you can earn a chip at the start of our next session.

Training Session Instructions for Control Subjects

My name is Anne and we'll be working together for sessions. We'll meet twice a week and do different tasks together. You will earn chips for finishing the tasks correctly. The chips can be traded in for prizes (show menu). You may save your chips if you like and buy a more expensive prize.

Instructions for Role Plays

Today we will work on some tasks that are a lot like the ones we did last time (hypothetical problems) except today we'll act out the situations. We'll use the steps again. Remember to do what you say when using the steps. Remember how last time we made up different solutions to each situation? Well, today we will think about the situation, think of possible coices and think about the consequences of each choice. Then we will act out each one and pick the one we think is best.

Appendix E

Sample Reinforcement Menu

Appendix E

Sample Reinforcement Menu

Stickers	2 chips
Candy	3 chips
Pencils	5 chips
Note Pads	10 chips
Rubber stamp	20 chips
Folder	25 chips
Pocket car	20 chips
Stuffed bear	36 chips

VITA

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Candidate for the Degree of

Doctor of Philosophy

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