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Title: The Effect of Auditory Subliminal Deactivating
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Hyperkinetic Children

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The effects of a subliminal auditory stimulus on the motor activity and task performance skills of hyperkinetic children were investigated. Fifteen boys between seven and twelve years of age, who were enrolled in one of three treatment groups for hyperactivity, were recruited for this study. Each child participated, weekly, in one 75 minute group session and one 15 minute individual session. Because of circumstances involving absences and vacation, attendance varied from seven to nine sessions. During base-line conditions, white noise was broadcast below the auditory threshold level of the subjects into both the group and individual treatment rooms. Data were collected in individual sessions on two computer tasks, Continuous Performance and Eye-hand coordination. All individual sessions were video-taped and later coded by two observers. The

occurrence and/or non-occurrence of off task behaviors, disruptive verbalizations, and gross motor activity were coded. During the treatment phase, subliminal, auditory deactivating messages containing two self-esteem and two relaxation phrases were broadcast. A single subject evaluation procedure, multiple baseline design across subjects, was used to evaluate the effect of the treatment condition on each subject. The auditory subliminal stimulus did not affect behavior or task performance. A positive trend, although inconclusive was developing in the experimental group, thus, the capability of subliminal messages to affect change in hyperactive children merits further research.

The Effect of Auditory Subliminal
Deactivating Messages on Motor
and Task Performance of
Hyperkinetic Children

by

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THE EFFECT OF AUDITORY SUBLIMINAL DEACTIVATING
MESSAGES ON MOTOR AND TASK PERFORMANCE
OF HYPERKINETIC CHILDREN

I. INTRODUCTION

Hyperactivity is the most common behavior disorder of preadolescent children (Wende, 1975). It is more common in boys than in girls with ratios ranging anywhere from 3:1 to 9:1. A generally accepted figure is 6:1 in favor of males (Barkley, 1981).

Educators often report an incidence rate of hyperactivity of 15 to 20 percent of all elementary school children (Yanow, 1973). However, since 1975, more methodologically sound and sophisticated studies have been carried out with large representative populations of public school children. All report rates well below ten percent (Bosco & Robin, 1980; Lambert, Sandoval & Sassone, 1978; Sprague, Cohen, & Eichlseder, 1977; and Trites, 1979). A prevalence estimate of between three and five percent of school age children is accepted now by most researchers (Barkley, 1981).

Hyperactive children have been portrayed as not energy efficient. Their activity is misdirected, purposeless, fidgety, and seemingly random . . . They tend to be chronically impulsive . . . in their overall behavior, in their social interactions, and in their

problem solving. They tend not to reflect, plan, organize, or monitor their own productions. Many such youngsters feel very much out of control. Their impulsivity is constantly getting them into trouble. Often they seem not to believe what they have done, feeling unaccountable for their unpremeditated acts because things seem to happen so fast (Levine & Okerlaid, 1980, p. 411).

Compared to his nonhyperactive classmate, the hyperactive child is more active and disruptive during classroom instruction and activities. He has a shorter attention span, is more impulsive, asks for teacher attention at inappropriate times, and has more frequent energy bursts and spontaneous verbalizations (Campbell, Endman & Bernfeld, 1977; Buchan, Swap & Swap, 1977; Klein & Young, 1979; Whalen, Collins, Henker, Alkus, Adams & Stapp, 1978; Whalen, Henker, Collins, McAuliffe & Vaux, 1979).

Klein and Young (1979), Campbell et al. (1977) and Whalen et al. (1978, 1979) have reported that hyperactive children alternate between on-task and off-task behaviors throughout an activity. High rate gross motor activity and disruptive verbalizations generally accompany the off-task behaviors.

These behaviors, off-task, gross motor activity, and disruptive verbalizations, have been monitored in this study.

The phenomenon of subliminal stimulation has been highly controversial since 1957 when some unwitting

theatre audiences in New Jersey were invited to "drink Coca-Cola" and "eat popcorn" in messages that were presented repeatedly below the recognition threshold and were superimposed on a movie in progress. A market researcher, James Vicary, leaked the information and stated that sales of popcorn increased 18% and Coca-Cola 58%. Public criticism was instantaneous; movie theatre customers were being influenced to purchase something without any awareness. No one managed to substantiate Vicary's claim, and although most market researchers and advertisers immediately lost interest in subliminal advertising, due to the sensationalism that subsequently surrounded the field, the past 25 years have seen considerable resurgence of national interest in subliminal stimulation in the fields of education, psychology, marketing and advertising. The most visible surge has been in the fields of marketing and advertising.

Marketers have taken new interest in the potential of subliminal stimulation since researchers have become more successful in their investigations. Producers of subliminal processing machines are actively seeking business in the commercial field. Subliminal processors are being used to reduce shoplifting, increase productivity, and to reduce high employee turnover in retail stores.

A more recent trend is the development and marketing of tapes and videotapes with embedded messages used by

people seeking self-help in the areas of smoking, over-eating, stress management and self-esteem.

Subliminal processing machines are being used in department stores, supermarkets, real estate agencies, automobile dealerships and radio and television stations. In fact, subliminal stimulation has itself become a product.

With this flurry of activity in the business world, educators' interest is peaked and renewed efforts are being made in the areas of research, design and implementation.

Other serious applications have been developed since 1956. Subliminal stimulation has been used for pilot selection by the Swedish Air Force since 1960. A visual subliminal, "Defense Mechanism Test," consists of a set of pictures that are flashed instantaneously on a screen. This test is designed to test the defense mechanism reflexes of potential pilots. The dropout rate has declined from 70% in 1970 when the screening test was formally implemented to 13% in 1981. Other countries, Norway and Denmark, have also adopted this subliminal procedure.

The focus of the early studies was on (1) whether stimuli that were presented below the established visual threshold would later be responded to by the subjects, and (2) if they were, under what conditions. By today, a number of studies have documented that individuals

can respond to stimuli and their behavior influenced by the stimuli even though the individuals cannot report on the stimuli existence (Bevan, 1964a, 1964b; Dixon, 1971, 1982).

A subliminal stimulus is defined as one whose intensity is below the established threshold of an individual, that is, it is inadequate to allow an individual to report either a sensation or a perception. Dixon (1974) identified three types of subliminal stimulus situations as (1) when the subject responds to a stimulus which he or she pleads total unawareness. (2) when the subject reports being stimulated, but denies any awareness of what the stimulus is, and (3) when the subject responds to stimulation in which the duration of intensity is below all previous threshold levels for that subject. These situations are differentiated from situations in which the subject is unaware but could be made aware of the stimulus if the subject's attention was drawn to it. With subliminal perception, the subject cannot identify the stimulus. But, although the stimulus is below a subject's threshold, research in the last 29 years appears to demonstrate that subliminal stimuli can change behavior (Dixon, 1982).

Strong behavioral effects have been claimed for three identifiable subliminal stimuli, visual, auditory, and the embedment of imagery in pictorial advertisements.

Visual stimuli are usually presented briefly by means of a tachistoscope. This device controls the duration of an exposure of a visual stimulus, so that the message and/or picture are flashed so quickly that the viewer is unable to report that it is present or absent. This type of visual stimulation is said to register subconsciously and thus influence subsequent behavior.

The second type of stimuli employed to influence behavior is by the delivery of low volume auditory messages. As with the visual stimulus, it is believed to be registered and processed by the subconscious.

The third type of stimuli entails hiding imagery or words in pictorial advertisements. These images or words are concealed so that the viewer is not aware of them but they are reported to have a subconscious effect.

The effects from any one of these subliminal stimuli may be either (1) general affective consequences (i.e., mood, anxiety) that are assumed to have either a positive or negative influence or (2) very specific direct consequences that influence the occurrence or nonoccurrence of a specific behavior (Moore, 1982).

Statement of the Problem

Increasingly, it is recognized that hyperkinetic children have difficulty in learning because of impulsivity, a short attention span, frequent energy bursts and spontaneous verbalizations. These behaviors generally

accompany off-task behavior which in turn interferes with learning.

Educators have sought solutions to these problems for decades, but special emphasis was placed upon hyperkinetic children when it was recognized that many of these children exhibited behaviors that qualified them as learning disabled and/or severely emotionally disturbed under P.L. 94-142. The law requires that each child have an individualized education plan, based upon the child's needs, that is continuously monitored and updated.

The burden of implementing strategies to remediate learning and behavior problems of these children fell on the shoulders of administrators, specialists and classroom teachers alike.

Many effective programs and innovative strategies have been developed, but there remains a gap as evidenced by educators' reports indicating that 15 to 20 percent of all school children exhibit hyperactive behaviors (Yanow, 1973).

Subliminal perception has been studied at virtually every college and university in the country. Although thousands of studies have been conducted, subliminal perception is primarily viewed as a laboratory tool. Until recently, technology had not evolved to allow the use of subliminal techniques in practical applications. That evolution has occurred. There are many producers

of subliminal processing machines, many with solid-state circuitry. These processing machines make it possible to move from the laboratory to the classroom.

Although sensationalism has surrounded the subject of subliminals for years, educators are taking a serious and professional approach to the powerful technology.

The use of subliminal auditory stimulation with hyperkinetic children may offer new treatment strategies to clinicians, specialists and classroom teachers.

Educators are concerned with developing innovative methodology that will assist children in overcoming misbehaviors that interfere with the acquisition of knowledge. The use of subliminal auditory stimulation with the specific population of hyperkinetic children could fill this critical need. Clearly then, investigation into the effects of subliminal stimulation on motor and task performance of hyperkinetic children is worthy of attention.

Purpose of the Study

The purpose of this study is to report on the effects of subliminal auditory stimulation on motor behavior and task performance of hyperkinetic boys.

The study will test and evaluate the data generated by the research. The subsequent findings will be used to determine the effectiveness of subliminal auditory stimulation to help hyperactive children be more attentive

and less impulsive. The results may provide information for more effective treatment.

The objectives of the study will be:

1. To determine the effect of subliminal auditory deactivating stimuli on impulsivity of hyperkinetic boys
2. To determine the effect of subliminal auditory deactivating stimuli on on-task behavior of hyperkinetic boys while doing a specific task
3. To determine the effect of subliminal auditory deactivating stimuli on gross motor activity of hyperkinetic boys while doing a specific task

Five dependent measures will be examined:

1. behavior rating scales for parents
2. a behavior rating scale for teachers
3. a child's self-report
4. a child's task performance
5. a child's behavior while performing a task

The Achenbach Behavior Checklist, the revised Conners Parent Questionnaire, the Kendall and Wilcox Self-Control Rating Scale, will be used for the first dependent measure. The Conners' Teacher Rating Scale will be used for the second dependent measure, and the Pier's-Harris Children's Self Concept Scale for the third dependent variable.

The fourth dependent variable, the child's task performance, will include two measures: The Continuous Performance Task-CPT- and the Handeye.

The fifth dependent variable will be observation using specific data collection sheets designed for the study with Kappa being used to measure interobserver agreement.

Significance of the Study

The significance of this study focuses on the need to develop strategies and techniques to help hyperactive children be more attentive and less impulsive and to find more effective learning treatments for children suffering from this disorder.

The problem then, narrows to the need to test the effects of auditory subliminal stimulation using the recently developed processing machine. This subliminal technology allows investigation to take place in more natural settings outside of the laboratory. Few educational researchers have investigated this aspect of auditory subliminal effect. It follows that it would be appropriate and timely to investigate the possible significant benefit to the hyperkinetic population.

The significance of this research is related to the following:

1. There is a need to investigate the benefits of subliminal perception as applied to hyperkinetic children.
2. New approaches in working with hyperkinetic children may result from using subliminal stimulation as a treatment strategy
3. This study may have specific application to classroom teachers, specialists, and clinicians who instruct hyperactive children
4. The hyperkinetic child may benefit by becoming more attentive and less impulsive in learning situations
5. Awareness of subliminal technology and the benefits of subliminal perception may lead to additional investigation

Research Hypotheses

This study was designed to investigate if and auditory deactivating subliminal stimulus used in conjunction with another treatment intervention would influence a hyperkinetic child to decrease motor activity and improve task performance skills.

It was hypothesized that a subject who was enrolled in a group treatment program and that was also receiving auditory deactivating stimuli below threshold would

- (1) decrease impulsivity as measured by the Computerized Performance Task,

- (2) increase on-task behavior while doing that task,
and
- (3) decrease gross motor activity while sitting at the
computer and completing the task.

Assumptions of the Study

The following assumptions underlying this study are:

1. That behavior can be measured through sufficiently
validated instruments
2. That all parents and teachers will respond appropri-
ately regarding the child's behavior on rating scales
during data collection
3. That all children will respond appropriately regard-
ing their behavior on rating scales during data
collection
4. That observers will record behavior appropriately
during data collection

Limitations of the Study

This study was confined to a group of 15 hyperactive boys who were enrolled in a small group program at a metropolitan children's mental health clinic in Northern Oregon. The study was limited by the availability of subjects and the size of the sample.

Other limitations of the study are discussed in Chapter V under Discussion and Implications.

Definition of Terms

Activating Messages: subliminal messages suggesting muscle energy, awakesness, and readiness for activity

Deactivating Messages: subliminal messages suggesting relaxation and positive thoughts

Hyperactivity has been described as "a high level of activity that is manifested in situations in which it is clearly inappropriate and cannot be readily inhibited upon command" (Ross & Ross, 1982)

Kappa is defined as the proportion of agreement after chance agreement is removed from consideration,

$$\text{Kappa} = \frac{(P_o - P_c)}{(1 - P_c)}$$

where P_o = observed proportion of agreement and
 P_c = chance proportion of agreement

Motor Behavior for the purpose of this study is defined as behavior that includes out-of-seat, leg swinging and hand waving

Off-Task is defined as any ten second interval in which the child is looking around the room, at the floor, at his body, or anywhere but the keyboard and/or monitor

Out-of-Seat is defined as any ten second interval in which the child's buttocks are not on the chair

Single-Subject Design refers to the systematic study of relationships between specific behaviors of an

individual child or a group of children and the specific techniques which are employed to change the child's or group of children's behaviors (Baer, Wolf, & Risley, 1968)

Subliminal Auditory Stimulation is sound or verbal message presented at a volume level just below the level of conscious hearing

Subliminal Perception is the subconscious recognition of spoken words or of pictures presented below the level of conscious awareness

Supraliminal: existing above the threshold of consciousness and distinguishable as a sensation

Trend: development of movement in the direction of change

White noise: a mixture of sound waves extending over a wide frequency range that produces a barely discernible static-like noise

II. REVIEW OF THE RELATED LITERATURE

Review of Previous Research

The majority of investigators interested in subliminal perception have used the tachestoscope method of visual stimulus presentation. Silverman (1966), utilizing a psychoanalytic framework, has used visual subliminal stimuli extensively to explore psychopathology. Throughout his numerous studies, a baseline measure of the behavior to be studied was taken for each subject. This behavior might be smoking, stuttering, eating, or psychotic symptoms. The tachistoscope was used to expose for 4 milliseconds either the experimental or the control stimulus. The experimental stimulus was always an emotion-laden verbal message that was usually illustrated with a drawing suggesting the same idea. The control stimulus was a neutral message that was not expected to arouse any important unconscious motives. To control for bias, their studies were done double-blind. Neither the researcher nor the subject knew whether the stimulus delivered was the experimental or the control message. The subjects did not know which message they were seeing because both messages looked like flickers of light. A discrimination task was

assigned to all subjects to verify that the presentation was truly subliminal. Both stimuli were viewed and the subjects tried to tell them apart. More than 90 percent of the subjects failed to distinguish the experimental and control messages at better-than-chance levels. And finally, the before and after assessments of behavior were always made by someone who did not know which message the subject had seen. In his early work, Silverman experimented with a variety of experimental messages. The stimulus was presented in single session and as an isolated intervention. Silverman and his associates have been using "MOMMY AND I ARE ONE" as the experimental stimulus and "PEOPLE ARE WALKING" as the control stimulus since 1974. Silverman's experimental design was the result of eight studies of male schizophrenics.

Since 1974, this visual subliminal exposure has been used in conjunction with other therapeutic techniques by Silverman. In one study (Silverman, Frank, & Dachinger, 1974), women who suffered from severe insect phobias were treated by systematic desensitization, and by a subliminal stimulus that was substituted for the usual relaxation techniques. Half the women viewed the MOMMY AND I ARE ONE message; the other half viewed the control message, PEOPLE ARE WALKING. Silverman reported that after four treatment sessions, the subjects receiving the experimental message showed significantly greater degree of improvement in their phobic symptoms

than the control subjects. However, after a more stringent statistical analysis was completed only a trend in the improved direction was shown. In two other studies (Silverman, Martin, Ungaro & Mendelsohn, 1978), the MOMMY message was incorporated with a behavior modification program to help obese women lose weight. The experimental group was more successful in losing weight and 84 percent of them continued to lose weight for some time compared to 32 percent of the control subjects.

Additional questions were now raised as to whether positive effects on pathological populations might also be shown in a normal population. Silverman, Ross, Adler, & Lustig (1978) carried out a series of four experiments with male students to look at whether a competitive perceptual motor skill, dart throwing, would be affected by subliminal words and pictures that either condemned or condoned defeating the opponent. The dart throwing accuracy of the group who received the message BEATING DAD IS WRONG was significantly impaired compared to the neutral group, who received the message, PEOPLE ARE WALKING. On the other hand, the group receiving the message BEATING DAD IS OK had a significant improved score as compared to the neutral message group.

Parker (1982) extended the research initiated by Silverman. Parker used subliminal methods with college students who were enrolled in a business law course. Parker's students were divided into three groups, two

experimental and one control. One received the MOMMY message, the second received MY PROF AND I ARE ONE, and the third, the control group, received the neutral message, PEOPLE ARE WALKING. Both experimental groups earned significantly higher grades than the control group.

Ariam and Siller (1982) studied tenth grade students in Israeli math classes. These students were divided into four groups. The messages were tachistoscopically presented with subliminal exposures of one of four messages in Hebrew. MOMMY AND I ARE ONE was delivered in two messages, one a literal translation and the other an idiomatic one. MY TEACHER AND I ARE ONE was the third experimental message, and the last message was the control, PEOPLE ARE WALKING IN THE STREET. The groups that were exposed to either MOMMY version earned significantly higher scores than the students exposed to either of the other two messages. Ariam and Siller's study extended Parker's work to another country with a different spoken language, to high school students, and to another subject area, mathematics.

Bryant-Tuckett and Silverman (1984) investigated whether the effectiveness of teaching can be increased with visual subliminal stimulation. The effects of the two messages, MOMMY AND I ARE ONE and PEOPLE ARE WALKING, on the academic achievement of emotionally disturbed adolescents at a residential treatment center were studied. The experimental group had statistically greater

improvement on the California Achievement Reading Test than did the control group. In addition the authors found that arithmetic achievement, self-concept, the handing in of homework assignments and self-imposed limits on television viewing were all improved for the experimental group as compared to the control group.

This paradigm has now been administered to over 1000 subjects in over 35 studies that involved over 24 different experimenters. While it appears very successful, two recent studies failed to replicate Silverman's earlier studies (Condon & Allen, 1980; Heibrun, 1980).

Condon and Allen (1980) attempted to replicate the treatment of the insect phobias study but failed. Their failure could have been due to the introduction of a new variable. Silverman et al. (1974) used as subjects women who had answered a newspaper advertisement offering treatment for insect phobias. They were sufficiently motivated to travel to the hospital for treatment. Condon and Allen (1980) used introductory psychology students who were fulfilling a course requirement as their subjects. Since the college students weren't as likely to be as phobic or as motivated, it may not be surprising that they were unaffected.

In all of Silverman's studies in which the visual stimulus was applied 4-5 times a week over 3-6 week periods (five studies in all), significant differences were produced. Condon and Allen's study (1980) applied

less frequent stimulation as did six other studies. Of these seven, three including Condon and Allen's (1980) reported negative findings. Silverman (1980), in discussing these failures to replicate, hypothesized that dosage is a variable. Dixon (1981) has pointed out that much more research needs to be directed towards discovering the critical variables, but there is a weight of evidence that this paradigm produces measurable changes in overt behavior.

Until the 1980's, most studies have been with visual subliminal messages. There has been little investigation into auditory subliminal stimuli. Most studies have primarily been concerned with signal detection, determining the presence versus the absence of a weak signal. There were a few studies in the 1970's that have added to the literature.

Corteen and Wood (1972) and Corteen and Dunn (1974) showed that the brain could successfully monitor and semantically analyze simultaneous two streams of information while preventing the processing of one from interfering with that of the other. The task of their subjects was to attend to prose that was presented above threshold into one ear. Into the other ear, city names, that previously had been associated with aversive consequences, were presented below threshold. The subject was instructed to press a key each time a city name was heard in either ear. The key was pressed only once during

the 114 occasions when critical stimuli were presented, but the city names did evoke a significant palmar galvanic response in the subjects so that even though there was no awareness of critical words in the non-attended channel, the words did set off a significant autonomic response. Their other task to attend to prose was not affected. These researchers have shown that when the secondary stimulus (that which is presented below threshold) is unrelated in meaning to the primary stimulus, then there is no interaction between the two inputs.

Zenhausern, Ciaiola, and Pompo (1973) and Zenhausern and Hansen (1974) have reported the effects of subliminal accessory stimulation, or white noise, on problem solving tasks. In the Zenhausern and Hansen (1974) study, six levels of white noise, three above threshold (10db, 35db, and 60 db) and three below threshold (-30db, -20db, and -10db) plus a no-noise condition were presented to 35 college male students while they replicated seven printed designs by overlaying solid and cutout squares of colored paper. Each subject had to replicate each stencil under each of the seven levels of stimulation. The -10db level resulted in the fastest replication time. As the intensity increased, so did the distractions. But at the +60db level, improvement in performance increased again at almost the -10db level. The authors had hypothesized that the effect of the white noise was dependent on the task involved. Previous studies

(Zwosta & Zenhausern, 1969; Zenhausern, Ciaiola, & Pompo, 1973; Zenhausern, Pompo, & Ciaiola, 1974) found that (1) with a sensory task, both subliminal and supraliminal (above threshold) stimulation helped, (2) with a perceptual task only supraliminal stimulation was effective and that was detrimental, and (3) with a motor performance task only supraliminal stimulation was effective (facilitory). In this last study the stencil design task involved motor performance which gives some evidence that high levels of white noise are related to improvement in motor performance.

Borgeat and Goulet (1983) measured physiological changes following activating or deactivating messages presented below threshold. The authors defined activating messages as ones that suggest muscle energy and activity in the same parts of the body, awakesness, and readiness for activity. Deactivating messages suggested heaviness and warmth on the various parts of the body from arms to the facial area, calm, relaxation, and sleepiness. Heart-rate, EMG, skin-conductance levels and responses, and skin temperature were monitored while the subjects listened passively, while they did a stressing task that was a mental calculation under a time pressure, and while they recuperated from the stressing task. The authors found that auditory suggestions presented below the recognition threshold still influence physiological responses. The physiological

responses were significantly affected by the activating but not by the deactivating subliminal messages during and following the stressing task. No significant effects appeared while the subject passively listened to the suggestion. Borgeat and Goulet point out that if their study is replicated and confirmed, then the application of this work could help in improving alertness and/or performance.

Pertinent Opinion

All of the reported studies have used adults or in one case older adolescents as subjects. The majority of these studies report that visual subliminal intervention affected behavior. In all the studies cited using visual stimuli below threshold, the stimulus had been used to enhance an additional therapeutic intervention. There have not been similar studies with auditory subliminal intervention. Thus, research in auditory subliminal stimulation is important and timely.

Summary of the State of the Art

Dixon (1981) has been the main theoretician and contributor to this field. He has gathered together the extensive evidence from all the studies on subliminal perception, synthesized it, attempted to clarify the major concepts, and then integrated these data with the psychology of cognition. While Dixon concludes that

the brain may respond to external stimuli which, for one reason or another, are not perceived consciously, there is still little agreement on the manifestations and mechanisms of subliminal perception.

Current Issues

With the resurgence of national interest in subliminal stimulation comes renewed controversy into the legal and moral questions of right to privacy. Last year, a subcommittee of the U.S. House Committee on Science and Technology held a hearing on subliminal communications that brought together equipment manufacturers, psychologists, attorneys and government officials. Although legal questions such as informed consent have been defined, moral issues are unclear, and it remains to be seen just how far the government will let advertisers, merchants, psychologists, and educators go in their quest to influence the American public.

Related Studies

The most abundant source of new research in the area of subliminal stimulation is in the area of market research. Marketers' interest in the potential of subliminals was stimulated by a report in Science magazine in 1980. This report, authored by two respectable investigators, R. Zajonc and W. Kunst-Wilson reported that like/dislike ratings ("affective reactions") could be

influenced by stimuli that are truly subliminal. Experiments showed that people who were exposed to a subliminal flashing of the word beef later reported themselves hungrier than those subjects not exposed. Another study showed people exposed to the subliminal flashing of the word coke reported increased thirst.

Dr. Hal Becker, a former Tulane professor trained in experimental neurology and electrical engineering is one of the leading producers of subliminal processing machines. His main focus has been the use of subliminal auditory messages to reduce shoplifting by employees and customers. Brief messages installed in the background music system told shoppers and employees that "I am honest" and "I will not steal." Six months of data collection reported a reduction in cashier shortages from \$125.00 a week to \$10.00. Pilferage loss dropped from \$8000.00 a month to \$2000.00. Subliminal auditory messages of "I am careful," "I am important," and "We are a team" reduced employee turnover by 50 percent in an 11 month experiment in a major supermarket. The data indicated that the experimental store's turnover reduction did not occur in the stores used as a control.

An interesting project using what appears to be plain white paper is being researched by the Suppa Corporation in Fallbrook, California. They have developed paper that purportedly "whispers to the eye." The Neuro Communication Research Laboratories in Danbury, Conn.

have tested advertisements for candy printed on Suppa's paper and have concluded that ads in which the word "buy" was embedded created more brain arousal and more desire to buy candy than ads with the word "no" embedded.

Mind Communications, Inc., in Grand Rapids, Michigan have developed and tested, with positive results, tapes with embedded subliminal messages that include everything from stopping smoking and coping with sugar addiction to being more confident in intimate encounters.

The advertising world has been intrigued with the possibility of monitoring brain waves to gauge how much arousal an advertising image or message creates. The Journal of Advertising Research (1984) has run four major articles describing the conditions under which this brain-wave activity and blood-flow activity is affected under various types of visual or auditory stimulation.

Herbert E. Krugman, an advertising researcher working for General Electric caused excitement in the business world when he began attaching electrodes to the back of the head of subjects to measure their brain wave activity when exposed to various types of imagery. Major corporations, advertising agencies and media executives rushed to psychophysicologists to guide them in decision making. Krugman claims to have found brain-wave measures useful in measuring a person's ability to resist distractions during a television commercial.

Another researcher, C. A. Langguth, at the Laboratory for Cognitive Psychobiology at Purchase, N.Y., is offering the promise of determining what ad people want most: evidence that a subject has positive feelings about a message, not mere arousal. He has been seeking to provide this answer by using a battery of four brain wave measures in conjunction with three physiological tests. Langguth claims that he can determine negative feelings through various brain wave measures.

Market researchers, advertising media executives, retailers, electronic and computer specialists have all banded together in their efforts to capitalize on the technology available to test the theory of subliminal stimulation. Educators should be greatly stimulated by this flurry of interest demonstrated by the business community and educational research efforts should be renewed.

III. METHODOLOGY AND PROCEDURE

This chapter includes description of the subjects, the apparatus, the design of the study, measurement definition, and the procedures used in collecting and analyzing the data.

Description of Subjects

A total of fifteen boys between the ages of seven and twelve were recruited for this study. Girls were not excluded, but none were referred nor were any enrolled in the treatment groups. Because the subjects in this study were all boys, the hyperactive child will be referred to as "he." The age groups of the subjects are as follows: four seven year olds, three eight year olds, three nine year olds, two ten year olds, two eleven year, and one twelve year old.

Prior to the implementation of this research project, 23 children had been referred, evaluated, and accepted into a program for hyperactive children at a metropolitan children's mental health clinic associated with a major hospital and medical center in Northern Oregon. The parents of these children had enrolled them in one of three 16 week treatment groups. The treatment groups' focus was to teach hyperactive children self control

techniques in order to help them reduce impulsivity. The groups met weekly at the clinic. The children's parents reported symptoms of hyperactivity, short attention span, distractability, impulsivity, low frustration tolerance, aggressiveness, destructiveness, poor school performance, and poor peer relationships.

No other assessment, observation; or information was required for acceptance into the clinic program at this point.

It was from this group of children that subjects for this study were recruited.

The parents of all 23 children were invited to participate in this study. Illness, vacations, noninterest, and drop-out from the clinic program accounted for the decrease in subject number from 23 to 15.

The subjects in this study came from families that fell into the middle to low upper socio-economic class. Subjects were healthy, well dressed privileged children whose parents were motivated enough to seek intervention at a clinic that required considerable travel in some cases.

Apparatus

Proactive Systems, Inc. located in Milwaukie, Oregon developed and patented the Proactive Messaging System in 1983. This messaging system presents an audio subliminal message that can be played up to 24 hours a day

in virtually any environment and requires no monitoring, maintenance, or interaction. Use of a digital speech system developed by Proactive makes the message tamper-proof. This system requires no background music or masking sounds, so the system can operate in any area, and can use existing speakers. The system was initially marketed as a shoplifting and employee theft prevention device for use in retail stores. High success of 20-65% reductions in total shortages, with an average reduction of greater than 30%, as reported by their retail chain clients, has encouraged the company to sponsor ongoing research in various areas such as hospitals, educational institutions, treatment centers, and by prescription. Because of the strength of their interest in this study, Proactive Systems, Inc. leased a messaging system to the researcher for one dollar per month. They also made the deactivating message microchip and provided personnel to install all the necessary components at the research site.

The Proactive Messaging System delivers auditory messages at a volume level just below the level of recognition, so the message while not being perceived by the individual is purported to be registered and processed by the subconscious. Proactive Systems, Inc. reports that the closer the message is to the auditory threshold level, the more effective it will be.

The deactivating message microchip made by the company used the voice of the same psychologist who ran the treatment program from which the subjects were recruited. The psychologist presented four 3-word phrases. Two phrases emphasized relaxation and two self-esteem. A relaxation phrase was paired with a self-esteem phrase and was repeated alternately with the other pair, i.e., relaxation, self-esteem, relaxation, self-esteem, etc. The following four phrases were selected by the researcher:

1. I do good work
2. I'm a good listener
3. I'm calm
4. I love me

The psychologist was blind as to the final four phrases used in the study. The company made a microchip of each phrase and then company personnel locked the four microchips into the company's tamper proof apparatus. The company masked the messages with white noise and installed on the device a switch so that the apparatus could be turned on to deliver only white noise or the message masked by white noise. The microphones that delivered the message were installed into the ceiling tiles of the two treatment rooms that were used for the study. The control devices were placed in rooms that were adjacent to each of the treatment rooms, one was in a closet of a room used infrequently and the second

was located on an empty shelf in the far corner of a room. The indicator switch, noise or message, was hidden from view.

All individual sessions were held in the small treatment room. This room contained a desk for the staff person and a computer modular unit for the child. This unit consisted of the following hardware in order to run the software for the project: (1) Apple IIe computer with two disk drives, (2) printer with a parallel interface card, (3) low resolution monitor, (4) 80-column card, (5) The Clock by Mountain Hardware Inc., and (6) Apple joystick. All sessions held in the small treatment room were videotaped. Across the room from the child, a video camera was attached to a shelf. A videotape was made of all the sessions that took place in that room.

The group sessions on self control were conducted by a psychologist and were held in the large treatment room.

Research Design

A single subject evaluation procedure, specifically the multiple baseline design across subjects (groups) was the experimental strategy selected. Baer, Wolf, and Risley (1968) first presented the rationale for the multiple baseline design in the literature. Essentially baseline data are collected on a variable or variables

across at least two individuals or groups. After a stable baseline is reached over the subjects in each group, the intervention is applied to one unit. When a change in the data is noted, then the intervention is extended to the next group. The introduction of the intervention is continued sequentially for all groups for whom baseline data were collected (Hersen & Barlow, 1976; Kratochwill, 1976; MacLeod, Andrews & Grove, 1980). While this design was initially used across individual subjects, it has been extended to groups by researchers such as Wilson and Hopkins (1973). Baer, Wolf and Risley (1968) discuss single subject procedures in the context of applied behavior analysis. This refers to the systematic study of the relationships between specific behaviors of the individual child and the specific techniques which are employed to change the child's behaviors. Lovitt (1975) describes five attributes of single subject evaluation procedures: (1) the direct measurement of the child's behavior, (2) the continuous measurement of the child's behavior on a daily or near daily basis, (3) an understanding of the idiosyncracies of the child's behavior, (4) the demonstration of a functional relationship between the intervention and the child's behavior, and (5) interventions that are adequately described and therefore replicable. As such, single subject evaluation procedures are highly compatible with investigation of

hyperkinetic behaviors due to the emphasis placed upon the individual child.

The single subject evaluation procedure, specifically the multiple baseline technique across subjects, was used, for this study. The target behaviors (defined later in this chapter under measurement definitions) were measured concurrently across the 15 children. Following three baseline sessions, Group A composed of five children received the subliminal intervention for eight weeks while concurrent baseline data continued to be collected on groups B and C each containing five children. When and if positive effects of the intervention became evident, intervention would then be applied to group C while group B continued under baseline conditions.

Three treatment groups, each group containing five children took part in the study over a 16 week period. The effects of auditory deactivating subliminal messages were to be examined on two of the three treatment groups of hyperkinetic boys according to the following schedule:

- Week 1 - Begin Self-control group. Explain research procedures to all children. White noise to be played into the treatment room.
- Weeks 2 through 5 - Collect baseline data on subjects in Groups A, B and C in the small treatment room.

Weeks 6 through 11 - Initiate subliminal treatment condition to Group A children in both treatment rooms. Continue baseline procedures for Groups B and C. Determine if treatment has an effect on subjects in Group A.

Weeks 12 through 17 - If no effect continue treatment condition with Group A and baseline procedures with Groups B and C. If effect continue treatment with Group A, initiate treatment with Group C, and continue baseline procedures with Group B.

Measurement Definition

Five types of dependent measures were examined. They were (1) behavior rating scales for parents, (2) a behavior rating scale for teachers, (3) a child's self-report, (4) a child's task performance, and (5) a child's behavior while performing the task.

The first dependent measure, behavior rating scales for parents, included three scales, Achenbach Behavior Checklist (Achenbach, 1978), Revised Conners Parent Questionnaire (Goyette, Conners & Ulrich, 1978), and the Self Control Rating Scale by Kendall and Wilcox (1979). An example of each scale may be found in Appendix A.

The Achenbach Behavior Checklist is an 113 item, three point questionnaire which was developed to be used by parents of hyperactive children. Items are rated as not occurring, sometimes occurring, or often occurring. The checklist provides a profile of specific childhood diagnostic categories. Test-retest reliability ranges from .72 to .97 with a significant decrease in scores between the repeated ratings (8-day interval) occurring only on the depression scale. Satisfactory stability over time was reported in that test-retest correlations over a 15-month period yielded a mean correlation of .63 for the scales (Barkley, 1981; Sattler, 1982).

The revised Conners Parent Questionnaire has a scale of 48 items which are rated on a 4-point scale with the categories of Not at all (score=0), Just a little (score=1), Pretty much (score=2), and Very much (score=3). The score for the factor, hyperactivity, is computed by summing the points across all items comprising the factor and dividing by the number of items in the factor. Items 4, 7, 11, 13, 14, 25, 31, 33, 37, and 38 are assigned to the hyperactivity factor. These items are circled on the questionnaire which may be found in Appendix A. A mean score of 1.5 is generally accepted as the lower limit for establishing hyperactivity. Interrater correlations were satisfactory and normative data are presented for 570 children by Goyette et al. (1978).

Kendall and Wilcox's Self-Control Rating Scale has 33 items and uses a 7-point continuum scale indicating impulsivity or self control. The total score is a sum of the 33 ratings. Norms are available (Kendall & Wilcox, 1979) and the scale has high internal consistency (.98), a test-retest reliability of .84 (Kendall & Wilcox, 1979), and is sensitive to treatment effects (Kendall & Wilcox, 1980).

The second dependent measure, a behavior rating scale for teachers, is the Conners Teacher Rating Scale (Conners, 1969, 1973). This scale is the most widely used and researched of the teacher rating scales and it is regarded as a good assessment tool. This is a 39 item, 4-point scale. The items assigned to each factor are scored in the same manner as the Conner's Parent Scale. Factor analysis of the scale revealed four item clusters: aggressive conduct, inattention, anxiety-fearfulness, and hyperactivity (Werry, Sprague & Cohen, 1975). The test-retest factor reliabilities range from .70 to .90 (Conners, 1973). Normative data are available. A mean score of 1.5 or higher is generally accepted as indicating hyperactivity. The items that comprise the hyperactivity factor have frequently been used in assessment and in the diagnosis of hyperactive children in the classroom setting (Douglas, Parry, Marton & Garson, 1976; Kupietz, Bialer & Winsberg, 1972; Trites, Blouin,

Ferguson & Lynch, 1981; and Trites, Blouin & Laprade, 1982). See Appendix A for an example of this scale.

The third dependent variable was the Pier's-Harris Children's Self Concept Scale (Piers & Harris, 1969). This is an 80 item, yes-no inventory that is completed by each child. Internal consistency ranges from .78 to .93 and the test-retest reliability is .77. See Appendix A for an example of this inventory.

The fourth dependent variable, the child's task performance, included two tasks, the Continuous Performance Task-CPT-(Klee & Garfinkel, 1983) and the Eye-hand coordination task-Handeye-(Klee & Garfinkel, 1983).

The Continuous Performance Task (CPT) measures inattention and impulsivity. Thirteen of the 26 letters of the alphabet are flashed on the computer screen randomly. Each letter remains on the screen for 100 milliseconds. The child was asked to press the computer space bar whenever the orange letter "S" was followed by the blue letter "T." The letters were randomly presented in five 100-letter blocks. Each block included ten targets of the specified color and letter combination and 20 S-T letter sequences of various other colors. The remaining 40 letters were a random presentation consisting of combinations of the 11 remaining letters. The time interval between each letter was set at 1000 milliseconds. The frequency of the presentation increased

following a correct response or decreased following an incorrect response by five percent from the current presentation frequency. The number of omissions, the correct combination missed, the number of commissions, incorrect combination recorded, and the time needed to complete the task were recorded.

Handeye, the eye-hand coordination task measures a child's ability to direct his behavior in a goal oriented fashion while inhibiting impulsive responses. The child had to negotiate a movable square around a series of obstacles of progressive complexity in order to hit a target on the video screen. There were 16 patterns of increasing complexity. The child used a joystick to control the movable square. Each time the movable square hit the sides of the obstacles, it was recorded as an error and a buzz sound was heard. Total errors and total elapsed time were recorded and then total errors per minute were calculated for each session.

The software for these two tasks were written for specific hardware requirements which are described in the Apparatus section of this chapter.

The fifth and final dependent variable was observation of the child's behavior while he performed the computer based tasks. Observers coded the occurrence or nonoccurrence of the behaviors off-task, disruptive verbalizations, and gross-motor activity. These behaviors were recorded on a data sheet that contained 15

6x6 grids. Each grid represented one minute of observation. Behaviors were represented on the six rows and time (10-second periods) on the six columns. During each 10-second interval, the observer marked in the appropriate box, defined by (1) the column that identified that particular time-interval, and (2) the row that represented that type of behavior, if off-task, disruptive verbalizations, or gross-motor activity occurred. If one of these behaviors occurred during a 10-second interval then its opposite, appropriate behavior was not recorded for that interval. The appropriate behavior was recorded for the interval only if its opposite, inappropriate behavior did not occur at any time during the interval. For any given 10-second interval, the frequency of occurrence or the duration of a particular type of inappropriate behavior was not recorded, only whether or not it occurred. The appropriate behaviors were included on the data sheet to help the observers stay focused on the correct interval. Thus during each 10-second interval three boxes were checked for task, talk, and body movement. The recording time was the number of specific consecutive 10-second intervals it took for the child to complete the task. An example of the data collection grid may be found in Appendix A.

Off-task behavior was defined as when the child looked away from the task, such as looking around the room, at the floor, at his body, or when the child

stopped working such as taking his hands off the joystick. Activities that were not distracting nor interfering with continuing on-task behavior, such as fiddling with hair, were not recorded.

When the child made noises, asked questions, made statements, and/or talked to self, then a disruptive verbalization was recorded for that interval. If a question was directed to a child, his reply was not recorded as a disruptive verbalization.

Behavior that included out-of-seat and constant disruptive movement such as swinging legs or waving hands in the air was recorded as gross motor activity for the interval. Changing seat position was not recorded unless the child got out of his seat.

Procedures

An orientation meeting was held for all parents who had consented to their child's participation in the Self-Control group. During this meeting the research study was explained to the parents, questions were entertained, and a copy of the Informed Consent Form was distributed to all attendants. The only detail of the study that was omitted was the content of the subliminal messages to be used. The parents were given an example of a phrase that was not recorded by the psychologist. Any parent who did not want their child to participate in the research study had a treatment group available

to them that would not be involved in the project. All of the parents expressed a willingness to participate. The three parent inventories were distributed to each parent with the request that they complete them prior to their child's first group session. Following the meeting, many of the parents explained the study to their children and after receiving their child's assent, they and their child signed the Informed Consent Form.

The Informed Consent Form and an outline of the research proposal was submitted to the Institutional Review Board of Hospital and Medical Center along with the board's initial review questionnaire for the protection of human subjects. The Institutional Review Board reviewed the consent form, the questionnaire, and the proposal and approved the project with the stipulation that the child's signature be added to the consent form. A copy of the Informed Consent, the Protection of Human Subjects Initial Questionnaire, and the letter of approval may be found in Appendix B.

At the first meeting of each Self Control group, the child psychologist explained the study, pointed out the microphones in the ceiling, and answered the children's questions. All of the 15 children subsequently gave their consent to participate and each signed the Informed Consent Form. Their parents returned the three inventories given them during the parent orientation meeting. All of the children had been previously tested

for hearing loss and color blindness. All subjects in the study had normal hearing and were able to recognize colors.

Each of the 15 children participated weekly in one 75 minute group session and one 15 minute individual session. Each of the three groups met once a week on either Tuesday, Wednesday or Thursday. Each child attended only his group on his specific day of the week. Thus on the day that the child participated in his Self Control group, he also participated in one 15 minute individual session.

At the first group meeting, baseline conditions were implemented. Specifically the Proactive Messaging System was turned on and white noise was broadcast into both treatment rooms. The small treatment room was not used during the first week as this session was used to explain both the procedures of the Self Control Group and the research project.

Beginning the second week of the Self Control group and the first week of the research project, baseline conditions were implemented. The Proactive Messaging System was activated and white noise broadcast into each of the treatment rooms. The children began coming individually to the small treatment room where they performed either the Continuous Performance task or the Eye-hand coordination task on the Apple IIe computer. The first two sessions were also used for the children to become

comfortable with the room, with the staff person, with the computer and with the tasks. Each session in the small individual treatment room was videotaped throughout the 16 weeks of the project.

During baseline each child completed, at the clinic, the Piers Harris Self-Report. The Conners Teacher Rating Scale was distributed to each child's teacher to be completed and returned during this phase of the study.

On days there were no group sessions, three observers were randomly assigned videotapes to observe and decode. A cassette recording tape had been made counting off 10-second intervals for one minute. These six intervals were repeated the length of the tape and thus the observers when they began recording, turned on both the cassette and video tapes simultaneously. The observers were seated so that they could not see how the other was recording but so they each could see the monitor and hear the cassette tape. At the beginning of each subject's session, the observer recorded the identifying information at the top of the data sheet and then when each was ready, the equipment was turned on. The behaviors were coded for that subject, the equipment was turned off, the data sheets were put in the appropriate box, new data sheets were prepared for the next subject and the equipment was turned on. This procedure continued until all the subjects for that observation session were coded.

Results of each subject's observation were tabulated as follows: the number of intervals that each behavior occurred divided by the total number of intervals. A resultant percentage was obtained for each of the behaviors, off-task, disruptive verbalizations, and gross body movement. In addition the total number of intervals in which one or more of these three behaviors occurred was calculated to give a percentage of total intervals per session that a child engaged in at least one of these behaviors.

Interobserver agreement was calculated at the end of each session. It was assessed by both percent agreement and by the statistic Kappa (Cohen, 1960).

The most common method of assessing interobserver agreement has been that of percent agreement (Johnson Bolstad, 1973; Kelly, 1977; and Yelton, Wildman & Erickson, 1977). It is calculated by taking the number of agreements of a particular behavior and dividing by the sum of agreements and disagreements. Although this method of computing interobserver agreement is computationally simple and easily interpretable, percent agreement has several limitations. For example, percent agreement is directly affected by the frequency of behavior (Johnson & Bolstad, 1973) and is likely to be inflated by the inclusion of high rate behaviors (Hartmann, 1977; Yelton, Wildman & Erickson, 1977). It is also not sensitive to the proportion of agreement which may be obtained

by chance (Hartmann, 1974; Hollenbeck, 1978) and it has been criticized for lack of statistical (e.g. metric) properties (Hollenbeck, 1978).

Cohen's (1960) Kappa avoids the problems of percent agreement and therefore is a statistical procedure recommended by several researchers for an analysis of inter-observer agreement (Hartmann, 1974; Hollenbeck, 1978). Hartmann (1974), for example, suggested the use of Kappa because it is flexible, has desirable statistical properties, and is superior in its handling of chance agreement.

Kappa is defined as the proportion of agreement after chance agreement is removed from consideration,

$$\text{Kappa} = \frac{(P_o - P_c)}{(1 - P_c)}$$

where P_o = observed proportion of agreement and P_c = chance proportion of agreement. An illustration of the computation of Kappa to measure interobserver agreement for this project is presented in Table 1. The Kappa table shows all entries where agreements occur on the main diagonals and where disagreements occur off the diagonal. It was of particular interest to know what the interobserver agreement was for a particular category. As suggested by Hartmann (1977) and Jones, Reid Patterson (1974), Light's (1971) extension of Kappa was used to calculate agreement for each of the specific

Table 1. An agreement matrix illustrating the computation of Kappa.

Behavior Codes	OBSERVER 1						Proportion of total - Observer 2 (P2)
	Talk	Quiet	Off-Task	On-Task	Body Move.	Still	
Talk	41	8					49/935=.052
Quiet	11	209					220/935=.235
Off-task			46	3			49/935=.052
On-task			5	279			284/935=.304
Body Mov.					62	6	68/935=.073
Still					12	253	265/935=.283
Proportion of Total for Observer 1 (P1)	.056	.232	.055	.302	.079	.277	

$$P_o = \text{sum of diagonal entries/total of all entries} \\ = 890/935 = .9519$$

$$P_c = (P1 \times P2) = (.056 \times .052) + (.232 \times .235) + (.055 \times .052) + (.302 \times .304) + (.079 \times .073) \\ + (.277 \times .283) = .2363$$

$$\text{Kappa} = (P_o - P_c) / (1 - P_c) = (.9519 - .2363) / (1 - .2363) \\ = .9370$$

categories. Using the following statistic, a measure of agreement between two observers was calculated for those items which Observer 1 assigned to the i th specific category:

$$K_{pi} = 1 - \{(1 - N_{ii}/N_{i+}) / (1 - N_{+i}/N)\}$$

For example, using the data from Table 1 for talk behavior

$$K_{pi} = 1 - \{(1 - 41/49) / (1 - 52/935)\} = .8271$$

Light's (1971) extension of Kappa was calculated for each category for each observation session.

At the beginning of each coding session, feedback was given to the observers as to their inter-observer agreement at the previous session. Any problems with the defined codes that had shown up in the interobserver agreement calculation were reviewed.

Baseline data were collected for three weeks. Intervention was begun with Group A. None of the staff working with the children were informed as to which group was to receive the intervention. A member of the staff of the mental health clinic who had no interaction with these groups of children turned the system on and off in both treatment rooms each day. Only the investigator, and the clinic director knew the intervention schedule. None of these people had direct contact with the subjects. All other personnel connected with the project were blind to the content of the messages and to the group receiving the intervention.

Group A met on Tuesdays and was to receive the intervention through Week 11. Following Week 11, a determination was to be made whether to initiate the intervention with a second group, C. Due to no evidence that the subliminal intervention was affecting the subjects in Group A, the second group continued with baseline procedures and Group A continued to receive the subliminal stimulation. Another evaluation was done at the conclusion of Week 13 which was the last possible date that the second group could begin the subliminal intervention, due to the length of treatment for the Self Control groups. This evaluation also did not indicate an effect from the subliminal treatment so all groups continued under the same conditions begun at Week 6. At Week 17, each child again completed the Piers Harris Children's Self-Concept scale and the parents were mailed the three inventories to complete and return.

To encourage attendance and thus participation in the research study, each child was paid \$2.50 at the conclusion of each individual session that he completed. At the conclusion of the study, a bonus payment of \$10.00 was paid to any child that participated in 100% of the sessions.

At the conclusion of the study, each child was asked to guess whether he received a subliminal message during the study and if yes, what was the content of the message. Parents who made an appointment with the

psychologist were given feedback as to their child's performance in the Self-Control group and with the tasks in the research study. These parents and children were informed whether the child had or had not received the subliminal message and the content of the messages.

At the conclusion of the study both staff and children who were exposed to the stimulus were asked to identify if they had been exposed and if so what had been the content of the message. None of the four staff involved correctly identified the group that received the subliminal treatment. None of the children reported that they had heard a message and none of them guessed correctly the content of the messages.

IV. ANALYSIS OF THE DATA

This chapter presents the results of the data analysis relative to the investigation.

Interobserver Agreement

All sessions throughout the study were coded simultaneously by two observers from videotapes. Three behaviors were recorded every ten seconds. Due to the format of the data sheet, the observer rested the side of her hand with the pencil to the right of the time block and coded the three observed behaviors in the appropriate column and row. As the session progressed in time, she slid her hand across the page from column to column and then down the page as she moved to the next row of blocks. Thus it was not possible for one observer to be aware of the other observer's coding behavior. In addition the observers are highly trained and have been employed on numerous studies for the past 5-10 years. After one two-hour training session, the observers were meeting criteria of a Kappa of .85 and Light's extension of Kappa of .80.

Throughout the study, the percent agreement ranged from 91% to 99%. Kappa ranged from .9074 to .9883 and

Light's extension of Kappa ranged from .8271 to 1.00. The Kappas obtained during each set of six recording sessions for each pair of observers (16 sessions in total) through the course of the study are illustrated in Table 2.

Table 2. Kappas obtained between each pair of observers throughout the study.

Session	Pair of observers		
	1 and 2	1 and 3	2 and 3
1	.9074	.9267	.9400
2	.9835	.9448	.9370
3	.9883	.9585	.9466
4	.9651	.9247	.9280
5	.9512	.9253	.9641
6	.9768	.9632	.9673

Parental Rating Scales

In order to measure the degree to which the variation in one variable was related to the variation in another, the ratings made by each subject's parents on the Achenbach Behavior Checklist for the categories, hyperactivity and aggression were converted to T-scores and then correlated with the Conners hyperactive index and Kendall's impulsivity index using Pearson's product-moment correlation coefficient +. This + indicates the strength of the linear relationship between the two variables. An integrated system of computer programs, The Statistical Package

for the Social Sciences (SPSS) was used to calculate Pearson's r (Nie, Hull, Jenkins, Streinbrenner & Bent, 1975). There were positive significant correlations ($\alpha=.05$) between each of the inventories for dads and for all but one, Achenbach aggression category and Conners hyperactivity index, for Moms. The correlation matrix is displayed in Table 3.

Table 3. Pearson's product-moment correlation matrix - Achenbach, Conners and Kendall inventories.

	Dads		Moms	
	Hyperact. (Conners)	Impulsive (Kendall)	Hyperact. (Conners)	Impulsive (Kendall)
Hyperactivity (Achenbach)	.5907*	.5933*	.7047**	.7236**
Aggressive (Achenbach)	.5186*	.7672**	.2736	.4624*
Impulsivity (Kendall)				

** $p < .01$

* $p < .05$

Next the differences between Moms and Dads in scoring the inventories was determined by computing the T statistic. These t-tests were run by also using SPSS. As is evident in Table 4, no differences were found. The highest mean scores on the Achenbach were the social withdrawal and hyperactivity scales. The mean scores for the Conners and Kendall inventories were in the range that discriminates between normal and clinic referred children.

Table 4. Differences between ratings completed by
Moms and Dads on the Parent Inventories.

Inventory	Scale	Subject	Mean	S.D.	d.f	T
Achenbach	Anxious	Mom	62.2508	8.181	11	.90
		Dad	64.0833	8.836		
	Depress	Mom	67.8333	7.778	11	1.19
		Dad	70.3333	10.281		
	Uncomm.	Mom	62.5833	6.459	11	1.79
		Dad	67.7500	10.797		
	Obsess.	Mom	65.8333	5.982	11	- .20
		Dad	65.4167	6.529		
	Somatic	Mom	60.0000	4.748	11	.93
		Dad	61.0000	5.560		
Social Withdrawal	Mom	74.7500	10.261	11	.39	
	Dad	75.4167	7.845			
Hyperactive	Mom	73.1667	6.847	11	1.55	
	Dad	75.7500	8.379			
Aggressive	Mom	1.0833	10.527	11	- .11	
	Dad	70.9167	10.308			
Delinquent	Mom	68.8333	8.133	11	.92	
	Dad	70.0833	8.867			
Conners	Hyperactive	Mom	1.9000	0.494	11	-1.21
		Dad	1.7167	0.451		
Kendall	Impulsive	Mom	174.1667	12.313	11	-1.51
		Dad	164.8333	15.701		

Teachers Rating Scale

The Conners Teachers Rating Scale was not distributed prior to the initiation of the Self Control group as that was the beginning of the school year. It was sent after the third week during the Baseline Condition for this study. But it was not until mid December that 12 out of 15 sent were returned. Because of the slow response rate and the remaining span of time left between ratings, it was decided not to mail out a follow-up questionnaire. Of the 12 that were returned, four were in each group. Seven of these 12 were identified as hyperactive by their teachers, Index > 1.5.

Group Data

Group A. This group received the audio subliminal messages. It consisted initially of six boys. One dropped out of the group midway through the Self Control group. In addition this group had one subject, 01, that was absent four out of the ten treatment weeks. Subjects 02, 03, and 05 missed one session and subject 04 missed two consecutive sessions. Five boys were followed including the boy that missed four sessions.

Figure 1 illustrates the performance of each subject in Group A as measured by the number of commissions on the Continuous Performance Task. Two subjects, 03 and 05, made a slight improvement. Subject 05 began showing

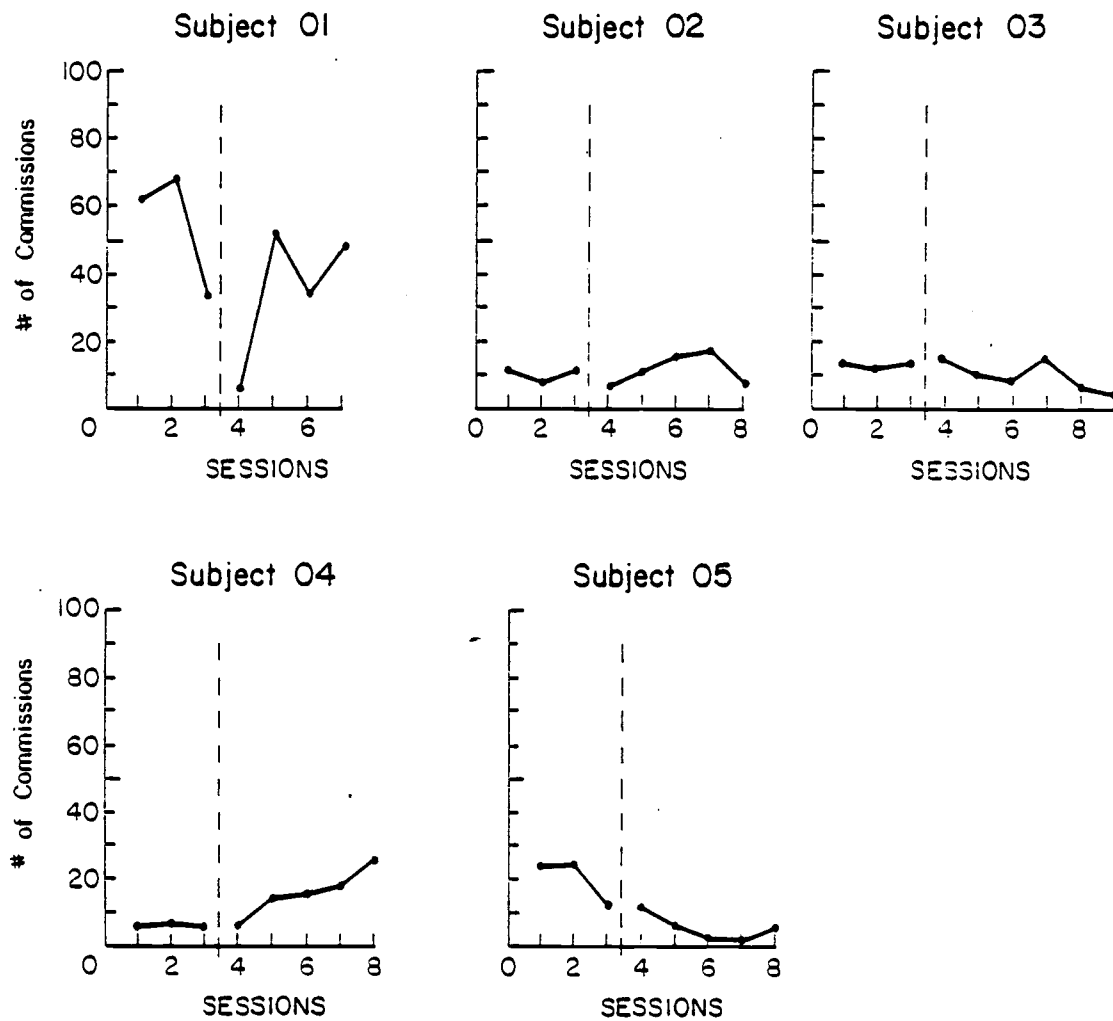


Figure 1. Number of Commissions on the CPT - Group A

some improvement in impulsivity at the fifth session. In addition during sessions 7 and 8, this subject was so consistently responding accurately that the average rate that the letters were presented had increased to .590 and .562 from the initial rate of 1000 milliseconds that the task is set at the onset. The performance and behavioral data for each subject is compiled on Tables 5, 6, 7, 8, and 9. This subject's data may be found on Table 9.

Subject 03 also reduced his number of commissions by the last two sessions. Looking at the data for these two subjects, Table 7 for Subject 03 and Table 9 for Subject 05, it is noteworthy that the number of omissions for both these subjects were generally consistent and within the range of baseline.

On the other hand, Subject 04 (see Table 8) increased his number of commissions. It is clear from Table 8 that this subject exchanged omissions for commissions.

As can be seen from Figure 1 and from Tables 5 and 6, no change occurred for subjects 01 and 02 in the number of commissions.

Besides hypothesizing that the number of commissions would decrease, off-task behavior and gross body movement were also to decrease. Figure 2 illustrates the percentage of time each subject was engaged in off-task behavior. Two subjects, 02 and 04, had no problem staying on task. There were no changes in subjects 01 and 03,

Table 5. Performance and Behavioral Data for Subject 01.

Group : A
Subject: 01

CONTINUOUS PERFORMANCE TASK (CPT)

Session	Performance				Behavior			
	#Omiss	#Commiss	Avg. Rate	Total Time	Talk	Off Task	Body Move.	Total
1. 10-09-84	4	62	1.460	730	39%	30%	86%	94%
2. 10-16-84	3	69	1.510	754	44	61	86	91
3. 10-23-84	15	34	1.306	653	25	45	82	86
4. 11-06-84	19	7	.831	415	23	0	75	83
5. 11-27-84	22	51	1.464	732	15	42	89	94
6. 1-22-85	23	34	1.546	773	1	57	100	100
7. 1-29-85	22	49	1.460	730	10	59	97	98

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Session	Performance			Behavior			
	Total Errors	Total Time	Errors/Minute	Talk	Off Task	Body Move.	Total
1. 10-09-84	299	9.13	21.749	40%	58%	54%	61%
2. 10-16-84	301	8.24	36.529	54	72	74	79
3. 10-23-84	397	10.20	38.922	38	58	81	84
4. 10-30-84	363	13.36	27.171	28	67	88	93
5. 12-04-84	124	10.26	12.086	10	25	47	53
6. 1-15-85	176	10.09	17.443	9	29	21	47
7. 1-29-85	308	14.33	21.493	5	48	48	52

Table 6. Performance and Behavioral Data for Subject 02.

Group : A
Subject: 01

CONTINUOUS PERFORMANCE TASK (CPT)								
Performance					Behavior			
Session	#Omiss	#Commiss	Avg. Rate	Total Time	Talk	Off Task	Body Move.	Total
1. 10-02-84	16	11	.695	347	10%	3%	35%	45%
2. 10-16-84	14	9	.593	296	9	3	48	48
3. 10-23-84	13	11	.601	33	11	0	52	56
4. 11-06-84	15	7	.607	183	0	0	19	19
5. 11-27-84	13	11	.568	271	0	0	0	0
6. 12-11-84	10	15	.543	288	0	0	0	0
7. 1-15-85	9	18	.537	268	0	0	0	0
8. 1-29-85	12	8	.513	256	0	0	0	0

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Performance				Behavior			
Session	Total Errors	Total Time	Errors/Minute	Talk	Off Task	Body Move	Total
1. 10-09-84	42	14.01	2.998	4%	6%	0%	6%
2. 10-16-84	46	13.48	3.412	38	18	2	38
3. 10-23-84	30	10.34	2.901	31	13	6	31
4. 10-30-84	17	8.23	2.066	21	15	0	23
5. 11-13-84	36	7.43	4.845	0	0	3	3
6. 12-11-84	10	7.12	1.404	9	0	0	9
7. 1- 8-85	3	7.48	0.401	9	0	0	9
8. 1-22-85	11	7.48	1.471	2	2	2	4
9. 1-29-85	5	10.04	0.498	28	10	16	41

Table 7. Performance and Behavioral Data for Subject 03.

Group : A
 Subject.: 03

CONTINUOUS PERFORMANCE TASK (CPT)

Session	Performance			Behavior				
	#Omiss	#Commiss	Avg. Rate	Total Time	Talk	Off Task	Body Move.	Total
1. 10- 2-84	18	13	.922	460	0%	13%	11%	16%
2. 10- 9-84	12	12	.626	313	0	18	69	74
3. 10-16-84	13	13	.648	358	0	31	78	84
4. 10-23-84	12	14	.595	297	0	30	63	67
5. 11- 6-84	15	10	.601	300	0	0	93	93
6. 12- 4-84	15	9	.618	309	0	9	69	78
7. 12-11-84	19	14	1.259	629	0	87	100	100
8. 1-15-85	17	6	.591	295	0	28	72	76
9. 1-29-85	18	3	.558	283	0	0	25	25

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Session	Performance			Behavior			
	Total Errors	Total Time	Errors/Minute	Talk	Off Task	Body Move.	Total
1. 10- 9-84	160	14.32	11.173	52%	5%	9%	56%
2. 10-16-84	151	13.06	11.562	71	10	31	78
3. 10-23-84	393	11.38	34.534	53	7	27	65
4. 10-30-84	95	11.20	8.482	7	0	10	10
5. 11-13-84	174	8.39	32.658	39	13	30	61
6. 12- 4-84	109	7.32	14.890	5	5	7	14
7. 1- 8-85	11	7.44	1.478	0	0	8	8
8. 1-22-85	12	6.58	1.824	0	0	0	0
9. 1-29-85	12	6.31	1.902	0	0	0	0

Table 8. Performance and Behavioral Data for Subject 04.

Group : A
Subject: 04

CONTINUOUS PERFORMANCE TASK (CPT)

Session	Performance			Behavior				
	#Omiss	#Commiss	Avg. Rate	Total Time	Talk	Off Task	Body Move.	Total
1. 10-02-84	15	6	.563	281	7%	0%	0%	7%
2. 10-16-84	16	7	.583	291	5	0	0	5
3. 10-23-84	16	6	.519	259	0	0	0	0
4. 11-06-84	14	6	.486	242	0	0	0	0
5. 11-27-84	10	13	.484	241	0	0	5	5
6. 12-11-84	9	15	.544	272	0	0	8	8
7. 1-15-85	9	18	.501	250	0	0	0	0
8. 1-29-85	4	26	.558	278	0	0	93	93

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Session	Performance			Behavior			
	Total Errors	Total Time	Errors/Minute	Talk	OFF Task	Body Move.	Total
1. 10-09-84	56	5.05	11.089	89%	0%	7%	89%
2. 10-16-84	50	5.25	9.524	8	0	51	53
3. 10-23-84	82	4.52	18.142		0	44	44
4. 10-30-84	56	5.05	13.380	0	0	4	4
5. 11-13-84	61	4.16	14.663	2	0	0	2
6. 11-27-84	13	4.09	3.178	15	4	0	19
7. 12-04-84	67	4.32	15.509	5	0	0	5
8. 1-29-85	53	4.01	13.217	0	0	0	0

Table 9. Performance and Behavioral Data for Subject 05.

Group : A
Subject : 05

<u>CONTINUOUS PERFORMANCE TASK (CPT)</u>								
Performance					Behavior			
Session	#Omiss	#Commiss	Avg. Rate	Total Time	Talk	Off Task	Body Move.	Total
1. 9-25-84	14	23	1.173	586	48%	44%	89%	92%
2. 10-09-84	13	24	1.100	550	38	50	91	93
3. 10-23-84	18	11	.740	370	28	28	33	61
4. 11-06-84	18	11	.978	488	0	67	90	92
5. 11-27-84	16	7	.618	309	35	10	90	90
6. 12-11-84	29	2	1.098	549	10	76	92	92
7. 1-15-85	18	1	.590	295	0	0	68	68
8. 1-29-85	17	5	.562	281	4	11	11	14

<u>HANDEYE</u>							
Performance				Behavior			
Session	Total Errors	Total Time	Errors/Minute	Talk	OFF Task	Body Move.	Total
1. 9-25-84	456	13.16	34.561	72%	39%	62%	81%
2. 10-09-84	431	12.52	34.425	84	36	60	96
3. 10-23-84	408	11.31	36.074	59	46	78	85
4. 10-30-84	331	10.26	32.261	50	41	80	90
5. 11-13-84	206	10.47	19.675	24	36	49	53
6. 12-04-84	97	14.28	6.793	48	51	82	88
7. 1-08-85	126	10.12	12.451	3	12	58	58
8. 1-29-85	45	7.17	6.276	0	3	25	25

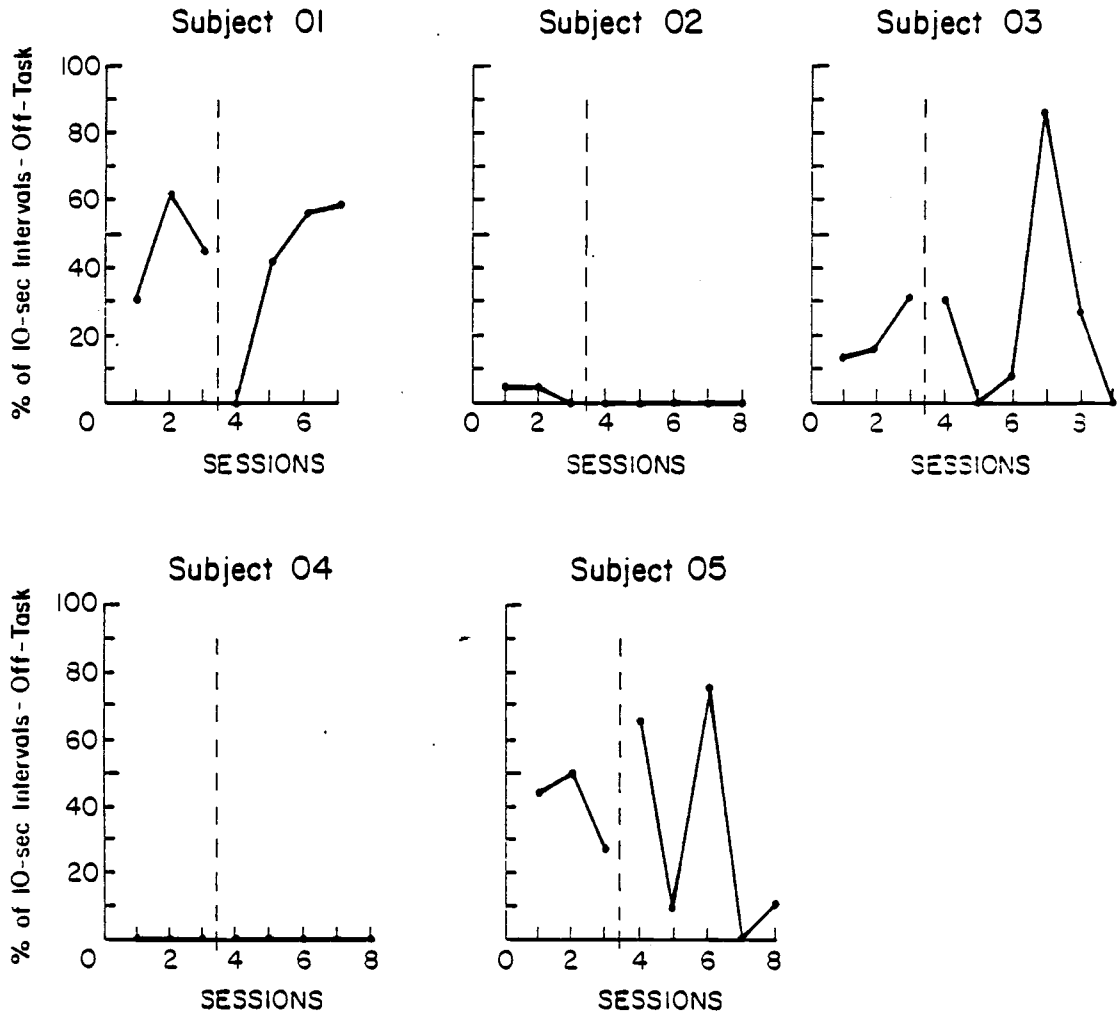


Figure 2. Percentage of 10-second intervals the subject was off-task while completing the CPT - Group A

both were inconsistent throughout the study. Subject 05 had a slight trend of decreasing off-task behavior, but more data points are needed to clearly say whether a change was taking place.

Whether the gross body movement of each child was affected is illustrated in Figure 3. There was no change in Subject 01. Subject 02 reduced his gross body movement at the beginning of the treatment condition and consistently was able to sit quietly while doing the task throughout the study. Subject 03 was very active until the last session when he reduced his gross body motion. Subject 04, on the other hand, worked quietly throughout the study until the last session when he was restless during the task. Subject 05 was in motion for all the sessions until the final one when he reduced his movements to 11% of the time that he was engaged in the task.

In summary one subject, 05, in particular showed a propensity to improve in each of the three hypothesized measurements, and Subject 03 exhibited movement towards improvement, but there were not enough data points for either of these subjects to verify that the trend would continue. Subject 02's behavior was within the normal range during the treatment condition. Subject 04's behavior is also within acceptable limits with the exception of the last data point, 93% gross body movement.

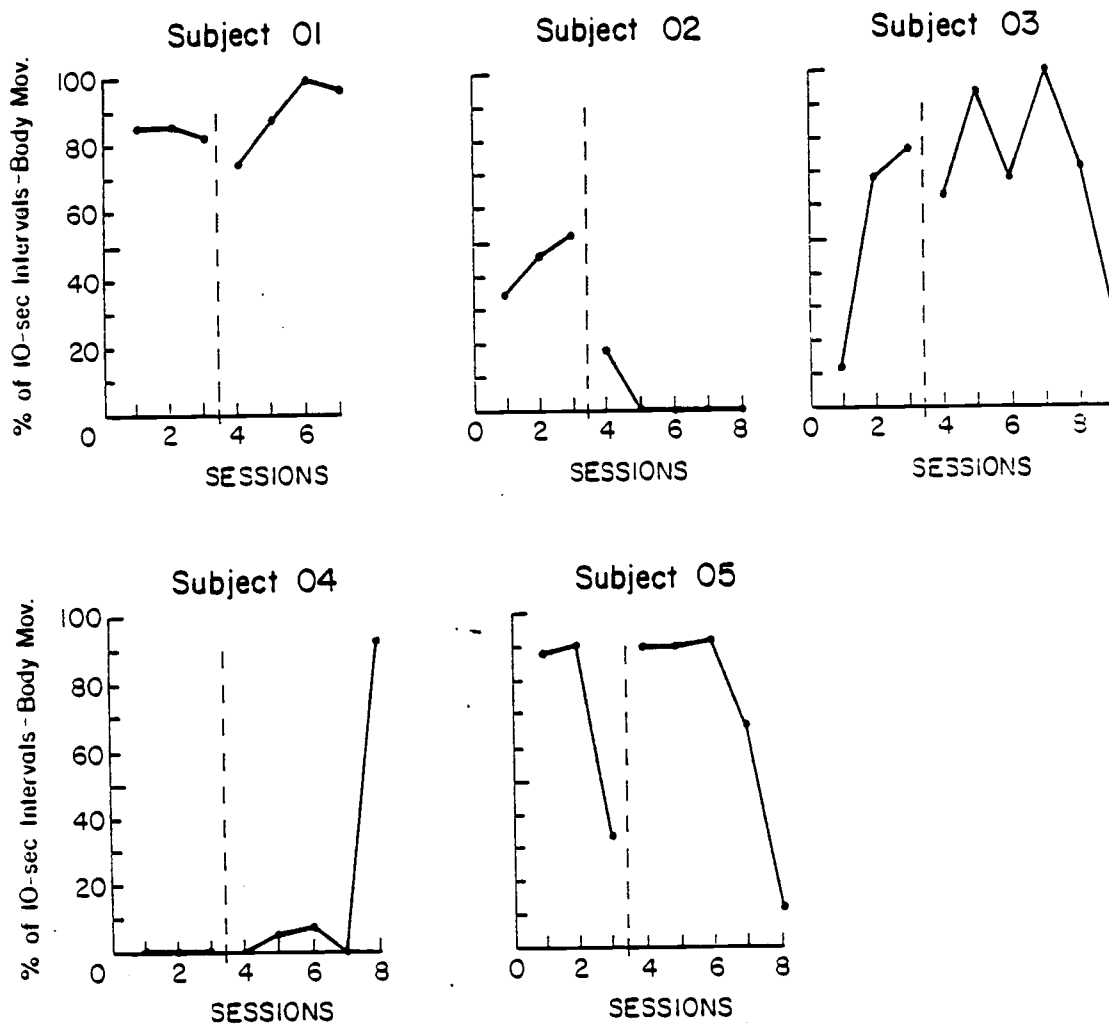


Figure 3. Percentage of 10-second intervals the subject was engaging in gross motor activity while completing the CPT - Group A

Group B. This group consisted of five boys who consistently were present; each one missing one session during the study.

In performing the CPT (see Figure 4), the number of commissions increased for Subject 09. Subjects 10 and 14 had inconsistent performances and increased their commissions at the last session. Subjects 11 and 12 had no change in performance with Subject 11 consistently having a low number.

Off-task behavior is exhibited in Figure 5. Subject 09 increased in off-task while the other subjects remained at baseline levels. Subjects 10, 11, and 12 attended to the task while Subject 14's off-task percentage is too high and too inconsistent.

Gross body movement did not change basically from baseline levels for this group. Subjects 09 and 14 were distractingly active while Subjects 10, 11, and 12 sat and worked quietly at the task. See Figure 6.

In summary no improvements were seen in any of the Group B subjects. Subjects 10 and 11 remained consistent. Two subjects, 09 and 14, had poor performances and interfering behaviors throughout the study. These subjects' data are summarized in Tables 10, 11, 12, 13, and 14.

Group C. Five children made up this well-attended group: One child attended all sessions and the other four missed one session each in the course of the study.

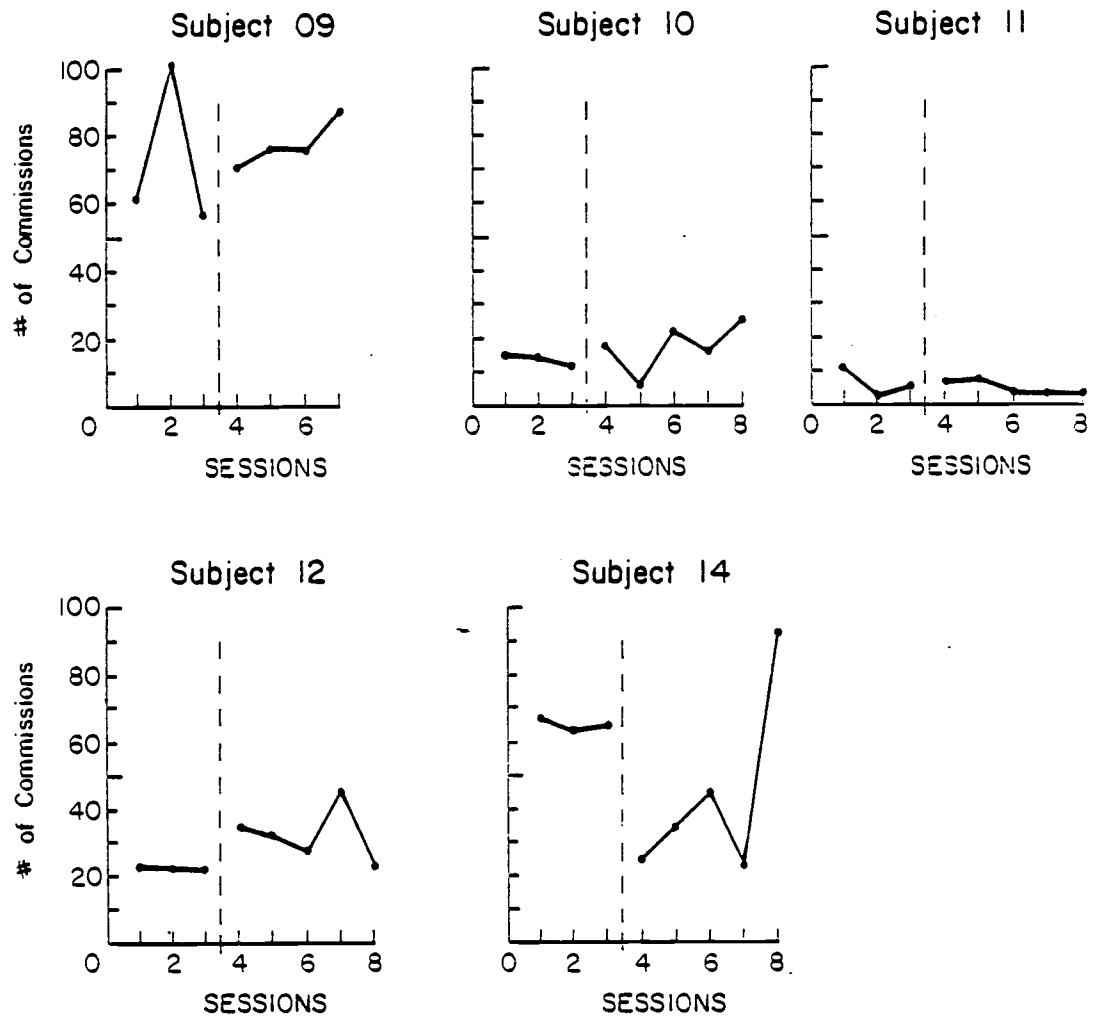


Figure 4. Number of Commissions on the CPT - Group B

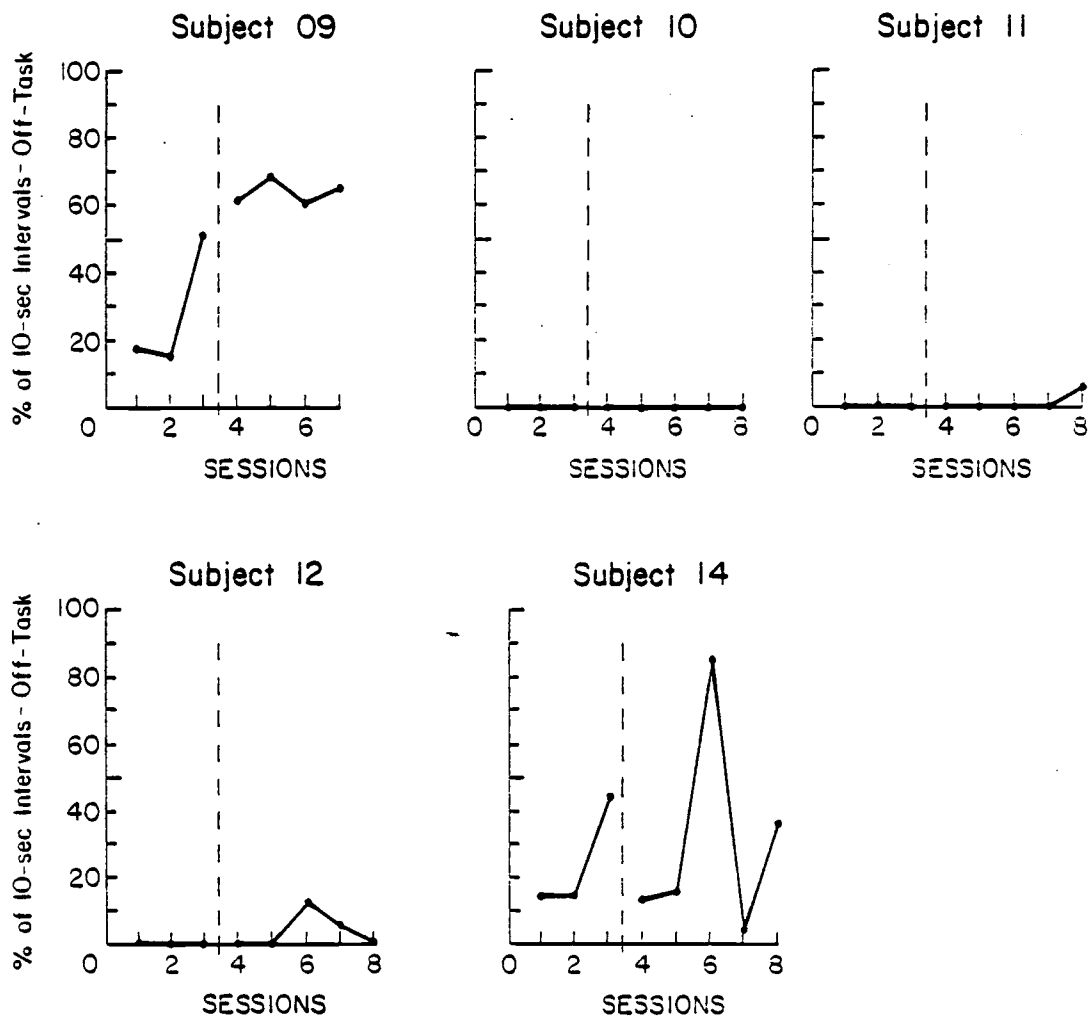


Figure 5. Percentage of 10-second intervals the subject was off-task while completing the CPT - Group B

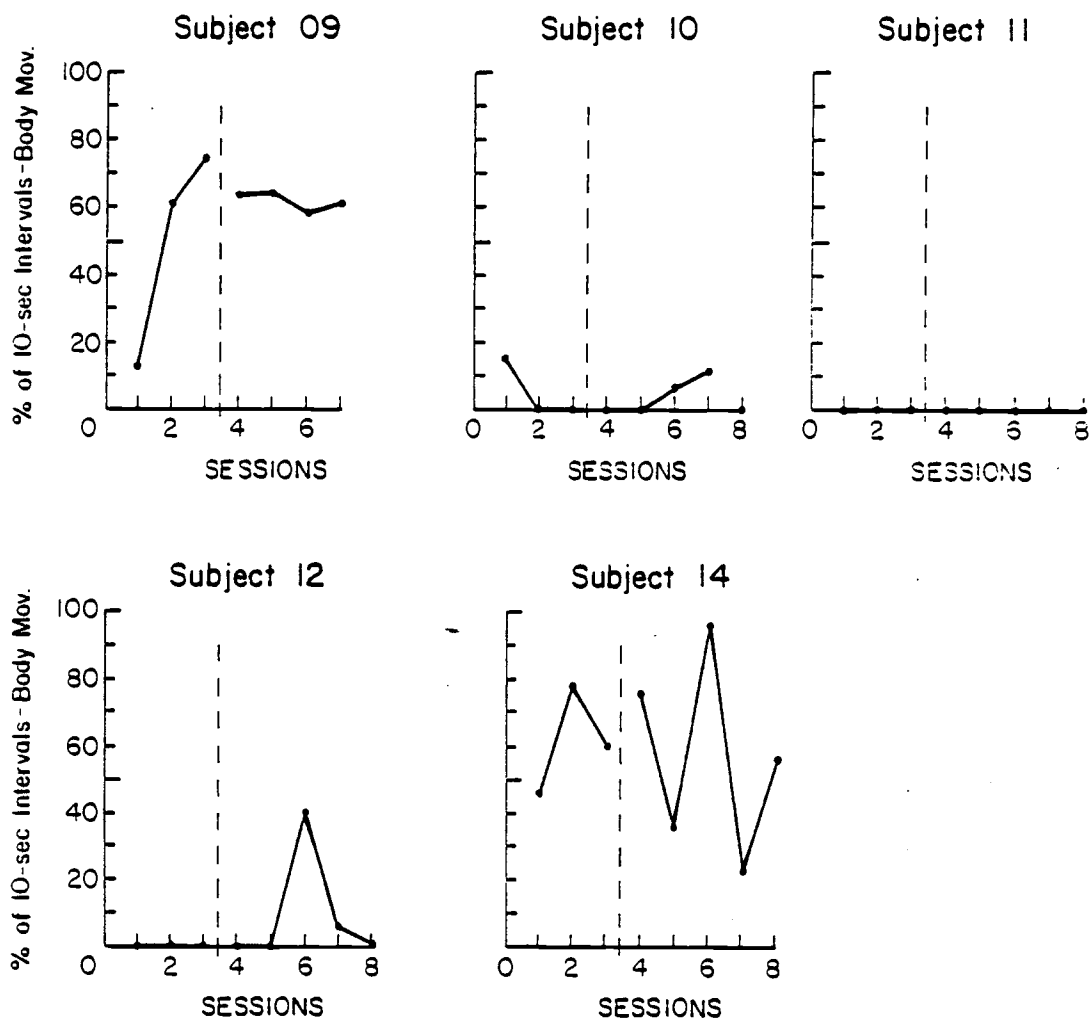


Figure 6. Percentage of 10-second intervals the subject was engaging in gross motor activity while completing the CPT - Group B

Table 10. Performance and Behavioral Data for Subject 09.

Group : B
Subject:: 09

Session	#Omiss	#Commiss	Avg. Rate	Total Time	Behavior			
					Talk	Task	B.Mov.	Total
1. 10-03-84	11	61	1.496	748	5%	18%	13%	31%
2. 10-17-84	5	101	1.540	770	7	16	61	66
3. 10-24-84	18	57	1.503	751	9	52	75	82
4. 11-07-84	9	71	1.488	744	40	61	63	88
5. 12-12-84	14	77	1.661	830	24	69	64	78
6. 1-16-85	13	76	1.549	774	21	60	59	83
7. 1-30-85	7	89	1.600	799	27	65	61	72
8.								

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Session	Total Errors	Total Time	Errors/ Minute	Behavior			
				Talk	Task	B.Mov	Total
1. 10-03-84	111	7.00	15.857	50%	0%	4%	54%
2. 10-17-84	192	7.40	25.946	42	15	30	49
3. 10-24-94	208	88.06	25.806	36	13	16	47
4. 10-31-84	77	7.41	10.391	52	24	46	70
5. 12-05-84	158	6.52	24.233	31	15	21	56
6. 12-12-84	332	9.51	34.911	61	26	47	77
7. 1-09-85	153	6.16	24.838	44	17	14	61
8. 1-23-85	76	5.32	14.286	31	19	15	47

Table 11. Performance and Behavioral Data for Subject 10.

Group : B
Subject: 10

Session	#Omiss	#Commiss	CPT		Behavior			
			Avg. Rate	Total Time	Talk	Task	B.Mov.	Total
1. 10-03-84	10	16	.583	291	33%	0%	17%	33%
2. 10-17-84	8	15	.499	249	0	0	0	0
3. 10-24-84	9	12	.484	241	0	0	0	0
4. 11-07-84	6	19	.512	255	0	0	0	0
5. 11-28-84	7	7	.490	244	0	0	0	0
6. 12-12-84	7	21	.566	282	0	0	8	8
7. 1-16-85	8	17	.523	261	0	0	11	11
8. 1-30-85	8	23	.595	297	0	0	0	0

Session	Total Errors	Total Time	Errors/Minute	Behavior			
				Talk	Task	B.Mov	Total
1. 10-03-84	70	4.55	15.385	32%	0%	12%	35%
2. 10-10-84	41	4.20	9.762	48	6	8	49
3. 10-24-84	36	4.29	8.392	39	5	3	40
4. 11-14-84	14	4.40	3.182	38	8	0	38
5. 12-05-84	10	5.09	1.965	56	13	0	63
6. 12-12-84	10	4.56	2.193	36	0	4	39
7. 1-09-85	1	4.54	.220	26	4	0	26
8. 1-23-85	3	4.51	.665	46	0	0	46
9. 1-30-85	23	4.26	5.399	36	16	0	48

Table 12. Performance and Behavioral Data for Subject 11.

Group : B
Subject: 11

<u>CPT</u>					Behavior			
Session	#Omiss	#Commiss	Avg. Rate	Total Time	Talk	Task	B.Mov	Total
1. 10-03-84	14	11	.657	328	0%	0%	0.0%	0%
2. 10-17-84	16	3	.515	257	0	0	0	0
3. 10-24-84	14	6	.491	245	0	0	0	0
4. 11-07-84	14	8	.440	275	0	0	0	0
5. 11-28-84	13	8	.590	295	3	0	0	3
6. 12-12-84	15	4	.511	255	3	0	0	0
7. 1-16-85	16	4	.502	250	0	0	0	0
8. 1-30-85	16	4	.624	312	3	6	0	10

<u>HANDEYE</u>				Behavior			
Session	Total Errors	Total Time	Errors/Minute	Talk	Task	B.Mov	Total
1. 10-10-84	32	7.30	4.384	3%	0%	0%	3%
2. 10-17-84	28	7.15	3.916	15	4	0	15
3. 10-24-84	18	6.40	2.812	24	5	0	24
4. 10-31-84	43	5.46	7.875	9	0	0	9
5. 11-14-84	36	5.18	6.950	0	4	0	4
6. 11-28-84	26	5.01	5.190	4	4	0	8
7. 12-05-84	10	5.09	1.965	15	0	0	15
8. 1-09-85	16	5.39	2.968	3	0	0	3
9. 1-23-85	3	5.56	.540	3	0	0	3
10. 1-30-85	5	5.42	.922	3	6	0	9

Table 13. Performance and Behavioral Data for Subject 12.

Group : B
Subject: 12

					<u>CPT</u>			
Session	#Omiss	#Commiss	Avg. Rate	Total Time	Behavior			
					Talk	Task	B.Mov.	Total
1. 9-26-84	8	23	.718	358	4%	0%	0%	4%
2. 10-17-84	13	23	.648	324	0	0	0	0
3. 10-24-84	8	23	.528	264	4	0	0	4
4. 11-07-84	6	36	.737	368	0	0	0	0
5. 11-28-84	11	32	.666	332	0	0	0	0
6. 12-12-84	6	28	.662	331	0	12	40	44
7. 1-16-85	9	47	1.063	531	0	6	6	11
8. 1-30-85	9	23	.727	363	0	0	0	0

				<u>HANDEYE</u>			
Session	Total Errors	Total Time	Errors/ Minute	Behavior			
				Talk	Task	B.Mov	Total
1. 9-26-84	62	8.26	7.506	6%	0%	0%	6%
2. 10-17-84	63	7.51	8.388	4	4	0	4
3. 10-24-84	61	6.13	9.951	0	0	0	0
4. 10-31-84	18	6.38	2.821	10	3	0	13
5. 11-14-84	30	6.00	5.000	0	0	0	0
6. 12-05-84	9	5.46	1.648	0	6	3	6
7. 1-09-85	6	6.11	0.982	0	0	0	0
8. 1-23-85	4	6.09	0.657	0	0	0	0
9. 1-30-85	4	6.10	0.656	0	0	0	0

Table 14. Performance and Behavioral Data for Subject 14.

Group : B
Subject: 14

					<u>CPT</u>			
Session	#Omiss	#Commiss	Avg. Rate	Total Time	Behavior			
					Talk	Task	B.Mov	Total
1. 9-26-84	2	69	1.510	754	1%	15%	47%	51%
2. 10-17-84	0	63	1.267	633	0	15	79	85
3. 10-24-84	0	66	1.488	744	0	45	60	66
4. 11-07-84	5	26	.703	351	0	14	75	78
5. 11-28-84	7	35	.807	403	0	17	37	39
6. 12-12-84	3	45	1.079	539	35	86	96	97
7. 1-16-85	8	23	.544	272	0	4	22	26
8. 1-30-85	6	92	1.557	778	9	38	57	58

				<u>HANDEYE</u>			
Session	Total Errors	Total Time	Errors/ Minute	Behavior			
				Talk	Task	B.Mov	Total
1. 9-26-84	19	4.48	4.241	0%	11%	11%	17%
2. 10-17-84	38	4.30	8.837	0	34	61	65
3. 10-24-84	41	4.15	9.98	0	22	30	43
4. 10-31-84	39	4.48	8.705	0	18	64	69
5. 12-05-84	19	4.02	4.726	9	14	23	36
6. 12-12-84	35	4.19	8.353	6	35	85	87
7. 1-09-85	19	4.22	4.502	0	32	0	32
8. 1-23-85	11	3.26	3.374	0	0	0	0
9. 1-30-85	48	4.14	11.594	19	52	69	76

Three of these subjects, 15, 17, and 23 were inconsistent but remained at baseline levels in the performance of the CPT, specifically the number of commissions made (please refer to Figure 7). Subject 16 was also inconsistent but he markedly increased his commissions. Subject 21 reduced his commissions and thus improved his performance. These subjects' data are summarized in Tables 15, 16, 17, 18, and 19.

The off-task behavior of these subjects may be seen in Figure 8. Subjects 15 and 21 were consistently on task; as was Subject 16 until the last session. Subject 17 was inconsistent but ended up at baseline level. Subject 23 was off-task a high percentage of the time when he reduced his off-task behavior to a very low level. Please note from Figure 7 his drop in commissions for that same session.

Changes in gross body movement (see Figure 9) did occur. Subject 15 slowly reduced--note spikes in the data--until the zero percentage level at the last session. Subject 16 was consistently sitting quietly until the increase at the last session. Subjects 17 and 21 were very inconsistent, while Subject 23 remained at the 74% level for five sessions and then had a marked drop to the 3% level at the last session.

In summary no consistent improvement occurred for any subjects except 21 who reduced his commissions.

Table 15. Performance and Behavioral Data for Subject 15.

Group : C
Subject: 15

					<u>CPT</u>			
Session	#Omiss	#Commiss	Avg. Rate	Total Time	Behavior			
					Talk	Task	B.Mov	Total
1. 9-27-84	15	9	.725	362	27%	0%	83%	87%
2. 10-11-84	13	11	.657	333	28	4	72	78
3. 10-25-84	10	17	.569	284	22	3	76	77
4. 11-08-84	5	25	.654	326	14	6	17	23
5. 11-29-84	7	18	.557	278	3	0	47	47
6. 12-13-84	5	21	.562	281	0	0	27	27
7. 1-24-85	7	18	.507	253	8	0	64	72
8. 1-31-85	10	11	.485	242	9	4	0	13

				<u>HANDEYE</u>			
Session	Total Errors	Total Time	Errors/ Minute	Behavior			
				Talk	Task	B.Mov	Total
1. 9-27-84	222	7.25	30.621	52%	2%	38%	62%
2. 10-11-84	196	7.16	27.374	47	0	13	50
3. 10-25-84	31	8.15	3.804	9	4	25	31
4. 11-01-84	12	7.31	1.642	0	2	16	16
5. 11-15-84	7	6.46	1.084	16	5	55	16
6. 12-04-84	4	6.42	.623	0	0	5	5
7. 1-10-85	4	8.31	.431	29	12	0	29
8. 1-31-85	2	7.14	.280	9	7	12	21

Table 16. Performance and Behavioral Data for Subject 16.

Group : C
Subject: 16

					<u>CPT</u>				
					Behavior				
Session	#Omiss	#Commiss	Avg. Rate	Total Time	Talk	Task	B.Mov	Total	
1.	9-27-84	13	18	.666	333	3%	3%	3%	7%
2.	10-11-84	14	14	.611	292	0	0	20	20
3.	10-25-84	5	24	.583	291	0	0	39	39
4.	11-08-84	11	10	.466	233	0	0	0	0
5.	11-29-84	5	29	.509	254	0	0	0	0
6.	12-13-84	8	17	.498	249	0	4	0	4
7.	1-17-85	5	31	.705	352	0	0	0	0
8.	1-31-85	13	100	1.5946	797	0	41	19	43

				<u>HANDEYE</u>				
				Behavior				
Session	Total Errors	Total Time	Errors/Minute	Talk	Task	B.Mov	Total	
1.	9-17-84	4	4.44	.901	0%	0%	0%	0%
2.	10-04-84	5	4.58	1.092	0	0	6	6
3.	10-24-84	1	4.03	.248	0	4	0	4
4.	11-01-84	19	3.49	5.444	16	5	16	21
5.	11-15-84	14	3.05	4.590	6	0	0	6
6.	12-06-84	8	3.23	2.477	0	0	0	0
7.	1-10-85	0	3.56	.000	0	0	0	0
8.	1-24-85	1	3.18	.314	0	0	0	0
9.	1-31-85	16	3.36	4.762	0	0	0	0

Table 17. Performance and Behavioral Data for Subject 17.

Group : C
Subject: 17

<u>CPT</u>					Behavior			
Session	#Omiss	#Commiss	Avg. Rate	Total Time	Talk	Task	B.Mov	Total
1. 10-04-84	16	11	.735	367	0%	0%	45%	45%
2. 10-18-84	13	14	.667	333	12	19	34	34
3. 11-01-84	12	16	.720	360	4	11	38	41
4. 11-08-84	8	29	.613	306	0	3	13	16
5. 11-29-84	5	52	1.247	623	11	22	76	81
6. 12-13-84	15	7	.591	295	0	0	24	24
7. 1-17-85	14	15	.724	362	8	5	3	16
8. 1-31-85	11	15	.650	325	0	17	38	48

<u>HANDEYE</u>				Behavior			
Session	Total Errors	Total Time	Errors/Minute	Talk	Task	B.Mov	Total
1. 10-04-84	177	8.17	21.665	0%	4%	2%	4%
2. 10-18-84	163	8.47	19.255	21	17	69	72
3. 11-01-84	114	6.44	17.702	15	10	40	46
4. 11-15-84	114	6.08	18.750	22	0	86	89
5. 12-06-84	172	6.59	26.100	10	23	5	33
6. 12-13-84	23	9.52	2.416	3	8	3	11
7. 1-10-85	10	7.51	1.332	0	0	0	0
8. 1-24-85	38	5.43	6.998	0	0	0	0
9. 1-31-85	41	6.28	6.529	5	5	3	10

Table 18. Performance and Behavioral Data for Subject 21.

Group : C
Subject: 21

				<u>CPT</u>				
Session	#Omiss	#Commiss	Avg. Rate	Total Time	Behavior			
					Talk	Task	B.Mov	Total
1. 10-04-84	15	32	.598	299	10%	5%	42%	44%
2. 10-11-84	14	30	.598	292	8	7	56	59
3. 10-25-84	5	32	.674	337	0	3	32	32
4. 11-15-84	6	18	.496	247	4	0	35	38
5. 11-29-84	9	10	.480	240	0	0	43	43
6. 12-06-84	9	11	.492	245	11	0	74	81
7. 12-13-84	7	14	.496	248	0	0	19	19
8. 1-17-85	8	20	.538	268	4	0	73	73
9. 1-31-85	10	12	.452	225	0	0	38	38

				<u>HANDEYE</u>			
Session	Total Errors	Total Time	ERRORS/ Minute	Behavior			
				Talk	Task	B.Mov	Total
1. 10-04-84	15	7.46	2.011	14%	0%	0%	14%
2. 10-11-84	17	7.21	2.358	50	16	14	52
3. 10-25-84	10	5.13	1.949	36	3	0	39
4. 11-01-84	10	5.00	2.000	15	0	4	19
5. 11-15-84	14	4.50	3.111	10	7	0	17
6. 12-06-84	5	4.46	1.121	0	7	0	7
7. 1-10-85	5	4.30	1.163	0	0	0	0
8. 1-24-85	24	5.36	4.478	35	19	26	55
9. 1-31-85	2	4.54	.440	0	0	0	0

Table 19. Performance and Behavioral Data for Subject 23.

Group : C
Subject: 23

<u>CPT</u>								
Session	Omiss	#Commis	Avg. Rate	Total Time	Behavior			
					Talk	Task	B.Mov	Total
1. 9-27-84	8	47	1.100	550	14%	26%	70%	72%
2. 10-18-84	14	30	.841	420	34	21	49	56
3. 10-25-84	15	32	.778	367	29	56	76	83
4. 11-08-84	14	38	1.357	678	4	54	78	87
5. 11-29-84	20	77	1.357	678	18	57	73	82
6. 12-13-84	15	139	1.222	610	0	46	74	82
7. 1-17-85	2	357	1.744	872	1	83	74	90
8. 1-31-85	8	20	.610	305	3	7	3	10

<u>HANDEYE</u>								
Session	Total Errors	Total Time	Errors/ Minute	Behavior				
				Talk	Task	B.Mov	Total	
1. 9-27-84	189	10.05	18.806	17%	15%	22%	30%	
2. 10-18-84	179	9.31	19.227	22	12	27	33	
3. 10-25-84	61	8.57	7.118	0	15	15	22	
4. 11-01-84	41	8.40	4.881	12	14	12	18	
5. 11-15-84	18	6.57	2.740	0	2	0	2	
6. 12-06-84	10	6.22	1.608	0	5	0	5	
7. 1-24-84	14	6.35	2.205	0	8	0	8	

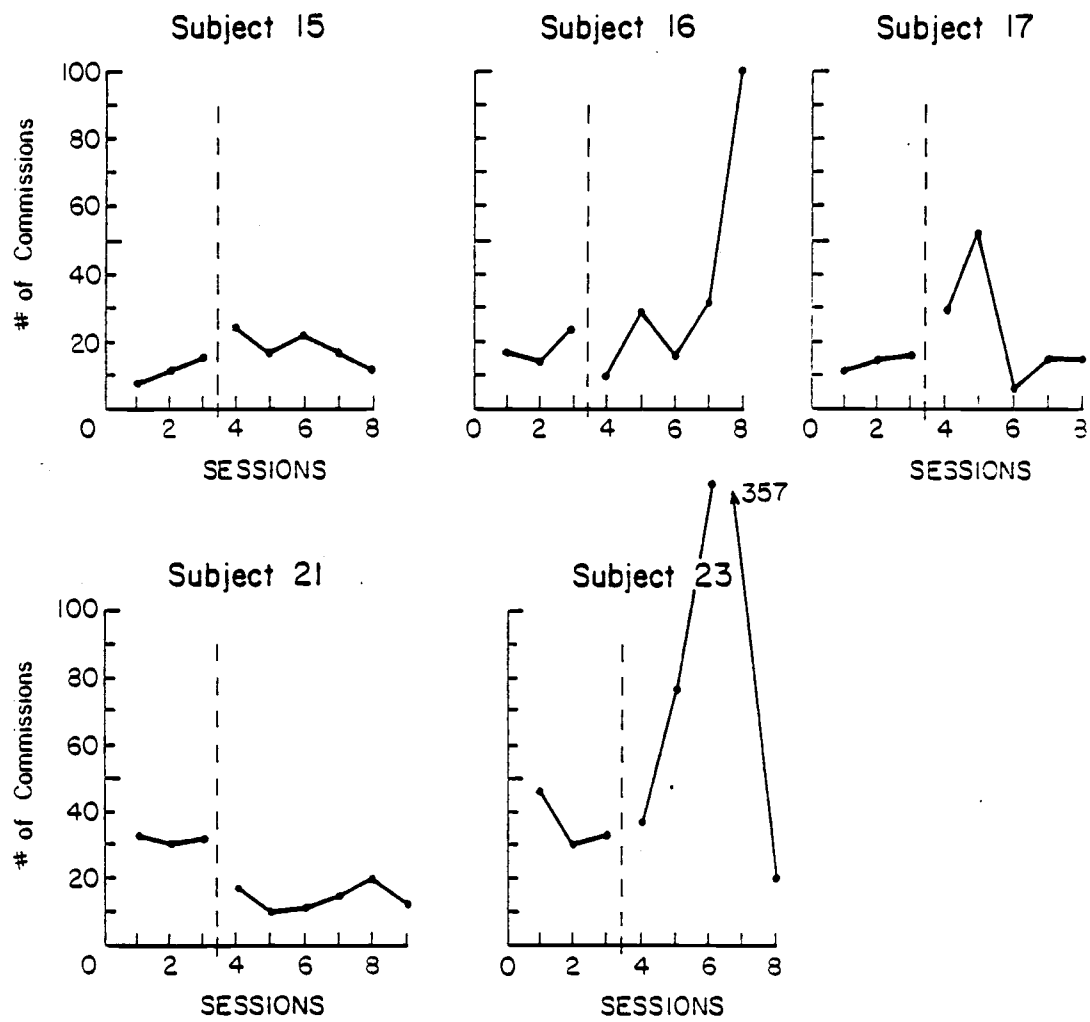


Figure 7. Number of Commissions on the CPT - Group C

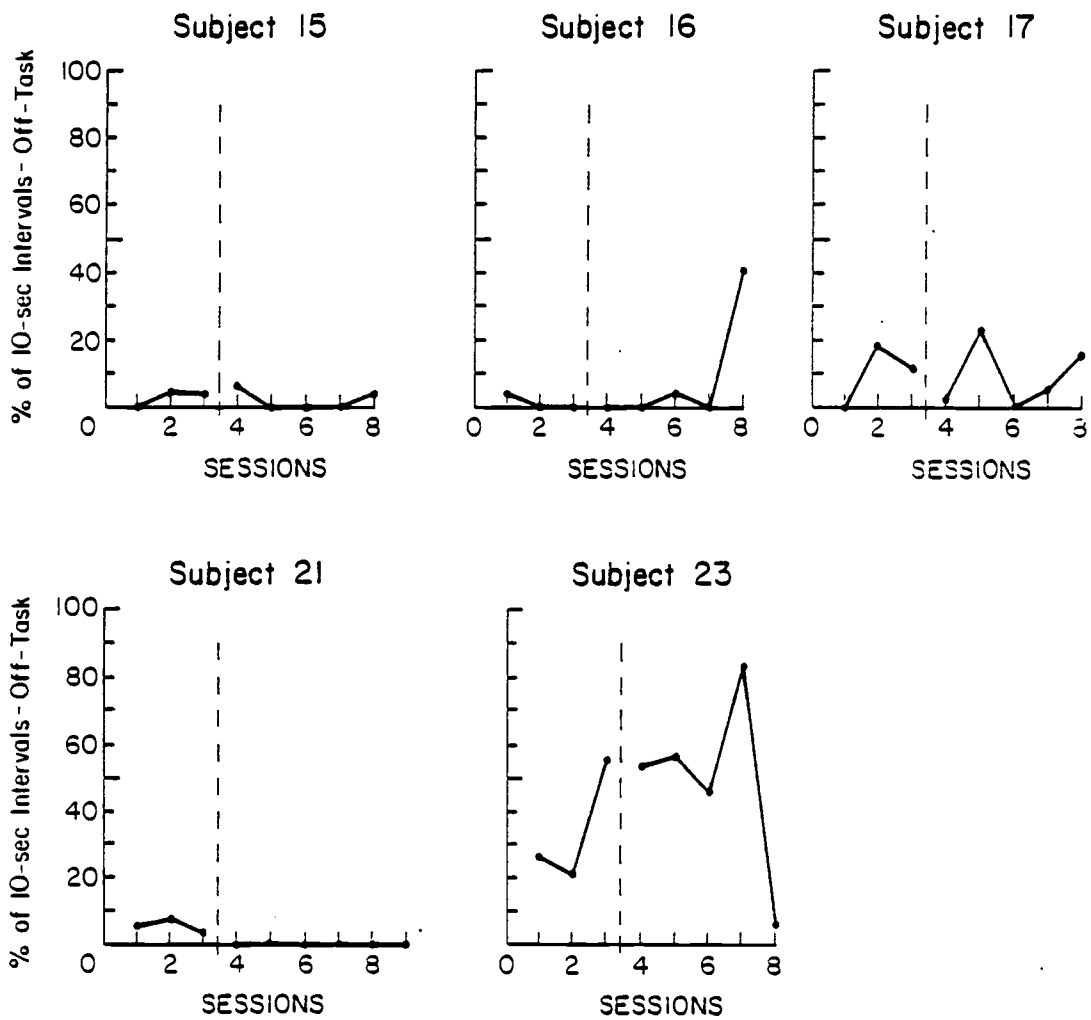


Figure 8. Percentage of 10-second intervals the subject was off-task while completing the CPT - Group C

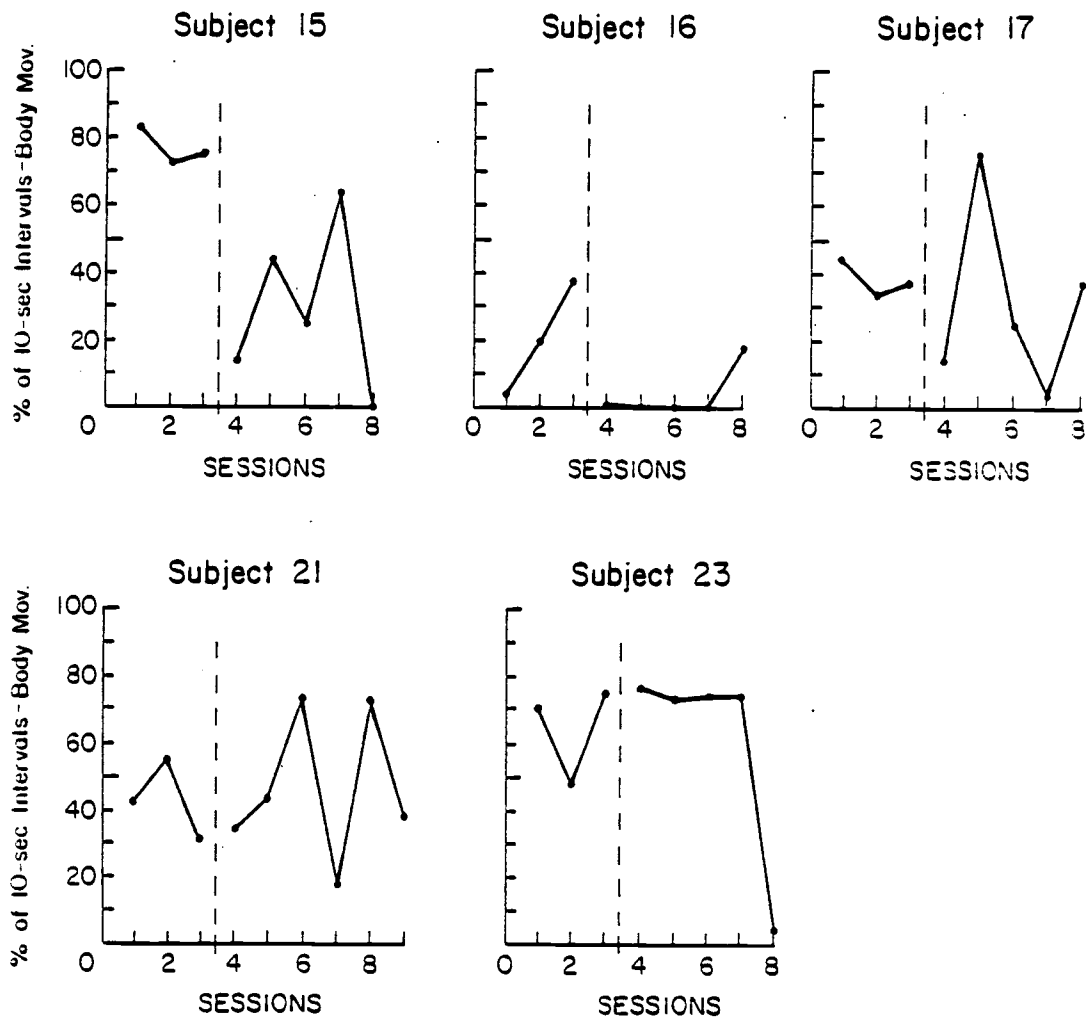


Figure 9. Percentage of 10-second intervals the subject was engaging in gross motor activity while completing the CPT - Group C

Subject 23's data is noteworthy for its inconsistency and the extreme highs and lows.

The eye-hand coordination task-handeye was not evaluated as it became evident during the course of the study that this task was subject to the learning curve. Students who were not familiar with the joystick initially improved quickly with familiarity to that piece of equipment. There were four subjects who never consistently improved, 01, 04, 09, and 14.

Summary of the Findings

It appears that no conclusive statement may be made, but it should be pointed out that (1) no subject improved in any of the three variables in Groups B, (2) positive trends may be developing for three subjects in Group A, and (3) Group C had one subject improve in performance.

But the positive performances by the three subjects in Group A have not been clearly shown to be a trend and the evidence is thus inconclusive. Based on the design of this study and the data collected when deactivating auditory subliminal stimuli were received by elementary age hyperkinetic children for 90 minutes per day once a week, it appears that neither the task nor the motor performance of these children were affected.

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter consists of four sections. First, the purpose of the study and research procedures are reviewed. Second, the findings are summarized on the data presented in Chapter IV. Third, conclusions are formulated and presented on the basis of the findings. And fourth, recommendations are made based on the conclusions.

Purpose

This study was proposed to report on the effects of subliminal auditory stimulation on the motor behavior, and the task performance of hyperkinetic children. The study was an investigation into the effects of deactivating messages delivered below threshold to a group of 15 hyperactive boys between seven and twelve years of age.

The purpose of the study was to test and evaluate the data generated by the research and to use the subsequent findings to determine the effectiveness of subliminal auditory stimulation to help hyperactive children decrease inattention and impulsivity.

Procedures

A messaging system that delivered continuous deactivating messages at a volume level just below the level of conscious hearing was installed at the research site. Three groups of hyperactive children participated in one 75 minute group session and one 15 minute individual session per week for 16 weeks. These sessions were held at a metropolitan children's mental health clinic associated with a major hospital and medical center in Northern Oregon.

A single subject evaluation procedure, specifically the multiple baseline technique across subjects was used for the study, and five types of dependent measures were examined.

Findings

Throughout the study, the percent of interobserver agreement ranged from 91% to 99%. Kappa ranged from .9074 to .9883 and Light's extension of Kappa ranges from .8271 to 1.00. These findings substantiate reliability and control of observer bias.

The parental rating scales data showed positive significant correlations ($\alpha=.05$) between each of the inventories for dads, and all but one for moms. The mean scores for the Conners and Kendall Inventories were in the range that discriminates between normal and clinic referred children.

Of the 12 Conners Teachers Rating Scale that were returned, seven children were identified as hyperactive by their teachers, Index > 1.5.

The data presented in Group A, the treatment group, indicate that one subject, 05, showed a propensity to improve in each of the three hypothesized measurements, and Subject 03 exhibited movement towards improvement, but there were not enough data points for either to verify that the trend would continue. Subject 02's behavior was in the normal range during the treatment condition as was Subject 04 with the exception of the last data point.

No improvements were seen in any of the Control Group B subjects. Subjects 10 and 11 remained consistent and Subjects 09 and 14 had poor performances and interfering behaviors throughout the study.

Subjects in Control Group C made no consistent improvement with the exception of Subject 21 who reduced his commissions. Subject 23's data are noteworthy for its inconsistency and the extreme highs and lows.

Conclusions

It appears that no conclusive statement may be made, but it should be pointed out that (1) positive trends may have been developing for three subjects in the treatment Group A, (2) no subject improved in any of the variables in control Group B, and (3) control

Group C had only one subject improve in performance. The positive performances by the three subjects in treatment Group A have not clearly shown a trend. Thus, the evidence is inconclusive.

From the evidence of this study the auditory subliminal stimulus did not affect behavior or task performance of hyperkinetic children.

Recommendations

One of the first questions that arises from this study is whether there was sufficient exposure to the stimulus. Each child in Group A was exposed for 90 minutes per week. Ninety minutes was selected because that was the minimum time that Proactive Systems recommended and the maximum amount of time that the hyperactive self control groups could run per week. Proactive Systems recommended exposure of a shorter duration, 60 minutes, three times a week. But it was not possible to find subjects to participate after school for 16 weeks three times a week. In addition, even if the subjects had been available, the clinic where this project was conducted did not have the space nor the staff to contribute to a project of that magnitude.

In the midst of this treatment intervention, long holidays fell, so that one week was missed at Thanksgiving and three weeks were missed over the winter vacation. One

group was exposed to the stimulus for six weeks, but at the end of this condition, no change was apparent from the data collected and the length of exposure to Group A was extended without adding a second group to the treatment condition.

In the successful studies completed by Silverman using a visual subliminal stimulus, the subjects were all exposed 4-5 times a week over three to six week periods. The visual stimulus is one of 4 milliseconds though and it can be delivered easily in conjunction with a second therapeutic intervention. The ideal environment for a study of this nature would have been a classroom setting in a local school. This setting would have provided the opportunity to expose the subject daily to the stimulus.

The content of the auditory message is another question that requires further investigation. For this study, a constraint was imposed by the equipment in that the phrase needed to be short enough to be contained on the microchip, approximately three seconds.

Deactivating messages were chosen because they incorporated much of the language that was being used in the Self-Control groups. The children are taught relaxation techniques and self talk and these messages were not dissimilar.

Activating messages that would not increase hyperkinetic behavior might be an effective message content.

In the study by Borgeat and Goulet (1983), physiological responses were significantly affected only by the activating and not the deactivating subliminal stimuli.

Messages whose content is specific to the performance task, or to the behavior, or to self control might be more effective and need to be tested. For example, in this study the message could have been "orange S, blue T." If this type of active statement does influence behavior, there could be a number of possible outcomes. For example, the student could increase his attention and reduce his omissions without increasing his commissions. On the other hand, this message maybe would only serve to increase a child's anticipation for the correct pair of letters to flash on the screen and thus increase his impulsivity.

The third type of message that has not been tested auditorily is Silverman's paradigm, MOMMY AND I ARE ONE. This emotion laden sentence has been used as a visual subliminal stimulus but there has been no study using this content auditorily.

Another variable that could have influenced the outcome of this research was the task chosen for the subjects to perform. This task, the Continuous Performance Task, is used for diagnostic purposes primarily (Klee & Garfinkel, 1983). It was selected because it did differentiate hyperactive children from other children and could be repeated without a learning effect. This

task was very boring and required intense concentration. Most of the children disliked the task, but enjoyed the opportunity to work on the computer. It is not known whether it is possible for hyperactive children to improve their score significantly under the conditions implemented in this study. It is known that the effectiveness of a drug regimen with a hyperactive child can be monitored with the Continuous Performance Task.

In addition this was a task that required considerable visual concentration. On the other hand, the message was delivered auditorily. In the studies conducted by Parker (1982), Ariam and Siller (1982) and Bryant-Tuckett and Silverman (1984), the subject was asked to visually imagine a situation that caused stress prior to an exam and then the subject was "flashed," delivered the visual stimulus. Due to the length of the auditory stimulus, 90 minutes, and its frequency, one time per week, the subject did not receive this type of preparation, but he did receive in his group, techniques that were compatible to the content of the subliminal messages being delivered.

The duration and actual frequency of behavior was not monitored, only whether or not it occurred in a 10-second interval. A more exacting coding measurement might have resulted in another conclusion. It is interesting to note that two observers noted on the data sheets of two subjects in Group A that there was a change in

the intensity of these children's motor activity. While both engaged previously in out-of-seat behavior such as climbing onto the computer and onto the table, now they sat and worked, but with swinging legs. This change in intensity was not reflected in the data collected.

The children were all monitored by video camera while they worked individually in the small treatment room. The camera was not obtrusive and was ignored by most of the children. When the project was reviewed with the individual child at its conclusion, most had forgotten that a camera was in the room and that their behavior had been recorded. In the large treatment room, the psychologist used a video camera to project the group's activities into a viewing room for the children's parents and teachers. Maybe because this equipment was so prevalent, the children tended to ignore its presence.

The subjects were all recruited from a population of boys who had been referred to self control training for hyperactive children. Some of the children were on medication and some were not; some who were taking medication were not benefiting from it by 4:00 p.m. This group training program did not monitor medication; this information was known to the clinic staff only if the child was seeing the psychologist privately as well. Consequently, medication was not controlled for in this study and it might account for some of the

variability in a subject's performance and behavior from one session to the next.

A post test on the Piers-Harris Self Concept Inventory for the subjects in this study may have yielded positive improvement in self concept. These data were not included in the research design.

A classroom setting would be a better environment for this type of field study. The exposure could be more frequent, a larger sample could be tested, and the environment of the classroom with the expectations of the teacher to listen could be maximized.

Based on the design of this study and the data collected, this research did not find an auditory deactivating subliminal stimulus to affect hyperkinetic children's task performance or motor activity. A positive trend, although inconclusive, was developing in the experimental group, thus, the capability of subliminal messages to affect change in hyperactive children merits further research.

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APPENDICES

APPENDIX A

Facsimile of Cover Letter for Parents

Dear Parent:

We would like you to complete the attached questionnaire. Please find time to give it your undivided attention since the information will be used by the team in making some preliminary decisions regarding the best way of addressing the questions and concerns you have raised.

Most parents and teachers have described the checklist as fairly straightforward but there are invariably a few questions or points of confusion. BEFORE tackling the questionnaire, please review the following questions we have been frequently asked.

1. What is this checklist?

This is the Achenbach Behavior Checklist which we use with all children, ages 4-16. It gives the information regarding potential areas of difficulty to be explored in our work.

2. Why are you asking me about behaviors which do not fit my youngster (student)?

Since the checklist is designed for use with a wide range of children it is necessary that many items be included that might not be applicable to a particular child.

3. If there are not any problems do I still fill it out?

Yes. The absence of a problem is just as valuable as information suggesting the existence of difficulty in the past 12 months.

4. What if I am not sure of how to answer an item?

This is understandable and you are simply being asked to respond as best as you can. We are asking for your opinion and there are no right or wrong answers.

5. How can I answer questions which ask how the child is feeling?

Remember, there are no right or wrong answers. Simply use your own feelings to guide your response.

6. Can I write on the questionnaire?

Certainly. Put a question mark next to any item which you are unclear about or where you are unsure of your response. Make any notes or comments that you feel might be helpful to us.

7. Is this a test of the adult?

No, we consider it an opportunity for you to give us additional information. Since we want your reactions, please do not confer with anyone else about your responses. Our interpretations of the questionnaire will be discussed at the scheduled conference.

IF YOU HAVE ANY ADDITIONAL QUESTIONS, PLEASE CONTACT THE CLINIC FOR CLARIFICATION.
THANK YOU FOR YOUR COOPERATION.

Achenbach Behavior Checklist

VIII. Below is a list of items that describe children. For each item that describes your child now or within the past 12 months. Please circle the 2 if the item is very true or often true of your child. Circle the 1 if the item is somewhat or sometimes true of your child. If the item is not true of your child, circle the 0.

-
- | | | | |
|---|---|---|--|
| 0 | 1 | 2 | 1. Acts too young for his/her age |
| 0 | 1 | 2 | 2. Allergy (describe): _____ |
| 0 | 1 | 2 | 3. Argues a lot |
| 0 | 1 | 2 | 4. Asthma |
| 0 | 1 | 2 | 5. Behaves like opposite sex |
| 0 | 1 | 2 | 6. Bowel movements outside toilet |
| 0 | 1 | 2 | 7. Bragging, boasting |
| 0 | 1 | 2 | 8. Can't concentrate, can't pay attention for long |
| 0 | 1 | 2 | 9. Can't get his/her mind off certain thoughts; obsessions (describe): _____ |
| 0 | 1 | 2 | 10. Can't sit still, restless, or hyperactive |
| 0 | 1 | 2 | 11. Clings to adults or too dependent |
| 0 | 1 | 2 | 12. Complains of loneliness |
| 0 | 1 | 2 | 13. Confused or seems to be in a fog |
| 0 | 1 | 2 | 14. Cries a lot |
| 0 | 1 | 2 | 15. Cruel to animals |
| 0 | 1 | 2 | 16. Cruelty, bullying, or meanness to others |
| 0 | 1 | 2 | 17. Day-dreams or gets lost in his/her thoughts |
| 0 | 1 | 2 | 18. Deliberately harms self or attempts suicide |
| 0 | 1 | 2 | 19. Demands a lot of attention |
| 0 | 1 | 2 | 20. Destroys his/her own things |
| 0 | 1 | 2 | 21. Destroys things belonging to his/her family or other children |
| 0 | 1 | 2 | 22. Disobedient at home |
| 0 | 1 | 2 | 23. Disobedient at school |
| 0 | 1 | 2 | 24. Doesn't eat well |
| 0 | 1 | 2 | 25. Doesn't get along with other children |
| 0 | 1 | 2 | 26. Doesn't seem to feel guilty after misbehaving |

CHILD'S NAME _____ AGE: _____ PARENT'S NAME _____

- 0 1 2 27. Easily jealous
0 1 2 28. Eats or drinks things that are not food
(describe): _____
- 0 1 2 29. Fears certain animals, situations, or places, other than school
(describe): _____
- 0 1 2 30. Fears going to school
- 0 1 2 31. Fears he/she might think or do something bad
0 1 2 32. Feels he/she has to be perfect
- 0 1 2 33. Feels or complains that no one loves him/her
0 1 2 34. Feels others are out to get him/her
- 0 1 2 35. Feels worthless or inferior
0 1 2 36. Gets hurt a lot, accident prone
- 0 1 2 37. Gets in many fights
0 1 2 38. Gets teased a lot
- 0 1 2 39. Hangs around with children who get in trouble
0 1 2 40. Hears things that aren't there (describe):

- 0 1 2 41. Impulsive or acts without thinking
0 1 2 42. Likes to be alone
- 0 1 2 43. Lying or cheating
0 1 2 44. Bites fingernails
- 0 1 2 45. Nervous, highstrung, or tense
0 1 2 46. Nervous movements or twitching (describe):

- 0 1 2 47. Nightmares
0 1 2 48. Not liked by other children
- 0 1 2 49. Constipated, doesn't move bowels
0 1 2 50. Too fearful or anxious
- 0 1 2 51. Feels dirty
0 1 2 52. Feels too guilty
- 0 1 2 53. Overeating
0 1 2 54. Overtired
- 0 1 2 55. Overweight

- 0 1 2 56. Physical problems without known medical cause:
 0 1 2 a. Aches or pains
 0 1 2 b. Headaches
 0 1 2 c. Nausea, feels sick
 0 1 2 d. Problems with eyes (describe): _____
-
- 0 1 2 e. Rashes or other skin problems
 0 1 2 f. Stomach aches or cramps
 0 1 2 g. Vomiting, throwing up
 0 1 2 h. Other (describe): _____
- 0 1 2 57. Physically attacks people
 0 1 2 58. Picks nose, skin, or other parts of body (describe): _____
-
- 0 1 2 59. Plays with own sex parts in public
 0 1 2 60. Plays with own sex parts too much
- 0 1 2 61. Poor school work
 0 1 2 62. Poorly coordinated or clumsy
- 0 1 2 63. Prefers playing with older children
 0 1 2 64. Prefers playing with younger children
- 0 1 2 65. Refuses to talk
 0 1 2 66. Repeats certain acts over and over; compulsions (describe): _____
-
- 0 1 2 64. Runs away from home
 0 1 2 68. Screams a lot
- 0 1 2 69. Secretive, keeps things to self
 0 1 2 70. Sees things that aren't there (describe): _____
-
- 0 1 2 71. Self-conscious or easily embarrassed
 0 1 2 70. Sets fires
- 0 1 2 73. Sexual problems (describe): _____
-
- 0 1 2 74. Showing off or clowning
- 0 1 2 75. Shy or timid
 0 1 2 76. Sleeps less than most children
- 0 1 2 77. Sleeps more than most children during day and/or night
 (describe): _____
- 0 1 2 78. Smears or plays with bowel movements

- 0 1 2 79. Speech problem (describe): _____
0 1 2 80. Stares blankly
- 0 1 2 81. Steals at home
0 1 2 82. Steals outside the home
- 0 1 2 83. Stores up things he/she doesn't need (describe):

- 0 1 2 84. Strange behavior (describe):

- 0 1 2 85. Strange ideas (describe):

- 0 1 2 86. Stubborn, sullen, or irritable
- 0 1 2 87. Sudden changes in mood or feelings
0 1 2 88. Sulks a lot
- 0 1 2 89. Suspicious
0 1 2 90. Swearing or obscene language
- 0 1 2 91. Talks about killing self
0 1 2 92. Talks or walks in sleep (describe):

- 0 1 2 93. Talks too much
0 1 2 94. Teases a lot
- 0 1 2 95. Temper tantrums or hot temper
0 1 2 96. Thinks about sex too much
- 0 1 2 97. Threatens people
0 1 2 98. Thumb-sucking
- 0 1 2 99. Too concerned with neatness or cleanliness
0 1 2 100. Trouble sleeping (describe):

- 0 1 2 101. Truancy, skips school
0 1 2 102. Underactive, slow moving, or lacks energy
- 0 1 2 103. Unhappy, sad, or depressed
0 1 2 104. Unusually loud
- 0 1 2 105. Uses alcohol or drugs (describe):

- 0 1 2 106. Vandalism
- 0 1 2 107. Wets self during the day
0 1 2 108. Wets the bed

- 0 1 2 109. Whining
0 1 2 100. Wishes to be of opposite sex
- 0 1 2 111. Withdrawn, doesn't get involved with others
0 1 2 112. Worrying
113. Please write in any problems your child has that were not listed above:
- 0 1 2 _____
0 1 2 _____
0 1 2 _____

PLEASE BE SURE YOU HAVE ANSWERED ALL ITEMS

Conners Parent Symptom Questionnaire

Parent's Questionnaire

Name of Child _____

Date _____

Please answer all questions. Beside each item below, indicate the degree of the problem by a check mark ()

	<u>Not at</u> <u>all</u>	<u>Just a</u> <u>little</u>	<u>Pretty</u> <u>much</u>	<u>Very</u> <u>much</u>
1. Picks at things (nails, fingers, hair, clothing).	_____	_____	_____	_____
2. Sassy to grown-ups.	_____	_____	_____	_____
3. Problems with making or keeping friends.	_____	_____	_____	_____
④ Excitable, impulsive.	_____	_____	_____	_____
5. Wants to run things.	_____	_____	_____	_____
6. Sucks or chews (thumb; clothing; blankets).	_____	_____	_____	_____
⑦ Cries easily or often.	_____	_____	_____	_____
8. Carries a chip on his shoulder.	_____	_____	_____	_____
9. Daydreams.	_____	_____	_____	_____
10. Difficulty in learning.	_____	_____	_____	_____
⑪ Restless in the "squirmy" sense.	_____	_____	_____	_____
12. Fearful (of new situations; new people or places; going to school).	_____	_____	_____	_____
⑬ Restless, always up and on the go.	_____	_____	_____	_____
⑭ Destructive.	_____	_____	_____	_____
15. Tells lies or stories that aren't true.	_____	_____	_____	_____
16. Shy.	_____	_____	_____	_____
17. Gets into more trouble than others same age.	_____	_____	_____	_____
18. Speaks differently from others same age (baby talk; stuttering; hard to understand).	_____	_____	_____	_____
19. Denies mistakes or blames others.	_____	_____	_____	_____
20. Quarrelsome.	_____	_____	_____	_____
21. Pouts and sulks.	_____	_____	_____	_____
22. Steals.	_____	_____	_____	_____
23. Disobedient or obeys but resentfully.	_____	_____	_____	_____
24. Worries more than others (about being alone; illness or death).	_____	_____	_____	_____
⑲ Fails to finish things.	_____	_____	_____	_____
26. Feelings easily hurt.	_____	_____	_____	_____

	<u>Not at all</u>	<u>Just a little</u>	<u>Pretty much</u>	<u>Very much</u>
27. Bullies others.	_____	_____	_____	_____
28. Unable to stop a repetitive activity.	_____	_____	_____	_____
29. Cruel.	_____	_____	_____	_____
30. Childish or immature (wants help he shouldn't need; clings; needs constant reassurance).	_____	_____	_____	_____
31. Distractibility or attention span a problem.	_____	_____	_____	_____
32. Headaches.	_____	_____	_____	_____
33. Mood changes quickly and drastically.	_____	_____	_____	_____
34. Doesn't like or doesn't follow rules or restrictions.	_____	_____	_____	_____
35. Fights constantly.	_____	_____	_____	_____
36. Doesn't get along with brothers or sisters.	_____	_____	_____	_____
37. Easily frustrated in efforts.	_____	_____	_____	_____
38. Disturbs other children.	_____	_____	_____	_____
39. Basically an unhappy child.	_____	_____	_____	_____
40. Problems with eating (poor appetite; up between bites).	_____	_____	_____	_____
41. Stomach aches.	_____	_____	_____	_____
42. Problems with sleep (can't fall asleep; up too early; up in the night).	_____	_____	_____	_____
43. Other aches and pains.	_____	_____	_____	_____
44. Vomiting or nausea.	_____	_____	_____	_____
45. Feels cheated in family circle.	_____	_____	_____	_____
46. Boasts and brags.	_____	_____	_____	_____
47. Lets self be pushed around.	_____	_____	_____	_____
48. Bowel problems (frequently loose; irregular habits; constipation).	_____	_____	_____	_____

Facsimile of Cover Letter for Teachers

Dear Teacher:

We hope that you have the chance to fill out the attached questionnaire. It is designed to help us learn more about how a student is doing at school and accordingly adjust our approaches with him. Your input is invaluable since it reflects how a youngster does in the demanding social and academic environment of school.

Please take an opportunity to complete the questionnaire, checking each item according to the degree to which it is observed. Please form your judgments based on the child's behavior over the last month. A self-enclosed envelope is included so that your questionnaire can be sent to the Children's Program.

Please do not hesitate to call if you have any questions or concerns. We would also be interested in any comments you might be able to add regarding changes in the student's behavior, learning or social interaction.

Sincerely,

Conners Teacher Rating Scale

NAME OF CHILD: _____ AGE: _____

NAME OF PERSON FILLING OUT FORM: _____

DATE: _____

Conners Teacher Rating Scale

Listed below are descriptive forms of behavior. Place a check mark
in the column which best describes this child. ANSWER ALL ITEMS.

Observation	Degree of Activity			
	Not at all	Just a little	Pretty much	Very much
CLASSROOM BEHAVIOR				
1. Constantly fidgeting	_____	_____	_____	_____
2. Hums and makes other odd noises	_____	_____	_____	_____
3. Demands must be met immediately - easily frustrated	_____	_____	_____	_____
4. Coordination poor	_____	_____	_____	_____
5. Restless or overactive	_____	_____	_____	_____
6. Excitable, impulsive	_____	_____	_____	_____
7. Inattentive, easily distracted	_____	_____	_____	_____
8. Fails to finish things he starts - short attention span	_____	_____	_____	_____
9. Overly sensitive	_____	_____	_____	_____
10. Overly serious or sad	_____	_____	_____	_____
11. Daydreams	_____	_____	_____	_____
12. Sullen or sulky	_____	_____	_____	_____
13. Cries often and easily	_____	_____	_____	_____
14. Disturbs other children	_____	_____	_____	_____
15. Quarrelsome	_____	_____	_____	_____
16. Mood changes quickly and drastically	_____	_____	_____	_____
17. Acts "smart"	_____	_____	_____	_____
18. Destructive	_____	_____	_____	_____
19. Steals	_____	_____	_____	_____
20. Lies	_____	_____	_____	_____
21. Temper outbursts, explosive and unpredictable behavior	_____	_____	_____	_____
GROUP PARTICIPATION				
22. Isolates himself from other children	_____	_____	_____	_____
23. Appears to be unaccepted by group	_____	_____	_____	_____
24. Appears to be easily led	_____	_____	_____	_____
25. No sense of fair play	_____	_____	_____	_____
26. Appears to lack leadership	_____	_____	_____	_____
27. Does not get along with opposite sex	_____	_____	_____	_____
28. Does not get along with same sex	_____	_____	_____	_____
29. Teases other children or interferes with their activities	_____	_____	_____	_____

Observation	Degree of Activity			
	Not at all	Just a little	Pretty much	Very much
ATTITUDE TOWARD AUTHORITY				
30. Submissive	_____	_____	_____	_____
31. Defiant	_____	_____	_____	_____
32. Impudent	_____	_____	_____	_____
33. Shy	_____	_____	_____	_____
34. Fearful	_____	_____	_____	_____
35. Excessive demands for teacher's attention	_____	_____	_____	_____
36. Stubborn	_____	_____	_____	_____
37. Overly anxious to please	_____	_____	_____	_____
38. Uncooperative	_____	_____	_____	_____
39. Attendance problem	_____	_____	_____	_____

Kendall Self Control Rating Scale

Name of Child _____ Grade _____

Rater _____

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

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

13. Can the child follow suggestions of others in group projects, or does he or she insist on imposing his or her own ideas?
- 1 2 3 4 5 6 7
able to follow imposes
14. Does the child have to be reminded several times to do something before he or she does it?
- 1 2 3 4 5 6 7
never always
15. When reprimanded, does the child answer back inappropriately?
- 1 2 3 4 5 6 7
never always
16. Is the child accident prone?
- 1 2 3 4 5 6 7
no yes
17. Does the child neglect or forget regular chores or tasks?
- 1 2 3 4 5 6 7
never always
18. Are there days when the child seems incapable of settling down to work?
- 1 2 3 4 5 6 7
never often
19. Would the child more likely grab a smaller toy today or wait for a larger toy tomorrow, if given the choice?
- 1 2 3 4 5 6 7
wait grab
20. Does the child grab for the belongings of others?
- 1 2 3 4 5 6 7
never often
21. Does the child bother others when they're trying to do things?
- 1 2 3 4 5 6 7
no yes
22. Does the child break basic rules?
- 1 2 3 4 5 6 7
never always
23. Does the child watch where he or she is going?
- 1 2 3 4 5 6 7
always never
24. In answering questions, does the child give one thoughtful answer, or blurt out several answers all at once?
- 1 2 3 4 5 6 7
one answer several
25. Is the child easily distracted from his or her work or chores?
- 1 2 3 4 5 6 7
no yes
26. Would you describe this child more as careful or careless?
- 1 2 3 4 5 6 7
careful careless
27. Does the child play well with peers (follows rules, waits turn, cooperates)?
- 1 2 3 4 5 6 7
yes no

28. Does the child jump or switch from activity to activity rather than sticking to one thing at a time?

1 2 3 4 5 6 7
sticks switches
to one

29. If a task is at first too difficult for the child, will he or she get frustrated and quit, or first seek help with the problem?

1 2 3 4 5 6 7
seek help quit

30. Does the child disrupt games?

1 2 3 4 5 6 7
never often

31. Does the child think before he or she acts?

1 2 3 4 5 6 7
always never

32. If the child paid more attention to his or her work, do you think he or she would do much better than at present?

1 2 3 4 5 6 7
no yes

33. Does the child do too many things at once, or does he or she concentrate on one thing at a time?

1 2 3 4 5 6 7
one thing too many

Pier's-Harris Children's Self Concept Scale

CHILD's NAME _____

FAMILY NAME _____

DATE _____

Here are a set of statements. Some of them are true of you and so you will circle the yes. Some are not true of you and so you will circle the no. Answer every question even if some are hard to decide, but do not circle both yes and no. Remember, circle the yes if the statement is generally like you, or circle the no if the statement is generally not like you. There are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

- | | | |
|--|-----|----|
| 1. My classmates make fun of me | yes | no |
| 2. I am a happy person | yes | no |
| 3. It is hard for me to make friends | yes | no |
| 4. I am often sad | yes | no |
| 5. I am smart | yes | no |
| 6. I am shy | yes | no |
| 7. I get nervous when the teacher calls on me | yes | no |
| 8. My looks bother me | yes | no |
| 9. When I grow up, I will be an important person | yes | no |
| 10. I get worried when we have tests in school | yes | no |
| 11. I am unpopular | yes | no |
| 12. I am well behaved in school | yes | no |
| 13. It is usually my fault when something goes wrong | yes | no |
| 14. I cause trouble to my family | yes | no |
| 15. I am strong | yes | no |
| 16. I have good ideas | yes | no |
| 17. I am an important member of my family | yes | no |
| 18. I usually want my own way | yes | no |
| 19. I am good at making things with my hands | yes | no |
| 20. I give up easily | yes | no |
| 21. I am good in my school work | yes | no |
| 22. I do many bad things | yes | no |

23. I can draw well	yes	no
24. I am good in music	yes	no
25. I behave badly at home	yes	no
26. I am slow in finishing my school work	yes	no
27. I am an important member of my class	yes	no
28. I am nervous	yes	no
29. I have pretty eyes	yes	no
30. I can give a good report in front of the class	yes	no
31. In school I am a dreamer	yes	no
32. I pick on my brother(s) and sister(s)	yes	no
33. My friends like my ideas	yes	no
34. I often get into trouble	yes	no
35. I am obedient at home	yes	no
36. I am lucky	yes	no
37. I worry a lot	yes	no
38. My parents expect too much of me	yes	no
39. I like being the way I am	yes	no
40. I feel left out of things	yes	no
41. I have nice hair	yes	no
42. I often volunteer in school	yes	no
43. I wish I were different	yes	no
44. I sleep well at night	yes	no
45. I hate school	yes	no
46. I am among the last to be chosen for games	yes	no
47. I am sick a lot	yes	no
48. I am often mean to other people	yes	no
49. My classmates inschool think I have good ideas	yes	no
50. I am unhappy	yes	no
51. I have many friends	yes	no
52. I am cheerful	yes	no
53. I am dumb about most things	yes	no
54. I am good looking	yes	no
55. I have lots of pep	yes	no

56. I get into a lot of fights	yes	no
57. I am popular with boys	yes	no
58. People pick on me	yes	no
59. My family is disappointed in me	yes	no
60. I have a pleasant face	yes	no
61. When I try to make something, everything seems to go wrong	yes	no
62. I am picked on at home	yes	no
63. I am a leader in games and sports	yes	no
64. I am clumsy	yes	no
65. In games and sports, I watch instead of play	yes	no
66. I forget what I learn	yes	no
67. I am easy to get along with	yes	no
68. I lose my temper easily	yes	no
69. I am popular with girls	yes	no
70. I am a good reader	yes	no
71. I would rather work alone than with a group	yes	no
72. I like my brother (sister)	yes	no
73. I have a good figure	yes	no
74. I am often afraid	yes	no
75. I am always dropping or breaking things	yes	no
76. I can be trusted	yes	no
77. I am different from other people	yes	no
78. I think bad thoughts	yes	no
79. I cry easily	yes	no
80. I am a good person	yes	no

Data Collection Sheet for Behavior Observation

SUBJECT _____ OBSERVERS: _____ DATE _____
 CODED: _____
 DATE _____
 TASK _____ RELIABILITY _____

Talk			
Off Task			
Body Movement			
On Task			
Sitting Still			
Talk			
Off Task			
Body Movement			
On Task			
Sitting Still			
Talk			
Off Task			
Body Movement			
On Task			
Sitting Still			
Talk			
Off Task			
Body Movement			
On Task			
Sitting Still			
Talk			
Off Task			
Body Movement			
On Task			
Sitting Still			

Grand Totals

Talk
 Off Task
 Body Movement
 On Task
 Sitting Still

APPENDIX B

Informed Consent
Hospital and Medical Center
Consent to Participate in Research Project

Subject: _____ Date: _____
Time: _____

Title of Research Project: The effect of auditory subliminal deactivating messages on motor and task performance of hyperkinetic children.

- I. I hereby agree and consent to my child's participation in the project designed to evaluate whether words emitted below the child's level of hearing will decrease inattention and impulsivity.

I understand that the following procedures are to be followed:

If I decide to have my child participate in this research study, my child will be one of approximately 16 children to participate during the next three months.

A minimum of eight weekly one and one half hour sessions will be required. During each of these sessions, my child will participate in the Children's Program's treatment group for hyperactive children. During these group sessions, my child may or may not receive an auditory subliminal message suggesting relaxation and positive thoughts.

During a 15 minute portion of each session my child will play computer games at a computer in another room and may or may not receive an identical auditory subliminal message. These computer activities are appropriate to the group treatment in that they allow the treatment staff to work on the elements of staying on task. In addition, these 15 minute sessions will be videotaped. Trained observers will score my child's behavior from the videotape. All sessions will be at the Children's Program at the Hospital and Medical Center.

Before my child's sessions begin, his hearing will be checked at the clinic by a speech and language specialist. There will be no cost to my family for this examination. I will be asked to complete three inventories: Achenbach behavior Checklist; Conners Parent System Questionnaire; and the Self-Control Rating Scale. Final acceptance into the research study will occur following the completion of these evaluations.

The results of this research project will be disseminated nationally, however, precautions will be made to insure the confidentiality of the participating children.

- II. I have been made aware that my child's participation in this research may result in certain discomforts and risks which include:

The major discomfort is not knowing the content of the message and if it is being delivered. I understand that the statement is positive and

that I and my child will be told the content of the message at the conclusion of the study. A second discomfort is the presence of a video camera. A third possibility of a risk occurring is through accidental disclosure of information gathered during the study. However, an extensive effort is made to insure each subject's anonymity.

I understand it is not the policy of the Department of Health and Human Services or any other agency funding the research project in which I am participating to compensate or provide medical treatment for human subjects in the event the research results in physical injury. I further understand that should I suffer any injury from the research project, compensation would be available only if I establish that the injury occurred through the fault of the hospital, its officers, or employees or my physician. I understand that further information regarding this policy may be obtained from the Office of Research Administration.

III. I understand that certain benefits are:

Information may be obtained concerning techniques to help hyperactive children be more attentive and less impulsive. At the end of my child's participation in the research project, I and My child will receive information on the study and on my child's performance.

At our request and with our permission, results may be shared with the clinic staff who worked with my child and family. The results may provide information for more effective treatment.

IV. Appropriate alternative procedures have been explained to me which are as follows.

I and my child may wait until the entire project is concluded and thereby benefit from the results at that time.

V. Following acceptance into the project, my child will be financially compensated for each of the sessions.

For each session completed, my child will receive \$2.50. My child will be paid after each session. If my child completes all of the sessions, a bonus of \$10.00 will also be paid at the conclusion of that final session.

I may ask any questions I like concerning the procedures on the above narrative. All questions should be addressed directly to the principal investigator.

VI. I understand I am free to refuse to participate or to withdraw from this study at any time and it will in no way affect my relationship with, or treatment at the Hospital and Medical Center.

I have read the foregoing.

(Signature of Parent)

(Date)

(Signature of Parent)

(Time)

(Signature of Child)

(Signature of Witness)

Protection of Human Subjects -
Initial Review Questionnaire

The information is requested to help reviewers decide the ethical propriety and legitimacy of the proposed activity. The questionnaire is based on DHHS regulatory requirements for the protection of human subjects and Good Samaritan Hospital and Medical Center policy.

Principal Investigator: (Last Name) _____ (First Name) (Initial) (Degree/Other) _____

Department/Division _____ Telephone _____ Proposed Funding Source _____
CHILDREN'S PROGRAM

Project Title THE EFFECT OF AUDITORY SUBLIMINAL DEACTIVATING MESSAGES ON MOTOR
AND TASK PERFORMANCE OF HYPERKINETIC CHILDREN

Has the same project been reviewed before? _____ If "Yes," title, date _____

___ Yes X No

1. Does the proposed work involve patients or healthy persons as subjects?
X Yes ___ No (If "No," no further information is needed. Sign and attach the questionnaire to the front of your proposal).
2. Does the proposed work involve research or other activities, established or unestablished procedures that go beyond the mere delivery of medical care? X Yes ___ No
3. Is, in the principal investigator's judgment, the proposed activity classified as: Therapy ___ Investigational X or Research ___

If more space is needed for any of the following items, add separate sheets. If an item is not appropriate, type "Not Applicable."

4. Describe the characteristics of the subjects to be used:

(a) ADULT PATIENTS ___ Yes X No HEALTHY ADULT VOLUNTEERS ___ Yes X No
(b) SEX X M X F AGE RANGE 8 to 12 Yrs. ESTMTD. NUMBER 18
(c) AFFILIATION OR SOURCE OF SUBJECTS, e.g. hospitals, outpatient clinics, general public, etc. CHILDREN'S PROGRAM OUTPATIENT CLINIC - HYPERACTIVE TREATMENT GROUPS

(d) SUBJECTS' DIAGNOSES AND GENERAL STATE OF HEALTH EXCELLENT HEALTH -
HYPERACTIVE

SPECIAL SUBJECT GROUPS

Are the subjects Minors Pregnant Women Mentally Retarded
 Fetuses Prisoners Mentally Disabled

If any of these groups apply, explain the necessity for using these particular groups. NATURE OF THE RESEARCH IS TO STUDY THE EFFECTS OF AUDITORY SUBLIMINAL PHRASES UPON HYPERACTIVE CHILDREN

6. CONFIDENTIALITY OF DATA ON THE SUBJECTS

(a) If for the purpose of the proposed activity identifiable subject records are being kept other than, or apart from, ordinary patient records, describe the precautionary measures to be taken to maintain confidentiality;

ALL SUBJECTS ARE ASSIGNED CONFIDENTIAL CASE NUMBERS WITH MASTER LIST MAINTAINED IN LOCKED FILE BY INVESTIGATOR. VIDEOTAPES LABELED BY CASE NUMBER OBSERVERS RECORD BEHAVIOR FROM VIDEOTAPES - IDENTIFY SUBJECT BY I.D.#.*(see below)

(b) Will identifiable subject data be transmitted to a person or office not associated with this institution (e.g. national coordinating offices, multi-study evaluation center, pharmaceutical firms, etc.)? Yes No

If "Yes," (1) include request for subject's permission in the consent form.
 (2) give name and address of receiving person or of the responsible director of the receiving office _____

7. INVESTIGATIONAL DRUG/DEVICE USAGE

(a) Will an investigational (unapproved) drug be used? Yes No

(b) Will a significant risk investigational device be used? Yes No

If (a) or (b) is "Yes," (1) attach the data on previous human experience, animal studies, and laboratory tests.
 (2) give name of person or firm that holds the IND/IDE and the date of filing _____
 (3) give the IND/IDE number _____
 (4) has sponsor been requested to withhold/restrict use of drug/device? Yes No

(c) Will an approved drug be used for an unapproved indication? Yes No

If "Yes," give name of drug, proposed usage, and dosage schedule _____

*SUBJECT RECORDS AND VIDEOTAPES ARE KEPT IN LOCKED FILE BY INVESTIGATOR. OBSERVERS HAVE WORKED FOR YEARS WITHOUT VIOLATING CONFIDENTIALITY. INSTRUCTION WILL AGAIN OCCUR.

8. RISKS TO SUBJECTS

(a) Describe any physical, psychological, social, economic, or other risks to the subjects:

<u>NATURE OF RISK</u>	<u>SERIOUSNESS</u>	<u>INCIDENCE/PROBABILITY</u>
1) ACCIDENTAL DISCLOSURE	MINIMAL	LOW
2) CHILD REACTIVITY TO PRESENCE OF VIDEO CAMERA	MINIMAL	LOW
3) CHILD REACTIVITY TO RECEIVING A MESSAGE HE CANNOT HEAR	MINIMAL	LOW

(b) Precautionary measures to be taken to eliminate or reduce the risks:

ALL CHILDREN WILL BE ASSIGNED I.D. NUMBERS. VIDEOCAMERA IS OUTSIDE THE ROOM AND WILL RECORD THROUGH A VIEWING WINDOW. AT CONCLUSION OF STUDY, CHILD AND PARENTS WILL BE TOLD THE CONTENT OF THE MESSAGE. DISCUSSION WITH PARENTS ON THE PROCEDURE OF THE STUDY. INFORMED CONSENT OF PARENTS. OBSERVERS WILL RECEIVE INSERVICE TRAINING REGARDING CONFIDENTIALITY.

9. BENEFITS

Describe the benefits that may reasonably be expected from the proposed activity for:

(a) The subjects: MAY BE MORE ATTENTIVE AND LESS IMPULSIVE

(b) The advancement of scientific-medical knowledge: PILOT STUDY - PRELIMINARY INVESTIGATION INTO WHETHER AUDITORY SUBLIMINAL PHRASES EFFECT THE MOTOR AND TASK PERFORMANCE OF HYPERACTIVE CHILDREN

10. INFORMED CONSENT (Required for Investigational and Research Studies)

Attach the form to be used for obtaining the informed consent of the subject:
(See General Operational Procedure 225.2 for guidance).

11. PROTOCOL

Attach the protocol (see General Operational Procedure 225.2 for guidance).

12. Are you a member of the medical staff Yes No
If "No," attach written assurance from a staff physician who assumes the medical responsibility for the subjects, if applicable.

13. ASSURANCES

- (a) I will promptly report to the Office of Research Administration any:
 (1) proposed changes in the activity, (2) changes in the informed consent form, (3) unanticipated problems involving risk to subjects or others, including adverse reactions to biologicals, drugs, radioisotope labeled drugs, or to medical devices, (4) injury or harm.
- (b) I will retain the documentary evidence of informed consent for at least three years after the proposed activity has been completed or discontinued.
- (c) The Institutional Review Board is obligated to continually review this activity. Therefore, I agree to furnish the committee relevant information on request.
- (d) I, the undersigned, agree to accept responsibility for the ethical conduct of the project and the protection of the rights and welfare of the subjects.

 Principal Investigator or Project Director

 Date
14. DEPARTMENT HEAD/CLINICAL CHIEF REVIEW

I have reviewed and approve the proposed study as relevant to the goals and objectives of this department. I concur in the classification of the study.

 Department Head/Clinical Chief

 Date
15. REVIEW COMMITTEE

Received	Initial Review		Committee Review		Verdict	Letter to Investigator
	Com- plete	Incom- plete	Expedited	Full Board		

Hospital Authorization Letter

September 17, 1984

At its meeting on September 17, 1984 the Institutional Review Board of the Hospital and Medical Center reviewed and approved your protocol entitled "Effect of Auditory Subliminal Deactivating Messages on Motor and Task Performance of Hyperkinetic Children" with the proviso that the consent form include provision for the minor subject's assent.

You are free to begin your study at any time following submission of the modified consent form. Please be advised that you should inform the IRB of any changes in your protocol or if any problems have emerged or serious or unexpected adverse patient experiences have been observed.