1975

Reduction of rocking in the adult retardate using overcorrective techniques

James Gill Hatfield

REDUCTION OF ROCKING IN THE ADULT RETARDATE USING OVERCORRECTIVE TECHNIQUES

BY

JAMES GILL HATFIELD

A THESIS
SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTERS OF ARTS IN PSYCHOLOGY
IN THE GRADUATE SCHOOL OF THE
UNIVERSITY OF RICHMOND

MAY 1975

ACCEPTANCE

This thesis has been accepted in partial fulfillment of the requirements for the Degree of Master of Arts in Psychology in the Graduate School of the University of Richmond.

Date _____

_____
Chairman

_____
Member

_____
Member

ACKNOWLEDGMENTS

The author gratefully acknowledges the guidance received from the members of his thesis committee, Dr. Leonard McNeal, Mrs. Jean Dickinson and Dr. Edward Tiller. Special thanks goes to the chairman of the committee, Dr. Tiller, for his valuable advice and continued support. The author again thanks Dr. McNeal, who is also Project Director of the Federal Project at Petersburg Training School and Hospital. His permission to employ members of his staff as trainers for this study made this study possible.

Thanks also goes to session trainers Cecil Goode and Carole Knott for their cooperation under sometimes trying circumstances. Finally, the author is also indebted to Pat Taylor for her assistance in performing the interobserver agreement checks.

ABSTRACT

This study attempted to reduce the frequency of stereotyped body rocking in three severely retarded adults, using Overcorrective procedures originally developed by Azrin and his associates. Using a single subject design with an Overcorrective treatment phase staggered for each subject, three subjects were observed in daily sessions designed to train the performance of recreational behaviors. It was hypothesized that these behaviors would functionally replace rocking once rocking was reduced by the Overcorrection. Results indicated that from a practical standpoint, Overcorrective procedures as they were instituted in this study were ineffective in reducing body rocking. A second treatment condition was instituted that attempted to demonstrate that an error in the recreational training procedures was responsible for a generally low frequency of appropriate behavior for all subjects, during the previous phases of the study. Except for one subject, this hypothesis was not confirmed. It was suspected that several procedural differences between a previous successful investigation of Overcorrection and the present study could have accounted for this study's results. Further results suggesting the possibility of reducing the frequency of stereotyped behavior by environmental changes was also discussed.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

Introduction

The institutionalized severely and profoundly retarded typically exhibit a number of stereotyped motor responses such as repetitive body movements, arm waving and finger movements (Gardner, 1971, p. 277). Berkson & Davenport (1962) and Kaufman & Levitt (1965) have reported that approximately two-thirds of the institutionalized retarded exhibit some sort of stereotyped motor response.

One type of behavioral problem which may be categorized as a stereotyped response is that of body rocking or the repeated back and forth movement of an individual's upper body which has no apparent environmental effect. This type of behavior, especially when it occurs at a high frequency and amplitude, appears extremely bizarre to the casual observer. More importantly, this behavior may also interfere with the acquisition of new appropriate response patterns (Bandura, 1971; Lovaas, Schaeffer & Simmons, 1965).

These factors, coupled with the pervasiveness of this type of response in institutions for the retarded, point to a need for an economical method of eliminating such undesirable behavior. Possible benefits that could accrue from the success of such a program would be: 1) increased effectiveness of on going behavior change programs due to the reduction of incompatable non-attending behavior (Bandura, 1971; Foxx & Azrin, 1973)and 2) increased social acceptance by the community for such handicapped people.

Investigations of stereotyped behavior such as body rocking have at times yielded conflicting conclusions as to the relative importance of

several variables in the acquisition and maintenance of these responses. However, the weight of the evidence supports the prime importance of two factors in fostering the emission of stereotyped responses: 1) the inherent reinforcing nature of the response (Berkson & Mason, 1964; Lovaas, Litrownik & Mann, 1971) and 2) an environment providing little reinforcement for alternate behaviors (Berkson & Mason, 1963; Guess & Rutherford, 1967).

Foxx & Azrin (1973) have recently proposed a theory that unifies these two findings into a useful explanation of stereotyped or self-stimulatory behavior. Reinforcement can originate from entirely within the organism or can come from its environment. Internal reinforcers that support rocking or other stereotyped behavior probably arise from the stimulation of kinesthetic and vestibular receptors (hence the label self-stimulatory behavior), while external reinforcers include primary reinforcers such as food items, reduction of physical discomfort and secondary reinforcers such as social praise and approval. External reinforcers are more difficult to obtain than internal reinforcers as they usually require attention to subtle discriminative stimuli in addition to complex responding. In an environment that provides little external reinforcement other than that required for biological health, or fails to train the severely handicapped individual in behaviors that will allow him to more effectively obtain external reinforcement, the simple responses that result in internal reinforcement may become prepotent. As rocking or other self-stimulatory behavior becomes more frequent, it will further reduce opportunities to acquire external reinforcement.

One may predict that responses that are reinforcing in themselves may be difficult to eliminate. Attempts to control self-stimulatory behavior

such as rocking have in fact met with only limited amounts of success. Programs of environmental stimulation have been shown to reduce the incidence of self-stimulatory behavior by one-third (Azrin, 1973) to one-half (Guess & Rutherford, 1967). In the context of a token economy on a ward for severely retarded adults, Thompson & Grabowski (1972, p. 163) found that frequency of rocking was reduced by 50% during periods of the day when adaptive behavior was reinforced.

Specific behavioral programs to reduce the frequency of rocking in the retarded and autistic have taken several approaches. Browning & Stover (1971, p. 92) used contingent time out from positive reinforcement to reduce rocking in an autistic, brain injured subject. Treatment consisted of asking the subject to leave the room until he was "finished" rocking whenever the rocking responses began. When the subject returned, he was greeted with profuse positive social reinforcement and comments that he was not rocking at the moment. Results indicated that mean frequency of rocking responses were depressed approximately 50% during the treatment condition when compared to baseline.

Browning & Stover (1971, p. 275) also reported an investigation of the effects of social punishment and social reinforcement in the control of rocking. Little treatment effect could be discerned even when the two variables were used in combination. The authors concluded that the response in this particular subject was exceptionally tenacious and hypothesized that rocking had its own reinforcing effect. In proposing alternate treatment approaches for such individuals, they suggested that incompatable responses might be conditioned which would prevent the occurrence of rocking. Mulhern & Baumeister (1969) reported such an approach where they reduced rocking behavior of two retardates by

one-third by reinforcing the behavior of sitting still. Gardner (1971) reported another such technique with an adult retarded subject who exhibited a high rate of rocking behavior. A competing response of dropping a ball through a chute was conditioned in numerous daily sessions. The task was gradually increased in complexity and, although no specific data was provided, it was reported that at the end of the treatment program, rocking was "reduced noticeably [p. 303]."

A treatment technique that has not been studied extensively is that of aversive stimulation such as hand slapping or electric shock. Lovaas (1966) used a contingent thigh slap to an autistic subject to eliminate various stereotyped behaviors in a language training session. Electric shock, used successfully in the elimination of stereotyped self injurious behavior (Tate & Baroff, 1966), could be equally effective in the control of rocking behavior. In one reported instance (Lovaas et al., 1965), contingent shocks completely eliminated self-stimulatory behavior including rocking in one autistic subject. It is apparent however, that serious ethical and legal questions remain concerning the use of these techniques when treating behavior that does not clearly imperil the health of the individual.

Recently, Azrin and associates have developed procedures to deal with a variety of problems associated with institutionalized populations. Under the general term of Overcorrection, dramatic results have been reported in the treatment of incontinence (Azrin & Foxx, 1971), aggressive disruptive behaviors (Foxx & Azrin, 1972; Webster & Azrin, 1973), poor eating habits (Azrin, 1973) and most recently, several self-stimulatory behaviors in children (Foxx & Azrin, 1973). The two features of the Overcorrective procedure are 1) "to overcorrect the environmental

effects of an inappropriate act and 2) to require the disruptor to intensively practice overly correct forms of the relevant behavior (Foxx & Azrin, 1973, p. 2)." The method of attaining the first objective has been designated Restitutional Overcorrection and requires the individual to restore his environment to an improved state from that which existed before his inappropriate behavior. As an example, an individual who eliminated on the floor would be required not only to mop up the results of his action but clean the entire floor of the room and wash out his own clothes if they had become soiled. The method of attaining the second objective has been designated Positive Practice Overcorrection and requires the individual to practice repeatedly correct forms of the misbehavior. As an example, an individual who eliminated on the floor would be required to practice the correct operations of toileting several times in succession.

The procedures involved in both Restitutional and Positive Practice Overcorrection possess several features that could result in their effectiveness. These are: 1) The educative nature of Positive Practice Overcorrection. It is assumed that requiring the individual to engage repeatedly in the correct forms of the misbehavior will teach the individual behaviors which will prevent the future occurrence of the misbehavior.

2) Time out from positive reinforcement. Implicit in the Overcorrective procedures is that the trainer provides no social reinforcement in supervising the procedure. A matter of fact approach is always used when interacting with the individual performing the Overcorrective procedures. Engaging in the Overcorrection also prevents the individual from engaging in other reinforcing activities such as interacting with

friends, engaging in recreation or receiving tokens or social reinforcement as a consequence of participating in other programs. Foxx & Azrin (1972) also recommend that the duration of the time out remain lengthy, thus extending the duration of the time out. Studies using both animals and normal human subjects have indicated that the effectiveness of a time out procedure is proportional to its temporal duration up to an optimal limit (Ferster & Appel, 1961; Zimmerman & Baydan, 1963). Although in his review, Gardner (1971, p. 294) reported no parametric studies dealing with the duration of time out and its effectiveness with retarded individuals, Browning & Stover (1971, p. 150) recommend time outs no longer than 15 minutes for most cases involving retarded and autistic children.

3) The aversive nature of the effort required in engaging in the Overcorrective procedures. Overcorrection requires that the individual perform all procedures with a significant degree of effort. The resultant fatigue may in the future serve to inhibit those maladaptive responses that precede the institution of the Overcorrective procedures.

4) The immediacy of the consequences. Implementation of the Overcorrective procedures immediately following the maladaptive responses reduces the reinforcing aspects of that behaviors' consequences (Azrin & Hutchinson, 1967). An individual who eliminated on the floor would thus have little opportunity to view the consequences of his actions, receive peer attention, or other idiosyncratic reinforcers when he would be required to immediately clean the floor. In addition, the prompt implementation of the procedures should serve to enhance their effectiveness in reducing the incidence of the preceding maladaptive responses. Azrin (1956), has shown that the effectiveness of an aversive

consequence is inversely proportional to the delay between the response and the aversive consequence.

For individuals who initially refuse or are unable to exhibit the required Overcorrective responses following verbal instruction, Azrin (1973) has developed the procedure of Graduated Guidance. The individual is manually guided by the trainer through the correct responses using only as much physical force as necessary. Verbal instructions are also given so that eventually, the individual should respond to verbal instruction alone.

In the recent study by Foxx & Azrin (1973), the effectiveness of Overcorrective procedures in eliminating several self-stimulatory behaviors was investigated. As self-stimulatory behavior, by definition, produces no known environmental consequence, therefore no environmental disruption occurs and hence Restitutional Overcorrection (the Overcorrection of the environmental disruption) would be inapplicable (Foxx & Azrin, 1973). However, Positive Practice Overcorrection could be used in these instances as long as functional or correct forms of the self-stimulatory behavior can be found.

In one case that Foxx & Azrin (1973) reported, efforts were made to eliminate stereotyped headweaving, a response similar to rocking, in a female retarded child. The rationale for the Overcorrective procedure was to teach the subject to hold her head still and move her head only for functional reasons such as when instructed to do so.

Briefly, the Positive Practice Overcorrection procedure consisted of restraining the subject's head immediately after head weaving responses began. The subject was then instructed to move her head to one of three positions: up, down or straight. If the subject did not immediately respond,

her head was manually guided using the graduated guidance technique. The subject was then required to hold her head in position for 15 seconds before another instruction was given. This procedure was continued for five minutes on every occurrence of head weaving.

In addition to accomplishing a shift in stimulus control for the head moving responses from a hypothesized internal source to an external source (the trainer's command), the authors also felt that this procedure would be educative in that the subject would learn specific responses to specific instructions such as "head up," "head down, " etc.

Once the Overcorrection was instituted and head weaving behavior had been absent for several days, a verbal warning procedure was put into effect that was designed to approximate usual consequences of such behavior. If the subject continued head weaving within a specified time following the verbal warning, the Overcorrective procedure was once again applied.

Results indicated that head weaving was virtually eliminated within daily six hour classroom sessions, 20 days after initiating the Over-corrective procedure. A later return to baseline conditions showed a recovery of head weaving to its previously high strength while further Overcorrective training again eliminated that response within five days. Later, verbal warnings continued to suppress entirely this behavior. It should be noted that the length of this Overcorrective training was lengthened to 20 minutes after the sixth day of the initial treatment condition and was later reduced to two minutes after the response was absent after four days.

The dramatic success of this procedure in the elimination of the self-stimulatory behaviors reported by Foxx & Azrin (1973) leads one to suspect that behaviors that are hypothesized to be in the same response

class as head weaving may be affected similarly by an Overcorrective procedure. Body rocking, which has previously been identified as a self-stimulatory behavior (Berkson & Mason; 1963, 1964), will be the target behavior of the present study. In addition to lending possible support for Foxx & Azrin's (1973) conclusion that Overcorrection is a useful technique to control self-stimulatory behavior, the present study is indicated for further reasons.

First, body rocking is the only self-stimulatory behavior that has had extensive evidence of attempts at control using techniques other than Overcorrection. (Browning & Stover, 1971; Gardner, 1971; Guess & Rutherford, 1967; Mulhern & Baumeister, 1967; Thompson & Grabowski, 1972). As mentioned previously, these earlier attempts at the control of rocking behavior have met with a limited degree of success. The application of Overcorrective training to rocking behavior would provide an opportunity to compare the effectiveness of treatment strategies across a single response topography.

Second, and of central importance in evaluating the usefulness of this technique, is whether or not desirable behavioral changes can be correlated with a reduction in body rocking. It has already been noted that a reduction in self-stimulatory behavior should enhance the effectiveness of behavior change programs by reducing non-attending behaviors (Bandura, 1971; Foxx & Azrin, 1973). These authors have further hypothesized that under conditions favoring the elicitation or acquisition of appropriate responses, elimination of self-stimulatory behavior may result in the appearance of more appropriate behavior. This is important, as it is a possibility that a treatment which merely eliminates rocking or other self-stimulatory behavior may render a person responseless

in certain situations or may lead to elicitation or acquisition of other types of inappropriate behavior. A treatment program that is effective in eliminating self-stimulatory behavior should therefore train alternate appropriate behavior that is functionally comparable to self-stimulatory responses. To be of worth to the individual, the behaviors replacing the self-stimulatory responses should be capable of providing eventually more reinforcement than that associated with self-stimulation. This evaluation demands that the behaviors to be trained to replace rocking behavior should involve activities that the individual could eventually perform to gain "natural" secondary reinforcement in the form of social approval from staff or peers, pride of accomplishment, or in the form of socially acceptable types of "stimulation" such as listening to music. Simple games that could be engaged in either a group or alone, assembly of simple puzzles, coloring in books and building structures or designs with blocks all would be likely activities that could replace self-stimulatory behavior. The present study will thus attempt to train behaviors that could functionally replace rocking and will evaluate the effectiveness of training by attempting to correlate a reduction of rocking with an increase in the occurrence of appropriate behavior both within training periods and in unstructured "free time" periods.

A final justification for this study was the application of Overcorrective training to adult retardates rather than child retardates and autistics. Applying this 0 overcorrection training procedure to an adult retardate who has exhibited self-stimulatory rocking behavior for a relatively long period of time should provide the severest test of it's effectiveness. Although Foxx & Azrin (1973) did not provide histories of their subjects'

self-stimulatory behavior, it seems reasonable to assume that adult retardates may have had longer histories of engaging in self-stimulatory behavior.

The following hypotheses were tested: 1) For all subjects, at least a 70% reduction in time spent rocking during daily sessions would be achieved during treatment as compared to baseline. This reduction was to be achieved during both training and free time periods within each session. In addition, this 70% reduction in rocking behavior would be maintained during the entire course of followup sessions where contingencies for rocking behavior were the same as in baseline. Although Foxx & Azrin (1973), reported complete suppression of self-stimulatory behaviors in their subjects after using Overcorrective procedures, a 70% reduction was chosen to take into account the possible greater difficulty in entirely eliminating this response after Overcorrective contingencies are lifted. It should also be sufficient to demonstrate the greater effectiveness of this procedure over other practically implemented treatment techniques.

2) The second hypothesis tested was that any reduction in rocking behavior during both treatment and followup could be correlated with a proportionate increase in appropriate behavior as defined by the experimenter. Although previous investigations have not determined possible consequences that reductions in rocking behavior may have on other behavior, it was felt that this increase would be the minimum that would yield a difference of practical importance.

Chapter 2

Method

Subjects

The subject pool consisted of 36 adult males residing in a state living unit for the severely retarded. These individuals ranged in age from 18 to 53 years, and all have been institutionalized for a significant portion of their lives. The 36 residents were all participating in a new program of environmental stimulation and behavioral management.

Three subjects for this study were selected initially on the basis of the following criteria: 1) the absence of obvious sensory or motor impairment and 2) body rocking behavior exhibited at a frequency of greater than 10% of the subject's waking hours when observed on his home living unit during two twelve hour periods from 7 AM to 7 PM. Body rocking was defined as more than two consecutive back and forth movements of the subject's upper trunk, observable at a distance of ten feet.

As this study employed a single subject experimental design, three subjects (replications) were determined to be sufficient to test the hypotheses outlined (Sidman, 1960). Furthermore, three subjects should have been the maximum that any one individual could train effectively given the severity of each subject's retardation. The addition of more subjects would have required either more individuals to train the subjects or the addition of more experimental sessions, both of which would have been impractical.

Table 1 summarizes the relevant characteristics of the subjects prior to beginning the study.

Insert Table 1 about here

Subject 2 was dropped from the study after the second baseline session due to his uncooperative behavior. Prior to the first and second baseline session, he had to be coerced into the experimental room. During the end of the first baseline session and the entire second baseline session, this subject refused to participate in any of the activities provided as well as refusing all of the consumable reinforcers available. He would generally sit in a corner of the room and moan, waving away anyone who came near him. Due to this lack of cooperative behavior, it was felt that the Overcorrective procedures would be difficult if not impossible to apply and that acquisition of recreational behaviors would be minimal. Under these circumstances, it would have been difficult to test the outlined hypotheses of this study with this subject.

Subject 4 was selected to replace Subject 2 at the end of the second baseline session. Although his observed frequency of rocking on his home living unit was only 6% of his waking hours, this subject came closest of any of the remaining potential subjects to the prescribed minimum 10% frequency of rocking behavior. Although selection of subject 4 violated the subject selection criterion, a reliance on only two subjects (replications) would have compromised the design of this study.

Trainers

Two staff members who worked with the 36 residents were selected to function as trainers for the study. Selection was based on an expressed interest in the study, general competence in working with the residents on the living units, and availability to work during times the experimental sessions were scheduled.

All members of the staff had at least a minimum degree of familiarity with principles of learning and techniques used to train the severely handicapped; therefore staff training for this study centered around refamiliarization with each chosen subject's specific behavior problems and deficits and the specific training methods to be used within the daily sessions.

The staff training was accomplished at first by an informal discussion with the two trainers and second, by two practice sessions where the trainers applied the recreational training programs with three trial subjects who were not chosen for the study. The practice sessions also gave the experimenter the opportunity to objectively evaluate trainer performance.

Informal discussion. An outline of the discussion topics described below was given to the trainers and appears in Appendix 1.

The informal discussion with the trainers allowed the experimenter to 1) familiarize the trainers with the specific purposes of the study and the reasons specific procedures were to be followed. As the trainers would later apply the Overcorrective treatment contingent upon a subject's rocking behavior, it would have been difficult to disguise or ignore the purpose of this treatment. The two trainers were thus informed of the major hypotheses of this study in order to insure that the direction of possible experimenter (trainer) bias could be determined accurately. A second purpose of this discussion was to 2) acquaint the trainers with their general responsibilities. These responsibilities included being on time for those sessions that they were to conduct and following the outlined session schedule as closely as possible. The discussion also enabled the experimenter to 3) instruct the trainers in the Overcorrective procedures. This entailed the experimenter

assuming the role of a rocking subject where both trainers demonstrated proficiency at applying Overcorrection including graduated guidance. In addition, the trainers were also informed of the procedure to follow when subjects were engaging in rocking or other inappropriate behavior during baseline and followup sessions. Finally, the discussion included 4) instruction in the training procedures and recreational target behaviors contained in Appendix 2 as well as a discussion of the Trainer Behavior Assessment Form. This checklist, taken in part from Lowther, Martin & McDonald (1971), was devised to assess staff behavior modification skills in applying operant programs with severe retardates. Two items from a similar checklist by Watson (1972) also appear in this checklist. The checklist was later applied by the experimenter during practice and experimental sessions to ensure that both trainers were functioning at a minimum effective skill level. Using their checklist, Lowther et al. (1972) determined that retardates' performance on a training task was positively correlated (.76 to .99) with trainer performance. Although the authors did not recommend a minimum score that would insure satisfactory subject performance, inspection of their data indicated that subject performance declined sharply whenever trainer performance dropped below 85% of the items scored correct. Accordingly, a minimum scoring criteria of 85% correct of the checklist items scored was used. A sample checklist form and scoring procedures manual with detailed scoring criteria appears in Appendix 3.

Practice sessions. During the two three hour practice sessions, the two trainers had the opportunity to practice and observe all procedures covered in the preceding discussion except those involving application of Overcorrection. The experimenter was present during the entire three

hour period to give guidance in how training procedures were to be applied. At the end of the first practice session, both trainers were evaluated by the previously mentioned checklist. Both trainers were judged individually while training the same practice subjects in the same set of randomly determined activities. A minimum score of 85% correct was required from both trainers before the probaseline sessions with actual subjects could begin.

To insure that proper trainer behaviors were being maintained throughout the study, each trainer was re-evaluated on the three subjects and a randomly chosen training activity during every fifth experimental session that they conducted. During these sessions, trainers were not told that they were being evaluated during the session. Again, the 85% correct score was required from the trainers over all further evaluations.

Finally, starting with the practice sessions, a "decision log" was kept by the trainers and experimenter to record clarifications of procedure or necessary changes in procedure. This insured that when a procedural problem arose, a record of the decision made would be available for future reference. If a problem was to arise twice, the decision concerning the problem should be the same both times.

Recording Procedures and Apparatus

Recording procedures. A random time sampling procedure was used throughout the study where the three subjects were observed by the experimenter during a pre-determined random five second interval each 60 seconds. This yielded up to 180 separate observations for each subject for each three hour session. Except during Overcorrective sessions, observations for a subject were suspended only when the subject

was not present in the experimental room. Generally, subjects were present at all times except for reasons noted in the procedure section. A sample data collection sheet appears in Appendix 4.

Although the relatively short length of the observation intervals minimized the problem of more than one behavior category occurring in a single observation interval, in the rare event where more than one category of behavior did occur, the behavior that occurred at the start of the observation period was chosen for recording.

Observed behavior was coded into one of four experimenter defined categories, each of which was mutually exclusive. The categories and criteria used during the six 20 minute training periods of the sessions were as follows:

1) Rocking behavior (scored "r" on the data collection sheet)- This category was defined by two back and forth movements of the subject's upper trunk, observable from a distance of 10 feet.

2) Inappropriate behavior (scored "-" on the data collection sheet)- This category included the following classifications of behavior: a) Other behavior which may be assumed to be self-stimulatory in nature such as head weaving, arm waving, pacing, and limb mouthing. b) Violent behavior such as hitting self, hitting others, threatening harm to others, abusive language directed towards others, destroying or attempting to destroy property in an obviously malicious manner. c) Out of seat behavior and non-on-task behavior such as when a subject who was supposed to be engaged in an activity that required sitting, was standing or when a subject who was supposed to be engaged in an activity that required standing, was sitting. Also, this category included engaging in activity not related to the activity scheduled

for that period of training. This included interrupting others and performing any other behavior incompatable with the concurrent performance of the required behavior.

3) Neutral behavior (scored "C" on the data collection sheet) - This category included behavior that was not on task yet was not clearly incompatable with on task behavior. This included standing or sitting and either staring or eating, drinking or smoking while engaged in no other behavior.

4) Appropriate behavior (scored "+" on the data collection sheet)- This category included behavior in which the subject was actively engaged in the task required. Talking to others was included when it was concerned with the task activity.

During six 10 minute free time periods that were scheduled for each session, no specific behavior was required of the subjects. This allowed each subject to engage in behavior that was most reinforcing and also provided an opportunity to observe behavior occurring under a second, less structured condition where instruction and reinforcers provided by the trainer were absent. Under inappropriate behavior, category c, out of seat behavior and non-on-task behavior was dropped from consideration during scoring with the exception that a subject could not interrupt other subjects engaged in appropriate behavior. Criteria for appropriate behavior was changed to engaging in any constructive activity (coloring, puzzle assembly), any gross activity (throwing a bean bag), social interaction (talking or playing with others), grooming behavior (straightening clothes, blowing nose with a tissue). Criteria for neutral behavior remained the same as above.

To insure that coded observations of behavior reliably reflected behavior that occurred within the observation intervals, inter-observer agreement measures were taken at several points during the study. In order to determine initial reliability of observation, a random one hour block of observations across subjects and behavior codes, selected from the first prebaseline session, was subjected to simultaneous observing and recording by a second, independent observer. During this period, both observers, while in view of each other, made their recordings with no consultation.

As the units of observation were relatively small and the chance rate of inter-observer agreement low ($.25^2+.25^2+.25^2+.25^2=.25$, assuming the subjects exhibited the four categories with equal frequency), the following percent agreement calculation was considered appropriate (Johnson & Bolstad, 1973):

$$\text{percent agreement} = \frac{\text{number of agreements}}{\text{number of agreements}+\text{number of disagreements}} \times 100$$

As an agreement score of at least 80% is considered minimal for accurate evaluation of recorded data (Johnson & Bolstad, 1973), baseline recording was not begun until this minimum score was met.

In order to determine the extent of what Campbell & Stanley (1966) have termed "instrument decay" in using humans as observing and recording instruments, two additional one hour blocks of observations across subjects were chosen from a random Overcorrection session and the second to last followup session. An 80% agreement score was again the minimum acceptable agreement figure.

Apparatus. An accurate wristwatch with sweep second hand indicating time to the nearest second was employed to time behavioral observations as well as the length of the three hour sessions. During the Overcorrective treatment sessions, a 1/10th second stopwatch was employed to time the length of the Overcorrective training. A complete

listing of all apparatus required during every session appears in Appendix 5.

Design

Although this study dealt with the behavior of the three subjects as it occurred concurrently within consecutive three hour experimental sessions, the data obtained were subjected to idiographic analysis. The design employed single baseline, treatment and followup phases for each subject. The independent variable consisted of contingent applications of Overcorrective procedures following initiation of body rocking on six consecutive treatment sessions. Baseline and followup consisted of a minimum of four sessions prior to treatment and a minimum of four sessions following treatment where rocking behavior was generally ignored by the trainer.

The introduction of treatment and followup was staggered for each subject to control for possible temporal factors that could have operated for all three subjects. As this overlap of experimental conditions prevented more than one subject from receiving the Overcorrective treatment during any one session, the trainers were not required to perform the impossible task of administering the Overcorrective treatments to more than one rocking subject. Also, the overlap allowed the opportunity to observe possible modeling effects of one subject observing Overcorrection being applied to another subject during the sessions. When the Overcorrective contingencies were introduced for one subject, the rocking behavior of the other two subjects should have remained unaffected. If rocking decreased in subjects not in treatment after Overcorrective training procedures were applied to a subject who was in treatment, a modeling effect could be hypothesized.

Table 2 illustrates the scheduling of the experimental sessions:

Insert Table 2 about here

In order to monitor hypothesized behavioral changes in addition to reductions in rocking behavior, a multiple baseline was used where dependent variable observations consisted of coded instances of experimenter defined body rocking, appropriate behavior, inappropriate behavior, and neutral behavior.

Procedure

Daily three hour sessions were conducted in a quiet, 9' by 17' room off the subjects' usual living area. The three hour session length was chosen as a practical time period that would be both long enough to determine treatment effectiveness yet short enough to maintain the close control of contingencies required to interpret accurately the obtained data. It was not expected that these three hour sessions would control behavior during the remainder of the subjects' day. However, the Overcorrective contingencies as implemented in this study could be practically extended with the goal of controlling rocking behavior during the subjects' entire day.

The experimental room was furnished with typical classroom furniture as well as a variety of recreational and educational items. The sessions were scheduled from 9 AM ot 12 noon, Monday through Friday. Immediately following the sessions, lunch was served with a period of rest following. This time period was chosen in order to provide maximum opportunity for the emission of rocking responses. In a previous study, Kaufman & Levitt, (1965) found that peak rates of self-stimulatory behavior typically occur prior to meals and rest.

The three subjects were all present in this room along with one of the two trainers who conducted the sessions and the experimenter-observer who sat in one corner of the room. Subjects were allowed to leave the experimental room only if they became ill or requested to go to the lavatory. The trainers alternated days that they conducted the sessions while the experimenter-observer was present during all sessions. The experimenter-observer did not interact with any of the subjects and spoke only to help the trainer stay on the prearranged schedule or to correct gross errors made by the trainer. This experimenter intervention was designed for only limited use to prevent any possibility of drastic decay in trainer performance between the formal Trainer Behavior Assessment checks.

Activity within the three hour sessions was designed around the training of recreational or educational activities that the subjects could eventually perform with little supervision. The following activities were trained for 20 minutes each session: 1) Exercises, which included hands over head stretch, toe touch, side stretch, and jumping or hopping. 2) Shape sorting, where the subjects were required to insert up to five different three dimensional geometric shapes into proper holes of a shape sorting box. 3) Jigsaw puzzles, where the subjects assembled a four to six piece wooden jigsaw puzzle. 4) Music listening, where the subjects turned off and on a cassette tape recorder and clapped or tapped their feet in response to the music beat. 5) Paper, crayon and scissor work where the subjects colored in picture outlines, copied simple drawings and cut paper with scissors. 6) A bean bag game where the subjects threw a bean bag into a target, smiled or clapped for their partners and retrieved the bean bag for their partners. Consult Appendix 2 for a precise description of the training procedures for each activity.

Training on these activities followed closely an operant paradigm

where each subject was reinforced with primary reinforcers and/or verbal praise on elicitation of an approximation of a desired response or the desired response itself. In order to insure continuity of training from session to session, a brief subject assessment form was filled out daily by the trainer to indicate subject performance for that day on each of the six recreational activities. This form, filled out during each recreational activity period, provided the trainer with the opportunity to grade the subject at one of four levels of responding from "no response" or"resists training" to "performing the activity on command of the trainer." A space for additional comments by the trainer appeared at the end of the form. A sample subject assessment form appears in Appendix 6.

In addition to training periods, periods of free time were scheduled to allow additional opportunities for subject initiated responses. Here, the trainer remained passive and interacted with a subject only if the subject initiated the interaction or, during the Overcorrective phase, if the subject began rocking.

Scheduling within each session further allowed approximately equivalent periods of one to one interaction between the trainer and each subject. The daily schedule followed throughout the study appears in Table 3.

Insert Table 3 about here

Pre-baseline and baseline procedures. In order to determine intial intercoder agreement as well as to allow the subjects to acclimate to the new physical and social conditions, the first baseline session was not

included in determining baseline frequency or stability for any behavior. Baseline recording was started on the session after the minimum 80% inter-observer agreement figure was met.

During pre-baseline and baseline, occurrences of rocking behavior and occurrences of other inappropriate behavior was ignored whenever possible. When rocking or other forms of inappropriate behavior directly interfered with interaction between the trainer and subject, a simple "(name of subject), no, stop (name of behavior)" was delivered.

At the end of the fourth baseline session, a measure of instability for all measured behavior categories was taken for each subject in the following manner. A percent of observations was computed for each measured behavior for each of the four sessions. The overall mean of the first two sessions (M1), the overall mean for the second two sessions (M2) and the grand mean of all the sessions (Mg) was then computed. The values obtained were then inserted into the following formula (Tiller, 1973):

$$\text{Instability score} = \frac{M1 - M2}{Mg}$$

In order to judge accurately the effects of subsequent Overcorrective treatment, the differences between M1 and M2 should be less than 30% of the grand mean for each subject (Tiller, 1973). This predetermined criterion avoids the experimenter's arbitrary "criterion by inspection" determination that a stable steady state has been reached when obtained data meet his expectations (Sidman, 1960, p. 265). Although the criterion chosen was not as rigorous as suggested by researchers familiar with laboratory animal behavior (Sidman, 1960, p. 260), control procedures

necessary to achieve such a highly stable steady state would not have been practical in this applied setting.

If the differences between M1 and M2 were greater than 30% of the grand mean for any subject for any one of the four measured categories of behaviors, the baseline for that subject was to be continued in two session increments with stability calculated following each additional second session until the 30% criterion was met.

The order in which subjects underwent Overcorrective treatment was determined on the basis of the subject reaching the baseline stability criterion first. If more than one subject met the stability criterion at the same time, selection was to be on the basis of random assignment.

Overcorrective treatment procedures. At the completion of the baseline phase for each subject, the Overcorrective treatment phase began. Here, session schedule and interaction with the subjects remained exactly as in baseline except that the Overcorrective training procedures were instituted whenever it was observed by the trainer that the subject was engaged in defined rocking behavior.

The Overcorrective procedures instituted followed closely the rationale for Overcorrection of head weaving outlined by Foxx & Azrin (1973). A functional form of rocking behavior is moving the upper trunk back and forth in response to a verbal command from the trainer. This functional movement training was implemented in the following manner. At the end of the second consecutive back and forth movement of the subject's upper trunk, the trainer immediately warned the subject, "(Name of subject), no, stop rocking." Following this, the subject was restrained from rocking further if he did not immediately cease rocking. This required that the trainer hold both of the subject's shoulders

while the trunk was held in an upright position. To facilitate Overcorrective training, if the subject was seated in a chair with a back, he was instructed to sit on the edge of the chair.

Next, the subject was instructed to complete one half of the rocking cycle and remain in that position for 30 seconds. The instruction was "lean forward." When the first half of the rocking cycle was maintained for 30 seconds, the subject was then instructed to return to the upright position. The instruction was to "sit straight." When the subject had returned to the upright position, another instruction to complete the rocking cycle was given. The instruction was to "lean back." The subject was then required to maintain this position for 30 seconds before the instruction to "sit straight" was given. In order that the subject would respond to the verbal instructions rather than the mere sequence of instructions, the order of the back and forth commands was randomized for each application of Overcorrection. These trainer elicited back and forth movements were continued for 10 minutes, a time period comparable to that chosen by Foxx and Azrin (1973) in their application of Overcorrection.

A graduated guidance procedure described by Azrin (1973) and Foxx & Azrin (1973) was utilized with those subjects who initially exhibited no response to the verbal instructions. In these cases, following the appropriate verbal command, the subject's shoulders were held by the trainer and were guided through the movements using only as much physical force as required. Whenever the trainer felt the subject continuing movement on his own, the trainer immediately relaxed his grip on the subject's shoulders. Whenever the subject ceased or began slowing his responses, the trainer tightened his grip and moved the shoulders once again.

Until the subject reliably responded to the verbal instruction alone, the trainer always at least "shadowed" the subject's shoulders in order to continue the forward movement of the response if the subject ceased or slowed movement.

As institution of the Overcorrective procedures for any subject necessarily interrupted the session training schedule, no behavioral observations were recorded while any subject was performing the Overcorrective procedures. For the subject receiving Overcorrective treatment, recording of rocking responses was of course , at an artifically low level as all rocking immediately resulted in Overcorrection. The remainder of observational categories (appropriate, inappropriate and neutral behavior) were recorded as usual when the subject was not engaged in Overcorrection.

In order that the behavioral observations would represent accurately behavior within that session, at least 60 minutes of observation time must have remained when the time of the combined Overcorrective treatments were subtracted from the overallsession length. If less than 60 minutes of observation remained (that is, if a subject was engaged in Overcorrection more than a total of 120 minutes) the observations for that session were to be discarded for all subjects. It should be noted that the imposition of the ten minute Overcorrective training for each instance of rocking placed a ceiling of 12 rocking attempts per session on each subject (12 rocking attempts X 10 minute Overcorrective training= 120 minutes). Although data from sessions where the subject rocked more than 12 times would have been discarded, the absolute ceiling for emission of rocking responses during the Overcorrection sessions would have been 13 (13 rocking attempts X 10 minute Overcorrective training = 180 minutes, the total session length).

Followup. At the completion of the sixth Overcorrection session for each subject, a followup phase which lasted a minimum of four days was instituted. This phase of the study was designed to approximate realistic consequences of rocking in the future. Contingencies for rocking behavior were essentially the same as during baseline where rocking as well as other inappropriate behavior was ignored except where it interfered with a one to one interaction with the trainer. In these cases, the same "No, stop (the name of the behavior)" was delivered as in baseline. A return to baseline contingencies would not necessarily result in a return to baseline behavior as the previous Overcorrective training would hopefully result in the entire stimulus complex of the experimental room and especially the trainers becoming discriminative for not engaging in rocking behavior. In addition, the occassional instructions to "stop rocking" given when rocking interfered with one to one interaction with the trainer should have been more effective in suppressing this behavior since it had been previously associated with the Overcorrective training. Also, hypothesized additions of appropriate behavior to each subject's response repertoire should have resulted in the rocking response becoming less prepotent.

The absence of the disruptive Overcorrection allowed an examination of the effectiveness of the prior treatment during this final phase. A computation was employed to determine how close treatment procedures came to reaching both goals of a reduction in rocking and an increase in appropriate behavior. This was obtained by dividing the actual amount of change in the target behaviors by the desired amount of change (Tiller, 1973):

$$TE = \frac{Bmg - Fmg}{Bmg - Tog} \times 100$$

TE is the percent of treatment effectiveness, Bmg is the baseline grand mean for either rocking or appropriate behavior, Fmg is the actual treatment or followup grand mean for either rocking or appropriate behavior, and Tog is the treatment and followup outcome goal. For rocking behavior, this goal equaled a 70% reduction in rocking behavior or a reduction to 30% of the baseline grand mean. For appropriate behavior, Tog equaled the percent reduction in rocking behavior from baseline to followup added to the baseline grand mean for appropriate behavior for that subject. For example, suppose that during baseline for a subject, rocking behavior occurred at a frequency of 30% of the baseline observations while appropriate behavior occurred at a frequency of 20% of the baseline observations. During treatment and followup, rocking behavior was reduced to 10% of the observations. Time spent rocking for this subject was thus reduced 20 percentage points. To find the treatment outcome goal for appropriate behavior, these 20 percentage points would be added to the appropriate behavior baseline grand mean which was 20%. In this instance, Tog for appropriate behavior would be an increase in appropriate behavior to 40% of the treatment or followup observations.

By specifying target behavior goals prior to implementation of the treatment procedures, one may avoid possible errors similar to those found in the previously discussed criterion-by-inspection method of evaluating the stability of baseline data. By specifying goals prior to obtaining the actual data, the experimenter does not arbitrarily decide whether or not the obtained data yields the desired treatment success.

Chapter 3

Results I

Trainer Assessment

During the practice session prior to beginning data collection, both trainers performed above the minimum 85% correct on the Trainer Behavior Assessment Form (Lowther et al., 1971). Further assessment of trainer behavior throughout the course of the study yielded scores ranging from 85% to 94% correct. Table 4 summarizes all scores received by both trainers.

Insert Table 4 about here

Interobserver Reliability

Reliability of observation during the prebaseline session yielded 88% agreement between the two independent observers. All other agreement checks during the Overcorrection and followup sessions yielded agreement ranging from 84% to 89%. Table 5 lists the results of the reliability checks performed during the course of data collection.

Insert Table 5 about here

Baseline Stability

A stable baseline had been obtained for subject 1 by the sixth baseline session. Therefore, Overcorrection was instituted with this subject first. At the end of the six Overcorrection sessions for subject 1,

subject 3 started Overcorrective training next, as the instability score fell below 30% for all measured behaviors for only this individual. By the end of the six Overcorrection sessions for subject 3, subject 4 had completed 16 baseline sessions. Although the instability score for rocking behavior was still above the maximum criterion at 54% for this subject, Overcorrection was started on the next session. The reason for this apparent violation of the stability criterion was that rocking behavior, the only behavior category out of the four measured that did not meet the stability criteria, was occurring at a low rate, generally around 5% of the observations. When behavior occurs at this low a rate, small fluctuations in the frequency of [illegible] behavior can result in the baseline not meeting the stability criterion. The instability score is more sensitive to small changes in behavior the lower the frequency that the behavior occurs. As the difference in mean frequency of rocking behavior between the first half of the baseline sessions (M1) and the second half of the baseline sessions (M2) was only 3 percentage points, the stability criterion was ignored in this instance.

Comparison of Subject Selection Rocking Behavior Samples with Baseline Rocking Behavior

A comparison between rocking behavior sampled to determine subject selection with baseline rates of rocking for the same subjects indicated little correspondence between rates of this behavior for three out of four of the subjects. Only subject 4 showed rates of rocking that were comparable across the two 12 hour behavior samples and baseline. Table 6 shows the difference in rocking frequencies for each subject.

Insert Table 6 about here

Treatment Effectiveness and Related Behavior Measurements

Subject 1. Figure 1 shows mean percent frequency of all measured behaviors across successive blocks of sessions. During the six session

---

Insert Figure 1 about here

---

treatment phase where Overcorrection was contingently applied for rocking, rate of rocking was reduced from a baseline average of 8.4% to 1.2% during training periods. During free time periods, rocking was reduced from a baseline average of 15.3% to 0.7% during treatment. Calculating treatment effectiveness on the basis of 100% treatment effectiveness equalling a 70% reduction in rocking, this reduction amounted to a 123% and a 136% treatment effectiveness during training and free time periods respectively.

During the 18 followup sessions, the rate of rocking averaged 3.3% during training periods and 9.2% during free time periods. Treatment effectiveness thus decreased during followup to 87% and 57% of the treatment outcome goal, during training and free time periods respectively. For this subject, the hypothesis that an average 70% reduction in rocking behavior would be maintained throughout all followup sessions was not confirmed.

Figure 1 also shows that the average frequency of appropriate behavior for this subject remained nearly the same during baseline, treatment and followup phases. Although during training periods, the treatment outcome goal of increasing appropriate behavior to 40% (35%[mean frequency of appropriate behavior during baseline] + 5%, [the decrease in frequency of rocking behavior from baseline to followup] = 40% [treatment outcome goal]),

was nearly met by an obtained 39% frequency of appropriate behavior, the measures of inappropriate and neutral behavior did not remain at a stable enough rate to allow a meaningful measure of treatment effectiveness to be taken. Frequency of inappropriate and neutral behavior both changed over sessions in amounts that were in excess of the increase in appropriate behavior. Calculation of treatment effectiveness for free time appropriate behavior would have been similarly pointless as the frequency of inappropriate and neutral behavior again both changed over sessions in amounts that were in excess of the changes in rocking and appropriate behavior.

Subject 3. Figure 2 shows mean percent frequency of all measured behaviors across successive blocks of sessions for subject 3.

Insert Figure 2 about here

During the six session phase where Overcorrection was contingently applied for rocking behavior, frequency of rocking was reduced from a baseline average of 25. 4% to 1.6% during training periods. During free time periods, rocking was reduced from a baseline average of 34.6% to 1.3%. Calculating treatment effectiveness, this reduction amounted to a 134% and 137% treatment effectiveness during training and free time periods respectively.

Over the next 12 followup sessions, mean rate of rocking behavior returned to nearly the baseline rate at 22.9% during training and 29.7% during free time periods. Treatment effectiveness during followup was thus only 14% of the expected 70% decrease in rocking behavior during training periods and 20% of the expected decrease during free time periods.

For this subject, the hypothesis that a 70% reduction in rocking behavior would be maintained over all followup sessions was thus not confirmed.

Figure 2 also shows that there was a slight increase in appropriate behavior over sessions during training periods. However, this increase was not accompanied by a rise in free time appropriate behavior. As the changes in rocking behavior during both training and free time periods were on the whole negligible, the hypothesis that a decrease in rocking behavior would be accompanied by an increase in appropriate behavior could not be tested with this subject. Ability to evaluate the hypothesis as outlined hinged upon finding an appreciable decrease in rocking behavior from baseline to followup.

Inspection of the remaining graphs showing frequency of inappropriate and neutral behavior reveals little other than a slight increase in inappropriate behavior during treatment and followup when compared with baseline.

Subject 4. Figure 3 shows mean percent frequency of all measured behaviors across successive blocks of sessions for subject 4. It can

---

Insert Figure 3 about here

---

be seen that this subject exhibited rocking behavior at a relatively low rate during baseline; 5.5% during both training and free time periods. During the six session Overcorrective treatment phase, rocking was virtually eliminated which amounted to a 143% treatment effectiveness during both training and free time periods. During the six sessions of followup, frequency of rocking recovered to an average frequency of 2.3% during training periods and 3.0% during

free time periods. This equalled an 84% treatment effectiveness during training periods and a 64% treatment effectiveness during free time periods. It should be noted that actual changes in the frequency of sampled rocking behavior from baseline to followup were quite small and the above treatment effectiveness scores give a spuriously high estimate of treatment effectiveness. For this subject, the hypothesis that an average 70% reduction in rocking behavior would be sustained throughout all followup sessions was thus not confirmed.

Although increases is appropriate behavior during training periods were negligible, there was an increase in free time appropriate behavior over sessions. This pattern was not evident with the other two subjects. However, because this trend was evident during baseline, it would be incorrect to assume that this increase could be related to any decrease in rocking behavior. Also, neutral behavior during free time showed a decrease in frequency greater than that for rocking. The hypothesis that a reduction in rocking behavior could be correlated with an increase in appropriate behavior was thus not confirmed for this subject.

Inspection of Figure 3 also shows that frequency of inappropriate behavior across sessions occurred at a uniformly low rate throughout the study, much lower than that for either of the other two subjects.

Additional Findings

Modeling or temporal effects. It was proposed that by overlapping institution of Overcorrective treatment for each subject, possible temporal factors or modeling effects could be discovered. However, analysis of measured behavior categories for individual sessions across subjects yielded no evidence that these factors were operating. Rocking behavior in one subject, along with other behavior categories, seemed unaffected when another subject started Overcorrective training.

Rocking behavior during music listening and other training periods. Over the course of data collection, it became evident that for at least subject 1, rocking behavior seemed to occur most frequently during the Music Listening periods when compared with all other training periods. Over all sessions of baseline and followup, this subject was observed to rock an average of 3.08% during all training periods other than Music Listening. Over these same sessions this subject was observed to rock an average of 10.66% during Music Listening periods. A single factor analysis of variance for repeated measures yielded a significant difference, $F = 8.53$ (d.f. 1,23), $p < .01$ in the percent of rocking behavior during Music Listening and all other training periods across baseline and followup sessions. The results of analyses of variance for rocking behavior during these same periods with the other two subjects did not yield statistically significant differences.

Chapter 4

Treatment 2

Data obtained during previous phases of this study indicated that it would be desirable to investigate new methods of increasing the frequency of appropriate behavior during the recreational training sessions. By increasing appropriate behavior, it may also be possible to further decrease the frequency of rocking behavior without continued use of the time consuming Overcorrection.

Analysis of data obtained during followup indicated that while all subjects added new recreational behaviors to their repertoire during the course of the study, this was not accompanied by a stable increase in sampled appropriate behavior. Further, for just one subject (subject 1) rocking behavior was only reduced 50% during followup when compared with baseline. The other two subjects experienced only negligible reductions in frequency of rocking.

Although subject 4 experienced a considerable increase in appropriate behavior during free time, it was not entirely clear why there was no proportionate increase in appropriate behavior during training periods. Further, for subjects 1 and 3, increases in appropriate behavior were negligible during both training and free time periods. One explanation would be that the training procedure put the display of appropriate behavior under the stimulus control of the trainer's instructions to engage in a specified recreational behavior. During training, numerous trainer instructions to engage in this or that behavior were used to facilitate subject responding and it may have been that the subjects

used these commands to discriminate when trainer delivered reinforcers would be forthcoming. A change in procedure to allow for only the reinforcement of subject initiated appropriate behavior should encourage the display of a greater amount of appropriate behavior than was evident during followup. Also, it would be hoped that a procedure to encourage the display of more appropriate behavior would have the effect of further reducing rocking behavior for all subjects.

In order to investigate the hypothesis that performance of appropriate behavior was under the stimulus control of the trainer's instructions to engage in a particular behavior, the experimental procedure was changed to generally allow for the reinforcement of subject initiated appropriate behavior only. If subject displayed appropriate behavior was under the control of trainer commands, this change in reinforcement procedure should increase the frequency of appropriate behavior when compared with the followup phase of this study.

Except where noted below, procedures of treatment 2 remained the same as in the previous followup sessions.

Trainers

The same trainers used during the previous portions of this study were used during this treatment phase. To familiarize each trainer with the change in procedure, an informal discussion was held where the procedure as described below was presented. The trainers then had a chance to practice the new procedure during a one-half hour practice session using trial subjects not chosen for the study. During this session, where each trainer conducted the procedure for 15 minutes, the experimenter-observer evaluated their behavior using the same Trainer Behavior Assessment Form used previously. The only change was that the categories

"Shaping and Chaining" and "Data Collection" which were essentially irrelevant for this treatment were deleted from evaluation. A minimum score of 85% of the scored items correct had to be achieved on this assessment before the treatment was allowed to begin. To insure that proper trainer behavior was maintained through the course of treatment, the trainers were assessed on the last session that they conducted without their knowledge.

Recording Procedures and Apparatus

Recording procedures. The same random time sampling procedure was used throughout this five session treatment that was used during the previous portions of this study. As the session length was reduced to one hour and 48 minutes (see procedure section for explanation), each session yielded up to 108 separate observations for each subject. A sample data collection sheet appears in Appendix 7.

Observed behavior was coded into one of six experimenter defined categories, each of which was mutually exclusive. For two categories, rocking behavior and neutral behavior, scoring criteria remained the same as in the previous portions of this study. The categories that were changed or added were as follows:

1)Other self-stimulatory behavior (scored "ss" on the data collection sheet) - This category included head rocking, arm waving, pacing, hand posturing, repetitive finger movements etc. This category was separated from the inappropriate behavior category as it was observed that during previous portions of the study, for some subjects, virtually all scored inappropriate behavior appeared to be self-stimulatory in nature.

2) Other inappropriate behavior (scored "-" on the data collection sheet) - This category included violent behavior such as hitting self or

others, abusive language directed toward others, destroying or attempting to destroy property in an obviously malicious manner.

3) Appropriate behavior (scored "+" on the data collection sheet)- This category included performance of any recreational activity such as coloring, assembling puzzles, throwing a bean bag, etc. This category also included grooming behavior such as straightening clothes or blowing nose appropriately.

4) Social interaction behavior (scored "si" on the data collection sheet) - This category included the utterance of vocal sounds. The scoring criteria was individualized for each subject as each was capable of different levels of verbal responding at the start of treatment 2. Each subject was scored and reinforced for social interaction behavior if each met the following criteria. For subject1&3 this included uttering an audible word and for subject 4 this included uttering at least a two word phrase. This category was separated from the appropriate behavior category in order to monitor this most important social behavior.

In order to determine initial reliability of observation, the 30 minute practice session using practice subjects was subjected to simultaneous observing and recording by a second independent observer. During this period, both observers, while in full view of each other, made their recordings without consultation. As the units of observation were small and the chance rate of inter-observer agreement low ($.167^2 + .167^2 + .167^2 + .167^2 + .167^2 + .167^2 = .167$, assuming the subjects exhibited the six categories with equal frequency), the same

percent agreement calculation used during the previous portions of the study was again utilized. Treatment 2 was not started until at least an 80% agreement score was obtained.

During the second to last treatment 2 session, a random 30 minute time block was again scheduled for reliability analysis. This insured that the previously discussed "instrument decay" (Campbell & Stanley, 1966) had not occurred and that scoring remained equivalent throughout the five sessions.

Apparatus. An accurate wristwatch with a sweep second hand indicating time to the nearest second was employed to time behavioral observation intervals as well as length of contingent reinforcement and nonreinforcement periods and overall length of the session. A 1/10th second stop watch was supplied to the trainer to time delivery of reinforcers during the sessions.

The same recreational equipment used during previous portions of this study was used during treatment 2. However, in order to allow a choice of activity during the sessions, all equipment was arranged in the center of a four by six foot table about which the subjects were seated.

Design

Although the total session length and the procedure of reinforcing appropriate behavior was altered from the original procedure, this second treatment was designed to be comparable to previous portions of this study. Additionally, since the trainer was to reinforce only one subject at a time during discrete six minute time blocks each 18 minutes, the remaining 12 minutes functioned as a probe for generalization of appropriate behavior from the reinforced periods.

The order that each subject was to go through these reinforced periods was counterbalanced within each session so that each subject received this condition twice at the beginning, middle and end of one of the six 18 minute periods.

The independent variable was the contingent reinforcement of subject initiated appropriate or social interaction behavior by the trainer during six 6 minute observation blocks each session. Dependent variable measures consisted of coded instances of the previously mentioned experimenter defined behavior.

Procedure

Daily 1 hour and 48 minute sessions were held in the same experimental room, started at the same time and used the same furnishings as in previous phases of this study. The new session length was chosen to closely match the total length of the six 20 minute training periods used during previous phases of the study while allowing an equal number of observations for each subject where appropriate or social interaction behavior was reinforced. Each of the six periods was thus 18 minutes long during which 12 minutes of each period appropriate or social interaction behavior was not reinforced by the trainer. During the

remaining six minutes of the period, subject initiated appropriate behavior was reinforced with praise and a consumable reinforcer according to a schedule described later in this section. Subject initiated appropriate behavior was defined as behavior meeting the scoring criteria for appropriate or social interaction behavior when such behavior did not follow a command or instruction by the trainer to engage in the behavior being performed.

The subjects never knew which phase that they were in for the order in which they went through the six minute reinforcement phases was changed in accord with the counterbalancing procedure described previously. The counterbalancing procedure took into consideration the possibility that subject behavior could change from the beginning to the end of each period, independent of trainer behavior. The trainer was given a list of when each subject was to receive contingent reinforcement for each period prior to every session. The observer informed the trainer when to switch to reinforcing the next subject by merely telling him or her of the time left for that period; 12 or 6 minutes left.

Subjects remained in the experimental room throughout each 18 minute period and were generally allowed to leave the room only if they became ill or requested to go to the lavatory. To minimize these breaks, at the end of each 18 minute period, the trainer asked each subject if he had to go to the bathroom. If any wanted to go, recording was suspended until all subjects and trainer returned to the experimental room. In any case, recording was suspended for at least two minutes at the end of each period to allow the trainer and observer to relax or light a cigarette, etc.

Activities available to each subject during each session period were the same as was available during previous phases of the study. A change from the previous procedure however, was that no specific activity was required for each 18 minute period. Subjects could engage in whatever activity they wished, provided that they did not disrupt the other subjects or trainer. This allowed the subjects to engage only in those recreational activities they found most reinforcing. Also, it allowed them to use the recreational materials in ways not originally trained, such as stacking shape box blocks into towers or playing catch with the bean bag. The only exception to this was that the cassette tape player was available to play only during the fourth 18 minute period of each session. This was due to the finding that rocking behavior for one of the subjects appeared most frequent during the Music Listening period during previous phases of this study.

In order to approximate contingencies for rocking behavior that were in effect during the previous followup phase, subjects were occasionally instructed to stop rocking whenever they were discovered rocking by the trainer. During the previous followup, subjects 1 and 3 received an average of about four instructions to stop rocking per session. Subject 4 received less than one instruction to stop rocking per session. The experimenter-observer instructed the trainer during the session if he or she had delivered as many stop rocking instructions to a subject as was the average for the followup sessions. The instruction given was "You've given enough stop rocking instructions to this subject today." This insured that possible increases or reductions in rocking behavior during this phase of the study when compared with followup were not due to just a greater or fewer number of stop rocking instructions given

when compared with followup. In order that the trainer would not use these instructions to excess, the trainer was never told how many "stop rocking" instructions could be given to a subject during each session.

Appropriate and social interaction behavior was contingently reinforced by the trainer according to the previously discussed conditions and prearranged schedule. Reinforcers for all subjects consisted of verbal praise and, when applicable, consumable reinforcers delivered simultaneously. During the reinforcement condition, praise was delivered immediately following the initiation of an appropriate activity by the subject, and praise and a consumable reinforcer was delivered approximately every 30 seconds when that activity was continued. Consumable reinforcers were not delivered immediately following initiation of appropriate behavior due to its possible disruptive effect on these behaviors. Also, for this reason, frequency of delivery of consumable reinforcers was reduced over sessions where possible.

Because subject initiated social interaction behavior was discrete in occurrence, usually consisting of a short word or phrase, a consumable reinforcer could be delivered following every occurrence of social interaction behavior. As the disruptive consumable reinforcer was delivered after the response was complete, it did not interfere with the occurrence of the response.

The inclusion of social interaction behavior as a separate reinforceable behavior recognizes the importance of this type of behavior in facilitating the delivery of reinforcers to the individual. While not usually thought of as a recreational behavior, social interaction, especially verbalizations, could provide the subjects with a variety of reinforcers from the environment. For each subject, social interaction

was reinforced at a level on which the subject functioned at the start of treatment 2 (Specific criteria for reinforcing this behavior for each subject was the same as it appears in the scoring criteria section under recording procedures).

In order to initiate appropriate responding at the beginning each 15 minute period for those subjects who did not immediately choose an activity from the center of the table, the trainer first asked the subject "(subject's name), what do you want to do?" while pointing to each piece of recreational equipment. If the subject failed to select an activity, the trainer then placed four pieces of recreational equipment in front of the subject. While showing the subject each item (a shape sorting box, a puzzle, paper and crayons and a beanbag), the trainer asked "(subject's name), do you want to do this?" As each subject had prior experience with manipulating each of these items, there should have been no problem for the subjects to manipulate successfully any of the items presented. If the subject still did not choose an activity, one item was placed before him to allow the opportunity to manipulate it later in the period.

Chapter 5

Results Treatment 2

Trainer Assessment

During the practice session prior to starting treatment 2, both trainers performed above the minimum 85% correct on the Trainer Behavior Assessment Form (Lowther et al., 1971). Further assessment of trainer behavior during the last session that each conducted were similarly satisfactory. All scores obtained by each trainer appears in Table 7.

Insert Table 7 about here

Interobserver Reliability

Reliability of observation during the practice session yielded 89% agreement between the two independent observers. When interobserver reliability was checked on the fourth treatment 2 session, agreement was again satisfactory at 83%.

The experimenter and second observer both felt that higher agreement figures would have been obtained during all phases of this study except for the fact that it was difficult for two observers to observe each subject at precisely the same moment even within the constraint of a five second observation interval.

Treatment Outcome

Subject 1. Figure 4 shows percent frequency of all measured behaviors across five successive treatment 2 sessions for subject 1.

Insert Figure 4 about here

During treatment 2, a large increase in frequency of appropriate behavior (appropriate behavior plus social interaction behavior) over comparable followup periods was evident only during the non-reinforcement periods. As inspection of the performance of appropriate behavior across individual sessions of treatment 2 revealed no trend towards an increase in these behaviors, the hypothesis that the performance of appropriate behavior was under the stimulus control of trainer instructions during the previous phases of the study could not be confirmed.

Social interaction behavior similarly showed no trend towards an increase in frequency over individual sessions. This behavior averaged less than 4% of the observations during both contingent reinforcement and non-reinforcement periods.

Figure 4 also shows a reduction in time spent rocking from followup to an average of 2.8% during the contingent reinforcement periods. When calculating treatment effectiveness for this procedure against baseline training periods, 95% of the 70% reduction in rocking behavior was achieved. During non-contingent reinforcement periods, rocking was reduced to 1.4% of the observations, which equals a 130% treatment effectiveness when compared against frequency of rocking during free time periods of baseline.

When comparing frequency of neutral behavior with frequency of appropriate behavior on a session to session basis, note that there is a negative correspondence between the two behaviors. An increase or decrease in one behavior was reflected in an opposite change in frequency for the other behavior.

It should also be noted that during treatment 2 where self-stimulatory behavior other than rocking was separated from previous criteria for inappropriate behavior, all inappropriate behavior recorded was self-stimulatory.

Subject 3. Figure 5 shows percent frequency of all measured behaviors across five successive treatment 2 sessions for subject 3.

Insert Figure 5 about here

During treatment 2, performance of appropriate behavior was not increased as expected during contingent reinforcement periods. During non-reinforcement periods, frequency of appropriate behavior was again relatively low. As this behavior also seemed variable from session to session with no trend towards an increase in these behaviors, the hypothesis that performance of appropriate behavior was under the stimulus control of trainer instructions during the previous phases of this study could not be confirmed with this subject.

Social interaction behavior during treatment 2 was essentially absent, with even periodic trainer prompts to say his name, frequently ignored.

Figure 5 further shows that rocking behavior during treatment 2 was highly variable. Calculation of treatment effectiveness for this treatment procedure reveals that rocking behavior was changed little from baseline, with a .02% treatment effectiveness during contingent reinforcement periods when compared against rocking behavior during training periods of baseline. During non-reinforcement periods, 31% of the expected 70% decrease in rocking behavior was achieved, when compared against rocking behavior during free time periods of baseline.

When comparing frequency of rocking behavior with the frequency of appropriate behavior from session to session, a negative correspondence could be seen. With one exception, an increase or decrease in one behavior was reflected in an opposite change in frequenc for the other behavior.

As with subject 1, it should be noted that all inappropriate behavior during treatment 2 was recorded as self-stimulatory.

Subject 4. Figure 6 shows the percent frequency of all measured behaviors across all five sessions of treatment 2.

Insert Figure 6 about here

During treatment 2, performance of appropriate behavior (appropriate behavior plus social interaction behavior) increased substantially when compared with previous followup sessions. For both contingent reinforcement and non-reinforcement periods, appropriate behavior was proportionately increased over followup. Thus, the hypothesis that the performance of appropriate behavior was under the stimulus control of trainer instructions during previous phases of this study was confirmed for this subject.

As with the other subjects, frequency of social interaction behavior remained low throughout treatment 2 with an average of less than 3% of the observations scored.

Figure 5 also shows that frequency of rocking behavior continued at a low rate during treatment 2. When calculating treatment effectiveness during contingent reinforcement periods against baseline training periods, 71% of the expected 70% reduction in rocking behavior was achieved.

During non-contingent reinforcement periods, treatment effectiveness equalled 49% of the outcome goal when compared against baseline free time sessions. Like the reductions in rocking behavior during followup, it should be again noted that actual reductions in frequency of sampled rocking behavior were in fact negligible when compared with baseline.

Unlike the other two subjects, the few instances of inappropriate behavior recorded during treatment 2 were not self-stimulatory behaviors. Although the behavior code as constructed could not enable an objective determination of the exact type of inappropriate behavior performed by this subject, notes made by the experimenter during the sessions indicate that persistent interrupting of the trainer was the chief inappropriate behavior performed by subject 4.

Chapter 6

Discussion

This investigation indicated that Overcorrective training was not as successful in eliminating self-stimulatory rocking in three retarded adults as a previous study which used retarded and autistic children as subjects (Foxx & Azrin, 1973). Out of three subjects who participated in all phases of this study, only one experienced even a small reduction in rocking behavior from baseline to followup. The other two subjects experienced only negligible reductions in frequency of rocking. For one subject (subject 4) this was due to low rates of rocking behavior during baseline; a somewhat larger reduction in rocking than was demonstrated in this study would have entirely eliminated this response.

Although the baseline procedure of reinforcing appropriate behavior could be assumed to be comparable between the present study and the more successful Foxx & Azrin (1973) investigation, in addition to subject differences, there were procedural differences in applying the Overcorrective procedures which could have accounted for this study's lack of practical effect.

First, the previous investigation (Foxx & Azrin, 1973) involved maintaining some of the Overcorrective contingencies for periods longer than was practical in the present study. Sessions where Overcorrective contingencies were in effect lasted up to 6 hours per day, 5 days per week compared with the present study's 3 hours per day, 5 days a week schedule. These longer daily sessions should have provided the

opportunity for more applications of Overcorrection per day which should have reduced the number of days needed to eliminate this response. It is possible that in the present study, there were not enough opportunities to apply Overcorrection to allow a decrease in this behavior to take place.

The second, and possibly most important difference in the application of the Overcorrective procedures was that in the previous investigation of Overcorrection (Foxx & Azrin, 1973), the experimenters maintained some of the Overcorrective contingencies continuously. This involved fading the length of Overcorrection as frequency of self-stimulation was reduced, ending in a verbal warning procedure where Overcorrection was applied only if too many verbal warnings were required in a given space of time. Although self-stimulation was entirely eliminated in some subjects in less than six daily sessions, it is apparent from their data that self-stimulatory behavior occasionally reappeared in further sessions, which may have required some additional application of Overcorrection. This continuous treatment could have prevented recovery of the self-stimulatory behaviors.

In the present time limited treatment, Overcorrective contingencies were discontinued after six sessions, whether or not rocking was entirely eliminated. As self-stimulatory behavior recovered in all subjects to some degree during follow-up, it is apparent that even the additional "treatment" of the reinforcement of appropriate recreational behavior was not sufficient to produce a continuing behavioral change.

A final difference in procedure of the present study involved purposely treating only one self-stimulatory behavior when other types of behavior definable as self-stimulatory were present in two out of three of the treated subjects. The prior investigation by Foxx & Azrin (1973) involved treating all self-stimulatory behavior occurring in each subject. Treatment contingencies were thus on a continuous schedule. Considering the intellectual deficits of the subjects in the present study, it may have been difficult for them to discriminate topographical differences between their own similar self-stimulatory behaviors. This could at least have been true where motor movements such as side to side swaying (which occurred in subject 1) would have produced internal stimuli similar to that produced by defined body rocking. The Overcorrective contingencies would have thus been on an intermittent rather than continuous schedule of application and could have impeded the suppression of rocking behavior.

With the exception of this last procedural difference, the changes made in the present study were primarily a result of time and staff limitations. It is possible that if sessions could have been scheduled for longer periods of the day with the treatment phase continued for several weeks rather than six days, a greater practical treatment effect could have been seen. An application of a more intensive treatment procedure, more closely comparable to the original Foxx & Azrin (1973) procedure, would now be indicated. A replication of the favorable results obtained by Foxx & Azrin (1973) could justify a parametric study of Overcorrection.

A parametric investigation that would systematically vary the presence or absence of several factors involved in Overcorrection (for example, the use of "correct" forms of misbehavior in positive practice) could

bring the conceptualization of this procedure closer to more conventional treatment techniques. Varying the length of application of the Overcorrective procedures and/or the length of time Overcorrective contingencies remain in effect, with subjects who exhibit differing frequencies of self-stimulatory behavior (for example, low, medium and high frequency self-stimulators) would contribute to finding the most economical application of Overcorrection. The results of such a study could specify the most economical and effective application of Overcorrection for an individual with a given frequency of self-stimulatory behavior.

It should be noted that continuation of the Overcorrective contingencies should not be necessary to continue the reduction of self-stimulatory behavior, if the analysis of the function of self-stimulatory behavior proposed by Foxx & Azrin (1973) is correct. Under conditions favoring the acquisition and display of appropriate behaviors, self-stimulation should not reappear once performance of these desirable behaviors are acquired and result in consistent reinforcement.

The hypothesis that a reduction in rocking behavior could be correlated with an increase in appropriate behavior could not be confirmed in this study. This was due largely to the relatively small reductions of rocking exhibited by two of the subjects whose rocking already was at a low rate and the ineffectiveness of Overcorrection in the remaining subject who engaged in rocking at a relatively high rate. This meant small reductions in frequency of rocking behavior which, according to the hypothesis as outlined, would have been associated with an equally small increase in appropriate behavior. Considering the added problem of the relative instability of the neutral and inappropriate behavior categories, much larger behavioral changes would have been required to draw meaningful conclusions.

Although the hypothesis that subject performance of appropriate behavior was under the control of trainer instructions could be confirmed only for subject 4 during treatment 2, this explanation still seems tenable for subject 1. By discarding the data from the first treatment 2 session, the graph of individual sessions revealed a gradual increase in performance of appropriate behavior during contingent and non-reinforcement periods. By the final treatment 2 session, appropriate behavior during contingent and non-reinforcement periods nearly equalled the frequency of appropriate behavior during the training periods of followup. Therefore, it is possible that a procedural error was made by not allowing all subjects at least one session to acclimate to the new contingencies before collecting data for treatment 2.

For subject 3, a probable explanation for the low rate of performance of appropriate behavior throughout all phases of this study would include a lack of reinforcer control. Throughout this study, this subject would frequently refuse consumable reinforcers despite continuing efforts to find new foods that would be reinforcing. To support this conclusion, frequency of appropriate behavior was highly variable during contingent reinforcement periods of treatment 2, this points to a lack of effective reinforcer control.

The continued reduction of rocking during treatment 2 was an encouraging result for subject 1. This would indicate that the modest reductions in rocking achieved with this subject during followup were not entirely situation specific.

A comparison of Subject Behavior Assessment Forms scored before starting baseline with those scored at the end of followup, revealed numerous additions of recreational behaviors to each subject's response

repertoire. That these additions were not reflected by an increase in appropriate recreational behaviors during free time for subjects 1 and 3 , points to an important implication of this study. Training skill in the performance of behaviors which the experimenter assumes will become intrinsically reinforcing, may not necessarily be performed out of the context of the training sessions. Subtle discriminative stimuli such as trainer prompts or the use of reinforcers which are only at best variable in effectiveness may limit the performance of desired behaviors from the training session. Future investigators attempting to train recreational behaviors in the severely retarded should insure that training techniques do not interfere with later performance of these behaviors outside the carefully controlled contingencies of the training session. One possible solution to this problem was suggested by the procedure of treatment 2, where trainer involvement in subject's behavior was reduced merely to dispensing positive reinforcers for desirable behavior.

An additional procedure of treatment 2, that of reinforcing initiation of social interaction behavior, proved to have little effect. A probable explanation was that social interaction behavior did not occur frequently enough in any of the subjects to allow enough reinforcement for learning to take place. Also, there was not enough time to shape or prompt verbal behavior in these individuals and still allow an adequate period for reinforcing recreational behavior.

Two additional findings that were not related to the original hypotheses of this study, point to a possible alternate treatment strategy for reducing self-stimulatory behaviors in some individuals. The first finding, that for subject 1, self-stimulatory rocking

occurred most frequently during Music Listening periods when compared with all other training periods is consistent with the second finding that frequency of rocking varied considerably for most of the subjects across different environmental settings. Frequency of rocking behavior was generally lower during training periods than during free time periods. Also, the subject selection behavior sample taken on the subject's home living unit did not appear to predict frequency of rocking during baseline.

These findings agree with conclusions reached by other investigators (Berkson & Mason; 1963, 1964) that different environmental factors are associated with differing rates of self-stimulatory behavior. By arranging an environment that minimizes the probability of self-stimulatory behavior, it could be possible to train alternate behaviors without resorting to specific individualized procedures to eliminate self-stimulation.

Overcorrection, as with other treatment techniques involving a time out consequence, requires that time normally spent on training new behaviors is frequently spent on eliminating undesirable behavior. Moderate length time outs such as the ten minute Overcorrection periods used in this study, take up much time even when self-stimulatory behavior occurs at a relatively low rate. As an example, subject 1, who rocked an average of 8% and 15% during respective training and free time periods during baseline, required an average of over four applications of the 10 minute Overcorrection per session, during the Overcorrective phase. As the trainer was required to attend to this subject exclusively while the Overcorrective movements were performed, much time was lost that could have been spent training new behaviors.

This author knows of no studies that have determined at what frequency self-stimulatory behavior must occur before there is a significant decrease in "attending" behaviors which would presumably interfere with the acquisition of new behaviors. Although it has been demonstrated (Lovaas et al., 1971) that a high rate of self-stimulatory behavior is associated with a lack of such attending behaviors, in light of the time consuming nature of Overcorrection, it also would be useful to discern at what frequency self-stimulatory behavior may be ignored without jeopardizing the success of other conditioning programs.

An additional advantage of not dealing directly with self-stimulatory behavior would be that individuals who would not cooperate with the application of Overcorrection (such as subject 2), would have access to treatment. If remedies for self-stimulatory behavior must involve the cooperation of the subjects themselves, it can be seen that some uncooperative individuals will be denied treatment.

Considering the staff shortages that presently exist in most facilities for the retarded, decisions concerning the relative economy of treatment techniques such as Overcorrection will continue to be important. Although it is probable that Overcorrection is highly effective in reducing self-stimulatory behavior, it may also be true that it is effective only when its method of application (for example, an indefinite continuation of the Overcorrective contingencies) is impractical for most treatment facilities to use. Further investigations which would replicate Foxx & Azrin's (1973) dramatic results would justify further study of the importance of several variables involved in the application of Overcorrection. Additional experimentation into the possibility of environmental amelioration of self-stimulatory behavior also would be warranted from a practical standpoint.

Table 1

Subject Characteristics Summary

	Age	Years in Institution	Social Age Equiv.[a]	Mental Age[b]	Medication[c]	Percent Rocking[d]
Subject 1	27yr.	14	4.2yr.	2.25yr.	Phenobarbital 60mgm. TID; Stelazine 5mgm. BID; Artane 5mgm. BID	38
Subject 2[e]	21yr.	9	3.4yr.	2.00 yr.	none	39
Subject 3	47yr.	29	4.5yr.	3.25yr.	none	10
Subject 4	40yr.	32	4.5yr.	1.08yr.	none	06

[a] As determined by the Vineland Social Maturity Scale.

[b] As determined by the Peabody Picture Vocabulary Test.

[c] This includes all tranquilizing medication recieved by each subject for at least two weeks before the beginning of the experimental sessions. This same medication level was maintained throughout the course of the study.

[d] As determined by 12 hour random time sampling over two days in January, 1974.

[e] This subject was dropped after the second baseline session due to his uncooperative behavior. He was replaced with subject 4.

Table 2

Schedule of Session Conditions

Subjects	Sessions																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
S1	B →						T1 →						F →							
S3	B →												T1 →						F →	
S4	-	-	B →																T1 →	

Subjects	Sessions														
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
S1	F →										T2 →				
S3	F →										T2 →				
S4	T1 →				F →						T2 →				

Note. Code is: B Indicates baseline session.

T1 Indicates Overcorrective treatment session.

F Indicates followup session.

T2 Indicates treatment 2 session.

Table 3

Session Schedule

Time	Activity	Target Behavior(s)
9:00-9:20	Exercises	Shape satisfactory performance of: hands over head stretch and toe touch, side stretch jumping and hopping movements
9:20-9:30	Free time	
9:30-9:50	Shape Sorting Box	Shape satisfactory discrimination of: circle, square, triangle, oblong, and half round so that the correct shapes will be reliably inserted into the proper holes of the shape box puzzle
9:50-10:00	Free time	
10:00-10:20	Puzzles	Shape performance of assembly of simple (4 to 6 piece) wooden jigsaw puzzle
10:20-10:30	Free time	
10:30-10:50	Music Listening and responses	Shape proper responses to music beat: hand clapping, finger snapping, foot tapping Shape operations of turning on cassette tape player
10:50-11:00	Free time	
11:00-11:20	Paper, crayon and scissor work	Shape performance of: using crayonsto color in picture outlines, copying simple drawings, cutting out shapes and drawings with scissors
11:20-11:30	Free time	
11:30-11:50	Bean Bag Throw	Shape bean bag throwing accuracy, audience response (smiling, clapping for partner) and bean bag retrieval
11:50-12:00	Free time	

Table 4

Trainer Assessment Summary[a]

Sessions	Percent Correct Trainer 1	Percent Correct Trainer 2
Practice	88	85
Session 5	94	86
Session 10	90	88
Session 15	91	--[b]

[a]This Trainer evaluation is based on the Trainer Behavior Assessment Form devised by Lowther et al. (1971).

[b]Trainer 2 conducted 12 sessions.

Table 5

Interobserver Agreement

Sessions	Percent Agreement
Prebaseline	88
Session 15	89
Session 29	84

Table 6

Comparison of Subject Selection Rocking Behavior Samples with Baseline Rocking Behavior

Subjects	Mean frequency rocking two 12 hour time samples[a]	Mean frequency of rocking during baseline[b]		Number baseline sessions
		Training Periods	Free time Periods	
subject 1	38%	8.4%	15.3%	6
subject 2	39%	62.5%	64.2%	2
subject 3	10%	25.4%	34.6%	12
subject 4	06%	5.5%	5.5%	16

[a]Samples collected in January, 1974.

[b]Samples collected between April and May, 1974.

Figure 1

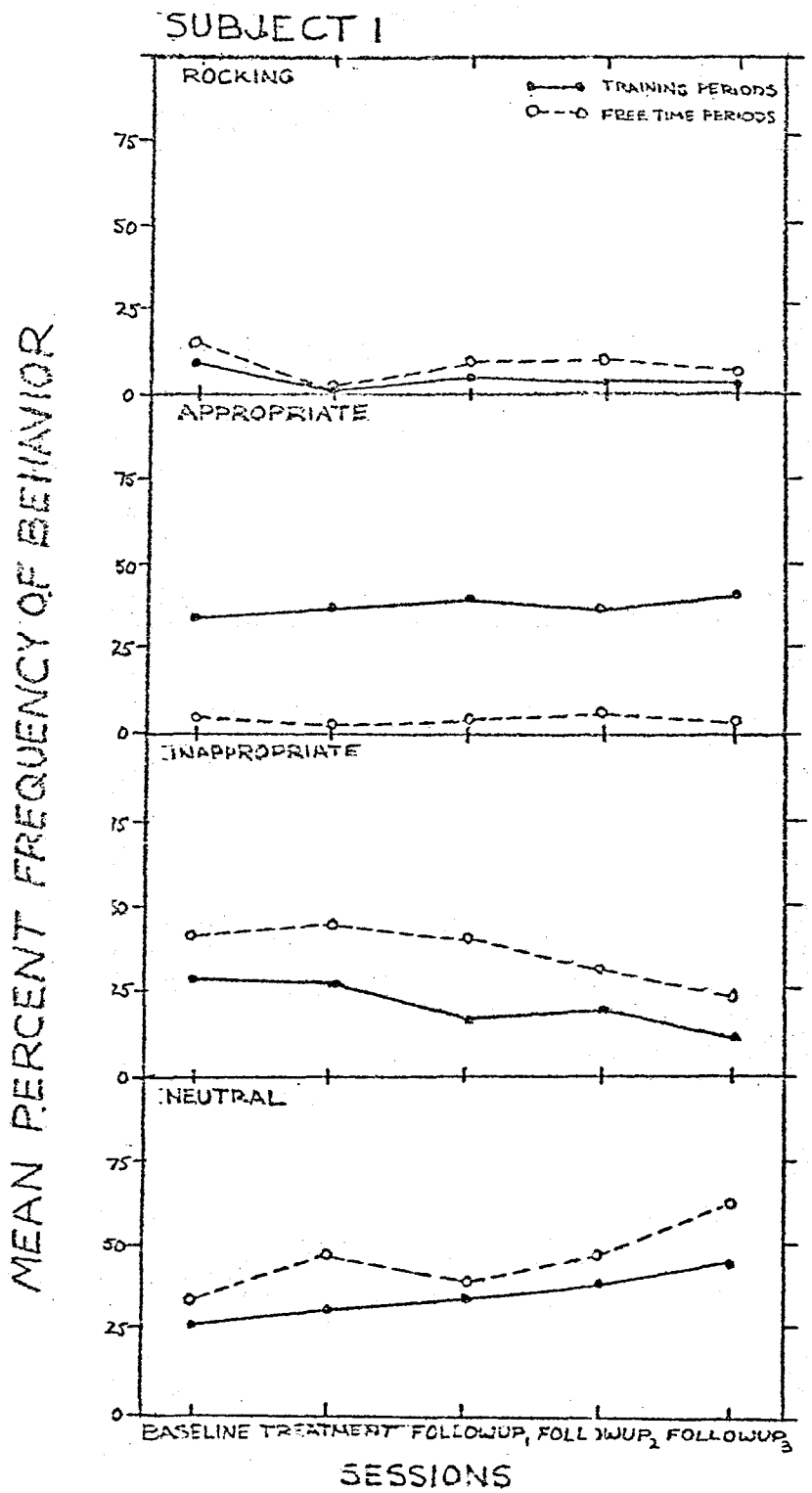

Fig. 1. Mean percent frequency of behavior scored across successive blocks of six sessions.

Figure 2

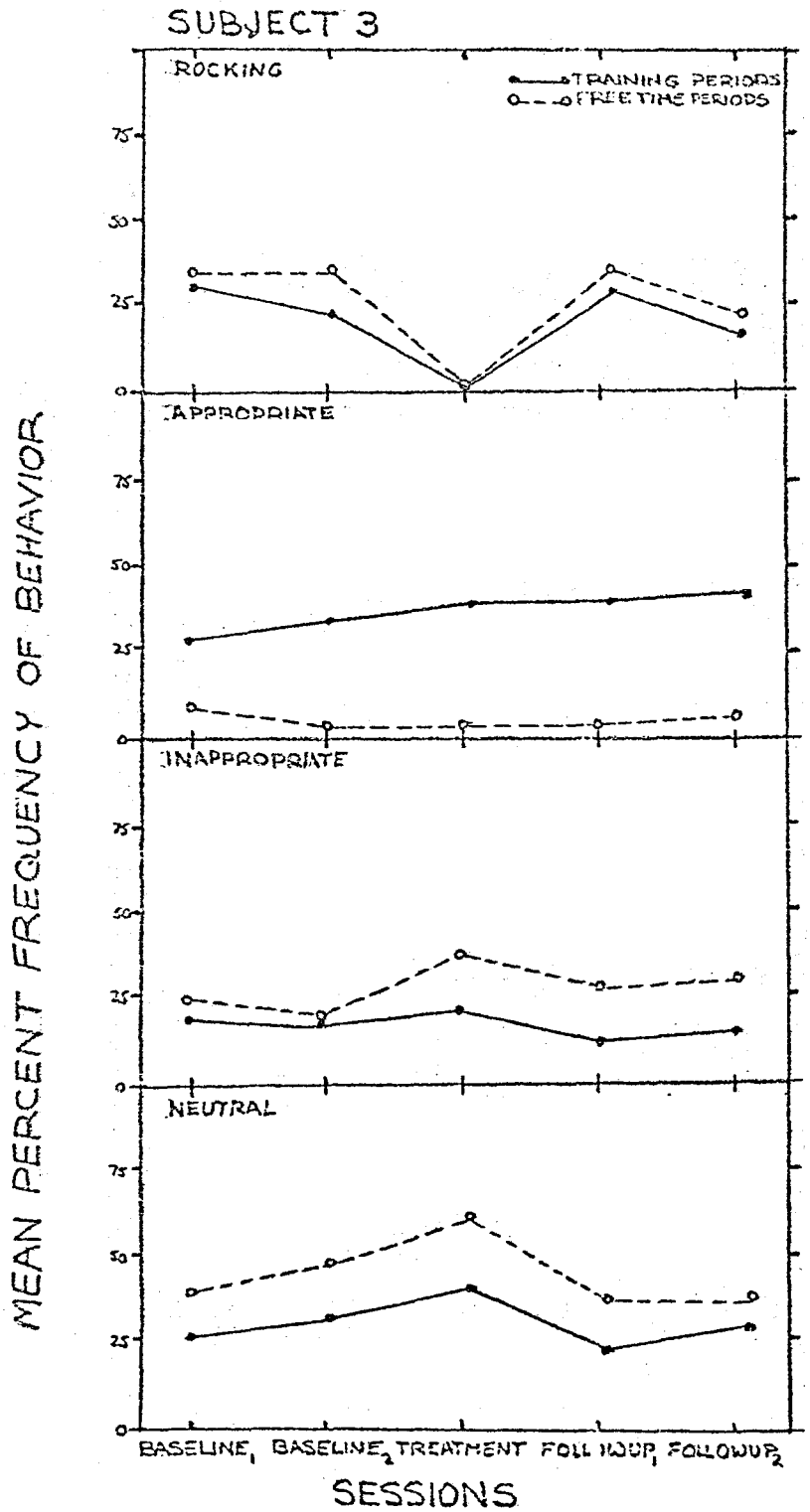

Fig. 2. Mean percent frequency of behavior scored across successive blocks of six sessions..

Figure 3

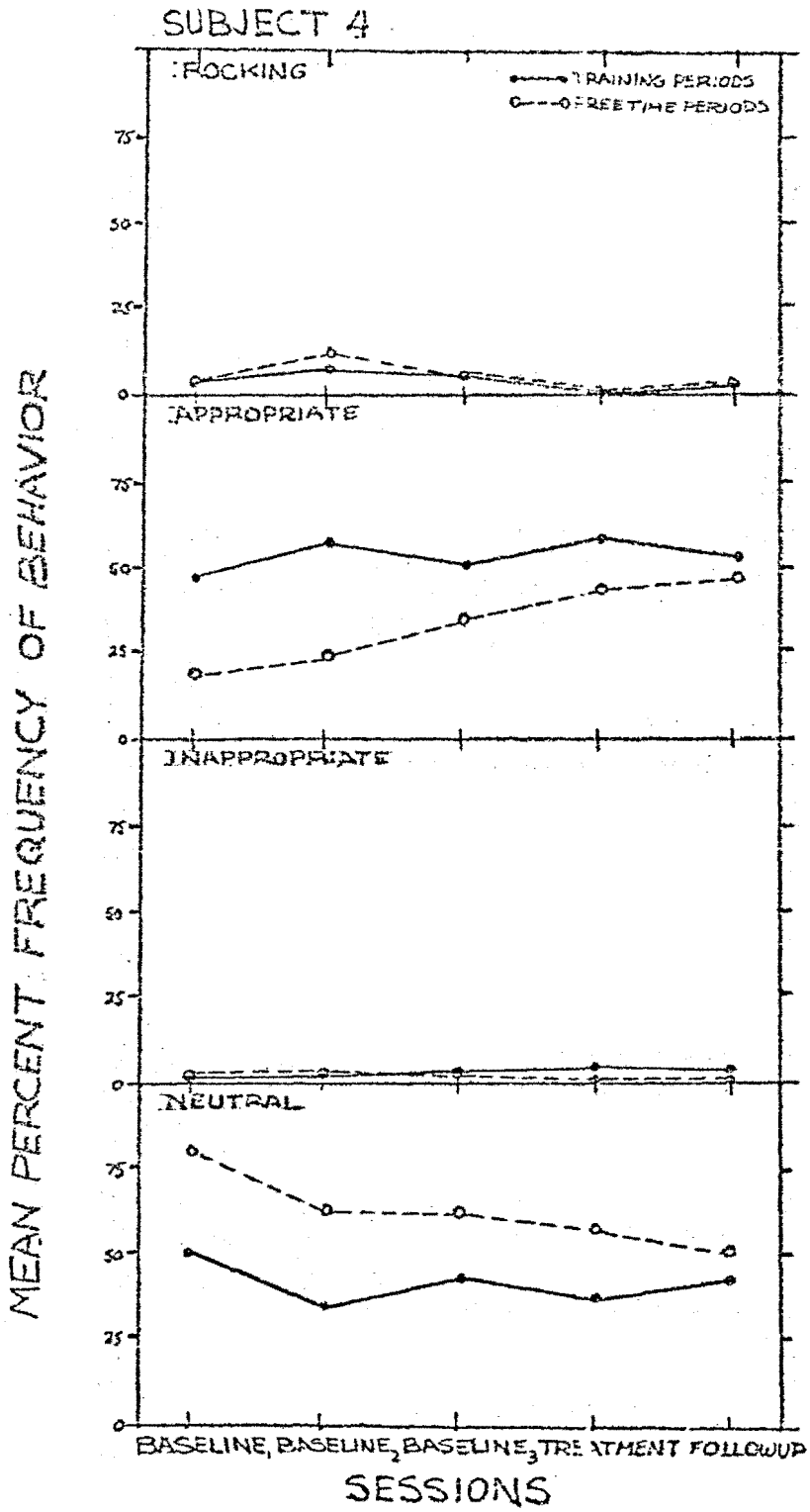

Fig. 3. Mean percent frequency of behavior scored across successive blocks of six sessions.

Table 7

Trainer Assessment Summary for Treatment 2[a]

Sessions	Percent Correct Trainer 1	Percent Correct Trainer 2
Practice Session 1	96	90
Session 34	93	96

[a]This trainer evaluation is based on the Trainer Behavior Assessment Form devised by Lowther et al. (1971). Trainer evaluation sections on shaping and chaining and data collection were deleted (see p. 40).

Figure 4

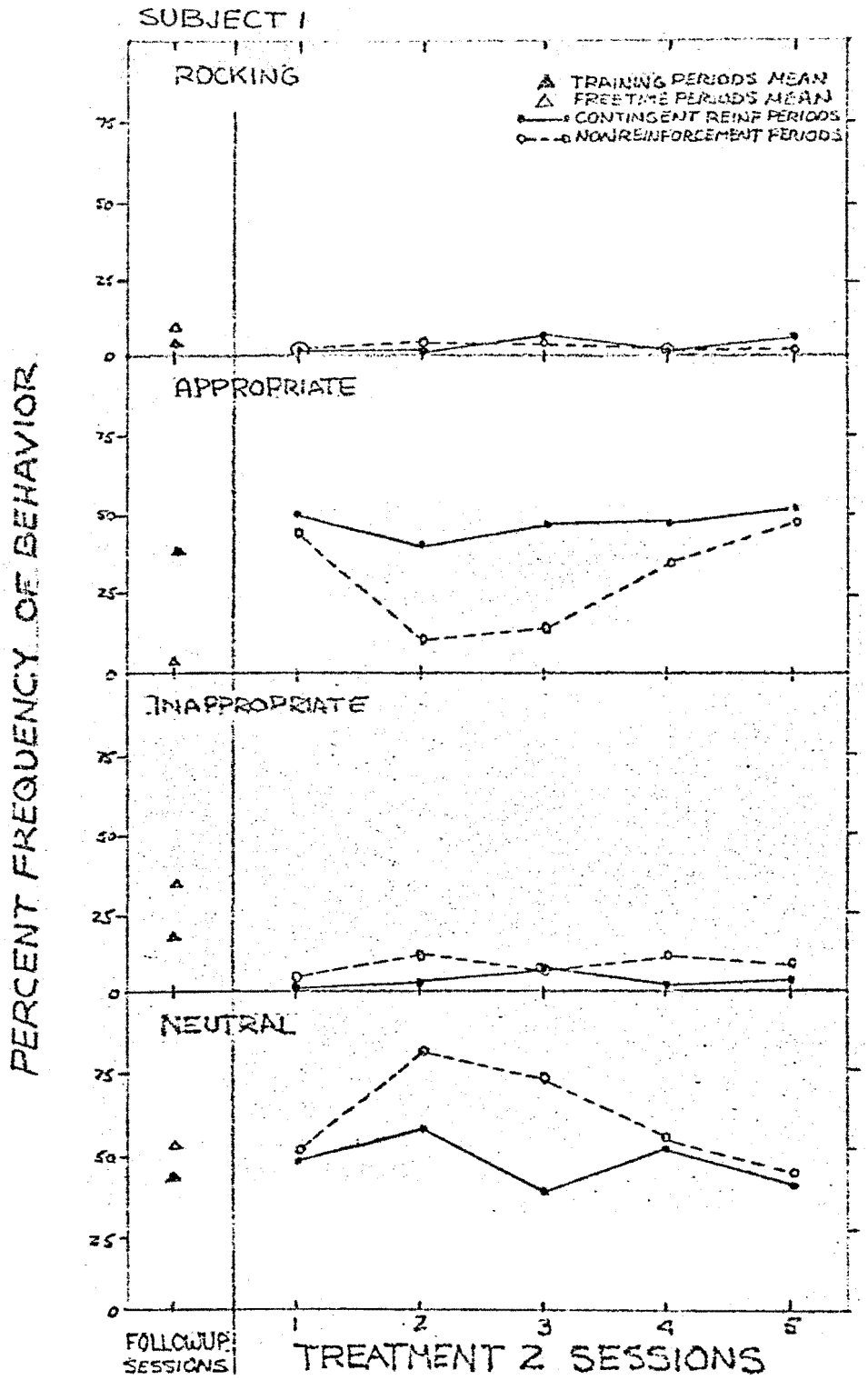

Fig. 4. Mean percent frequency of behavior scored during followup and percent frequency of behavior scored during each session of treatment 2.

Figure 5

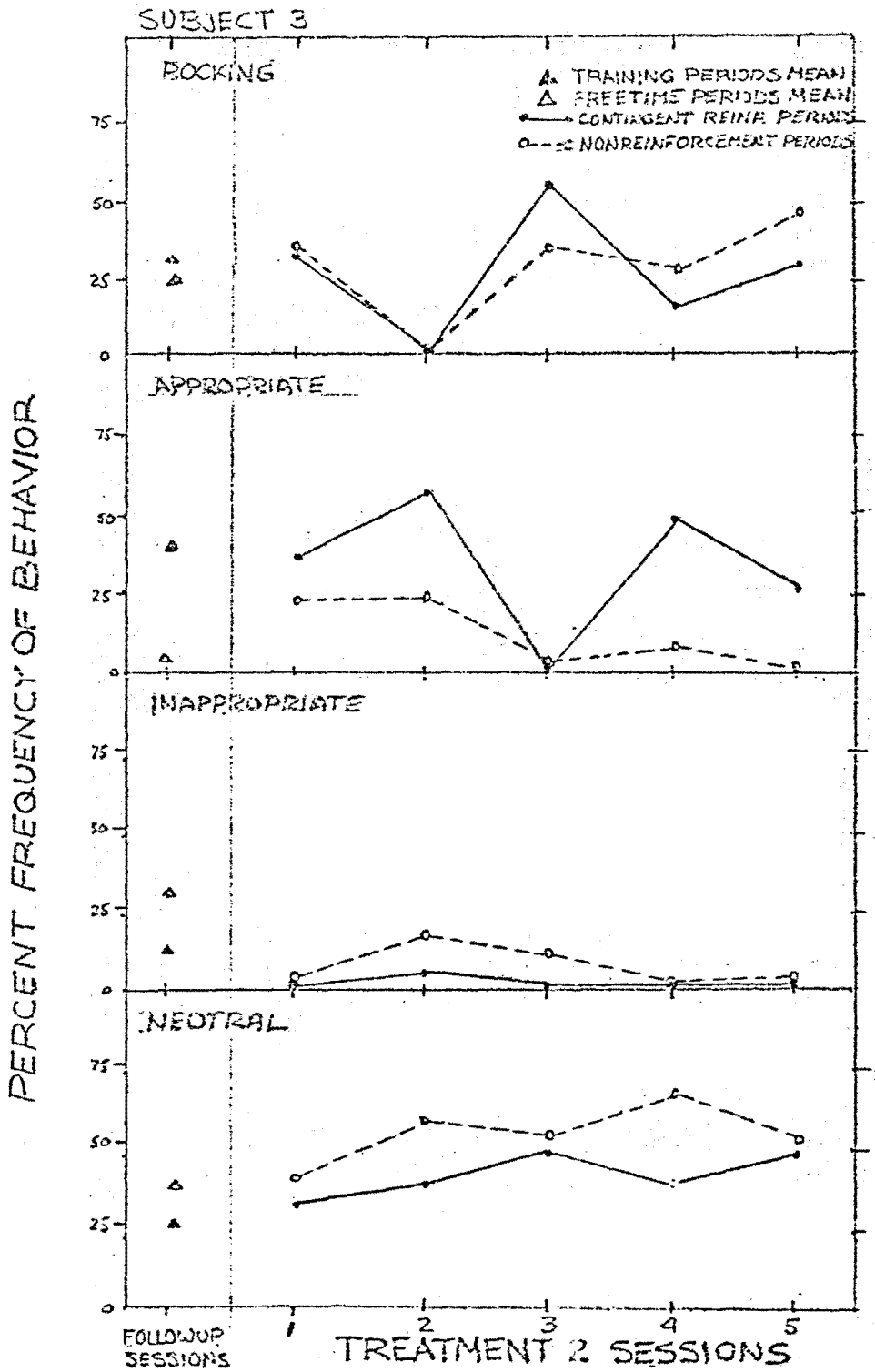

Fig. 5. Mean percent frequency of behavior scored during followup and percent frequency of behavior scored during each session of treatment 2.

Figure 6

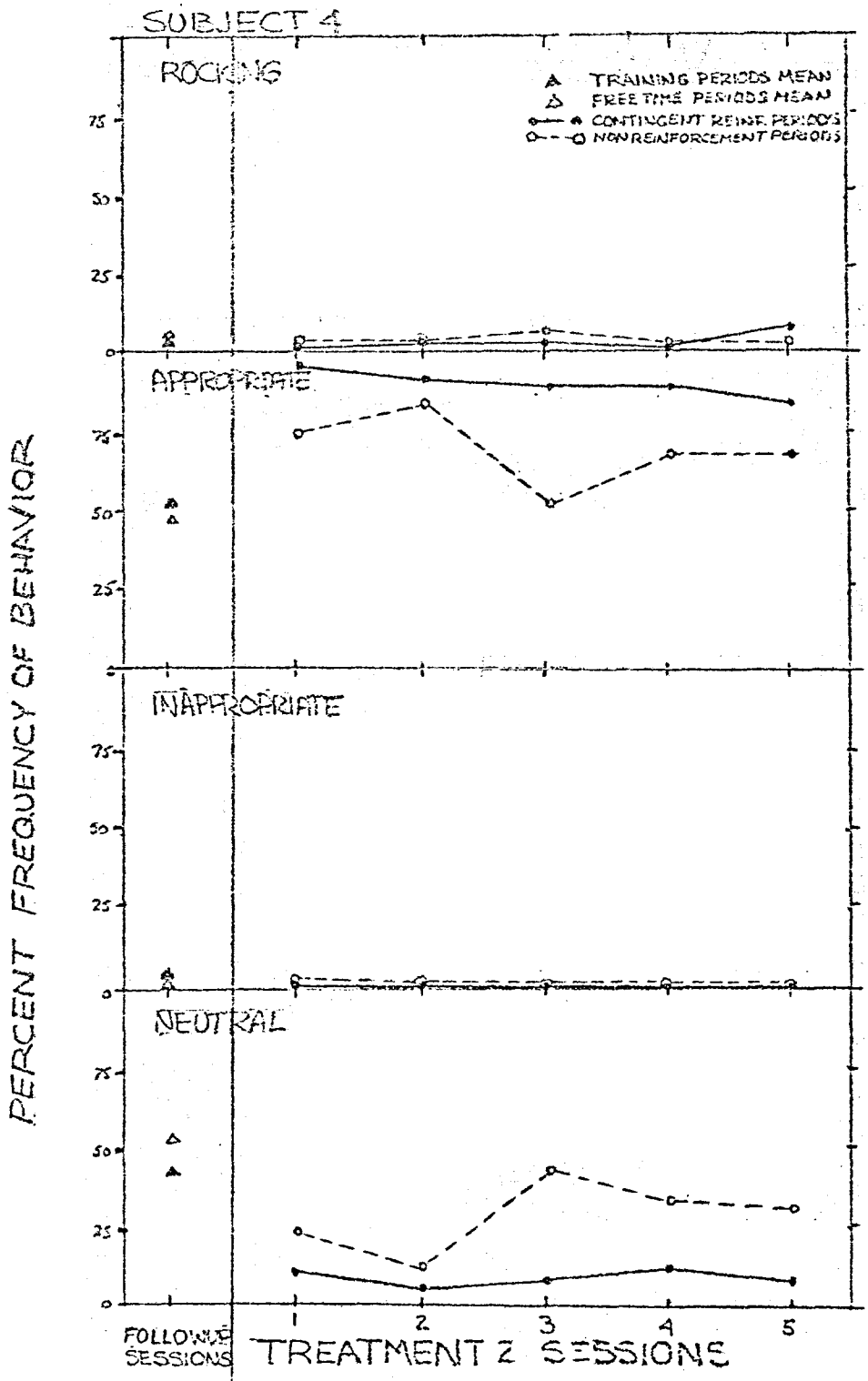

Fig. 6. Mean percent frequency of behavior scored during followup and percent frequency of behavior scored during each session of treatment 2.

D

References

Azrin, N. H. Some effects of two intermittent schedules of immediate and non-immediate punishment. Journal of Psychology, 1956, 42, 3-21.

Azrin, N. H. Overcorrection. Paper presented to the Behavior Modification Workshop, Atlanta, Georgia, March, 1973.

Azrin, N. H. & Foxx, R. H. A rapid method of toilet training the institutionalized retarded. Journal of Applied Behavior Analysis, 1971, 4, 89-99.

Azrin, N. H. & Hutchinson, R. R. Conditioning of the aggressive behavior of pigeons by a fixed-interval schedule of reinforcement. Journal of the Experimental Analysis of Behavior, 1967, 10, 395-402.

Bandura, A. Psychotherapy based upon modeling principles. In Bergin, A. E. & Garfield, S.L. (Ed.) Handbook of Psychotherapy and Behavior Change, New York: John Wiley, 1971.

Berkson, G. & Davenport, R. K. Jr. Stereotyped movements in mental defectives: I Initial survey. American Journal of Mental Deficiency, 1962, 66, 849-852.

Berkson, G. & Mason, W. A. Stereotyped behavior in chimpanzees: Relation to general arousal and alternative activities. Perceptual and Motor Skills, 1964, 19, 635-652.

Berkson, G. & Mason, W. A. Stereotyped movements in mental defectives: III Situation effects. American Journal of Mental Deficiency, 1963, 68, 409-416.

Browning, R. M. & Stover, D. O. Behavior Modification and Child Treatment. New York: Aldine Atherton, 1971.

Campbell, D. T. & Stanley, J. C. Experimental and Quasi experimental Designs for Research. Chicago: Rand McNally, 1966.

Ferster, C. B. & Appel, J. B. Punishment of S^{Δ} responding in matching to sample by time-out from positive reinforcement. Journal of Experimental Analysis of Behavior. 1961, 4, 45-56.

Foxx, R. M. & Azrin, N. H. Restitution: A method of eliminating aggressive-disruptive behavior of mentally retarded and brain damaged patients. Behavior Research and Therapy, 1972, 10, 15-27.

Foxx, R. M. & Azrin, N. H. The elimination of autistic self-stimulatory behavior by Overcorrection. Journal of Applied Behavior Analysis, 1973, 6, 1-14.

Gardner, W. I. Behavior Modification in Mental Retardation. New York: Aldine Atherton, 1971.

Guess, D. & Rutherford, G. Experimental attempts to reduce stereotyping among blind retardates. American Journal of Mental Deficiency, 1967, 71, 984-986.

Johnson, S. M. & Bolstad, O. D. Methodological issues in naturalistic observation: Some problems and solutions for field research. In Hamerlynck, L. A., Handy, L. C. and Mash, E. J. (Ed.) Behavior Change, Methodology, Concepts and Practice, Champaign, Ill.: Research Press, 1973.

Kaufman, M. E. & Levitt, H. A study of three stereotyped behaviors in institutionalized mental defectives. American Journal of Mental Deficiency, 1965, 69, 467-473.

Lovaas, O. I. Reinforcement therapy (16mm sound film) Philadelphia: Smith, Kline and French Laboratories, 1966. Cited by Bandura, A. Psychotherapy based upon modeling principles. In Bergin, A. E. and Garfield, S.(Ed.) Handbook of Psychotherapy and Behavior Change, New York: John Wiley, 1971.

Lovaas, O. I, Litrownik, A, & Mann, R. Response latencies to auditory stimuli in autistic children engaged in self-stimulatory behavior. Behavior Research and Therapy, 1971, 9, 39-49.

Lovaas, O. I, Schaeffer, B. & Simmons, J. Q. Experimental studies in childhood schizophrenia: Building social behavior in autistic children by use of electric shock. Journal of Experimental Research in Personality, 1965, 1, 99-109.

Lowther, R, Martin, G. & McDonald, L. A behavioral checklist for assessing staff behavior modification skills in an operant program with severe retardates. Paper presented at the 32nd Annual Convention of the Canadian Psychological Association, St. Johns, Newfoundland, June, 1971.

Lowther, R, Martin, G. & McDonald, L. Behavioral assessment of staff behavior modification skills. Unpublished manuscript, G. L. Martin, Department of Psychology, St. Paul's College, University of Manatoba, Winnipeg, Manatoba, 1972.

Mulhern, T. & Baumester, A. A. An experimental attempt to reduce stereotypy by reinforcement procedures. American Journal of Mental Deficiency, 1969, 74, 69-74.

Sidman, M. Tactics of Scientific Research. New York: Basic Books, 1960.

Tate, B. G. & Baroff, G. S. Aversive control of self-injurious behavior in a psychotic boy. Behavior Research and Therapy, 1966, 4, 281-287.

Thompson, T. & Grabowski, J. Behavior Modification of the Mentally Retarded. New York: Oxford University Press, 1972.

Tiller, E. H. Some comments on single subject research designs and treatment environments. Paper presented at the Southeastern Psychological Association, New Orleans, April, 1973.

Webster, D. R. & Azrin, N. H. Required relaxation: A method of inhibiting agitative-disruptive behavior of retardates. Behavior Research and Therapy, 1973, 11, 67-78.

Watson, L. S. How to Use Behavior Modification with Mentally Retarded and Autistic Children. New York: Pergamon Press, 1972

Zimmerman, J. & Baydan, N. Punishment of S^{Δ} responding in humans in conditional matching to sample by time out. Journal of the Experimental Analysis of Behavior. 1963, 6, 587-597.

Appendixes

Appendix 1

Trainer's Responsibilities

I. General responsibilities.

A. Sessions will run from 9:00 A.M. to 12 noon. We should be ready to begin promptly so arrive early to prepare required material, review previous session's data and get the subjects.

B. Follow the outlined session schedule to the letter. If you are straying from the session schedule, the experimenter-observer will inform you.

C. Subjects must remain in the session room throughout the session period. Exceptions are illness of the subject and restroom breaks. On restroom breaks, accompany the subject(s) to and from the restroom. To minimize the problem of subjects wanting to go to the restroom during a training period, ask each subject if he has to go at the beginning of each free time period.

II. Baseline and followup sessions.

A. For subjects in either baseline or followup, ignore all inappropriate behavior except:
1. If it endangers the health of the subject or others in the room.
2. If destruction of valuable equipment is imminent.
3. If it interferes with one to one interaction with the subject. At certain times, you must interact with a particular subject. If the subject is engaging in any behavior that is preventing your interaction, warn him once to stop. Say "(subject's name), stop (name of behavior)."

III. Overcorrection.

A. The experimenter-observer will inform you prior to each session which subject is to receive Overcorrection on that day.

B. When you see a subject engaged in defined rocking behavior and is in the Overcorrection condition, first tell him "(name of subject), stop rocking." Then as soon as possible, restrain his shoulders if he has not stopped rocking by the time you reach him. Next, have him sit on the edge of the chair if he is sitting.

C. Begin Overcorrection. Always give the command (lean forward, lean backward, sit straight) and then wait an instant before using the graduated guidance procedure.

D. Follow the randomized instruction sheet for the order of the instructions.

E. Stop Overcorrection when the experimenter-observer says stop.

IV. A list of training programs, session schedule, and trainer assessment criteria will accompany this handout.

Appendix 2

Training Programs

Exercises - 20 Minutes

Target Behaviors:
Subject will satisfactorily perform the following exercise movements when the trainer demonstrates the action along with the appropriate command. The exercises are: a) hands over head stretch.
b) toe touch.
c) side stretch.
d) jumping with both feet and hopping on one foot.

Hand Over Head Stretch - 5 minutes

1. Begin by having subjects line up in front of you. Demonstrate hand over head stretch while saying "Everyone, hands over head and stretch." While saying "Keep your hands up", go to each subject that has his hands up in the proper manner and reinforce socially with a verbal "good" and pats on the back.[1] If any subject does not respond after your demonstration and command, take their arms by the wrist and raise them repeating the command of "hands over head and stretch." When hands are up, let go of them slowly while saying "keep your hands up", to see if the resident will maintain the position. Be sure to reinforce with praise while the subject's hands are over his head, whether or not you have to actually hold them up. When everyone has their hands over their heads say, "Okay, let them down."

2. Repeat the above step focusing on the individuals who need physical guidance to perform. Gradually fade your assistance by not following through completely on your "hands over head" guidance. Prompts and guidance should continue to be faded until verbal commands are all that is necessary to initiate movement.

3. When all individuals will reliably hold their hands over their heads for a brief time (5 seconds) begin gradually lengthening the time they must hold their hands up until they can hold their hands up for 15 seconds. At the same time, while hands are up in the air, model stretching movements (stand on toes, reach as high as you can) while saying "Everyone stretch and touch the ceiling!" Be sure to verbally reinforce those that are stretching or at least trying. For those who are just standing with their hands up, go over to them, repeat the "stretch" command and pull up on the subject's arms. Relax your grip on the subject's arms when the subject begins stretching on his own. Do not forget to verbally reinforce when the resident has stretched with or without your help.

Toe Touch - 5 minutes

1. Demonstrate the toe touch in front of your lined up subjects.

[1] Use consumable reinforcers sparingly during exercises, consumption of these reinforcers may be incompatable with a high activity level.

While demonstrating, say "Everyone touch your toes." After you have done this for a few seconds, look around and verbally reinforce subjects who are in a bent forward position. If any subject does not respond after your demonstration and command, go over to him, say "touch your toes", and put your left hand on his stomach and your right hand on the back of his neck. Push down with your right hand.

When you have the subject leaning forward at approximately a 90° angle, reinforce socially and pat him on the back. When everyone is bent forward, say "Okay, stand straight." Repeat the above sequence, focusing on those who do not bend over to your command. Gradually fade your assistance in bending over by not following through with your guidance and using less force.

2. When everyone is reliably leaning over to your command, begin saying "Everyone stretch and touch your toes" while the subjects are bent over. Go to each subject who is not trying to reach further down and gently push down on their back for an instant while saying, "stretch and touch your toes." Fade this assistance quickly by pushing down with less force.

Side Stretch - 5 minutes

1. Demonstrate the side stretch in front of your lined up subjects. This is holding your arms out to the side parallel with the floor and stretching your trunk to the side until your arms are at a 90° angle to the floor. While doing this say, "Everyone stretch to the side." After you have done this for a few seconds, look around and verbally praise those who are at least approximating the side stretch. Next, go to each of these subjects and prompt final correct performance of the side stretch.

2. Finally, go to those subjects who are not performing at all and guide the correct performance of the movement. This is done by first having the subject hold his arms out parallel with the floor. Move his arms up to the proper position while saying, "hold your arms out." When this is performed, hold the subject just below the arms and push from side to side while saying, "stretch to the side." Verbally reinforce the resident whenever you can feel him moving properly on his own. At the same time, gradually relax your grip so that he may perform more of the movement on his own. Tighten your grip and provide more assistance if he slows or stops his movement.

Jumping and Hopping - 5 minutes

1. Demonstrate jumping up and down in front of your lined up subjects. Try to jump and land on the balls of your feet. While doing this, say "Everyone jump up and down." After doing this for a few seconds, look around and verbally praise those subjects who are attempting higher jumps or landing with both feet on the floor at the same time. Say "jump higher" while holding both feet on the floor at the same time. Say "jump higher" while holding the subject with both hands beneath the arms and pushing up when the subject jumps up. Gradually relax your grip as the subject begins to jump higher on his own.

For those who are not landing with both feet on the floor at the same time, tell them to "hold your feet together!" If this fails, hold a consumable reinforcer over the head of the subject. Tell him to "jump up" to get it. Immediately reinforce if he makes an approximation of jumping with both feet together.

Finally, go to those residents who are not jumping at all and hold them with both hands beneath the arms. Push up as you say to the subject, "jump up". Relax your grip as the subject begins making the movement more on his own. When each resident has jumped for 15 seconds with or without your assistance, demonstrate once again and repeat the above steps.

Hopping

For those subjects who find jumping easy, spend the last couple of minutes of this session demonstrating jumps on one foot. Begin by demonstrating a jump on one foot to the resident and say "hop up and down." If the subject finds this difficult or does not attempt the movement, begin by holding the subject's left leg off the ground or ask the subject to balance on one leg. When the subject can perform standing on one leg without your help and with little difficulty (without losing his balance), return to the hopping task, demonstrating the movement first and then guiding if necessary by holding the subject with both hands below the arms.

Playskool Shape Box - 20 minutes

Target Behaviors:
Subject will be able to reliably insert all five shapes of the shape box into their proper holes.

1. Pretest the subject to see what shapes he can assemble. Hand each shape to the subject twice. If he cannot fit the shapes fairly quickly, take the shape from him and hand him another.

2. Train using the shapes the subject doesn't know. Review the shapes he knows frequently however by giving him a known shape every four or five trials.

3. If he does not know any shapes, begin with the square. Show the subject the square block and put it through the square hole a few times. Then hand the resident the block. Guide his hand to the proper hole if necessary so there is not too much "trial and error" on the subject's part. Praise and give consumable reinforcers when the block goes through the hole. Repeat this many times, gradually fading your assistance.

4. When the subject can put the block through the proper hole consistently, begin alternating this square shape with the circle. Train the circle as with the square in step 3; guide his hand to the proper hole, etc. When the resident is putting the square in the proper hole, begin leaving out consumable reinforcers for putting the square through. Continue reinforcing with consumables on circle whenever the subject makes it

in the circle shape.

5. When the subject is consistently making correct responses with both the circle and the square, begin alternating the triangle with the square and circle using the same preceding steps. Reinforce with consumables only following insertion of the triangle.

6. The order of the remaining shapes should be rectangle and half round pieces. Reinforce with consumables only for inserting the last piece being learned. When all pieces are learned, begin gradually fading the consumable reinforcers. Remember to regularly praise for proper performances however.

Puzzles - 20 minutes

Target Behaviors:
Subject will be able to assemble a simple (4 to 6 piece) wooden jigsaw puzzle.

1. Begin by showing subject a 2 to 4 year old level (Playskool, Sifo) wooden puzzle. Explain to the resident what the puzzle depicts. Then, slowly disassemble the puzzle. Ask him to assemble the puzzle. If he does so quickly, praise and repeat this step with a more difficult puzzle. So long as he is making reasonable progress in assembling the puzzle (takes no more than 60 seconds to insert the first piece) let him continue.

2. If he can't seem to put the pieces together at all, or can only get one or two pieces in, begin assembling the entire puzzle with the exception of an arbitrary last piece. All puzzle pieces are numbered on the back of the piece. Number one would be the last piece, number 2 the second to last piece, etc. Train puzzle assembly in the same order each day to aid learning. Put this piece over the hole so that all the resident has to do is "jiggle" the piece to make it fall in. If the resident still has difficulty in putting the piece in, take the resident's hand in yours and guide him through, "jiggling" the piece until it falls in. Reinforce with praise and a consumable when the piece does fall in. Fade your assistance as quickly as possible in jiggling the piece in.

3. When the subject can reliably "jiggle" this piece into the puzzle (no errorsin the last three trials), move this same piece over so that it is next to the hole that it is supposed to go in. Position the piece so that it is at the same attitude as the hole it is supposed to fit. Point to the edges along the puzzle piece and the hole it is supposed to fit. Resident must then move the puzzle piece over to the hole and then "jiggle" it in. Reinforce as before.

4. Next, after the subject can reliably perform step 3 (no errors in the last 3 trails), move this same piece off the puzzle to the desk. The subject must then pick up the puzzle piece and lay it over the hole and then "jiggle" it in.

5. When the subject can put one puzzle piece in reliably, start with a second puzzle piece that is adjacent to the first. Leave the first piece on the table top and the second piece over the hole that fits it. Require that the subject jiggle the second piece in before putting the first piece in place. Continue with this second piece in the same manner as in training assembly of the first piece. Remember to require the subject to assemble the first piece last on each trial.

6. Continue with all the rest of the pieces in the above manner. Praise subject for the assembly of each piece, but make the delivery of a consumable contingent on the assembly of the entire puzzle.

7. Begin fading consumable reinforcers when the subject can assemble entire puzzle without help.

Hints: 1. Point out similarities in puzzle pieces and holes to facilitate assembly.
2. Try to have the subject assemble the puzzle pieces in the same order on every trial.

Music Listening - 20 minutes

Target Behaviors:
1. Subject will be able to turn on and off a Panasonic cassette tape player with color coded on and off keys.
2. Subject will be able to follow the beat of music as evidenced by hand clapping or foot tapping.

1. Spend the first 5 minutes of each session training the operation of the tape recorder. Demonstrate turning on the tape recorder by pushing the green button down. Say to the subject "now you turn on the tape recorder". Verbally prompt and gesture by pointing to the green button if the subject does not attempt to turn on the player. If he still does not turn on the player, take his hand in yours and guide his finger through the movements. Reinforce with praise and a consumable when the button is pushed all the way down. Remember to fade your assistance on further attempts. This is done by not following through on your movements to the button (requiring the resident to perform the last operation of actually pushing down on the button), and relaxing your grip on the subject's hand. When the subject can reliably turn on the tape recorder, train stopping it on alternate trials. This is done as above except the subject must push down on the red button.

2. Using tapes with an obvious rhythm or beat, shape clapping responses by first demonstrating clapping to the music, while saying "clap to the music", then taking the subject's wrists and if necessary, clapping them with the beat. Gradually relax your grip on their wrists as they begin clapping to the beat. If the subject begins losing the beat, take their wrists again and guide the movements.

When the subject can reliably clap to the beat of the music (for 60 seconds or more), train foot tapping to the music. First demonstrate by tapping your foot to the music while saying "tap your feet to the music." If the subject does not tap his foot with yours, lift his right leg up and down to the music by holding his leg behind the knee. Gradually use

less force in lifting the leg as the subject begins performing the action on his own. Remember to reinforce with praise and occassionally a consumable reinforcer for staying with the beat. As eating will likely interrupt clapping or foot tapping, dispense when possible only after a song is complete. Whenever turning on or off the player during the sessions, have a subject do it.

Paper, Crayon and Scissor Work - 20 minutes

Target Behaviors:
1. Subject will be able to color inside the lines of simple geometric forms as well as pictures of common objects (outline of a car, man etc.).
2. Subject will be able to trace over simple geometric forms as well as simple outlines of objects.
3. Subject will be able to copy, with a sample present, simple geometric forms or objects.
4. Resident will be able to cut paper with scissors, along a straight line.

1. Begin session by passing out materials needed for the next 20 minutes. This will be crayons and paper. As you pass these out, ask each subject what the objects are, repeating the names for them if necessary. Start work with the geometric forms sheet, having each subject color inside the lines of first the circle, then square and finally the triangle. Demonstrate to each subject what needs to be done on a sheet of your own paper, saying "color in the circle" etc. If the subject has difficulty staying inside the lines, take his hand in yours and make short back and forth movements inside the lines. Be sure the subject is watching what he is doing. If he is not, stop for a moment and say "look down here."

Gradually relax your grip on the subject's hand to see if he continues staying inside the lines. If he does, let him make some movements on his own, stopping him if he goes grossly outside the form. Remember to praise frequently when the resident is staying within the lines.

2. When the shapes have been colored in, hand out a new sheet of paper with the forms and a piece of tracing paper. Demonstrate to each subject what needs to be done on a sheet of your own paper while saying "trace around the circle" etc. If the subject does not begin, demonstrate again using his paper and crayon. If he still does not perform, take the subject's hand in yours (with crayon), put the subject's other hand on the paper to hold it all in place, and guide his crayon over the form. Be sure he is looking at what he is doing while you demostrate. When repeating this, try using less force on his hand, and pausing to see if he will continue the movements on his own. Reinforce if he does so.

3. Using the same form previously used in tracing, line a blank sheet of paper next to it and demonstrate copying the form, while saying "copy the circle" etc. If the subject does not begin copying the form, take his hand in yours and make the movements. Be sure he is paying attention to what he is doing. Make each movement deliberate, pausing for a moment before beginning with the next. When repeating this, frequently

stop to let the resident make some of the movements on his own. Further, gradually reduce your assistance by relaxing your grip on the subject's hand as he continues movement on his own.

4. With the time remaining in the session, pass out the heavily lined paper and scissors. Demonstrate to each subject what needs to be done on a sheet of your own paper. Take the scissors and begin cutting along the right hand line of the paper. Say "cut the paper on the line." If the subject does not begin or has difficulty holding the scissors properly, put the scissors in his hand for him and guide his hand along the line as he cuts. Pause frequently to see if he will continue cutting along the lines. Remember to praise frequently as long as the subject is cutting along the lines satisfactorily.

Bean Bag Throw - 20 minutes

Target Behaviors:
1. Subject will be able to accurately throw a bean bag from a distance of at least six feet.
2. Subject will make appropriate clapping, smiling responses when another resident makes it in the target.
3. Subject will sit behind the target and return the bean bag after it has been thrown by another resident.

1. Subjects should be able to sit quietly in a chair for about three minutes at a time with little verbal prompting. Arrange two chairs in the following manner. One directly behind the target and one about half way between the target and the spot where the subject will be throwing; this just off the line where the bean bag will travel after being thrown. One resident will throw the bean bag (standing) one resident will be the audience (sitting) and one resident will return the bean bag (sitting).

2. Depending on the intial skill of the subjects, a trash can, bucket or smaller target may be used as a target. Pretest each subject by asking him to "throw the bag into the bucket" target, etc. Set the foul line (a stick or tape) at a point where the poorest member of the group can hit the target about $\frac{1}{2}$ of the time.

3. Begin each game by asking the members to sit in their chairs with the exception of the one player who will be throwing. Each player gets 6 throws to a turn. Order of players goes, thrower, to audience, to bean bag returner.

4. Concentrate mainly on the thrower at first. Encourage his throws and help him with his movements, providing physical guidance if needed. Reinforce with praise and a consumable on each shot that goes in the target. Emphasize that he must stay behind the foul line.

The other players should be sitting quietly while the one player is throwing. After the bean bag is thrown, encourage the "returner" to pick up the bag, return it to you and sit back down. He may also just throw it back to you. Praise if he does this or a close approximation, but don't spend too much time with him now if he is troublesome. The audience should be encouraged to clap and laugh (trainer provides model) when another resident makes a target.

5. As the games go smoother, spend more time on getting the "returner" to reliably return the bag to the trainer. Later, this may be switched to returning it to the thrower. Finally spend more time with the "audience", prompting claps and smiles. You may also encourage audience responses from the "returner."

6. When the above steps go smoothly and residents improve their throwing skill, begin moving the foul line back. Also, competitive situations may be set up where only the person who makes the most targets per round would get a consumable reinforcer, etc.

Appendix 3

+ correct
- incorrect
n/a not applicable

Sample Scoring Sheet

Trainer Behavior Assessment Form [1]

Type of Activity(s) Trained_____ Name of Trainer_____
Session Time_____ Name of Resident _____
Session Date_____ Name of Observer_____

A. Session Preparation

1. Prepares materials for session before beginning.
2. Reviews data and procedure from previous session.
3. Has knowledge of immediate goal of session.
4. Gets acquainted with S before training.
5. Tests for reinforcer effectiveness before beginning.
6. Selects an effective reinforcer.

B. Prompting and Fading Controlling Stimuli

1. Uses S's name before a command.
2. Uses correct verbal command.
3. Uses verbal prompts correctly.
4. Fades verbal prompts correctly.
5. Uses physical prompts (gestures) correctly.
6. Fades physical prompts (gestures) correctly.
7. Uses physical guidance correctly.
8. Fades physical guidance correctly.
9. Allows edible reinforcer to be consumed before next trial

C. Manipulating the Consequences

1. Reinforces correct response immediately.
2. Gives verbal reinforcement enthusiastically.
3. Gives physical reinforcement enthusiastically.
4. Gives verbal reinforcement with edible reinforcement.
5. Withholds reinforcement following wrong response.

D. Shaping or Chaining

1. Demonstrates familiarity with sequence of steps.
2. Demonstrates desired behavior where appropriate.
3. Starts with the correct step.
4. Proceeds to the next step when the S is ready.
5. Returns to previous step when necessary

E. Data Collection

1. Records resident performance during training.
2. Fills out performance sheets accurately.

F. General Evaluation

1. Demonstrates adequate patience during training.
2. Respectfully handles residents.
3. Ignores inappropriate behavior that does not interfere with training.

items scored _____
items correct_____

[1] Form modified from Louther, R., Martin, G., & McDonald, L. (1972); and Watson (1972)

Appendix 3 continued

Scoring Method

Items A1 through A6 on the scoring sheet are scored once before training begins, at the beginning of the three hour session. One 20 minute training activity is selected at random from the six scheduled, for evaluation on the remaining items B1 through 9, C1 through 5, D1 through 5, E1 and 2, and F1 through 3. Items B1 through 9, C1 through 5, D1 through 5 and E1 are scored by the observer while training is occurring. The observer scores these items on successive training trials across subjects until all items are scored or the 20 minute training session is complete. Where observing of subject behavior to record on data sheets interferes with scoring of the checklist, subject observations will take precedence. Scoring of the checklist continues when subject observations are recorded for the five second time block. As the five second subject observations occur randomly, there should be no bias in the trainer assessment.

Due to the nature of some of the activities being trained and learning by the subject, some of the checklist items will not be applicable during some training activities. For instance, if a subject does not need physical guidance to perform an activity, items B5 and 6 would not be scored but would be marked not applicable (N/A).

Items E2 and F1 through 3 are scored by the observer immediately following the end of the training session. Percentage correct is calculated by dividing total items scored correct by the total number of items scored correct or incorrect.

Appendix 3 continued

Scoring Criteria[1]

I. Session Preparation.

1. The trainer prepares all material for the session before getting the subject.

General Comments.

This should always be done before the subject is brought to the room. The attention span of the severely retarded is already all too short, and frequently, if he is kept waiting, his behavior will deteriorate, and he will become noisy, self-abusive, aggressive or restless. It is highly desirable that the resident comes eagerly to the sessions and looks forward to participating in them. In this way we are more likely to obtain his cooperation.

Scoring Criteria.

a) Trainer sets up machines and equipment if they are being used in the session.

b) Trainer has desks properly positioned with reinforcers, data sheets, etc. on desk ready to be used. Any items that the subject might use in the session are ready to be used.

2.&3. The trainer has knowledge of thesubject's performance on the previous session and the immediate goal of the current session.

General Comments.

Before we conduct any session we must know exactly how much the resident presently knows or can do. Otherwise, we will waste time on needless repetitions thereby frustrating both the subject and ourselves; perhaps even more serious is the possibility that we will advance too quickly and fail in our attempts to teach a next step. Also, it is important that there should be consistency in applying techniques and procedures between trainers. When trainer A demonstrates a particular response, say crossing laces on a shoe one way, and trainer B who conducts the next session uses a different method, we reinforce different behaviors, the subject becomes confused and our records of performance fall off.

Scoring Criteria.

a) Trainer takes subject's file and reviews data from previous sessions before starting his own session.

b) Trainer does not stop in the middle of the session to check back on the procedure or ask an observer for advice.

c) Trainer follows the identical procedure that other trainers before have followed unless a change in procedure has been agreed upon. (See decision log, p. 16)

4. Trainer gets acquainted with the subject before training.

Scoring Criteria.

a) Trainer gets acquainted with the subject before the session. Trainer talks to the subject a little before the start of the session (says "Hi, how are you today?" or "do you want to earn some candy?" etc.) rather than grabbing the subject, putting him in his chair and starting the session with no preamble.

[1] From Lowther, Martin and McDonald (1972) except where further footnoted.

5. The trainer tests for reinforcer effectiveness before training (reinforcer sampling).

General Comments.

It is most important to find an effective reinforcer for each individual. We must find something which when presented following behavior, will lead to an increase in that behavior. A useful approach is to allow the subject a choice of such things as potato chips, candies, sweet cereal, cake, etc. When none of these are quickly selected by the subject he should be observed carefully in an attempt to identify some item in which he or she shows an interest.

Therefore, it is important not to simply use what is on hand and readily available, but to test a variety of possible reinforcers to find out what will be effective at that particular moment in time.

Scoring Criteria.

a) Trainer places a variety of possible reinforcers (three different items)in front of the subject and asks him what he wants.

6. The trainer selects an effective reinforcer.

Scoring Criteria.

a) Subject consumes reinforcer immediately (if edible) without being told to do so, he does not sit and play with it.

b) Subject attends to/or plays with the reinforcer (if not edible) during the reinforcement interval.

B. Prompting and Fading Controlling Stimuli.

1. The trainer uses the subject's name before a command.

General Comments.

We all like to be addressed by our name, and this has the additional benefit of helping to catch the subject's attention. An example would be the trainer saying, "Rita, lace your shoe", rather than "Lace your shoe." The constant repetition might also help a resident learn his own name and respond to other commands preceeded by his name.

Scoring Criteria.

a) The trainer addresses the subject by his name either before, during or following a command. eg. "Rita, lace your shoe" or "Lace your shoe, Rita" or "OK, here's your shoe, Rita, lace it."

2. The trainer uses correct verbal command.

General Comments.

For most of us slight variations in verbal commands still produce the right response; for the severely retarded, however, this can be confusing. The same correct and consistent verbal command should always be used, especially early in training. For example, during a dressing session, the trainer may first ask the subject to find the "good side" or find the "bad side" of a sweater. After a few minutes he may ask the subject to find the inside and outside of the sweater, and later ask him to find the right side of the sweater and the wrong side. The subject may find the use of several terms for the same item (side of sweater) confusing and this would likely lead to an increase in the number of wrong responses emitted.

Scoring Criteria.

a) A clear verbal command is given by the trainer.

b) The command should be given in an audible voice (ie: command may be recognized up to five feet away.

c) The command should be consistent throughout the session, not "lace that shoe", then "Put this here", etc.
d) The trainer does give a command. He does not take it for granted that the subject is so far advanced that no command is necessary. Sometimes the subject will sit and look at the trainer for a command while the trainer sits and looks at the subject waiting for him to respond. (This does not apply when commands are deliberately being faded out or when it has been previously decided that only gestures will be used).
e) The command is only given when the subject is attending to the trainer and behaving properly.

3. The trainer uses verbal prompts correctly.

General Comments.

A verbal prompt is a statement by the trainer which provides further cues to the subject; eg. After the command "Put the block in the hole," the trainer might add the verbal prompt "Put the big block in the blue." Verbal prompting is of little use if it is not applied at exactly the right time. It is sometimes given too soon (before the subject has had a chance to respond to the command) or too late (after the subject is no longer attending to the trainer). When the prompt is given at the right moment (after the subject has made three consecutive wrong responses or after the subject has not responded to a command for five seconds but is still attending), the subject will likely make a correct response which will increase.

Scoring Criteria.

a) The prompt is only given when the subject is attending to the trainer (looking directly into his eyes) or the task at hand, and not engaging in undesirable behavior.
b) The prompt is given only after the subject has been given sufficient time to respond to a command. Sufficient time would generally be about five seconds after the command was given.
c) The verbal prompt is clear, audible, and easily understood, eg: "Put the lace over here in this hole", not "here".
d) The prompt is given in a neutral tone. It is not shouted at the subject as a sharp "No!" would be shouted, nor is it presented along with derogatory comments such as, "over here, stupid."

4. The trainer fades verbal prompts correctly.

General Comments.

Fading refers to the gradual alteration of the stimuli controlling a response so that the response eventually occurs to a new set of stimuli. The importance of fading verbal prompts over sessions cannot be over emphasized. If the subject receives a great deal of reinforcement for responding to a given set of stimuli at one stage, it will become increasingly difficult to extinguish responding at this stage and to condition responses to a slightly different set of stimuli. For example, the longer that the trainer uses verbal prompts such as "This is the green circle; it is the same color as grass, green," the more difficult it will be to make the subject respond after a more simple prompt such as "This is green." Much time and effort may be wasted giving the subject many verbal prompts when they could easily have been faded over the sessions until no prompts were necessary.

Scoring Criteria.

a) A particular verbal prompt is used by the trainer until the subject has made three consecutive correct responses. The intensity of the prompt is then decreased slightly, eg. "This is the knife, you cut meat with a knife," to "This is the knife."

b) If the subject makes over three consecutive incorrect responses at any stage of fading the prompt, the trainer returns to the previous stage until three consecutive correct trials are obtained and then continues with the fading.

5. The trainer uses physical prompts correctly.

General Comments.

Frequently, early in session training, a physical prompt is necessary to help the subject respond to the verbal command. A physical prompt consists of a gesture by the trainer. For example, to the command, put the lace in the hole, the trainer might add the physical prompt of pointing to the desired hole. The appropriate physical prompt given at the right moment can lead to success in obeying the verbal command. This in turn leads to positive reinforcement for the subject and the increased likelihood that the behavior will occur in the future. As with the verbal prompt, a physical prompt should not be given before the subject has had sufficient time to respond (usually about 5 seconds) and only when the subject is attending to the trainer or the task.

Scoring Criteria.

a) The prompt is only given when the subject is attending to the trainer (looking directly into his eyes) or to the task and not engaging in undesirable behavior.

b) The prompt is given only after the subject has been given sufficient time to respond to a command. Sufficient time would usually be 5 seconds after the command was given.

c) A physical prompt is given only when necessary, (ie: after 3 consecutive incorrect responses with verbal prompts alone). The physical prompt should not be given before a verbal prompt is attempted.

d) The physical prompt consists of a clear gesture that can easily be seen from 5 feet away. For example, in shoe lacing the trainer should clearly point to the hole to be laced rather than waving his hand in the general direction of the shoe (Unless fading is under way as described below).

6. The trainer fades physical prompts correctly.

General Comments

The physical prompt should be faded out as quickly as possible for the same reason that the verbal prompt is faded out.

Scoring Criteria.

a) A particular physical prompt is used by the trainer until the subject has made three consecutive correct responses. The intensity of the prompt is then decreased slightly, eg: The trainer might start by putting his finger on the appropriate hole and telling the subject to lace his shoe. When the subject reaches criteria the trainer would then point to the hole from six inches away and tell him to lace the shoe.

b) If the subject makes over 3 consecutive incorrect responses at any stage of the fading of the prompt, the trainer returns to

the previous stage until 3 consecutive correct trials are obtained and then continues the fading procedure.

7. The trainer uses physical guidance correctly.

General Comments.

A subject may require complete physical guidance when a new task is initially introduced. Physical guidance is used when the subject fails to respond to either a verbal or a physical prompt. He is physically guided through the task so that the desired response will occur and be reinforced, thus increasing the probability that it will occur again. The guidance is gradually faded out until the subject carries out the task on his own and is reinforced for responding without guidance.

As with verbal and physical prompts, physical guidance should be given only after the subject has had sufficient time to respond, usually about five seconds and when the subject is attending. Unless this is closely monitored a trainer may obtain a high rating on this assessment form by physically guiding the subject through most of the tasks, whether or not it is necessary, thus giving the subject little or no opportunity to make an incorrect response. Often, the fact that a trainer has given excessive physical guidance can only be seen when another trainer works with the same subject using greatly reduced physical guidance.

Scoring Criteria

a) The prompt is only given when the subject is attending to the trainer (looking directly into his eyes) or the task and not engaging in undesirable behavior.

b) Physical guidance is given only when necessary (after 3 incorrect responses have been made by the subject with physical prompts only.

c) Guidance is given firmly. If the subject pulls away the trainer takes his hands again and forces him through the task.

8. The trainer fades physical guidance correctly.

General Comments

The physical guidance should be faded out as quickly as possible for the same reasons that the verbal prompts and physical prompts are faded out.

Scoring Criteria.

a) Physical guidance of a particular intensity is used by the trainer until the subject has made 3 consecutive correct responses. The intensity of the guidance is then decreased slightly, eg: When asking the subject to wash his face for the first time, the trainer may guide his hand through the entire process of rubbing the wet cloth on his face. When criteria is reached the trainer may only guide the subject's hand with the cloth up to the subject's face and subject must then go through the motions of washing his face by himself.

b) If the subject makes 3 consecutive incorrect responses at any stage of fading the guidance, the trainer returns to the previous stage until 3 consecutive correct trials are obtained and then do the fading.

9. The trainer allows edible reinforcers to be consumed before the next trial.

General Comments.

There is little incentive to making a correct response for a candy for instance, while the subject is still eating the previous one. Also, in some sessions such as mimicking and object naming sessions, it is difficult for the subject to respond while eating.

Scoring Criteria.

a) The trainer does not give a new command until the subject has completely consumed the reinforcer (eg: his mouth is empty as evidenced by termination of chewing and swallowing).

C. Manipulating Consequences.

1. The trainer reinforces correct response immediately.

General Comments

The reinforcer will reinforce or increase the probability of the behavior that immediately preceeds it. If it is not given immediately after the desired response has occurred, another response may be emitted and then followed by the reinforcer. In this case the wrong response may be reinforced. For example, a subject might correctly mimic a word and then slap herself on the head before the reinforcer is given. In such a case head slapping would be reinforced.

Scoring Criteria.

a) The delay between a correct response and the reinforcement should be no longer than 1 second.

2&3. The trainer gives physical and verbal reinforcement enthusiastically.

General Comments

The enthusiasm with which we give reinforcement eg: "Good girl!", usually increases the reinforcing value of our action. The more reinforcing the event which follows a correct response, the more likely that the response will occur again.

Scoring Criteria.

a) The trainer has a smile on her face when delivering a reinforcer.

b) The trainer's voice is not a monotone but shows variation in both pitch and loudness.

c) The trainer does not deliver physical reinforcers mechanistically.

4. The trainer gives verbal reinforcement with material or edible reinforcers.

General Comments.

Once again the verbal reinforcer often adds the the power of the reinforcing event. Also, hopefully, after the repeated pairing of the verbal reinforcer and edible reinforcer (candy, etc.), the former alone will become more effective secondary reinforcer for the subject, and can be used effectively to reinforce any desired behavior in any situation. For example, "Good Boy!", repeatedly paired with candy results in "Good Boy!" alone being sufficiently reinforcing at a later stage.

Scoring Criteria.

a) Trainer gives the subject a verbal reinforcer when he hands the subject a token.

b) Trainer gives the subject a verbal reinforcer when the subject is consuming the edible reinforcer, eg: "Isn't that candy good?"

5. The trainer correctly withholds a reinforcer following a wrong response.

General Comments.

Obviously one does not wish to increase the future probability of incorrect responses. It is therefore, important that the trainer does not reinforce the subject after he has responded incorrectly. A wrong response should be followed by a sharp "No!" and a minimum pause of 5 seconds. Then a prompt or a new command may be given.

Scoring Criteria.

a) Following an incorrect response, trainer says "No!", then waits a minimum of 5 seconds before prompting or giving a new command or in any way proceeding with a new trial.

D. Shaping or Chaining.

1. The trainer is familiar with correct sequence before the session begins.

General Comments.

It is important that the trainer be familiar with the correct sequence before the session begins. Valuable time may be wasted if the trainer finds it necessary to stop in the middle of the session and look up the correct procedure. Also, the subject may start to fidget while the trainer is occupied. Finally, even though the task is broken down into a number of smaller tasks, the sequence in which the events would naturally occur is kept. It would be confusing to the subject if he was asked to perform the task out of sequence.

Scoring Criteria.

a) The trainer does not pause during the middle of a session for more than a few seconds (Usually 10 or 15 seconds) to re-read the correct procedure.

b) The trainer does not ask the subject to perform tasks out of the prescribed order. The correct sequence of tasks should be written out and available to trainer and the observer before the sessions are started.

2. The trainer demonstrates the desired behavior where appropriate.

General Comments.

Often, in a chaining procedure, it is helpful if each new step is appropriately demonstrated by the trainer when that step is first introduced. The trainer can then effectively attempt to teach the subject to perform that particular step utilizing verbal prompts, physical prompts, or physical guidance, depending on which is appropriate.

Scoring Criteria.

a) Where appropriate, the trainer demonstrates each step clearly before giving the subject a command to perform that step, (i.e. Trainer shows the subject exactly what behaviors are involved in following that command before giving that particular command).

3. The trainer starts with the correct step at each session.

General Comments.

In addition to being familiar with the entire correct sequence of the training task before the session begins, (which is what the first item under shaping as described above refers to), the trainer must be familiar with the current steps that the subject is working on in

order that each session and each trial may be started at the appropriate point. In some tasks, the trainer may wish to start completely from scratch at the beginning of each session. However, in other tasks, it may be desirable to start each session and each trial with the step that completed the last session of trial.

Scoring Criteria

a) The trainer starts each session and trial with the correct step (it would be necessary to be familiar with the procedure agreed upon by the other staff members in order to determine which is the correct step to start with).

4. The trainer proceeds to the next step when the subject is ready.

General Comments.

If, either in shaping or chaining, the subject receives a great deal of reinforcement at any given step, then that particular step is likely to become extremely resistant to extinction. Therefore, when a new step is introduced, the subject may persist with the behavior that was developed at the previous step. On the other hand, if performance at any given step is not well established, and a new step is introduced, then the subject might extinguish altogether in the sense that no appropriate behavior is firmly established in his repertoire upon which succeeding steps may be built. Thus, one must proceed at a pace that's not too fast, but not too slow. This pace may vary somewhat from subject to subject and from task to task, and the following criteria is suggested as one that we found to be adaptable to a wide variety of subjects and tasks.

Scoring Criteria.

a) The trainer proceeds to the next step in the sequence when the subject has responded correctly on the current step for three consecutive trials.

5. The trainer returns to a previously successful step if necessary.

General Comments.

We have previously indicated in this form, that when training subjects, the procedure followed is usually one where a command is given, and the trainer's subsequent behavior depends on the behavior of the subject. That is, if the subject does not respond, or if he responds incorrectly, then additional verbal prompts may be given. If these are insufficient, physical prompts may be given, and if these are insufficient, physical guidance might be given. When correct behavior is obtained, then the physical prompts and guidance and/or verbal prompts are gradually faded out. Sometimes, however, it is desirable not to provide additional prompting or guidance other than providing the initial cue for the behavior. For example, when we previously shaped a girl to walk without assistance to the dining room at mealtimes, we used a shaping procedure that did not involve physical prompting or guidance. The subject was first required to move from her chair to another chair that was placed at a table with food on it at a distance of approximately two feet away. Over a series of meals, this distance was gradually extended; the subject was reinforced with a meal for walking further and further by herself. When such a procedure is used, it is necessary to monitor the subject's behavior closely, and if one proceeds to new steps too rapidly, as indicated in frequent errors at a new step, then it is necessary to

return to previous steps, so that the behavior at earlier steps may be more firmly established, prior to proceeding to new steps. Therefore, the criteria below should be followed in such cases.

Scoring Criteria.

a) If a subject makes several (usually three) incorrect responses at a given step, in shaping, then the trainer returns to the immediately preceeding step until three additional correct trials are achieved at that preceeding step. The trainer then moves on to the next step that was performed incorrectly, in order to try again.

E. Data Collection.

1. The trainer records the subject's progress during the session.

General Comments.

The data sheets should be filled out as the session progresses, for if the trainer leaves this to the end of the session, he may forget important points that should have been recorded.

Scoring Criteria.

a) Trainer fills out the appropriate data sheet while the session is in progress and not after the completion of the session.

2. Fills out performance sheets accurately.

Scoring Criteria.

a) Trainer fills out performance sheets correctly, graphing correctly where appropriate.

F. General Evaluation.

1. Demonstrates adequate patience during training.[2]

General Comments.

A training session can be a very tiring experience for the trainer as well as the subject. Sometimes everything goes well, and sometimes it doesn't. When it doesn't, the trainer often becomes irritable and loses patience with the subject. He may begin demanding too much, too soon, and too often. He may start raising his voice or otherwise indicating that he is losing his patience.

Scoring Criteria.

a. Trainer remains calm in most situations and does not become obviously irritable as evidenced by raising voice level or handling the subject abruptly.

2. Respectfully handles subjects.

General Comments.

This is really self evident. The retarded are entitled to the same respects as any other human being. In addition, we are constantly "shaping" their behavior whether or not we are always aware of it. They will tend to imitate our speech, and attitudes toward others.

Scoring Criteria

a) Trainer does not stop in the middle of a session to tell an observer that he is tired of doing this session with such a dummy, etc. Trainer only interrupts a session if a question comes up that must be answered immediately or if he is called away by something important.

b) Trainer prompts the subject after a wrong response rather than shouting at him.

[2] from Watson (1972).

c) Trainer does not throw in comments which have nothing to do with the session, for instance "Boy are you dumb" etc.

3. Ignores inappropriate behavior that does not interfere with training.[3]

General Comments

Often in a training session a child responds negatively. He may misbehave in a variety of ways: by throwing objects, screaming, banging his head etc. It is usually best to ignore this behavior because paying attention might reinforce him, and the behavior would continue, unless some particular procedure, such as time out, is being used to eliminate the behavior.

Scoring Criteria.

a) Trainer ignores most bad behavior unless the behaviors are destructive to the subject or other subjects.

[3] from Watson, (1972).

Sample Data Sheet[1]

TIME	S1	S2	S3	TIME	S1	S4	S3	TIME	S1	S4	S3	TIME	S1	S4	S3	TIME	S1	S4	S3
9:00.20				:36:30				:11:45				:47.35				22.55			
:01.05				37.50				:12.40				:48.15				:23.40			
:02.25				:38.10				:13.15				:49.35				:24.40			
:03.55				:39.40				:14.10				:50.30				135.30	D		
:04.00				:40.05				:15.50				:51.30				:26.40			
:05.50				:41.25				:16.35				:52.40				:27.15			
:06.55				:42.40				:17.15				:53.55				:28.30			
:07.50				:43.45				:18.55				:54.55				:29.45			
:08.05				:44.45				:19.35				:55.10				:30.10			
:09.40				:45.05				:20.20				:56.20				:31.55			
:10.05				:46.00				:21.30				:57.10				:32.40			
:11.00				:47.40				:22.15				:58.20				:33.50			
:12.35				:48.35				:23.15				:59.55				:34.35			
13.00				:49.05				:24.30				[illegible]				:35.50			
:14.10				:50.25				:25.55				11:00.45				:36.05			
:15.20				:51.50				:26.20				:01.35				:37.15			
:16.10				:52.10				:27.10				:02.45				:38.35			
:17.25				:53.20				:28.05				:03.40				:39.15			
:18.25				:54.35				:29.35				:04.35				:40.45			
:19.20				:55.45				:30.05				:05.05				:41.55			
:20.10				:56.20				:31.40				:06.35				:42.20			
:21.15				:57.35				:32.30				:07.35				:43.20			
:22.45				:58.45				:33.40				:08.45				:44.25			
:23.10				:59.20				:34.20				:09.05				:45.35			
:24.15				[illegible]				:35.05				:10.20				146.00			
:25.25				10:00.50				:36.25				:11.25				:47.30			
:26.35				:01.50				:37.15				:12.05				:48.55			
:27.30				:02.40				:38.55				:13.15				:49.00			
:28.25				:03.00				:39.00				:14.00				:50.20			
:29.25				:04.55				:40.45				:15.40				:51.50			
:30.30				:05.50				:41.30				:16.40				52.20			
:31.30				:06.20				:42.20				:17.30				:53.15			
:32.15				:07.40				:43.25				:18.55				:54.10			
:33.55				:08.45				:44.45				:19.25				:55.45			
:39.00				:09.35				:45.40				:20.35				:56.00			
:35.15				:10.45				:46.35				:21.15				:57.30			
																:58.15			
																:59.20			

[1]Observation intervals are for 5 seconds beginning with the second indicated.

Appendix 5

Catalogue of Apparatus

Observation and Recording Apparatus

1. One Seiko Pressmatic 5106-7050 wristwatch.
2. One Sears 1/10th second stopwatch with 15 minute dial.
3. One subject data sheet and pencil.

Trainer Assessment

1. One Trainer Assessment Form and Scoring Criteria (Appendix 3).

Furniture

1. One 4 ft. by 4 ft. table.
2. Two 2 ft. by 3 ft. tables.
3. Six chairs.

Consumable reinforcers (Availability of consumable reinforcers varied from time to time, however, each session had at least the following items):

1. M&Ms or Sixlets.
2. Fritos or Potato Chips.
3. Shelled, salted peanuts.
4. cigars and cigarettes.

Training items

1. Three Playskool Shape Sorting Boxes with shapes.
2. Five Playskool wooden jigsaw puzzles, Numbers 155-14, 155-18, 155-19, 165-12, and 165-2.
3. One Fisher Price wooden jigsaw puzzle, "Transportation."
4. One Panasonic cassette tape player RQ 409S with color coded green start and red stop buttons.
5. One 60 minute cassette tape with assorted music with a good beat, Flatt and Scruggs bluegrass music, Herbie Mann, "Memphis Underground" and piano rhythm music.
6. Three sets of large diameter crayons.
7. Three blunt nose scissors and three sheets of heavily lined paper.
8. Assorted stimulus sheets for coloring or copying. This included geometric shapes, stick man, man, and a car and bus.
9. One standard trash can (bean bag target)
10. One bean bag, 6 in. by 6 in.

Subject Assessment.

1. Three Subject Assessment forms and pencil.

Appendix 6
Subject Assessment Form

Subject Name_____ Trainer Name_____ Date____

	POOR	GOOD	EXCELLENT
Exercises			
Hands over head and stretch			
1. Holds hands over head			
2. Holds hands over head and stretches			
Toe touch			
1. Bends forward at waist			
2. Bends forward and reaches for toes			
Side stretch			
1. Holds arms out, parallel with floor			
2. Holds arms out and stretches from side to side			
Jumping and Hopping			
1. Jumps up, both feet leave floor			
2. Balances on one leg (which leg?)			
3. Hops on one leg (which leg?)			
Shape Sorting, can subject consistently insert:			
1. Square			
2. Circle			
3. Triangle			
4. Rectangle			
5. ½ round			
Puzzles (which puzzle worked on this session?			
1. can assemble one piece (s)			
2. " " two "			
3. " " three "			
4. " " four "			
5. " " five "			
6. " " six "			
Music Listening			
1. Can turn on cassette player			
2. Can turn off cassette player			
3. Claps with music beat			
4. Taps feet with music beat			
Paper, crayon and scissor work			
1. Colors inside the lines of objects (specify objects:)			
2. Traces over lines of objects (specify objects:)			
3. Copies simple objects (specify objects:)			
4. Can hold scissors properly			
5. Can cut, not tear paper			
6. Can cut along heavy lines with scissors			
Bean Bag Throw			
1. Throws bean bag accurately (hit target ½ time from ft.)			
2. Makes audience responses (to receive excellent, must perform without prompting from trainer)			
3. Returns bean bag (to receive excellent, must perform with no prompts from trainer)			

RECORD COMMENTS YOU MAY HAVE ON BACK OF FORM CODE: these go in poor col.
NR - no response or resists
PG - need physical guid.
P - need verbal prompts
CC - performs on command

Appendix 7

Data sheet for Treatment 2

TIME	S1	S2	S3	TIME	S1	S2	S3	TIME	S1	S2	S3
9:00				:40				:20			
:01				:41				:21			
:02				:42				:22			
:03				:43				:23			
:04				:44				:24			
:05				:45				:25			
:06				:46				:26			
:07				:47				:27			
:08				:48				:28			
:09				:49				:29			
:10				:50				:30			
:11				:51				:31			
:12				:52				:32			
:13				:53				:33			
:14				:54				:34			
:15				:55				:35			
:16				:56				:36			
:17				:57				:37			
:18				:58				:38			
:19				:59				:39			
:20				10:00				:40			
:21				:01				:41			
:22				:02				:42			
:23				:03				:43			
:24				:04				:44			
:25				:05				:45			
:26				:06				:46			
:27				:07				:47			
:28				:08							
:29				:09							
:30				:10							
:31				:11							
:32				:12							
:33				:13							
:34				:14							
:35				:15							
:36				:16							
:37				:17							
:38				:18							
:39				:19							

VITA

James Gill Hatfield was born on November 9, 1947, in Cleveland, Ohio. In 1969 he was awarded a Bachelor of Arts degree from Hanover College. Following two years in the Armed Forces, he began graduate study in psychology at the University of Richmond where he anticipates completing the requirements for a Master of Arts degree in psychology in October, 1974. From November 1972 to March 1974 he served as Assistant Director of a Federally supported project to work with retarded residents of Petersburg Training School and Hospital. Since March of 1974, he has worked part time as a member of the staff of this project. In May of 1974, he presented preliminary results of this study to the Virginia Academy of Science at Old Dominion University in Norfolk, Virginia.