ATTAINMENT OF GROSS MOTOR SKILLS BY THE SEVERELY AND/OR PROFOUNDLY MENTALLY RETARDED: FIVE CASE STUDIES

A THESIS

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We hereby recommend that the thesis prepared under our supervision by Sharon Faye Self Allbright entitled ATTAINMENT OF GROSS MOTOR SKILLS BY THE SEVERELY AND/OR PROFOUNDLY MENTALLY RETARDED: FIVE CASE STUDIES

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DEDICATION

To my husband, Jon Lyn, who unselfishly shares his wife with her second love, her work, and to my children, Amber and Jon II, who generously share their mother with the other special children in her life.

TABLE OF CONTENTS

PAGE

ACKNOWLEDGMENTS iii

DEDICATION iv

LIST OF FIGURES vii

CHAPTER

I. INTRODUCTION 1

Purpose of the Study 2
Statement of the Problem 2
Definitions and/or Explanations of Terms 3
Research Questions 4
Limitations of the Study 5

II. REVIEW OF RELATED LITERATURE 6

III. PROCEDURES FOLLOWED IN THE DEVELOPMENT OF THE STUDY . . . 18

Sources of Data 18
Preliminary Procedures 19
Selection of the Subjects 19
Selection and Description of the Instruments 19
Selection of the Case Study Method 22
Planning and Implementation of the Study 22
Collection of Data 23
Treatment of Data 25

IV. PRESENTATION OF THE FINDINGS 26

Case Study Number One: Subject M 26
Case Study Number Two: Subject D 38
Case Study Number Three: Subject A 50
Case Study Number Four: Subject C 66
Case Study Number Five: Subject J 77
Summary and Comparison of the Five Case Studies 89

V. SUMMARY, CONCLUSION, DISCUSSION, AND RECOMMENDATIONS FOR FURTHER STUDY 91

PAGE

Summary 91
Conclusion 95
Discussion 95
Recommendations for Further Study 98

APPENDICES 100

A. Programming Aids 100
B. CAMS Motor Program Placement Test 105
C. CAMS Motor Program 120
D. DASH--Adapted Social-Emotional Pinpoint Scale 146

BIBLIOGRAPHY 150

LIST OF FIGURES

FIGURE		PAGE
1.	Summary of Progress for Case 1, Subject M	38
2.	Summary of Progress for Case 2, Subject D	50
3.	Summary of Progress for Case 3, Subject A	66
4.	Summary of Progress for Case 4, Subject C	77
5.	Summary of Progress for Case 5, Subject J	89
6.	Summary and Comparison of Skills Acquired and Retained by All Subjects	90

CHAPTER I

INTRODUCTION

All too often the severely and/or profoundly mentally retarded individual is denied the opportunity to participate in appropriate physical activity. Moran (1979) explains that several aspects of the child's growth and development are improved as he progresses physically. She suggests that instruction in motor-related activities should be the first step in the severe or profound retardate's learning program. To deny the retardate this motor skill instruction is to deny him/her the right to attain his/her fullest developmental potential.

Under Public Law 94-142 (U.S. Government, 1975), physical education is required for all handicapped children. President Reagan has proposed changes in this law which would narrow the population served to those with severe disabilities. Thus, future trends may place more emphasis on the severely and/or profoundly handicapped and their education needs. Most physical education teachers have never developed the competencies to effectively meet the needs of this low-functioning population. Unfortunately, there is a scarcity of research data, instructional resources, and motor assessment instruments for the severely and/or profoundly mentally retarded populations (Harding, 1977). One study (Altman, Talkington, & Cleland, 1972) conducted with this population tested for the effectiveness of using modeling and verbal instructions

on gross motor performances. The researchers concluded that this methodology was ineffective. A need for further research along similar lines is clearly indicated.

The severely and/or profoundly mentally retarded person is entitled to receive the most effective program of instruction available. Since it appears that gross motor skills are essential for developing the full potential of this select population, an urgent need exists for determining the most effective method for providing gross motor training to the severely and/or profoundly mentally retarded.

Purpose of the Study

The purpose of this study was to identify the motor responses of five severely and/or profoundly mentally retarded children who had received training in gross motor skills through participation in an individualized physical education program. Another aim of the study was to check for elicited behavioral changes after participation in an individualized physical education program.

Statement of the Problem

The problem of this study entailed the investigation of the motor responses of five severely and/or profoundly mentally retarded children who participated in an individualized physical education program. The subjects were students enrolled at the Shady Grove Career Development Center, a special education facility of the Grand Prairie Independent School District, Grand Prairie, Texas. The researcher served as the

teacher for all subjects and met with each one individually. The program entailed 5 20-minute sessions per week, for 8 weeks, during the spring of 1981. During the initial session, each child's placement in the motor program was determined by means of the Curriculum and Monitoring Systems' placement test (Casto, 1979), and each child's pretest information was recorded. On the last day of the program period, the placement scores were recorded as posttest scores. An adaptation of the Developmental Assessment for Severely Handicapped's social-emotional scale (Dykes, 1980) was completed every week throughout the study including the last day. A post-posttest was given at 10 weeks to check for retention of motor skills and behavioral changes. Based upon the findings, a conclusion was drawn concerning the appropriateness of individualized motor performance training for this selected population.

Definitions and/or Explanations of Terms

For the purpose of clarification, the following definitions and/or explanations of terms have been established for use in the study:

Severe and/or Profound

The terms, severe and profound, were used interchangeably throughout this study. The literature, as well as the Grand Prairie Independent School District, used this terminology interchangeably primarily because of the difficulty of accurately categorizing these two levels of mental retardation.

Profound Mental Retardation

The degree of mental retardation present when intelligence testing

> scores are more than 5 standard deviations below the norm . . . such persons require continuing and close supervision, but some persons may be able to perform simple self-help tasks; profoundly retarded persons often have other handicaps and require life support systems for maintenance. (Grossman, 1977, p. 149)

Severe Mental Retardation

> A term used to describe the degree of mental retardation when intelligence testing scores range more than 4 and up to 5 standard deviations below the norm (20 to 35 on the Standard-Binet and 25 to 39 on the Wechsler Scales [extrapolated]); such persons require continuing and close supervision but may perform self-help and simple work tasks under supervision, sometimes called dependent retarded. (Grossman, 1977, p. 149)

Case Study

> A case study consists of an intensive investigation of the case unit, especially with respect to initial status of symptoms, collection of explanatory data, and diagnosis or identification of causal factors, looking toward remedial or developmental treatment. (Good, 1966, p. 310)

Adapted Physical Education

> Adapted physical education consists of a diversified program of developmental activities, games, sports, and rhythms suited to interests, capacities, and limitations of students with impairments, disabilities, or handicaps who may not safely, successfully, or with personal satisfaction engage in unrestricted activities included in general physical education programs. (AAHPER, 1976, p. 33)

Research Questions

The researcher investigated the following research questions:

1. Will individualized instruction in gross motor skills improve physical mobility in the severely and/or profoundly mentally retarded?

2. Will individualized instruction in gross motor skills elicit behavioral changes in the severely and/or profoundly mentally retarded?

Limitations of the Study

The study was subject tc the following limitations: (a) five severely and/or profoundly mentally retarded students from the Grand Prairie Independent School District in Grand Prairie, Texas; (b) the degree tc which the subjects were representative of the population from which they were drawn; (c) the degree to which the subjects were motivated to perform; (d) the reliability, validity, and objectivity of the tests administered; (e) the extent to which the case studies were compiled and reported objectively; (f) the reliability and objectivity of a checklist system of cbserving and recording changes in physical mobility and behavior during each instructional session; (g) the availability of personal and medical histories and evaluations which made up the case studies of the five subjects; (h) 8 weeks of individualized instruction, 5 days per week fcr approximately 20 minutes per day; (i) the obtaining of parental consent; (j) the previous motor experiences of the subjects; and (k) the degree to which the subjects were willing and/or able to comprehend and perform.

CHAPTER II

REVIEW OF RELATED LITERATURE

An extensive investigation of related literature revealed that the present study in no way duplicated previous research. Unfortunately, there is a scarcity of research data for the severely and/or profoundly mentally retarded population. The review of related literature was limited to selected studies which provided background information on methodology and program approaches, as well as mobility training techniques for profound retardates.

A study conducted by Jenkins (1968) at the Denton State School in Denton, Texas, during the fall of 1967, investigated values of physical education as a means of improving the gross motor performance of 38 mentally retarded boys. The subjects' ages ranged between 9 and 14 years and the IQ scores ranged between 20 and 50. Subjects were randomly assigned to experimental and control groups. Each group of 19 subjects was compared on Heath rail-walking, standing broad jump, 30-yd. dash, and an original hopping test. The experimental group met for an individualized program of instruction 1 hour per day, 5 days per week, for 7 weeks. The control group followed the usual regime of the Denton State School. Each session with the experimental group was divided into 4 segments with 10 to 12 minutes spent in walking, running, hopping, and jumping activities. Various behavior modification techniques and

procedures were used. The children were awarded consistently with candy, hugs, and verbal praise whenever they made a correct motor response. The investigator believed that this technique motivated the children to improve their level of performance. Kinesthetic stimulation and visual aids were used to elicit responses from the subjects.

After 7 weeks, a posttest comprised of the 4 tests used to measure proficiency in the basic movements of rail-walking, running, jumping, and hopping was administered. The tests administered were (a) the Heath Rail-Walking Test, (b) the 30-yd. dash as described by Francis and Rarick, (c) the standing broad jump test as described by Scott and French, and (d) an original hopping test, Nessler Square Hopping Test. Differences among all pretest scores were nonsignificant; posttest scores showed significant improvement and differences favored the experimental group in all but the 30-yd. dash.

The data collected were treated statistically and subjected to a t-test of significance. The experimental group improved significantly ($p < .01$) in rail-walking ability. The experimental group also improved significantly ($p < .001$) in jumping ability as measured by the standing broad jump and hopping ability as measured by the Nessler Square Hopping Test. The experimental group did not improve significantly ($p > .05$) in running ability as measured by the 30-yd. dash.

Webb (1969) conducted a study in which 32 severely and profoundly mentally retarded subjects were selected by ward personnel of the Glenwood State Hospital-School in Glenwood, Iowa. Staff members believed

that these 32 children had good potentiality for improvement for the following reasons: (a) ability to relate to staff, (b) awareness of physical environment, (c) severity of behavior problems, and (d) previous lack of therapy of any kind. The study, conducted in 1968, included 17 males and 15 females ranging in age from 2½ to 17½ years with a mean age of 10 years. Social ages, as computed by the Vineland Social Maturity Scale (VSMS), were between 2 and 21 months with a mean social age of 8 months. All subjects were diagnosed as having encephalopathy from known or unknown causes. Developmentally, 21 children had both head and trunk control, 21 sat alone, 4 crawled, 4 stood alone without walking, and 5 walked alone. Sensory motor training was administered for an hour a day, 4 days a week for an average of 8 months. Training techniques were designed to increase level of awareness, stimulate movement, improve ability to manipulate the environment, and develop posture and locomotion. Before training, each child was given a sensory-motor evaluation to determine individual levels of sensory integration and motor performance. The level of development in four behavior areas was recorded on the Awareness, Movement, Manipulation of the Environment, Posture and Locomotion Index (AMMP). This was a rating scale developed by the author to assess sensory-motor development in the profoundly retarded. The instrument is still in the experimental stage and is being tested for its validity and reliability. The AMMP Index includes 50 items to measure 4 areas: Awareness--16 items, Movement--10 items, Manipulation of Environment--10 items; and Posture and

Locomotion--12.

Pretest and posttest evaluations were made with the AMMP rating scale to assess sensory motor development. Each subject was also evaluated with the VSMS. About half of the subjects showed increased awareness, all subjects gained improved movement patterns, two-thirds gained in reaching and grasping objects (all subjects who did not initially relate to adults gained this ability), and there was some gain in posture and locomotion in all but one subject. Measures of control tendencies indicated a slight group trend toward improvement on both instruments. A correlation of .78 was obtained between the two measures.

Calder (1970) conducted a study to develop a method of determining the motor age of severely or profoundly mentally retarded children. An additional purpose was to develop pilot motor age profiles which would give diagrammatic representation of range and specificity of an individual's motor ability. The researcher's objectives were to provide practitioners with a test for measuring individual motor ability, provide a measure for establishing current level of motor functioning, and provide a basis for an individualized physical activity program.

There were a total of 56 children included in the study that was conducted at the Mansfield State Training School and Hospital in Connecticut in the fall of 1969. The subjects consisted of 37 boys and 19 girls with chronological ages ranging between approximately 4 and 19 years. The mean age of the boys was 9 years; the mean age of the girls was 11 years. All subjects' IQ scores were 51 and lower. These

subjects were given 83 tests and were classified as to balance and maintenance of posture, locomotion, and receipt and propulsion. Scoring was on a pass/fail basis. There were no statistical analyses reported.

The researcher concluded that functional abilities and patterns of exceptional children were different from normal children. Specific mention was made of the importance of looking at individual motor patterns and specific abilities of children rather than general trends based on such characteristics as chronological age, mental level, or diagnostic category.

Maloney and Charrett (1970) tested the effectiveness of a gross motor approach (balance beam walking) for training attention control with severely and profoundly retarded children. In 1969, 22 severely and/or profoundly mentally retarded males from the Pacific State Hospital in Pomona, California, were selected for participation in the study. The subjects were randomly selected from a hospital ward of 65 patients and randomly assigned to one of two groups--walking-board group and attention-control group. The chronological ages of the subjects were between 6 and 12 years. Mean mental ages for the 2 groups were 1 year, 7 months and 1 year, 1 month, respectively.

It was hypothesized that "if attention control or attention span was increased through gross motor training and if generalization occurred, visual discrimination learning rate would increase since fewer attentional shifts would occur in the learning situation" (p. 41). The

walking-board group was programmed for 5-minute sessions, 5 days a week over a 4-week period. Training followed the systematic walking-board procedures presented by Kephart and consisted of walking forward, backward, and sideward on an elevated 2 in. by 4 in. rail. If the subject attended, or limited his attending to the task of board walking, he remained on the rail. The attention-control group was programmed for the same amount of time in an attempt to control for the effects of interpersonal interaction. Specific control group activities were not included in the materials.

After participation in the program, the walking-board group learned in significantly fewer trials than the control group on a two-choice discrimination training program. Each subject was tested daily for a series of 20 trials. The difference of mean numbers of sessions to meet the criterion was significant at the .05 level. The authors reported that effects of training enhanced attention control in the experimental group. This study, however, did not provide enough support that such transfer occurred.

Auxter (1971) conducted a gross motor developmental program for 12 non-ambulatory, profoundly retarded persons. Their chronological ages ranged between 12 and 30 years with mental ages between 6 and 18 months. None had control over bowel movements or could eat independently. The subjects resided at the Polk State School in Polk, Pennsylvania. The retardates were trained on a 1:1 basis in a program designed to enable them to more adequately cope with their physical environment by

(a) increasing range of motion, (b) developing extensor strength, (c) improving proprioceptive stimulation, and (d) developing integrative function of joints. Subjects had many common problems including tight gastro-soleus muscles, hamstrings, and hip flexors.

By comparing the motor abilities of the profoundly mentally retarded with the motor development scales for the normal population, an entrance point in the program was established. Individualized prescribed activities at the subject's level of development were administered. The program was implemented by physical education personnel at the Polk State School who were oriented to activities and procedures for program implementation. Throughout the study, considerable emphasis was placed on the sequencing of the activities. The investigator believed that activities designed to increase the range of motion of contracted joints were most important. Such activities were conducted prerequisite to all other parts of the program which were related to movement exploration, anti-gravity control, and the development of motor control.

Since the profoundly mentally retarded as a group have an extremely low motivational level, the investigator made use of three motivational techniques. These methods included giving social approval, giving M & M candies, and allowing various aversive consequences throughout the program.

Although no statistical analyses were reported, the program did yield positive results. Gains were made in some aspect of the program in all cases. With increased motor function, subjects seemed to

engage voluntarily in a variety of motor activities.

Moran (1971) investigated the effects that participation in the front crawl swimming stroke would have upon the development of IQ and social competence of trainable mentally retarded children. To determine if participation in the front crawl swimming stroke would be more effective than participation in conventional developmental tasks on the attainment of these competencies was another aim of the study. Twenty trainable mentally retarded children, ranging in age from 64 to 85 months with IQ scores ranging from 25 to 55 were chosen as subjects. The children were from the Garfield Training School in Salt Lake City, Utah. The children were divided into two groups based on pretest results of the Peabody Picture Vocabulary Test (PPVT) and the Vineland Social Maturity Scale (VSMS). During a 10-week experimental period, the 2 groups, determined by age, sex, and test results, met twice a week for 30 minutes. One group received instruction in the front crawl swimming stroke. This group received instruction in arm, leg, and breathing aspects of the orthodox swimming stroke. The group receiving instruction in the conventional developmental tasks practiced skills necessary to tie a shoe, match shapes and sizes, eye-hand coordination and finger-dexterity activities. Posttests were given at the end of the experimental period on both measures to both groups.

Significant differences between and within groups were determined by the t test. Participation in the front crawl swimming stroke revealed significant improvement at the .05 level in the development of

IQ, and at the .01 level in the development of social competence. The subjects who performed developmental tasks improved significantly only in social competence.

Altman, Talkington, and Cleland (1972) investigated the relative effectiveness of modeling and verbal instruction on severe retardates' gross motor performance. From the Austin State School's resident population, 45 severely mentally retarded, ambulatory males were randomly selected and assigned to 1 of 3 treatment groups. The groups consisted of modeling (M), verbal instruction (VI), and control (C). The subjects' ages ranged from 6 years, 3 months to 15 years, 8 months, with a mean age of 10 years, 9 months. Their IQ scores ranged from 10 to 50, with the mean being 27.5.

The investigators explored the effectiveness of modeling and verbal instruction with this population to determine if the severely retarded were non-imitative. The experiment took place immediately after the subjects witnessed 2 minutes of either modeling, verbal instruction, or "small talk". The modeling and verbal instruction involved the manipulation of a reversible Dixon chair that was used as the testing object. A model sat in the chair for 12 seconds, rose, reversed the chair, sat and rocked vigorously, then repeated the process for 8 reversals. For the VI group, verbal directives such as "See the chair", "Sit in the chair", "Turn the chair over", and "Rock in the chair" were given repeatedly. In the control condition, the investigator initiated "small talk" in which no verbal or gestural references were made to the chair.

The subjects were then given 2 minutes to interact with the testing object. The examiner recorded each subject's responses and found that the lack of significant group differences supported the previously reported non-imitative status of the severely mentally retarded. The investigator suggested that the lack of spontaneous imitative behavior of the severely retarded may have been attributed to their sensory deficits. It was also suggested that the combined use of verbal instruction and modeling might be beneficial in prompting motor responses from this select population.

Wilson (1980) researched the motor responses of six profoundly mentally retarded, multiply handicapped children during participation in an aquatic program. The subjects ranged in age from 9 to 19 years and were from the Denton State School, Denton, Texas. The study took place on the Texas Woman's University campus in Denton, Texas. The researcher investigated the following specific questions: (a) Would participation in an aquatic program improve physical mobility? and (b) Would participation in an aquatic program expedite interrelationships among participates? Observational data were recorded daily by the practicum students assigned to the subjects. The Wilson Observational Checklist was used to record all data. This 22-page observational checklist encompassed 10 broad areas entitled: (a) Ambulation Skills, (b) Self Help Skills, (c) Communication, (d) Accommodation to Water, (e) Participation Abilities, (f) Socialization Skills, (g) Balance Skills, (h) Breathing Skills, (i) Body Buoyancy, and (j) Strokes and Safety Skills.

Progressive skills were listed under each area. This checklist served as daily instructional objectives for the practicum students who acted as instructors for the subjects. The aquatic program entailed 40-minute sessions, twice a week for 6 weeks during the spring of 1980. Each subject was paired with two instructors.

The researcher concluded that 4 of the 6 subjects responded favorably or progressed in 50% or more of the interrelationship skills. Based upon the data gathered by the case study method of investigation, the investigator affirmed the research questions. Due to the functional level of the subjects, socialization skills were elicited, but not retained. The investigator concluded that no one method of teaching was adequate for any one subject. No statistical data were given.

Tuley (1981) conducted a study dealing with the effects of aquatic intervention with four severely mentally retarded children. The subjects, ages 9 through 12 years, were residents of the Denton State School in Denton, Texas. They were seen on a 1:1 basis by the investigator 5 times weekly, 30 minutes per session, for a period of 6 weeks during the summer of 1980. The sessions of aquatic activities included basic water adjustment skills, swimming skills, and water play. Utilizing the Modified Wilson Observational Checklist, pre- and posttests were administered to determine changes in behavior and ability of the subjects during the aquatic program. The Modified Wilson Observational Checklist was divided into two major categories--behavioral skills and aquatic skills. The behavioral skills consisted of communication,

participation, and socialization. The aquatic skills were composed of accommodation to water, balance, breathing, body buoyancy, and strokes and safety. The total number of skills performed in each of these 8 subcategories was divided by the total number of skills possible in that category and multiplied by 100 to obtain the percentage of skills performed.

The results of Tuley's study yielded "yeses" to the research questions concerning the benefits of aquatic activities on the improvement of swimming ability and behavior of severely mentally retarded children. The investigator noted the necessity of maintaining a 1:1 teacher/student relationship during the instruction of aquatic skills for the severely mentally retarded. Also noted was the importance of review, repetition, consistency, and discipline in the teaching of this select population. Pretest and posttest scores were treated graphically; however, no statistical analyses were reported.

CHAPTER III

PROCEDURES FOLLOWED IN THE DEVELOPMENT OF THE STUDY

The purpose of this investigation was to identify the motor responses of five severely and/or profoundly mentally retarded children who had received training in gross motor skills through participation in an individualized physical education program. The procedures followed in the development of the study are described in this chapter under the following headings: Sources of Data, Preliminary Procedures, Selection of Subjects, Selection of the Instrument, Selection of the Case Study Method, Planning and Implementation of the Study, Collection of Data, and Treatment of Data.

Sources of Data

Documentary and human sources provided the data utilized in this study. Documentary sources included personal files, medical reports, related published and unpublished research, books, and periodicals. Data gathered from human sources were from a motor program and a social-emotional pinpoint scale, the investigator, each subject's classroom teacher, and five severely and/or profoundly mentally retarded children from the Grand Prairie Independent School District, Grand Prairie, Texas.

Preliminary Procedures

The available literature and other sources of information related to the study were surveyed by the investigator. A copy of the revised and approved Prospectus of the study was filed in the Office of the Provost of Graduate Studies at the Texas Woman's University. Permission to conduct the study was secured from the Human Subjects Review Committee of the Texas Woman's University, Denton, Texas. Permission from the parents and/or guardians of the subjects for their participation in the study was also secured.

Selection of the Subjects

The following criteria were established for selection of subjects: (a) classified as severely and/or profoundly mentally retarded as assessed by the Grand Prairie Independent School District; (b) good attendance records; (c) parental permission; and (d) physically capable of performing the tasks. Five children met this criteria and were, therefore, selected for inclusion in this study.

Selection and Description of the Instrument

The instruments used in the collection of data for this investigation were selected according to the following criteria: (a) must be reliable, objective, and valid; (b) must be applicable to the selected population; (c) must be simple to organize, administer, score, and interpret; and (d) must require equipment that is available or easily obtained.

A thorough review of available assessment tools for the severely and/or profoundly handicapped population revealed two exceptional measures that met these criteria. The Curriculum and Monitoring System (CAMS) Placement Test and early intervention program was designed for the handicapped child (Casto, 1979). There are five curriculum programs within the instrument. These five CAMS programs include: Receptive Language, Expressive Language, Motor, Self-Help, and Social-Emotional. The Motor Program was designed to teach the handicapped those gross and fine motor skills usually acquired from birth to 5 years of age. The instrument was used to determine each subject's placement level and served as the curriculum design for their motor programs. The investigator chose to concentrate efforts on the gross motor skills' objectives for the following reasons: (a) a physical education program was more conducive to the teaching of gross motor skills; and (b) most of the fine motor objectives were pursued in the children's regular classrooms. The program stimulated gross motor development patterns beginning with raising the head and proceeding through running and hopping.

The validity and reliability information about the instrument was still being gathered by Casto and, therefore, was unavailable at the time this study was undertaken. The investigator concluded that the instrument was applicable to the population, required equipment that was available or easily obtained, was simple to organize, administer, score, and interpret, and contained extremely beneficial teaching

suggestions and step progressions. The teaching/learning process that was presented was very thorough in that the child was required to receive 4 "yeses" on each step criterion before he/she was allowed to advance to the next step of the objective. The investigator believed that CAMS had potential as an extraordinary teaching tool. A copy of the CAMS placement test and program appear in Appendix B.

An adapted version of the Social-Emotional Pinpoint Scale of the Developmental Assessment for the Severely Handicapped (DASH) (Dykes, 1980) was used to assess behavioral changes in the subjects. This scale was 1 of 5 areas included in the DASH program. The other areas of the program were Self-Help Skills, Motor, Receptive Language, and Expressive Language. Of the 226 behaviors that were included within the scale, the investigator chose to address 35 behaviors that could be specifically related to motor and social growth within an individualized physical education environment. The investigator believed that the attaining of behaviors such as showing more activity, improving eye-contact, smiling, imitating, tracking, protecting self, cooperating, and participating were very important objectives and warranted consideration within the study. If a certain behavior were observed at least 50% of the time during a week's period, it was checked as being present during that week. The behaviors on the checklist ranged from those one might expect to find in a 0- to 1-month-old child to those found in a 96-month-old child. Thus, the Social-Emotional Pinpoint Scale of the DASH program met established criteria for this study and was, therefore, selected to

monitor behavioral changes in the subjects. The checklist was completed weekly by both the investigator and the students' classroom teachers to achieve interrater reliability. A copy of DASH appears in Appendix D.

Selection of the Case Study Method

Stouffer (1962) stated that by using the case study method, the investigator would be able to concentrate on an intensive study of a limited number of traits. Since the investigator chose to limit the area of investigation to gross motor skills and behavioral changes in a very limited population, the case study method was deemed the best method for collecting and reporting data.

The case study method of reporting allowed the investigator the opportunity of studying and recording intricate aspects of each subject's personality as well as motor and social development throughout the study period. Van Dalen (1979) described the case study method as doing more than collecting facts but attempting to "trace interrelationships between facts that will provide a deeper insight into the phenomena" (p. 294). The investigator's objective of constructing a comprehensive, integrated picture of each subject was met by utilizing the case study method of reporting.

Planning and Implementation of the Study

Daily sessions were held for the students' optimum learning opportunities. A 1:1 teacher/subject ratio was used to provide the best method of instruction. A variety of materials and motivational aids

was used during instruction and was listed under "materials" and "notes" on the daily progress forms. A copy of this form appears in Appendix A. Also appearing in Appendix A is a list of materials and motivational aids that were used during the study. The CAMS placement test served as a pretest, posttest, and post-posttest for the study. The CAMS' gross motor objectives served as the basis for instruction during each daily session. The students worked on three objectives concurrently. As those three objectives were met, new objectives were set. A motor program sheet for each objective appears in Appendix A. A daily plan sheet was completed for each child. "Notes" included such items as social interactions, reinforcers, spontaneous activities, materials, et cetera. A monthly program plan and summary sheet were completed for each child. An adaptation of the DASH Social-Emotional Scale was checked weekly by both the investigator and the students' classroom teachers. A copy of this scale appears in Appendix D. A posttest was given on the final day of the 8-week study. A post-posttest was given at 10 weeks to check for retention of motor accomplishments and behaviors.

Collection of Data

The investigator reviewed the files of the five subjects for relevant data for inclusion in the case studies. Data collected from the files contained the following: (a) personal data, which included sex, age, date of birth, etiology, diagnosis, developmental age, and ethnic group; and (b) background information which included medical and

developmental histories. During each session, the investigator gathered information from anecdotal records and personal contact with the subjects. This information was reported in the investigator's observations.

The CAMS' placement test was used to determine the subjects' present motor ages and beginning points in the motor program. This placement test served as the pretest, posttest, and post-posttest for the study. The CAMS' motor program was used as both the basic curriculum and the basis for determining each subject's daily progress. The investigator charted progress on the CAMS objectives' assessment sheets during each session. Data were collected on a response-by-response basis. If the subject met the trial criterion, a "yes" response was recorded. If there were no response or the response were incorrect, the "no" column was marked. Data collected during individual sessions were then transferred to the summary sheet. Completion of this data sheet provided a record of all objectives and steps completed. It also provided a record of how many days and how much time each day were required to attain each objective. A copy of this form appears in Appendix A.

The DASH Pinpoint Scale was utilized weekly to note behavioral changes. This instrument was used by the subjects' classroom teachers as well as the investigator to increase the reliability of the results. It was checked weekly to note behavioral changes and again at 10 weeks to note retention of behaviors.

Treatment of Data

A case study was prepared on each subject utilizing personal data, investigator's observations, background information, and data collected from the pretest, posttest, and post-posttest. Results of these tests were graphically treated and presented. Data from the observational checklist were also analyzed and reported.

CHAPTER IV

PRESENTATION OF THE FINDINGS

A case study was prepared on each of the five severely and/or profoundly mentally retarded children who met the previously established criteria. The information which comprised the data for the case studies was compiled from several sources, including: daily anecdotal records, personal files, medical and/or developmental evaluations, motor program results, social-emotional checklist results, investigator's observations, and information from the children themselves. Each case study's information was divided into the following main subject areas: (a) Personal Data, which included the subject's date of birth, age, sex, ethnic group, height, weight, etiology, diagnosis, IQ, and developmental age; (b) Family Background; (c) Medical and/or Developmental History; (d) Adjunctive Therapists' Reports; (e) Investigator's Observations and Program Activities; and (f) Summary.

Case Study Number One: Subject M

Personal Data

Date of Birth: 11-5-74	Sex: Male
Age: 6 years, 4 months	IQ: Undetermined
Developmental Age: 3 years	Weight: 38 lb.
Ethnic Background: Caucasian	Height: 30 in.

Etiology: Hydrocephalus secondary to subdural hematoma with developmental retardation

Diagnosis: Cerebral palsy, spastic quadriplegia with hypotonia

Family Background

Subject M was the product of a normal, full-term pregnancy. This was the 18-year-old mother's first pregnancy. When the subject was between 4 and 6 months of age, his parents separated. Shortly afterward, the mother died of unnatural causes, and the subject was legally adopted by his natural grandparents. The adoptive parents demonstrated much love, interest, and concern for him. Subject M's condition was attributed to a blow to the head when he was approximately 3 months of age, before he was adopted. Child abuse was suspicioned but could not be proven.

Medical and/or Developmental History

Subject M's first evaluation was performed at the age of 16 months by an agent for the Special Education Service Center, Region X, in Richardson, Texas. He was determined to have a mental age of 4 months, with a mental quotient of 25. Subject M was described as a hypotonic child who had a shunt. The subject was observed to lift his head in the prone position, to bear weight on forearms and occasionally on extended arms, and to attempt to pull himself along on his stomach. Subject M rolled both to the right and left. When placed in a sitting position, he propped forward and could not lift his head or assist in assuming sitting. He would not bear any weight on his legs. Deep

tendon reflexes were increased symmetrically in the biceps, knees, and ankles. The subject exhibited a bilateral babinski. He was hypotonic and hypermobile in all extremities.

At age 28 months, Subject M's second evaluation was performed by the Special Education Service Center. His mental age was determined to be 11 months with a mental quotient of 39. Progress was described as having gained 7 months during a 12-month period in the area of gross motor development. The gains were in his abilities to lift his head from supine, sit unsupported, creep reciprocally, pull to standing, and walk in the parallel bars using a 4-point gait. He continued to be slightly hypotonic and hypermobile.

At age 28 months, a routine re-evaluation of communication skills was also completed. At that time his adoptive mother reported improvement in his ability to understand what was said to him. On the Vineland Social Maturity Scale, Subject M earned a social age of 1 year, 3 months, and a social quotient of 52. This was a gain of 4 months since his last evaluation. He had no formal audiological testing because he responded to all environmental sounds. Concerning the speech mechanism, a normal formation was seen. Tongue movements appeared to be sluggish. His adoptive mother reported difficulty with feeding, and his chewing was inconsistent. Subject M's adoptive mother reported approximately five single words used appropriately by the subject. He made his wishes known through pointing and pulling on the hand of his adoptive mother.

In September of 1978, Subject M was enrolled in the Grand Prairie

Independent School District. The results of the assessments determined that he met the eligibility criteria for programs for the severely handicapped. Placement was made at Shady Grove Career Development Center in the class for the severely and/or profoundly retarded.

Adjunctive Therapists' Reports

Music Therapist--4/5/81. Subject M was working to increase on-task behavior and appropriate social skills. He attended to task 80% of the time for 5 minutes without prompts in group activities. The subject was becoming more appropriate in his language. Eye contact was poor, but he required fewer prompts to maintain it. He was more socially aware than at the beginning of the year. Subject M was accurate in identifying members of a group. He interacted appropriately with his peers when they initiated interaction; however, he did not initiate contact with them.

Occupational Therapist--3/18/81. Subject M was influenced by the tonic labyrinthine reflexes. Head and body righting reflexes were present. Protective extension and equilibrium responses were emerging. Fine motor skills were developed through the 18th month level. He had some sensory integration problems but not overtly. Subject M could feed himself using a spoon but preferred to use his fingers. He could undress and dress himself with some prompting, except for fastenings.

Treatment was focused on developing equilibrium and protective responses. During a 20-minute session, the spasticity in his legs could be decreased sufficiently to get some equilibrium responses of the foot.

Protective extension was becoming more rapid.

Physical Therapist--1/20/81. Subject M was a friendly but very distractible 6-year-old boy. He walked independently to the evaluation room but, because of his distractibility, his cooperation in the testing environment was minimal. The subject frequently repeated phrases such as "hello" four or five times.

Subject M was assessed in the following areas: gross motor development, fine motor coordination, ocular function, range of motion, and gait. In the area of gross motor assessment, Subject M successfully completed the presented tasks through the 18th month level. Some of the activities in the 18-month- to 2-year-level that he demonstrated difficulty with were: walking up and down stairs with one hand held, squatting down and coming up without using hands, going up and down stairs alternating feet, galloping, and running. The subject demonstrated poor and delayed balance reactions in quadruped, kneeling, and half-kneeling positions. Minimal reactions when standing were demonstrated, and if pushed off balance, he fell without using his arms for protection.

In the area of fine motor coordination, Subject M successfully completed most presented tasks through the 2-year-level. Activities he demonstrated difficulty with in the 2- to 4-year level included: building 6-7 block tower, unbuttoning large buttons, copying a circle, and screwing and unscrewing nuts and bolts.

In the area of ocular function, the subject did not move eyes

consistently to follow an object in any plane, or converge his eyes when an object was moved toward his face. His poor visual tracking ability resulted in poor eye-hand coordination in activities such as tracing shapes or catching a ball.

In the area of range of motion, Subject M demonstrated normal range with the exception of voluntary ankle dorsiflexion (pulling foot up at the ankle). Full passive range was obtained manually by the therapist.

In the area of gait, the subject demonstrated the following deviations: uneven arm swing (right more diminished than left), lack of trunk rotation (a natural component of walking), a wide base stance, knees held rigidly straight throughout gait, and decreased stance time on right leg. The feet were flat when stepping rather than putting the heel down first and rolling onto the ball of the foot.

Subject M demonstrated an approximate 3-year delay in gross motor and fine motor development. General muscle tone was hypotonic, and he lacked well-developed balance reactions. Due to his poorly developed visual tracking, his eye-hand coordination was not developed in rela--tion to his age.

Investigator's Observations and Program Activities

Subject M was a 30-in. tall, 6-year-old boy. He was extremely good-natured and cooperative within the play environment. The subject was energetic and did not tire of repeated attempts to accomplish his goals. His attention span was very short, but with constant reminders,

he diligently attended to his tasks. His verbal communication was for the most part, limited to "yes/no" responses and echolalic phrases. Although Subject M was diagnosed as having spastic quadriplegia, the condition was extremely difficult to detect. He walked somewhat stiff-legged with little hip rotation.

Subject M's placement test indicated that his starting point in the CAMS program was at the 24-month level. Subject M had no problem with any of the gross motor objectives up to that point. The subject was willing to attempt any and all of the objectives presented to him, but he demanded that the investigator hold his hand throughout his endeavors. His first goal, No. 62, was to be able to walk up 5 steps by putting 2 feet on each step, holding the handrail with 1 hand. His second goal, No. 65, was to walk down 5 steps by putting 2 feet on each step, holding the handrail with 1 hand. His third goal, No. 69, was to walk on his tiptoes at least 5 steps. These 3 goals were pursued concurrently, with each goal being given 6 to 7 minutes' consideration during each session.

After only one session, it was apparent that Subject M could perform more effectively if he wore rubber-soled shoes rather than his regular leather-soled walking shoes. The investigator contacted his adoptive mother with this request, and the next day the subject was wearing new tennis shoes. The shoes greatly benefited his efforts. After a week's time, the investigator noticed a change in Subject M's gait while wearing his tennis shoes. He seemed much more secure in his

foot placement and developed a less rigid walking pattern. The subject's step-climbing was immediately improved as well. Subject M spent 2 weeks on goals No. 62 and No. 65. Some accompanying activities were practiced to help with leg-lifting and hip rotation. These activities included ladder-climbing and walking up an inclined board. The subject did not feel secure unless he was holding the investigator's hand. To help him transfer from holding a hand to holding the handrail, the investigator held one end of a metal bar while the subject held the other end, easing his hand up the bar as he climbed. Once he became accustomed to the bar supporting him instead of a person, he met his goal of climbing up and down the steps. The first step of the objective, which was to walk down two steps with assistance in moving his legs, was accomplished on the second day (3/3/81). By the seventh day the subject was able to walk up and down two steps when the backs of his thighs were tapped to show him which leg to move next. The criteria for accomplishment was met during the 14th session (3/19/81).

Because of his rigidity and poor balance skills, goal No. 69, walking on tiptoes, was one of the most difficult for Subject M. He did not realize the concept until after the investigator demonstrated the skill barefooted and had the subject remove his socks and shoes. His best attempts were made after the investigator made up an elevator game to encourage his standing on his tiptoes. The investigator said, "Going up", and then counted the floors, "1, 2, 3, 4, 5, going down, THUD!" Subject M derived much pleasure from this simple activity and he

eventually increased the amount of time that he could remain on his tiptoes. Four days were spent on mastering step 3 of the objective which was to walk on tiptoes for 5 steps while holding the investigator's hand for balance. Another 4 days were spent before Subject M was able to walk on his tiptoes unassisted. This task was accomplished during the 11th session (3/16/81).

As Subject M mastered an objective, another was introduced. His fourth goal, No. 72, was to be able to jump in place with both feet. He enjoyed practicing for this skill on the mini trampoline. Another activity that was fun for him was called "Jump-Bump". The investigator said, "I jump, you jump, we both jump--now let's bump". Subject M thought the bumping was fun, and he learned to jump in the process. The subject began working on this particular objective on the 11th day of the program and met criteria for accomplishment on the 16th day (3/23/81).

Subject M's 5th objective, No. 73, was to stand on 1 leg with assistance. At first, when he lifted his leg as the investigator began counting off the 10 seconds, he began counting to 5 and "thudding" as if playing "elevator". Once the subject had finally learned one routine, it was difficult for him to accept and learn a new one. Subject M giggled all the way through learning this objective. He thought it was extremely funny each time the investigator raised her own foot off the floor. While achieving this objective, the behavior of reaching out to catch and protect himself emerged. Before, the subject was perfectly

content to fall to the floor, giggling all the way when he lost his balance or footing. Subject M accomplished the first 2 steps of this goal, standing on right and then left legs with assistance for 5 seconds, after the first 2 days of working on this objective, which were the 16th and 17th days of the program. Step 3, standing on right leg for 10 seconds with assistance for balance, was mastered during the 19th session, after 4 days of working on that objective. He finally achieved the objective on the 23rd day of the program (4/1/81) or after 8 days of attempting that particular objective.

Subject M's 6th objective, No. 74, was to walk 5 ft. between 2 parallel lines, 8 in. apart. This particular goal required much practice before it was accomplished. The subject did not understand the concept of staying between the lines and seemed not to realize that his feet were touching the boundaries when he stepped on the lines. To make the activity more concrete, the investigator made use of an 8-in. walking board that was positioned 2 in. off the floor. After Subject M accomplished the task of remaining on the board while walking 5 ft., the investigator changed his boundaries. Two ropes, 5 ft. in length, were placed 8 in. apart on the floor and positioned to cover 2 strips of masking tape. After practicing walking between the ropes and walking between the tape lines, he developed the concept and mastered the skill. The weeks of April 5, 12, and 19 and May 29 were devoted to his attainment of this objective.

The last goal attempted by the subject was No. 75, to leap from a

height of 18 in. This activity was somewhat frightening to the subject, so it was pursued very slowly. This task was made more interesting by relating his leaping from the platform to leaping from a diving board. Together, the investigator and Subject M leaped from the platform while holding their noses and pretended to swim around to the steps behind the platform which substituted for the make-believe pool ladder. With this approach, the subject felt more at ease and did not tire of the activity. After 24 sessions, Subject M accomplished the task on 4/24/81.

Summary

In summary, Subject M was introduced to 7 gross motor skills. The skills were developmentally sequenced and introduced in the CAMS order of presentation. According to the pre- and posttest scores, the subject progressed from an entry level of 24 months to an exit level of 36 months. He successfully completed each goal attempted. His accomplishments were obtained slowly, but the investigator believed that, given enough time, the subject was capable of attaining each gross motor skill presented in the CAMS motor program. On the post-posttest at 10 weeks, Subject M was allowed 3 trials for each objective. It was determined that he had retained each skill that he had originally mastered.

According to the social/emotional pinpoint scale, the investigator and classroom teacher agreed that the subject had significantly improved in the following areas: (a) tracking with eyes the movements of an adult for at least 20 seconds as adult moves from room, (b) protecting himself by moving away, holding up hands, et cetera, (c) initiating

his own activity for play, (d) participating in competitive exercise games, and (e) participating in imaginative play of "let's pretend that . . .". It was interesting to note that, after 3 weeks, the investigator observed Subject M seeking others for play and/or interaction. While this behavior was observed by the investigator throughout the remainder of the study, it was never witnessed by the classroom teacher. The post-post evaluations at 10 weeks indicated that Subject M had retained these behaviors.

Figure 1 represents a summary of Subject M's progress. Exemplified is the subject's entry level in the motor program (pretest), exit level (posttest), number of retained motor skills (post-posttest), number of changed behaviors (according to the social/emotional checklist), and number of retained behaviors. Also indicated is the number of months gained in terms of gross motor development and the specific objectives that were attained.

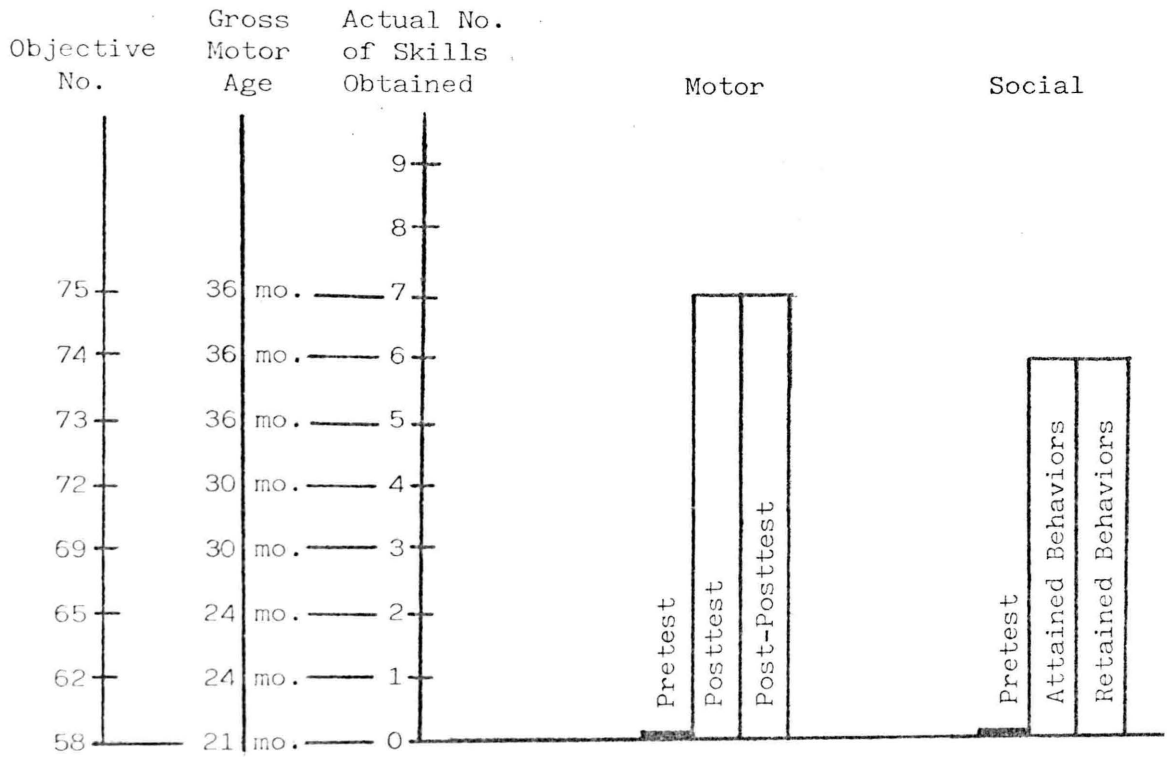

Figure 1. Summary of Progress for Case 1, Subject M.

Case Study Number Two: Subject D

Personal Data

Date of Birth: 9-14-72 Sex: Male

Age: 8 years, 6 months IQ: Undetermined

Developmental Age: 7 months Weight: 22 lb.

Ethnic Background: Caucasian Height: 36 in.

Etiology: Cri du chat syndrome with ventricular septal defect

Diagnosis: Severe brain dysfunction and mental retardation/seizures

Family Background

Subject D was delivered by Caesarean section. He was premature by

weight although he was a full-term baby. The subject's mother reported that her pregnancy with the subject was somewhat different from her other three in that she experienced no morning sickness. She was on a diet during the pregnancy and received medical prenatal care. During the pregnancy she became dehydrated, suffered from gastroenteritis, and at one point a physician prescribed an excessive amount of medication. During the pregnancy she also experienced some spotting and some high blood pressure. Subject D weighed 4 lbs., 11 oz. at birth but dropped down to 4 lbs., 7 oz. before leaving the hospital. He was born with a crooked penis. The subject developed jaundice which required special incubation. He stayed in the hospital for 2 weeks after birth because of difficulty in breathing and turning blue easily. Subject D also had a heart murmur.

At 3 months of age the subject underwent cardiac catheterization at which time his heart disorder was diagnosed. He reportedly had a ventricular septal defect, which is a hole between the lower chambers of the heart, with mild pulmonary stenosis. During the postnatal history the subject received treatment for failure to thrive.

Subject D lived with his parents, an older brother, and two older sisters. The subject's siblings readily accepted and helped care for him. Subject D's mother believed that she could not provide the subject with all the education and stimulation he needed. She also believed he needed additional peer contact. Subject D's mother had not sought formalized programming in the past, reportedly because both her husband

and family had been resistant to it. According to the mother, Subject D's father had been fearful the subject might die if he had to deal daily with an environment less protective than home, especially because of his health problems. Subject D's mother was hopeful about the benefits of day programming but was strongly against residential placement. The subject's mother appeared to have most of the responsibility of caring for Subject D. She seemed to enjoy providing the care and was interested in watching him develop. The subject's mother was unable to obtain baby sitters for her son and usually took him wherever she went. She and her husband rarely had outings, apparently by choice. The subject's mother described their marriage as "stormy" and their relationship appeared poor.

Medical and/or Developmental History

The following information was summarized from the subject's medical reports and a comprehensive assessment performed by the Fort Worth State School, Fort Worth, Texas, in 1978. Subject D always had difficulty sucking and swallowing and had been tube fed since he was 1 year of age. The subject had been diagnosed as having cri du chat syndrome. A chromosomal study was performed which, according to the medical records, was somewhat inconclusive. He was also diagnosed as having a ventricular septal defect. According to his mother, the physicians were unable to perform open heart surgery on the condition because of the subject's heart weakness. The subject's activities were not usually limited by the heart condition, but when he laughed frequently, he reportedly

turned blue around the mouth. The subject's mother reported his heart problem had also caused growth problems. Subject D was easily susceptible to colds, bronchitis, and infections. The subject's medications were Phenobarbital and Dilantin for seizure control and Lanoxin for his heart condition. He occasionally took suppositories for irritability. In the past, Subject D had required that mucous be suctioned from his throat as he was unable to discharge it himself. This procedure, however, was not needed for the past 2 years. Subject D was able to sit for a short while without support. He was able to roll over from front to back. This was his usual means of ambulation. He was able to raise himself up on his hands and could stand with support. His mother felt his vision and hearing were adequate. He did tend to have a wax buildup in his ears. According to his mother, the subject had made approximations of some words including: "daddy", "nana", "mama", and "yeah yeah". At times, he attempted to imitate the words of his brother. He reportedly understood some of what was said to him and particularly knew when someone was talking about leaving the room or the house. Subject D's mother reported that he indicated when he was wet or soiled by fussing. He did not assist with dressing. The subject liked people, especially older people, but did not like being around babies. He enjoyed children playing with him. Subject D occasionally acted angry with his mother. He did not begin smiling until he was 1 year old. By the time he was 4 years old, he sometimes laughed aloud. His mother believed that the subject was capable of learning new skills. He reportedly recognized

the family's camper and looked for familiar words on the side of it. The subject enjoyed being outdoors or looking outdoors. He enjoyed watching television when there was a great deal of action in the program. He reportedly liked music except for opera.

Adjunctive Therapists' Reports

Music Therapist (4/2/81). Subject D met the music therapy objectives that had been established. Objectives included consistently attending to the source of stimulus and improving eye contact. The subject consistently played a rhythm instrument for 30 seconds without prompts. He had begun to respond appropriately to simple commands. The subject's progress had been very slow, but his appropriate behaviors were reinforced by musical stimuli.

Occupational Therapist (1/15/80). Subject D was non-ambulatory and he exhibited little active movement. When lying on his stomach, he was able to support himself on his elbows or with extended arms. The subject had slight head lag when pulled to sitting. Head control was fair and he seemed to be beginning to exhibit fair trunk control. Subject D could bring his hands to his mouth and used a palmar grasp when objects were placed in his hands, but he did not actively reach for objects presented. The subject was unable to maintain a crawling position. When put in a standing position, a positive supporting reaction was present. Full range of motion was noted in all joints. According to the Comprehensive Developmental Evaluation Chart, the subject was found to be currently functioning at the 4- to 5-month level in both gross motor and

manipulation skills. Reflex development also appeared to be at the 4-month level with scatter to 6 months. He was found to be severely delayed in developmental skills.

Speech and Language Assessment (1/9/80). Subject D did not localize sources of sound but inconsistently quieted and/or smiled when a sound was introduced. Vocalizations consisted mainly of vowel sounds. The subject was functioning at the 12-week level in receptive language abilities. He showed indirect and direct regard of his environment and frequently stopped vocalizing when an adult joined in or when sound was introducted. In expressive language abilities, Subject D appeared to be functioning approximately at the 10-week level. He demonstrated throaty noises and cried with changes in pitch resembling a weak, high-pitched cry. The subject vocalized playfully and uttered single vowel sounds. His mother reported that he was beginning to make some babbling sounds.

Audiological Evaluation (1/9/80). Results of an impedance test revealed a shallow type A tympanogram for each ear. Subject D had low static compliance measurements of .12 cc for the right ear and .15 cc for the left ear. Acoustic reflexes that were evoked from each ear were elevated. The reflex from the left ear at 4000 Hz was absent. Impedance measurements were not within normal limits and indicated that the subject was functioning with at least a mild conductive type hearing loss in each ear. This type of hearing deficit would affect his hearing acuity when he was separated by several feet from the source of the sound.

Psychological Report (8/3/80). All of Subject D's activities were infantile. He was unable to sit alone and did not grasp objects. When an object was placed in hand, he could hold it for a few seconds before dropping it. The subject responded to the examiner's voice by turning his head and following a brightly colored object with his eyes. He drooled and sucked his thumb during the evaluation. Although many toys were introduced, he displayed no interest in them. Subject D was pleased when his mother came into the room and wanted her to hold him. His mother reported that Subject D did not play with anything but did like to listen to music.

Investigator's Observations and Program Activities

Subject D was a 3 ft., 22 lb., non-ambulatory boy. The subject did not seem to interact with his environment except for an occasional unsolicited smile. He was quiet and very pleasant until he was forced to work. At that time he began a high-pitched whine of complaint that lasted until he was allowed to rest. Subject D often babbled when he was content, but he was essentially non-verbal. During the pretest, he was extremely passive and did not make eye contact.

The subject's pretest, which was performed on 2/26/81, placed him at the 4-month level of motor development. The first gross motor skill that he was unable to accomplish was No. 9, to roll from his back to his side. The subject could perform the next stated goal which was to hold his head steady when pulled to a sitting position, therefore, that goal was not addressed. The second goal with which the subject had

difficulty was No. 12, to roll from his right side to his left side and back again. The third goal of his beginning program was No. 26, which was to crawl on his forearms for a distance of 2 ft. These 3 goals were pursued concurrently for the first 2 weeks of the program.

Objective No. 9 called for a favorite toy to be used as a motivational aid. Subject D had no favorite toy and had never shown an interest in any toy or plaything. The investigator experimented with several items before finding one that seemed to hold the subject's interest, a toy xylophone. As the investigator played "Reveile", Subject D obediently followed the instrument with his eyes. After practice, he began turning his head to follow the toy. The subject would not, however, independently roll to his side to track the xylophone. The investigator tried a variety of methods before one was found that encouraged Subject D to turn all the way up on his side. By placing the subject on a mat situated about 2 ft. off the floor and then lowering the toy to the floor, the subject was forced to turn his entire body rather than just his head to find the toy. This routine was followed until he learned to roll to his right and left sides. The subject had accomplished this goal by the completion of the eighth session (3/25/81).

The subject's second objective, No. 12, which was to roll from one side to the other and back again, was taught in the same manner as the previous objective. Because this goal demanded that Subject D attend to the task at hand for a longer length of time, it was more difficult for him to master. To give the subject extra practice in attending and

tracking, the investigator offered a variety of activities designed to gain and keep his attention. These included watching a Dukane projector, tracking floating soap bubbles, tracking a brightly-colored, swinging, suspended wiffle ball, and watching a ball roll out of Fetch-it-Freddy's mouth. These activities were practiced along with the other objectives for the following 2 weeks. By the end of the 20th session (3/27/81), Subject D had conquered this objective. In the process, the subject had begun responding positively, with a giggle or smile, to verbal and tactile reinforcement given by the investigator.

Subject D's third goal, No. 26, which was to crawl on his forearms for a distance of at least 2 ft., was extremely difficult for him. The subject had virtually no strength in his arm and shoulder area. It was evident that some strength-building activities needed to be practiced before this goal could be attempted. The investigator had the subject practice raising his arms toward her before she would pick him up. This particular movement of the subject had never been observed by the investigator. The investigator also positioned the subject in side-sitting, arms outstretched, grasping a bar. Since Subject D had poor sitting balance in this position, he was forced to exert some effort to keep himself upright. The subject continued to practice these and similar activities throughout the remainder of the investigation, but he was never able to accomplish this goal.

Two additional objectives were introduced to the subject as he reached the first two goals of his motor program. His fourth goal was

No. 27, to assume and maintain a creeping position on his hands and knees. A variety of methods were used to help the subject practice this position. In addition to the activities found within the 7 steps of this objective, the subject practiced the creeping position on a scooter board, with his stomach resting on a deflated ball, leaning over the bottom rung of a ladder, straddling an inflated innertube, and propping over the thigh of the investigator's outstretched leg. After practicing for 3 weeks, the subject was able to maintain the creeping position unassisted for the length of the session. He did progress through the next-to-the-last step which was to assume a creeping position with assistance at his hips. This was accomplished by placing Subject D on the floor on his stomach and forearms and helping him assume a hands and knees position by pulling back on his hips to help him bend them. At this point, he moved his arms into position while the investigator helped him with his hips. As he moved his hands, his feet were kept from slipping by the investigator's bracing them with her knees. He did not, however, manage to assume this position without assistance.

The last goal attempted by the subject was No. 29, which was to sit erect for 30 seconds. Subject D could already maintain himself in tailor and side-sitting by supporting himself with both hands on the floor. He had never practiced straight-leg sitting. As the investigator allowed for practice of straight-leg sitting, she also helped Subject D learn to sit upright while tailor and side-sitting without the

use of his hands for support. The investigator followed the same steps as were outlined for Objective No. 29, and by the conclusion of the investigation, Subject D had mastered sitting unsupported in all positions. He was able to sit erect for 5 minutes before tiring. The investigator dangled a brightly-colored, suspended wiffle ball in front of the subject as he practiced the sitting positions. By the end of the investigation (4/24/81), the subject had begun to reach out and grasp at the ball with both hands. This was the first time the investigator had observed Subject D physically interact with his environment.

Summary

In summary, Subject D entered the program at the 4-month motor age level. He accomplished that objective, No. 9, as well as the next objective, No. 12, at the 5-month level. The subject mastered only 2 steps of the 4-step objective No. 26. He managed to meet the criteria for 6 of the 7 steps of the following objective, No. 27, which was at the 6-month level. The last goal attempted was a 9-month level skill. Subject D mastered this skill by the end of the investigation. Of the 5 goals attempted, the subject mastered 3, completed 6 of 7 steps of 1, and completed 2 of 4 steps of another. His exit level on his posttest was 9 months. On the post-posttest at 10 weeks, he had retained each skill he had mastered.

According to a comparison of the adapted social/emotional pinpoint scale, the investigator and Subject D's classroom teacher agreed that he significantly improved in the following behaviors: (a) shows more

activity than previously when left alone, (b) reacts within 2 seconds to sudden loud noise, (c) fixes eye contact for at least 3 seconds on person or object, (d) smiles in response to pleasant stimulus, (e) responds to adult voice by increasing body movements or by ceasing crying within 10 seconds of hearing sound, and (f) tracks with eyes the movements of an adult for at least 20 seconds as adult moves from room. When the checklist was charted again at 10 weeks, Subject D had retained these behaviors.

Figure 2 represents a summary of Subject D's progress. Exemplified is the subject's entry level in the motor program (pretest), exit level (posttest), number of retained motor skills (post-posttest), number of changed behaviors (according to the social/emotional checklist), and number of retained behaviors. Also indicated is the number of months gained in terms of gross motor development and the specific objectives that were attained.

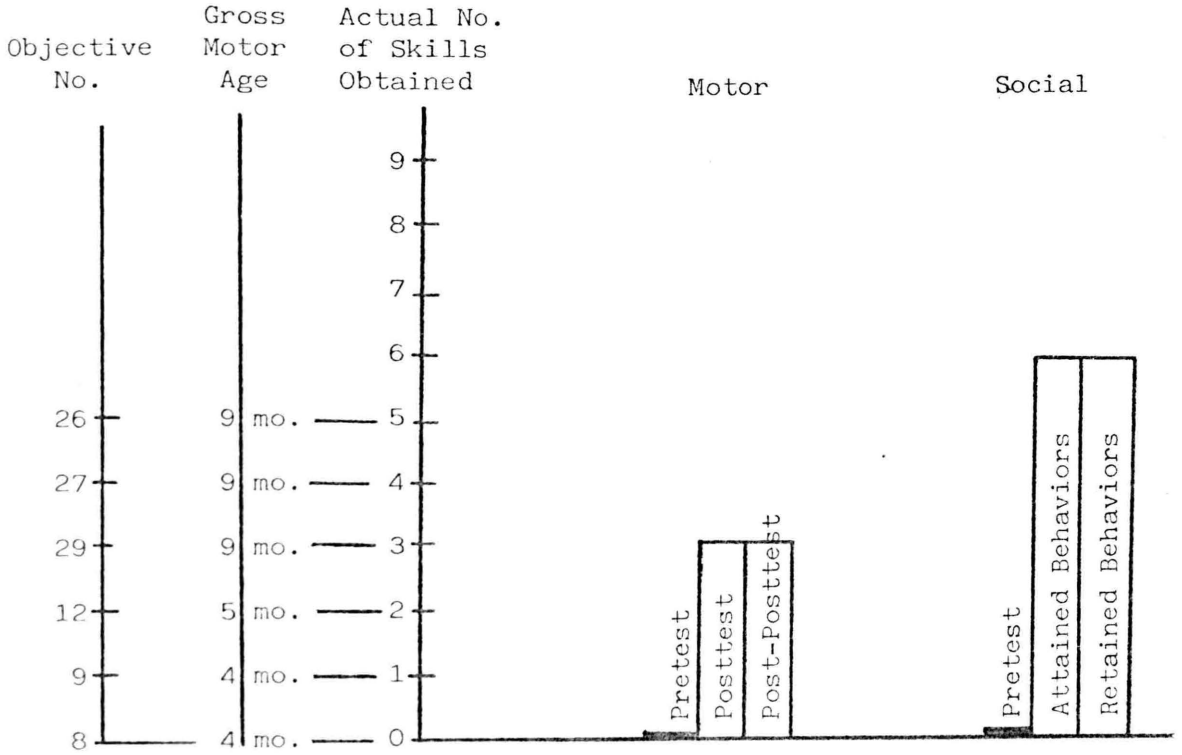

Figure 2. Summary of Progress for Case 2, Subject D.

Case Study Number Three: Subject A

Personal Data

Date of Birth: 4/8/70 Sex: Male

Age: 10 years, 11 months IQ: Undetermined

Developmental Age: 3 years Weight: 110 lbs.

Ethnic Background: Caucasian Height: 49 in.

Etiology: Brain trauma at birth

Diagnosis: Brain dysfunction/severe mental retardation

Family Background

Subject A was the product of a third uncomplicated pregnancy and,

according to the doctor, the baby was early, but the mother thought that he was 2 weeks overdue. Birthweight was 10 lbs., causing a difficult delivery after which it took approximately 3 minutes for the subject to begin breathing. Both parents were in good health. Subject A was an enormous eater and grew extremely fast. The mother thought his lack of motor development was due to his excessive weight, but by 1 year, she realized that something was wrong with him. At 18 months, he could sit alone, and he started crawling and scooting at 2 years. At 3½ years, he walked alone.

Subject A lived with his parents and two older siblings. The oldest brother was rather shy and the other brother seemed very well adjusted. They both were doing well at school. There was no history of mental retardation in the family. His mother reported that the subject was hyperactive and clumsy, and that he was constantly on the move but his activity was unorganized. He was impulsive and uncoordinated. Most of the time, he was a very happy child.

The mother reported behavior suggestive of a very manipulative and indulged child who was infantilized and did what he wanted. She believed his behaviors were based on fear; and this fear was the reason he would not sleep alone, sat inactive when left at a babysitter's, or could not tolerate being left in a closed room. There was much denial by the mother of problems or concerns. Contacts between the father and Subject A were few and their relationship was poor. The mother was with all three children throughout the day. Her stimulation of the subject

was brief, without follow through, as the subject was not interested. The overall home environment appeared depressed, with most efforts directed at coping with day-by-day requirements, while avoiding negative behaviors from the subject. The subject was not toilet trained. He was able to say the words, "mama" and "dada", understood simple instructions, and could feed himself with his fingers and occasionally with a spoon.

Medical and/or Developmental History

At 6 months, the subject's mother noticed twitching of his hands and arms. These twitching seizures were always restricted to arms and hands and were never generalized. Subject A's medication included Dilantin, Phenobarbitol, and Phenergan Fortis for rest. The subject had always been an extremely chubby child. He was a big eater and never seemed to have enough. At 1 year, he weighed more than 30 lbs. In 1973, he was hospitalized for several days with a high fever and possibly pneumonitis.

Subject A had a comprehensive evaluation performed at the age of 7 years by the Children's Medical Center, Dallas, Texas. A summary of his physical examination was as follows. The subject was a large-framed child. There were no obvious deformities of skeleton. He did not appear to be acutely ill. He did not have any symptoms of chromosomal abberation syndromes. His muscles were developed and subcutaneous fat tissue appeared to be adequately distributed. Head was noted as normocephalic, perhaps with slightly prominent frontal bones. There was no

pain to percussion. Great fontanel was closed, and frontal hairline was definitely low. Texture of hair was normal and scalp was healthy. Placement of ears was not lower than normal and eardrums were clear. Eyes exhibited slightly hyperteloric extraocular movements. The whole face seemed to be rather wide, The nose was normal, and the mouth was large with wide jaws and spaces between the decidual teeth. Moderately enlarged tonsils were noted. The neck was supple with no webbing. The chest was well developed and symmetric; lungs were clear. Examination of the heart revealed a regular rhythm and no murmurs. There was quite pronounced hyperlordosis of the lumbar spine and protuberance of the abdomen. The abdomen was soft with no organomegaly or hernias. External genital were normal. Large hands and feet were noted; however, they were not out of proportion with the rest of the body. There were no grossly abnormal dermatoglyphics. The feet were flat.

A summary of the subject's neurological evaluation is as follows. Subject A appeared to be moderately hyperactive and responded to some verbal restrictions. Most of the time he appeared to be cheerful; he grinned and laughed. When displeased, he shrieked and kicked. The subject said "mama" and could understand simple instructions given by both his mother and the examiner. His cranial nerves appeared intact. The subject's gross and fine motor coordination were poor. On two occasions during the examination, there were episodes of short-lasting twitching of forearms and hands. During these periods of time, he appeared to be fully conscious and kept his equilibrium. Deep tendon reflexes were

equal, 1 to 2+ on all extremities. Subject A did not seem to have any abnormal reflexes. His walk was on a wide basis and he could not run. The subject's muscle tone and strength were good.

On the Cattell Infant Intelligence Scale, Subject A received a mental age score of 15.2 months with a resulting IQ score of 18. His primary deficiency appeared to be in the area of expressive language skills. A basal age was established at the 10-month level with scattered credits through the 18-month level. He appeared to have good receptive language and could comply with requests when he was motivated. On the Vineland Social Maturity Scale, the subject received an age equivalent score of 2.88 years with a resulting social quotient of 42. These scores tended to indicate that the subject was functioning intellectually and adaptively in a range between severe to profound mental retardation.

In an evaluation performed by an agent for the Grand Prairie Independent School District, Subject A's behavioral characteristics were described as follows. Affective: The subject was often "resistant", stiffened body, grunted, hit, bit, especially when around others (as opposed to 1:1). Occasionally, he did things that would inflict pain upon himself (bit self, pinched lip between two blocks, poked self with stick). He also kissed self as well as others. Social: Interaction with peers was low. When the subject did interact, it was usually by putting his face very close to their faces and verbalizing with unintelligible speech. He usually wanted the teacher or aide near him and

interacted with adults he was familiar with by clinging to their waists or necks. Typical behaviors seen in the classroom: Subject A's visual memory skills seemed to be high and he learned well through that mode. He could follow directions, although they usually needed to be repeated several times before he carried them out. Occasionally, he looked as though he were in a daze and did not seem to be aware of things going on in his immediate environment. This may have been due to medication.

Adjunctive Therapists' Reports

Speech and Language Assessment (3/23/79). Subject A appeared quite hyperactive and distractible, and his attention span was extremely short. No formal speech and language evaluation measures were attempted. According to the mother, he reportedly was less hyperactive and distractible at school and could attend and participate in class activities.

The subject said two meaningful words at home--"mama" and "uh" (produced loudly). He often said a word once had did not continue using it daily. The subject followed simple directions that were familiar, and he followed more consistently when the direction was paired with a gesture. The mother stated that Subject A would hit her when he wanted something but did not use vocalization other than "uh". If the mother did not understand, the subject would usually get the item himself. His mother stated that he did not like to watch television, but that he loved to play in dirt and would do that for periods of 10 to 15 minutes.

The subject's mother thought his hearing was normal. He had one episode of otitis media. The subject often talked loudly when speaking

or when angry. The Communicative Evaluation Chart was completed using information obtained through observation and from the mother's report. It appeared that the subject was functioning on a 6-month level in most speech and language abilities with some scatter into the 12-month level. No expressive verbal communication was heard during the evaluation and Subject A used simple gestures to express simple concepts and his wants and needs. He followed simple directions from his mother with gesture. During the assessment, Subject A was moving constantly and did not focus on any object for more than 2 to 3 seconds. Several destructive and manipulative behaviors occurred and the mother spanked the subject's extremities in order to get him to do something she directed him to do while he was playing.

Occupational Therapy (2/16/81). Subject A was programmed for dressing skills and increasing attention span. He could remove his shirt, socks, and shoes with no guidance. The subject required prompting to accomplish this task. He did confuse front and back. One problem he had with dressing was his lack of good mobility in the trunk area. For fine motor skills, his problem was one of maintaining attention on the task. Physical observations indicated no physical limitations, normal muscle tone, and slight uncoordinated movements. He did not appear to have reciprocating arm movements when walking.

It was suggested that gross motor training be aimed at smoother, more coordinated movements of extremities incorporating such skills as walking backward, standing on one foot, hopping, jumping, climbing, and

balancing skills. Activities for improving fine motor skill included developing better pincer grasp, building towers with cubes, using form board with basic shapes, peg board activities, and crayon and paper activities.

Physical Therapy (1/21/80). In the area of gross motor, Subject A could perform activities up to the 5-year-old level that did not require good balance skills or jumping off the ground. He could balance momentarily on the left leg but not on the right. The subject could not squat down and come up without using his hands. Stability and balance were fair in kneeling and half-kneeling. When Subject A was asked to stand, he did not come up from half-kneeling; instead, he came up from a bipedal stance using his arms. He could run, but it was slow and uncoordinated. The subject could catch a large ball but only from a close distance, and performance of the activity was uncoordinated. He did not skip, gallop, walk on his tiptoes, or jump.

In the area of gait, Subject A shuffled his feet, walked with an overall flexed posture (knees and hips bent), and wide base of support. He had uncontrolled movements of the left more than the right arm. All of these deviations became exaggerated when the subject was excited or ran.

In the area of activities of daily living, Subject A could independently feed himself with utensils but most of the time he finger fed. He could independently brush his teeth. The subject could independently manage a slipover garment but ripped and tore at garments with buttons.

In the area of ocular function, Subject A could follow an object in all directions. Convergence could not be tested due to his grabbing the testing object and biting the teacher.

The subject did not have the stability and controlled movements necessary for the acquisition of many gross motor skills. His behavioral problems had apparently contributed greatly to his lack of exposure to gross and fine motor skills and dressing skills.

Psychological Consultation (9/18/80). Cognitively the subject functioned between a 1- and 2-year-old level. It appeared that he could maintain an image in his mind long enough to find a hidden object but it was not clear to what extent this was possible. He could attain objects by using intermediary objects to assist such as in retrieving a toy car by pulling a string. He participated sporadically in a cooperative type of play by placing a puppet's head on an adult's finger and initiating interaction. The subject also engaged an adult in play with the bubble set. He lacked basic form discrimination and seemed to misperceive differences in shape between various objects.

Subject A appeared to be functioning as severely mentally retarded and was extremely impulsive and potentially dangerous to other students through biting. He reportedly had a seizure disorder and on two occasions behavior resembling petit mal seizures was observed in the classroom. Subject A previously was taking Phenobarbitol and Dilantin, and more recently, Ritalin.

Instructional objectives for the subject included simple imitation

activities such as imitating the building of a block tower, finding hidden objects which were viewed as they were hidden, imitating sounds, combining sounds into words, and then labeling objects by saying the words. He was to practice discrimination tasks so that he could learn how to differentiate between a circle, square, and various other forms. Stringing activities were used to assist in the development of seriation concepts.

Initial behavioral training was focused on compliance training. That is, the subject was trained to come when called and to sit upon command. Further training for Subject A was to establish eye contact with the teacher when given a verbal cue. The verbal cue was paired by showing the subject an object he wanted to interact with, but he was required to furnish the appropriate behavior before he could engage in the activity. Verbal over correction was used whenever Subject A bit. That is, the teacher spoke harshly to the subject for a longer period of time than usual, scolding him about biting or attempts to bite. This technique helped curtail this inappropriate behavior.

Investigator's Observations and Program Activities

Subject A was a husky, 49-in., 110-lb. extremely hyperactive male. He made very little eye contact and was non-verbal except for the words, "mama" and "uh". The subject called all of his teachers "mama", usually using the expression whiningly when he was asked to do something that he did not want to do. He loudly said "uh" to indicate his displeasure. The investigator believed that the subject comprehended much more than

he pretended to understand. For example, Subject A was busying himself about the room when the investigator purposely told her aide to not let him have the big orange ball. Immediately the subject sped across the room to capture the big orange ball, never looking in the investigator's direction, grinning all the way. Subject A had good eye-hand coordination but poor eye-foot coordination. His poor eye-foot coordination could probably partially have been attributed to his weight and poor balance skills..

The pretest evaluation placed Subject A at the 24-month level in the motor program. His beginning 3 objectives were determined to be goals No. 62, walking up 5 steps, holding the handrail with 1 hand, and putting 2 feet on each step, No. 63, running 10 steps forward, and No. 65, walking down 5 steps while holding the handrail with 1 hand and putting 2 feet on each step.

Two of these objectives, No. 62 and No. 65, were also being pursued by Subject M. The same techniques used with Subject M, including inclined board walking, were utilized with Subject A. In addition, ladder climbing was practiced by the subject to foster smoother leg-lifting and foot placement. Subject A's weight and poor balance skills hampered his success with these objectives. At first, Subject A reluctantly ventured the climb with his body flexed, one hand on the rail, and the other on the step. The investigator realized that he was totally unmotivated to climb the steps. Climbing the steps was not fun for the subject because they tended to frighten him. It did not take long to find some things that the subject enjoyed and worked hard to attain. His motivators/

rewards were chewing gum, playing with Fetch-it-Freddie, and blowing soap bubbles. By the completion of the 15th session (3/19/81), Subject A had met the criteria for accomplishment for objectives No. 62 and No. 65.

Goal No. 63, running 10 steps, was extremely difficult for Subject A. The investigator stood beside the subject, threw a bean bag across the room, and encouraged Subject A to race with her for it. Subject A's attempt at running was exemplified by quick, shuffle steps. The first step was to have the subject practice marching. He enjoyed performing this activity with music. After the subject had mastered marching to a slow beat, the investigator had him practice faster marching. The attainment of the criteria for step 3 of the objective, slowly hopping from one foot to the other, was met with great difficulty. The investigator made use of a treadmill to help practice transferring weight from one foot to the other. The subject caught on fairly easily after being manually manipulated through the process of "step-push-drag". As he improved on the treadmill, he began to internalize the concept of quicker stepping. It was evident that Subject A enjoyed this activity as he laughed all the way through it during practice. The next step was to transfer running on the treadmill to running across the floor. To do this, the investigator demonstrated a simple game. The investigator got on the treadmill, ran a few steps, jumped off, ran across the room to a desk where a bottle of bubbles awaited, and blew bubbles into the air. The game delighted the subject. After Subject A was walked through the

game and then run through the game several times, he learned to do the activity alone. He was not allowed to blow bubbles if he did not run to the table. During this activity, another word became a part of the subject's limited vocabulary, "bubbles". The subject began to whisper the word each time he was allowed to play with them. The bubbles seemed to fascinate him, and he was delighted when they popped on his face. As long as the bubbles were around, there was never a problem with prevailing upon the subject to run. This objective was mastered during the 26th session (4/6/81).

The other two objectives that were pursued after the accomplishment of the first two goals were No. 69, walking on tiptoes for five steps, and No. 72, jumping in place with both feet. Both of these tasks were also being practiced by Subject M. The same tactics as were used with Subject M were employed with Subject A. In addition to the "elevator game" and the objective's step progressions, another activity was practiced by the subject to aid in his attempts to stand and walk on his tiptoes. The investigator placed the bar on the junior gym at a height that would allow the balls of the subject's feet to touch the floor as he hung by his arms from the bar. The subject's favorite toy, Fetch-it-Freddie, was strategically positioned so that it could not be seen unless Subject A stood on his tiptoes. Each time the subject managed to find the toy by standing on his tiptoes, he was allowed a few minutes to play with it. After Subject A acquired the concept of standing on his tiptoes, the step progressions were carried out, holding the toy over

the subject's head. The total number of sessions devoted to this particular objective was 20, and he met the criteria on the 34th day (4/16/81) of the investigation.

Subject A enjoyed working toward the accomplishment of objective No. 72, jumping in place with both feet. The subject practiced jumping up and down on the mini trampoline with assistance at his waist and while holding the tramp bar. He progressed through the second and third steps which were jumping on the trampoline with the investigator holding his hands and jumping on the trampoline unassisted. Seven sessions were spent on this progression. The fourth and fifth steps of the objective, which were to straighten his legs forcefully and quickly, gave Subject A difficulty. He did not want to bend his knees, and it was extremely difficult to force the subject into any position in which he did not want to be. He continued to grunt "uh" and flail his arms with each attempt to work through these steps. The investigator decided to try something different. Fetch-it-Freddie was again utilized as the subject's motivator. Subject A was given an incentive to jump by having the toy placed on a shelf just higher than he could see by standing on his tiptoes. The subject's records indicated that he had fairly good visual memory; therefore, the investigator believed that this approach should work with him. After the investigator repeatedly demonstrated placing the dog on the shelf, jumping up, finding the dog, taking the dog down with great enthusiasm, and then replacing the toy, Subject A began making attempts to do the same. By the end of the study period

(4/24/81), he had met the criteria for accomplishing this goal.

The last objective attempted by this subject was No. 73, which was to stand on 1 leg for 10 seconds while holding the investigator's hand. Subject A cooperatively advanced through the first 2 steps which consisted of standing on his right and left legs for 5 seconds with assistance in holding his raised leg. As long as the investigator continuously talked to the subject and held his attention, he obliged. This technique did not work, however, when the amount of time was extended to 10 seconds and the assistance of holding his leg was withdrawn. The investigator tried several methods before she found one that worked with the subject. By demonstrating popping a balloon by stomping on it, the investigator gained the subject's interest and attention. In the beginning, the investigator placed a balloon under his foot immediately after he raised it off the ground. Subject A thought it was very funny when the balloon "jumped" out from under his foot as he tried to pop it. He enjoyed the game and was successful at managing to pop the balloon. The investigator slowly increased the amount of time it took for her to position the balloons for the subject. Eventually, the subject mastered the objective by standing on 1 foot for 10 seconds while waiting for the balloon to be placed and for the game to begin again. This objective was accomplished by the end of the investigation (4/24/81).

Summary

Subject A was introduced to and accomplished 6 objectives. He entered the program at the 24-month level of gross motor performance. He

exited the program at the 36-month level. The subject's success required the utilization of many external motivational techniques. Results of the post-posttest at 10 weeks indicated that Subject A had retained each skill with the exception of jumping in place with both feet. The subject, however, would not perform the tasks without the use of the motivational aids as prompts.

According to the social/emotional pinpoint scale, the investigator and classroom teacher agreed that Subject A had improved in the following areas of behavior: (a) seeks eye contact during the first 2 to 3 minutes of attention from the caregiver--makes attempts to see face of caregiven, (b) increases action at the sight of a toy, (c) ceases or interrupts activity in response to command, "no", (d) imitates actions of adult, (e) seeks others for play or interaction, (f) cooperates with caregiver's request (1 out of 2 requests), and (g) initiates own activities for play. At 10 weeks, the scale was charted again to check for retention of behaviors. Each behavior was observed with the exception of his seeking eye contact during the first 2 to 3 minutes of attention from the caregiver.

Figure 3 represents a summary of Subject A's progress. Exemplified is the subject's entry level in the motor program (pretest), exit level (posttest), number of retained motor skills (post-posttest), number of changed behaviors (according to the social/emotional checklist, and number of retained behaviors. Also indicated is the number of months gained in terms of gross motor development and the specific objectives that were attained.

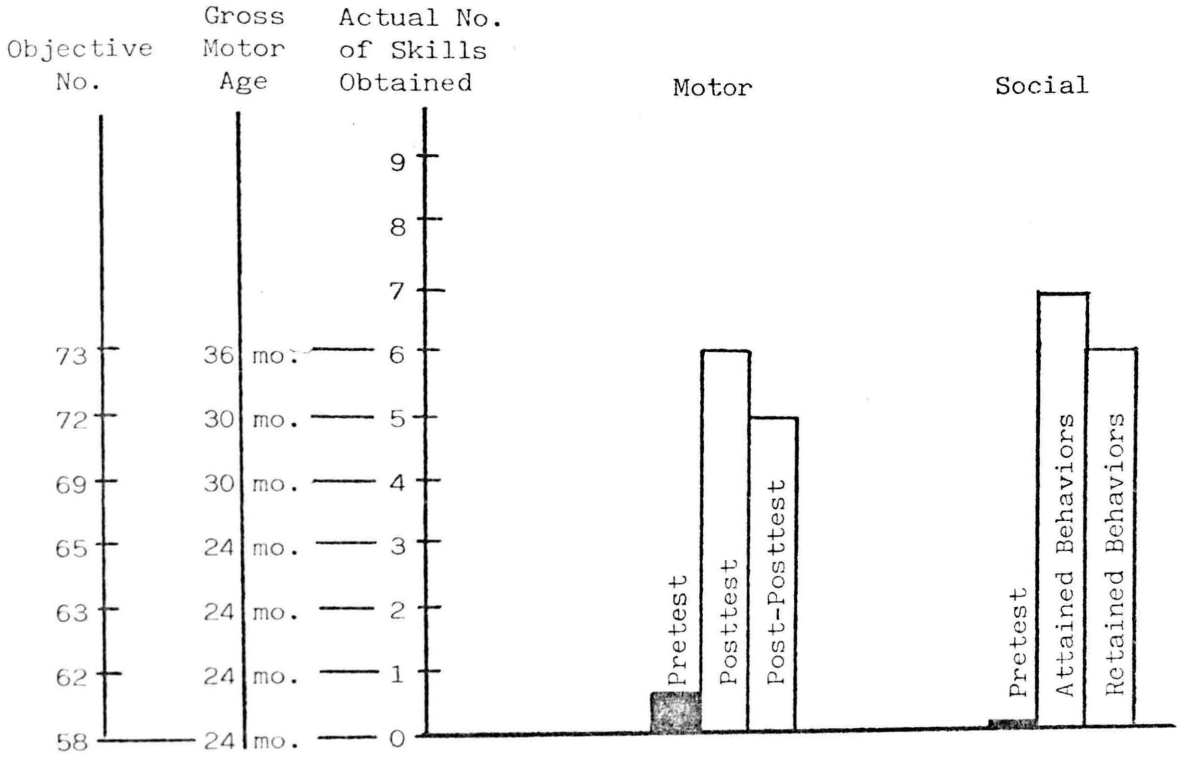

Figure 3. Summary of Progress for Case 3, Subject D.

Case Study Number Four: Subject C

Personal Data

Date of Birth: 5/3/71 Sex: Female

Age: 9 years, 11 months IQ: Undetermined

Developmental Age: 6 months Weight: 57 lbs.

Ethnic Background: Caucasian Height: 49 in.

Etiology: Anoxemia

Diagnosis: Severe brain damage, cerebral palsy, profound mental retardation

Family Background

Subject C was the product of a normal, full-term pregnancy. The subject was the third of four children. The parents, siblings of the subject, and the subject lived together in their own home. They all exhibited interest, love, and concern for the subject. Reportedly, the siblings were good about helping with Subject C, and the subject responded well to them.

The lack of adequate oxygen in the subject's blood was the cause of her severe brain damage. This condition was discovered shortly after birth. Subject C's first formal evaluation was not performed until the subject was 2½ years of age.

Medical and/or Developmental History

Subject C's initial evaluation from the Cerebral Palsy Treatment Center, Dallas Society for Crippled Children, Dallas, Texas, was completed in 1974. The subject was 33 months old with a mental age of 8 months which yielded a mental quotient of 24. She was carried into the evaluation room and placed in a Captain's chair. Her sitting balance in the chair was fair, and sitting balance on a mat was good. She demonstrated the ability to reach out, touch or grasp, and release objects involuntarily. After touching an object, Subject C quickly withdrew her hand as if she were tactile defensive. The subject demonstrated some aimless movements and constantly kept her fingers in her mouth; constructive play patterns were not observed. She demonstrated constant tremors and flaring of her fingers. Good eye contact was never noted

throughout the evaluation. The subject's head was large for her body. She responded by laughing when her mother stimulated her by tickling. Otherwise, she appeared disinterested and unresponsive throughout the evaluation.

At 4½ years of age, the subject was re-evaluated by the same agency. A social quotient of 21 was obtained on the Vineland Social Maturity Scale. Her age equivalent was 11 months. Results of the REEL Language Scale indicated a scatter to 9 months in receptive language. There was a wide scatter to 6 months in expressive language. Concerning her hearing, the subject's response to environmental sounds occurred at normal entrance levels. An examination of the speech mechanism revealed severe involvement of the oral musculature and tongue. The subject's deciduous teeth were discolored and there were a number of capped teeth. There was a high palatal vault. Concerning communication, Subject C vocalized and cried to make her needs known. She demonstrated anger by kicking and screaming and shook her head to indicate "no". Her severe speech and language delay was related to her generalized motor and intellectual development delay. The prognosis for the subject was reported as guarded.

The subject's third evaluation was performed in 1976. Her chronological age was 4 years, 10 months. The Cattell Infant Intelligence Scale was given and indicated the subject had an IQ of 9 with a mental age of 5 months. Subject C could not walk, talk, sit unsupported, or raise her hands for more than a few seconds at a time. When well-braced,

the subject could sit. When left alone on the floor, she tended to curl up in the fetal position. Subject C seemed to be interested in her surroundings and quickly adapted to new persons and new places. The subject appeared to understand her own name and responded with ner particular type of wriggling and smiling. Some vocalizing was heard but no verbalizing. When a music box was turned on, she hummed and moved to the music with some degree of rhythm. The subject frequently stared fixedly at the examiner but there was practically no understanding in her eyes. Occasionally, her right eye did not fuse. Subject C displayed a marked startle reaction to sudden movements of other persons and to loud noises. The subject did not move with purpose and could hold an object for only a few seconds when it was placed in her hand. Slight interest was shown in a red ball and a doll, but aside from these, only the music box and verbal communication caught her attention. Subject C's level of mental abilities ranged from 4 to 7 months with a mental age of 5 months.

The subject's most recent evaluation was performed in October of 1980, by an agent of the Grand Prairie Independent School District, Grand Prairie, Texas. The assessment instruments used to obtain data were the Brigance Inventory of Early Development and the Developmental Assessment for the Severely Handicapped. Subject C was determined to be at the pre-speech stage of language development. She made sounds when she was alone (6 months), understood and responded to her name (7 months), shook head "no" and gave affection (7 months). The subject sat unsupported, leaned forward, and returned to the upright position.

She moved her head and eyes in every direction. Subject C did not stand independently. The subject chewed and swallowed small pieces of solid food. She cooperated in dressing and removed her socks, but she required support of her head, back, and shoulders when being dressed. She was furnished with an adapted wheelchair by Scottish Rite. The subject was under medication for seizures. Concerning her emotional behavior, she resisted any pressure to do anything she did not want to do. The subject played 10 minutes without demanding attention and reached for, hugged, or kissed family members. Subject C smiled and vocalized when receiving attention. The subject's mother reported that the subject was happy, affectionate, even tempered, and sometimes stubborn. The parent stated that Subject C enjoyed listening to music and watching television.

Adjunctive Therapy Assessments

Music Therapy (4/2/81). Subject C's main goal was to increase her attending behavior. She had some gains in this area. The subject maintained fairly good eye contact on a 1:1 basis but had no imitative skills. Subject C was beginning to respond to 1-step commands without prompting. Her tactile defensiveness had decreased a great deal. The subject played rhythm instruments for approximately 30 seconds without prompting. She also allowed the therapist to hold her hands to assist in using them in various activities (i.e., clapping, striking percussion instruments). Subject C's progress was very slow, but she had progressed. She responded very well to activities involving acapella singing but not as well to music activities involving the use of records.

Occupational Therapy (3/16/81). Subject C did not consistently attend to visual or auditory stimuli. She had poor back extension in sitting. With a tight trunk, the subject ambulated with much physical prompting. The subject seemed to lack trunk rotation and the protective extension response. Treatment had concentrated on improving trunk rotation and developing some basic movement patterns which required her to move the arms, developing protective extension and equilibrium, and improving ambulation with minimal aid. The subject was resistive to touch and desensitization was practiced. She reached for a toy but not consistently. Subject C tended to sit on her low back rather than her buttocks. Correction of this poor posture was practiced but not attained.

Investigator's Observations and Program Activities

Subject C was a 49-in. tall, 57 lb., 9-year-old non-ambulatory female. She was a very pleasant, often smiling child who was tactile defensive. The subject, apparently, always had things done for her and was very resistant to doing anything physically exerting. She complained by whining each time she was taken out of her wheelchair and placed onto the mat, probably because she knew she was going to be asked to attempt movements she had not previously had to make on her own.

The subject's placement test indicated that her starting point in the CAMS program was at the 4-month level. The first gross motor skill that she was unable to accomplish was No. 8, which was to lift her head and chest for 5 seconds. Her second objective was No. 9, which was to

roll from her back to her side. The last of the subject's objectives was No. 12, which was to roll from her right to left and back again. Her second objective was also at the 4-month level, while her third objective was at the 5-month level.

The first step of objective No. 8 was to lift the head for 5 seconds while lying on the stomach. Subject C was already able to do this. The second step was for the subject to lift her head and upper chest off the floor with assistance. This task was practiced for 12 sessions, through the 17th day of March. The subject was placed on her stomach on a mat with her arms bent and her hands near her head. The step progression called for a toy to be waved in front of her and for her to be encouraged to lift her head and shoulders. As the subject raised her head, the investigator was instructed to help the subject raise her upper chest off the floor by putting her hand under the subject's chest or by holding the subject's shoulders and gently lifting. After much practice, the subject had not responded with the slightest bit of improvement in doing the task; therefore, the investigator experimented with several other techniques. The two best motivational aids were found to be a musical stuffed kitten and the Dukane filmstrip projector. A partially deflated ball served to support the subject. The ball was placed under her chest after it was lifted up off the mat. It had been reported that the subject enjoyed watching television and that it held her interest. The investigator utilized some lively cartoon filmstrips and the Dukane projector in an attempt to get the subject to attend and to motivate her to accomplish the task at hand. The projector was

first placed directly in front of her at floor level. Subject C simply had to turn her head forward to watch the film. Gradually, the projector was raised to higher levels in 4-in. increments. As the subject began to follow the projector as it was raised, the investigator saw more and more effort by the subject to lift her chest off the floor. With each good attempt, the investigator placed the partially deflated ball under the subject's chest and allowed her to prop and watch the film. This procedure was followed with decreasing aid from the ball for propping. The projector was raised higher and higher to encourage lifting and stretching. Intermittently, Subject C was encouraged to locate a musical stuffed kitten that was found to be of interest to her. The kitten was, as was the projector, placed at the various levels with the highest level being 2 ft. from the ground. The use of the ball for support was gradually diminished. By alternating the practicing of these two techniques, Subject C eventually was able to lift her head and chest unassisted. The process, however, required the entire length of the investigation. By the end of the investigation, Subject C must not have considered this task work because whining ceased and she giggled throughout the session.

Subject C was concurrently pursuing objective No. 9, which was to roll from her back to her side. The subject had no problem with the first step of this objective which called for her to turn to her left side. It was her habit, when left alone, to roll to her left side and assume the fetal position. The subject could not, or would not, demonstrate rolling to her right side. In fact, she became adamant when

encouraged to do so. With the utilization of the stuffed kitten and the projector the same process followed with Subject D was used to accomplish this objective. After several trials, the investigator found that the use of these items was inadequate to motivate her to attempt the task. The next few sessions were spent trying different motivational aids with the subject. The investigator believed that the bubbles were too subtle to grasp Subject C's attention. The subject paid no attention to Fetch-it-Freddie and was unable to chew gum. It had been reported that the subject was occasionally interested by differently textured items and by red objects. Such objects were gathered by the investigator and, after presentation to the subject, several were found to attract her attention. Among these items were a red yarn ball, a red hair brush, red play dough, a piece of sand paper, a white wiffle ball with a big red happy face painted on it, and a Raggedy Ann doll. Before these aids were incorporated within the step objectives, they were used by the investigator while playing with the subject. An attempt was made to elicit reaching and grasping behaviors from Subject C. This was accomplished with a certain degree of consistency. At first, the subject quickly withdrew her hand when she was encouraged to touch the unfamiliar objects. She did not, however, withdraw eye contact from the object and eventually began to reach for the object via her own volition. The investigator followed the step progression suggestions of helping the subject turn by assisting at her shoulder and hip, and then by assisting only at the shoulder, and finally encouraging the subject to roll over

unassisted. Subject C refused to roll all the way up onto her side until the investigator placed her on a mat situated 2 ft. above the floor and lowered the items to the floor. When this was done, the subject was forced to turn her entire body, rather than just her head, to maintain eye contact with the items. Although the accomplishment of this goal was very slow, the criteria for its accomplishment were met by the completion of the investigation.

The third objective, No. 12, was to roll from her right to left side and back again. Subject C never successfully completed this goal. She was able to turn her head straight up while she was lying on her left and right sides, and she eventually managed to roll from one side to the other with assistance at her shoulders and hips. The subject's best attempts were made after the investigator incorporated the game of "peek-a-boo" into the activity. The investigator's teaching aide assisted the subject at her hips and shoulders while the investigator went from one side of the mat to the other, calling "peek-a-boo". This game delighted the subject, but it only provided enough motivation to get the subject from one side, to her back, and over to her other side. Subject C was never able to complete a smooth roll. She always paused on her back and did not continue unless another stimulus was introduced. Even with all of the aids used, the subject's attention was not held without the investigator constantly talking to her. By the conclusion of the study period, 4 of the 7 step progressions had been mastered for this objective.

Summary

In summary, Subject C entered the program at the 4-month motor age level. She accomplished that objective, No. 8, as well as objective No. 9, which was also at the 4-month level. The third goal was at the 5-month level, and the subject's progress was very slow with only 2 objectives being met in an 8-week period. On the post-posttest at 10 weeks, Subject C was, as was each of the other subjects, allowed three trials for each objective. It was determined that she had retained both skills that she had originally mastered.

According to a comparison of the adapted social/emotional pinpoint scale, the investigator and Subject C's classroom teacher agreed that she significantly improved in the following behaviors: (a) showing more activity than previously when left alone, (b) making smile-like responses when touched or talked to, (c) smiling in response to pleasant stimulus (i.e., speaking to, patting, stroking, kissing, et cetera), and (d) smiling and vocalizing in response to direct verbal or physical interaction with caregiver. When the checklist was charted again at 10 weeks, Subject C had retained these behaviors.

Figure 4 represents a summary of Subject C's progress. Exemplified is the subjects's entry level in the motor program (pretest), exit level (posttest), number of retained motor skills (post-posttest), number of changed behaviors (according to the social/emotional checklist), and number of retained behaviors. Also indicated is the number of months gained in terms of gross motor development and the specific objectives that were attained.

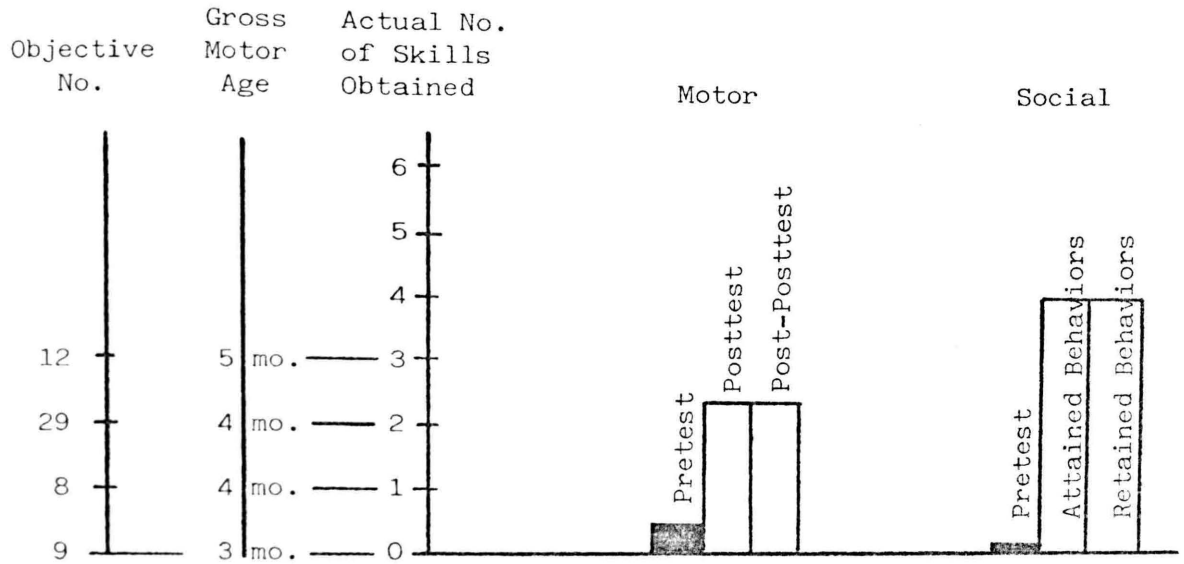

Figure 4. Summary of Progress for Case 4, Subject C.

Case Study Number Five: Subject J

Personal Data

Date of Birth: 12/6/70 Sex: Male

Age: 10 years, 2 months IQ: Undetermined

Developmental Age: 3 years Weight: 65 lbs.

Ethnic Background: Caucasian Height: 47 in.

Etiology: Down's syndrome

Diagnosis: Chronic ear infection, seizure disorder, severe mental retardation

Family Background

Subject J was the product of a normal, full-term pregnancy and weighed 4½ lbs. at birth. The subject's mother was in her middle 20's at the time of this birth. Subject J lived with both parents and an

older brother in their own home. The subject was well cared for and greatly loved by each family member and had received schooling since 3 years of age. He had developed several self-stimulatory behaviors including rubbing his left hand up and down the left side of his head and face, spinning objects, twisting side-to-side with arms outstretched, and making a noise that could be described as sounding like an appliance's motor. His mother reported that the family did not try to curtail any of these behaviors at home because they were the only things that the subject enjoyed doing besides eating. Subject J's mother reported that the subject had a large appetite and was even-tempered. She stated that the subject used to display several autistic characteristics such as not wanting to be touched or to touch others. She stated that he was now, but had not always been, an affectionate child.

Medical and/or Developmental History

There was no record of any formal assessments performed for Subject J until one was completed when he entered the Grand Prairie Independent School District, Grand Prairie, Texas, in 1980. An informal monitoring sheet from his private school was completed in 1979, which covered the following six areas. Physical Development and Health: Subject J's height and weight gains had been monitored throughout the year, but no nutritional evaluation was completed because the 4-day food record was not returned from home. He had a good appetite at school. Concern was expressed over the subject's seizure medication and his constipation problems. It was suggested that the subject's parents increase the

fiber content of his diet and that he increase his daily exercise. Sensorimotor: The subject had begun to jump independently on the trampoline and was practicing jumping from a low step. He walked up and down stairs with assistance. Reportedly, his balance and coordination were gradually improving. He was beginning to play ball with an adult 3 to 5 ft. away. His fine motor skill progress had remained stable. He could build a tower with minimum assistance, and he was able to turn thick-paged books. Communication: Reportedly, the subject followed some simple commands, such as sit, stand, come, no, stop, pull up your pants, flush the toilet, 50 to 75% of the time, but he was still inconsistent. Social: The subject's toilet training had greatly improved, however, he continued to have an occasional problem after lunch and when lying down. He had been noted to masturbate more frequently if left unattended for a period of time when lying down or going to the bathroom. It was not felt that this had become a problem at that time. Subject J continued to spin any object available, rubbed his head, and made humming-motor noises if not in a 1:1 situation. He seemed more aware of specific children and would follow them around and allow them to initiate interactions. Cognitive: Subject J could build a tower of cubes with assistance, had begun to roll play dough, could do simple puzzles with supervision and assistance, and could mark on paper after some prodding. He could sort three shapes and colors with minimal difficulty. Adaptive Behavior and Independent Living Skills: Subject J ate well but needed to be reminded not to put whole things into his mouth (i.e.,

cookies, sandwiches).

In October of 1980, an agent for the Grand Prairie Independent School District, Grand Prairie, Texas, administered the Brigance Inventory of Early Development and the Developmental Assessment for the Severely Handicapped to obtain new assessment data. According to that assessment, Subject J had the following self-help skills: (a) fed self independently using fingers and spoon and held fork in fist; (b) could remove pull-down garments and put on pull-up garments with assistance; (c) cared for his own toileting needs except for help in wiping; and (d) dried his hands with assistance. Concerning his emotional status, he was described as distracted, short attention span, no eye contact, frustrated, happy, usually obedient, affectionate, even-tempered, dependent, bed-wetter, and unsociable. His adaptive behavior was below his chronological age. Reportedly, he enjoyed watching sports and other television programs. His intellect had to be measured on developmental scales and the average of those scales indicated a developmental age of 3 years. In terms of gross and fine motor, the subject walked up and down stairs with assistance, attempted to stand on a balance board with one hand held, caught a ball with his hands and chest, picked up small objects with a pincer grasp, and completed a puzzle with 3 to 5 pieces. He attended to simple commands, had a strong cry, gave affection, made pleasure sounds, and had tonation in his voice. He was in the pre-speech stage of language development. Subject J's developmental milestones were all delayed.

Adjunctive Therapists' Reports

Music Therapy (4/2/81). Subject J had met his established objectives of consistently attending task 90% of the time for 5 minutes, maintaining eye contact on command, and decreasing his self-stimulatory behavior. The subject needed 1:1 assistance on all tasks. He began participating in group tasks without prompting which indicated an increased social awareness. The subject consistently followed commands, but his receptive language was minimal. He was reinforced by musical stimuli. He exhibited behaviors in Music Therapy not typical for a child of his intellectual functioning (i.e., advanced rhythms).

Occupational Therapy (3/20/81). The subject maintained good sitting balance and had good head and trunk control. He preferred "W" position when sitting on the floor. Subject J tracked crossing the midline and had very short eye contact. He apparently had normal hearing but no speech. He repeatedly made a humming sound. Equilibrium reactions and protective responses were present. The subject's gait had a broad base, and opposition in arm swing was not noted.

Investigator's Observations and Program Activities

Subject J was a 47-in., 65 lb., ambulatory, non-verbal, 10-year-old Down's syndrome boy. The subject was very cooperative within the play environment. His self-stimulating behaviors were not witnessed by the investigator throughout the duration of the study. He was a pleasant, affectionate child who smiled often and enjoyed hugging. By the completion of the study, Subject J's eye contact had improved and he

attended to task more diligently and with less prompting.

Subject J's placement test indicated that his starting point in the CAMS program was at the 24-month level. This was the same starting point as 6-year-old Subject M had earned. Their programs were very similar with their first 3 objectives being the same. Subject J's first goal, No. 62, was to walk up 5 steps by putting 2 feet on each step, holding the handrail with 1 hand. His second goal, No. 65, was to walk down 5 steps by putting 2 feet on each step, holding the handrail with 1 hand. The subject's third goal, No. 69, was to walk on his tiptoes at least 5 steps. These 3 goals were pursued concurrently, with each goal given approximately 7 minutes of consideration during each session.

Subject J progressed through each step of climbing up and down 5 steps with minimal difficulty. Two variations were incorporated to facilitate his performance of these activities. The subject demonstrated a better understanding of "step up" by tapping the top of his foot and then tapping the step to which he was to advance. Some accompanying activities that were practiced included walking up an inclined board, ladder-climbing, and stepping over objects in an obstacle course. Subject J enjoyed the step-climbing and proceeded immediately to the steps each day when he came into the room for instruction. In fact, after this objective had been learned, it was used as a reward for the subject when he demonstrated good attempts while working toward the attainment of his other goals. After his 10th session (3/13/81), the subject had mastered the step-climbing objective. Several times during the

practicing of this objective, Subject J proceeded to climb a step or two by alternating his feet.

The investigator decided to skip over to objective No. 76, which was to walk up 5 steps, holding a rail, and alternating his feet since the subject appeared to be ready to attempt it. Step 1 was a review of the objective that he had just accomplished. By tapping the back of his thigh and then the step on which he was to place his foot, he progressed cooperatively through each of the 6 steps within the following 6 sessions. Subject J knew that the instructor had lots of hugs and kisses awaited him after he climbed the 5 steps putting only 1 foot on each step. That fact, plus the fact that he seemed to be having fun, was enough motivation for him to accomplish the goal quickly and easily.

The attainment of objective No. 69, which was to walk on his tiptoes for 5 steps, was much more difficult for Subject J. The investigator demonstrated the skill barefooted and then had the subject remove his socks and shoes during the practicing of this objective. Before Subject J was able to participate in any of the objective's activities, the elevator game or searching for Fetch-it-Freddie, he had to be taught the concept of pushing up and bearing his weight on his toes. This idea was extremely difficult for the subject to comprehend. Several techniques were tried to facilitate his understanding, including the strapping of 2-in. blocks underneath the heels of his shoes. His best attempts were made after the investigator made up a game which incorporated one of his best motivators, affection. The investigator sat in a

chair, her knees together and feet flat on the floor. Subject J stood directly in front of and facing her. The investigator placed the subject's hands on her knees while the teacher's aide knelt behind the subject. As the investigator said "up", her aide lifted the subject's heels. As he bent forward, he received a kiss from the investigator. When the investigator said "down", her aide gently pulled downward on the subject's heels. When he was back in his original position, he received a hug from the investigator. As the investigator repeated the phrase, "Up, kiss, down, hug", the subject was helped through the game. He was delighted and grinned from ear to ear throughout the game. Slowly, his help from the aide was withdrawn. At first, the subject tried to get his reward by simply leaning forward rather than going up on his toes. When he realized that his attempts were not going to evoke a reward, his efforts improved until he was pushing up to his toes without assistance. The game was then pursued with the investigator standing and holding his hands, rather than the subject leaning on the investigator's knees. After 12 sessions, the subject was ready to begin practicing step 1 of the objective. The 3 remaining steps and the previously mentioned activities were practiced during the following 5 sessions. By the completion of the 18th session (3/25/81), the criteria for accomplishment had been met by the subject.

Jumping in place with both feet, objective No. 72, was the subject's fifth goal. Subject J enjoyed the "Jump-Bump" game that was previously described. Other accompanying activities included jumping

on the mini trampoline and jumping up and down on a large inflated innertube. Subject J progressed from practicing these activities with assistance at his waist, to the investigator's giving assistance by holding his hands, and finally, to the subject's holding the tramp bar. The subject enjoyed these activities and would participate in them without any prompting. He had no problem with transferring from trampoline and innertube-jumping to jumping up and down on the floor. It was not necessary to take Subject J through steps 4 and 5 which dealt with teaching him to straighten his legs forcefully and quickly while standon the floor. He progressed through steps 6 and 7, which dealt with jumping in place with assistance by holding his waist and then by holding his hands during the 8th and 9th sessions devoted to this objective. The subject did, however, have difficulty with the last step of the objective, which was to jump up and down with both feet, unassisted. After 3 additional sessions (April 13 to 15) of repeated demonstration by the investigator and practice by the subject, he accomplished the objective. Subject J was not particularly excited or pleased with himself for having accomplished his goal, but he did love the praise, applause, and hugs he received for doing so.

The subject's 6th objective was No. 73, which was to stand on 1 leg with assistance for at least 10 seconds. The investigator presented this objective exactly as it was outlined in the CAMS manual. Subject J progressed beautifully from step to step, spending one session on each step. He did not need to practice the accompanying activities for

reinforcement, however, the investigator introduced the "Pop the Balloon" game just for the fun of it. At first, the subject was frightened by the sound when the balloon popped as the investigator demonstrated the game. The investigator had almost decided not to use this game with him when the subject reached for a balloon, placed it on the floor, and began stepping on it, trying to pop it. Subject J stepped rather than stomped on the balloon, therefore, he had little luck with bursting it. The investigator secretly helped him with the task with the aid of a straight pin. When he finally managed to burst the balloon, he was ecstatic. This became one of his favorite activities. The subject had mastered this objective after only seven sessions.

Subject J accomplished objective No. 74, which was to walk for 5 ft. between 2 parallel lines which were 8 in. apart. Although this objective was not included in his program, the subject was asked to practice it, and the task was incorporated within an obstacle course that was used as an accompanying activity throughout the program.

The last objective attempted by Subject J was No. 75, which was to leap from a height of 18 in. leading with 1 foot. Practice for the attainment of this objective began during the 30th session (4/10/81). This activity was pursued very slowly and was begun from a height of 4 in. rather than 8 in. as the first step of the objective suggested. Fetch-it-Freddie was placed on the floor directly in front of the 4-in. platform. The object of this game was to jump from the platform, over Fetch-it-Freddie, and onto the floor without awakening the dog. When

this was accomplished, the investigator awoke Fetch-it-Freddie so that the subject could play with him for a few minutes. This procedure was followed as the subject progressed through the first 4 steps of the objective. Activities contained within these steps included a demonstration by the investigator of leaping from heights of 8 and 12 in., the subject's leaping from heights of 8 and 12 in. while holding the investigator's hand, and finally, the subject's leaping from heights of 8 and 12 in., leading with one foot, unassisted. Subject J began to balk on the 4th step when he was asked to leap from a height of 12 in., unassisted. With prompting, however, he managed to meet the criteria for the step on the 37th day of the program. Steps 5 and 6 of the objective dealt with heights of 18 in., of which the subject wanted no part. Subject J's eyes grew wide and he began to cry each time he was asked to attempt the 18-in. leap with or without the investigator's assistance. The investigator was content to leave this objective at step 5 and spend the last 3 days of the program in review and practice of the new skills learned by the subject and in playing some of the subject's favorite games.

Summary

In summary, Subject J was introduced to 7 gross motor skills. Of those 7 objectives, he accomplished 6. He managed to meet the criteria for 4 of the 6 steps of the 7th objective. The skills were developmentally sequenced and, with the exception of objective No. 76, were introduced in the CAMS order of presentation. According to the pre-

and posttest scores, the subject progressed from an entry level of 24 months to an exit level of 36 months in terms of gross motor development. On the post-posttest at 10 weeks, Subject J was allowed 3 trials for each objective. It was determined that he had retained each skill that he had originally mastered.

According to the social/emotional pinpoint scale, the investigator and classroom teacher agreed that the subject had significantly improved in the following areas: (a) fixes eye contact for at least 3 seconds on a person or object, (b) increases actions at sight of a toy, (c) resists (i.e., cries, sits down, or crawls away from) any pressure to do something he does not want to do, (d) squeezes or shakes appropriate toys to produce sound after demonstration of toy, (e) vocalizes when receiving direct attention, (f) tracks with eyes the movements of an adult for at least 20 seconds as adult moves from room, (g) protects self by moving away, holding up hands, et cetera, and (h) cooperates with caregiver's request. When the checklist was charted again at 10 weeks, Subject J was determined to have retained these behaviors.

Figure 5 represents a summary of Subject J's progress. Exemplified is the subject's entry level in the motor program (pretest), exit level (posttest), number of retained motor skills (post-posttest), number of changed behaviors (according to the social/emotional checklist), and number of retained behaviors. Also indicated were the number of months gained in terms of gross motor development and the specific objectives that were attained.

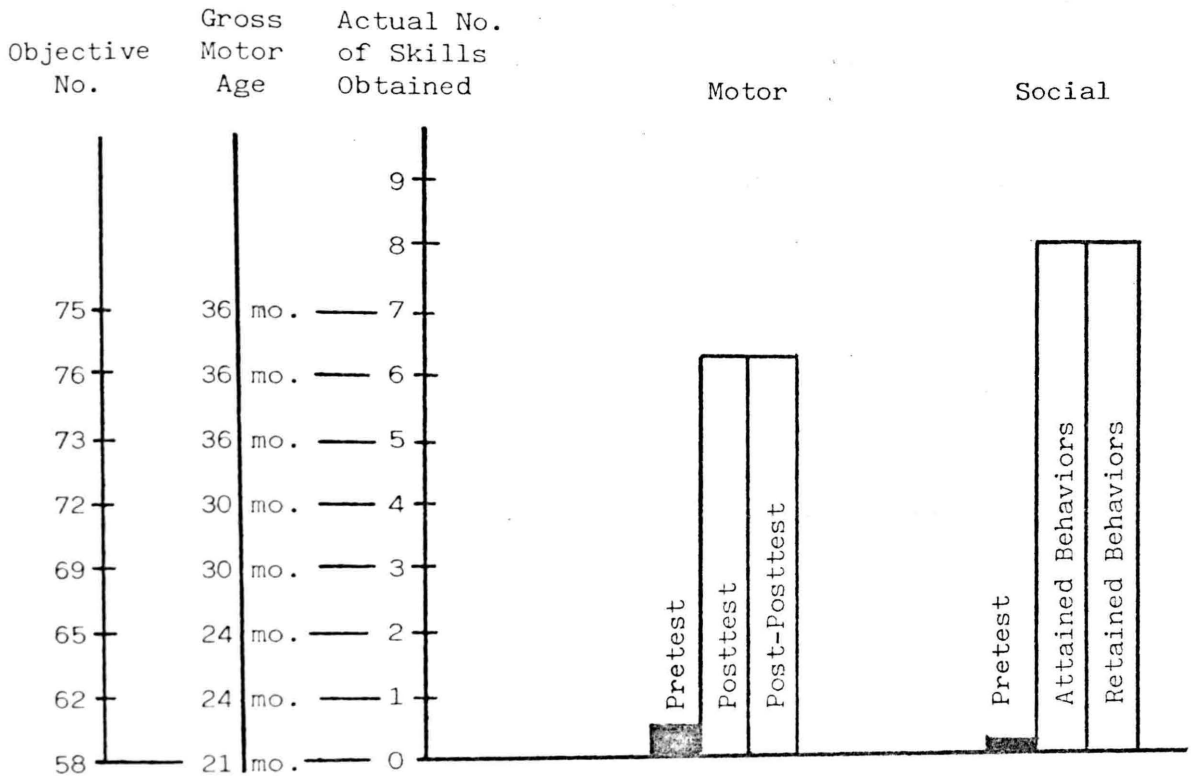

Figure 5. Summary of Progress for Case 5, Subject J.

Summary and Comparison of the Five Case Studies

Figure 6 represents a summary of all of the subjects' progress. A comparison of the subjects' progress, in terms of the number of motor skills and behaviors that were attained and retained, was indicated. Subject M exhibited the largest number of skills acquired and retained, whereas Subject C demonstrated the smallest number of skills acquired and retained. Subject J exhibited the greatest number of social skills acquired and retained, whereas Subject C demonstrated the smallest number of social skills acquired and retained.

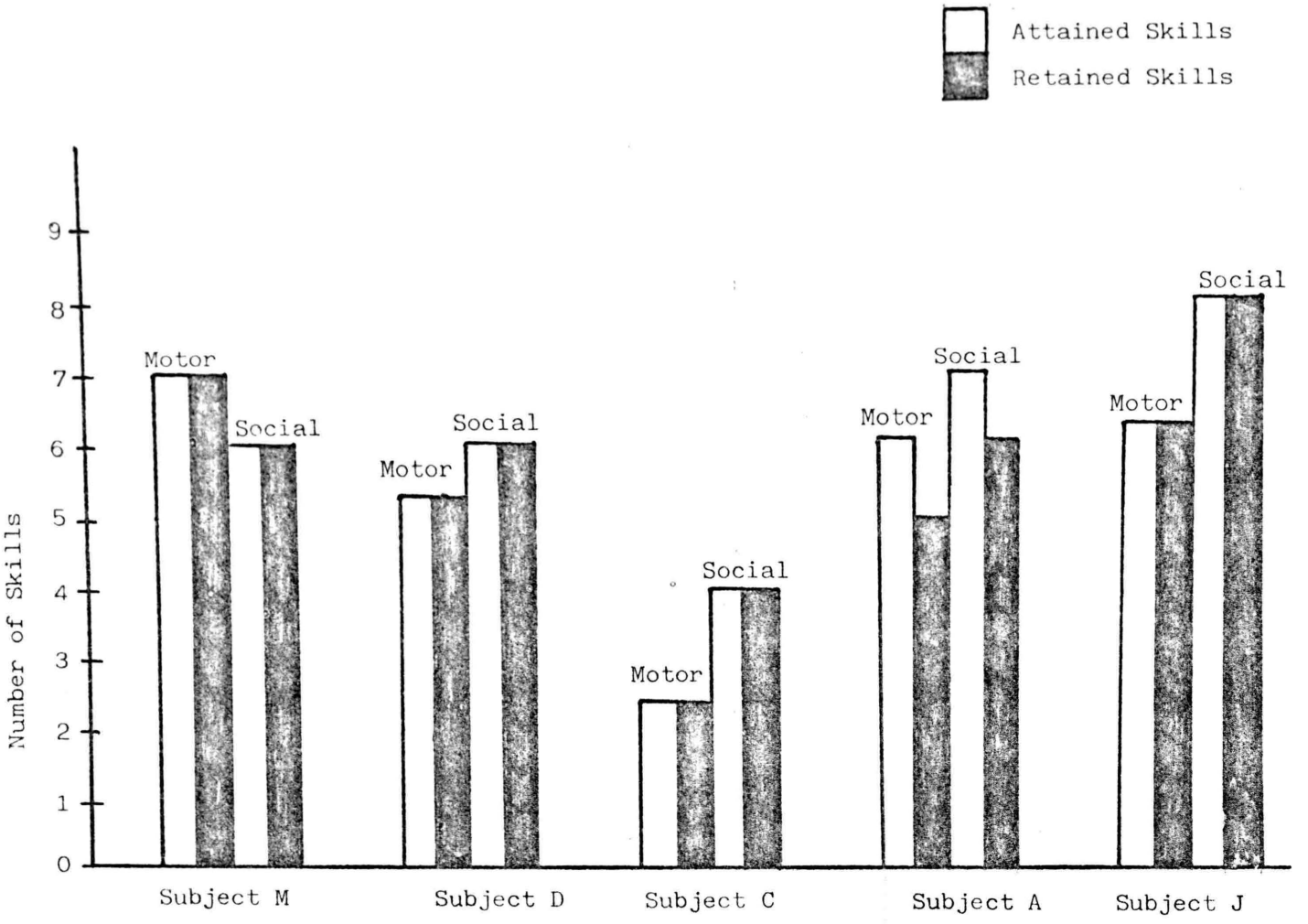

Figure 6. Summary and Comparison of Skills Acquired and Retained by All Subjects.

CHAPTER V

SUMMARY, CONCLUSION, DISCUSSION, AND RECOMMENDATIONS FOR FURTHER STUDY

The purpose of the investigation was to identify the motor and behavioral responses of five severely and/or profoundly mentally retarded children who had received training in gross motor skills through participation in an individualized physical education program. The investigator sought to determine whether participation in an individualized physical education program would improve the physical mobility of the subjects and whether it would elicit behavioral changes in the subjects.

Summary

Authorities have established the fact that several aspects of a child's growth and development are improved as he progresses physically. It has been suggested that instruction in motor-related activities should be the first step in the severe or profound retardate's learning program. Unfortunately, a review of literature revealed that there is a scarcity of research data, instructional resources, and motor assessments for the severely and/or profoundly mentally retarded populations. A few researchers have investigated the effects of various motor training techniques on the mentally retarded. Three studies (Moran, 1971;

Wilson, 1980; Tuley, 1981) examined the effects that various aquatic programs had on the mentally retarded. Improvements in IQ, physical mobility, and interrelationships among participants were found. Altman et al. (1972) investigated the relative effectiveness of modeling and verbal instructions on severe retardates' gross motor performances. A lack of spontaneous initiative behavior was found in this population. It was suggested that the use of verbal instruction and modeling together might be beneficial in prompting motor responses from this select population.

A study conducted by Jenkins (1968) investigated the values of physical education as a means of improving the gross motor performances of mentally retarded boys. The investigator found that subjects who received training in physical education improved significantly in jumping and hopping ability. Results of a study by Webb (1969) indicated that approximately half of the 32 severely and/or profoundly mentally retarded subjects increased awareness levels whereas all subjects gained improved movement patterns after participation in a specially designed training program. Two-thirds of the subjects improved in abilities to reach and grasp objects. Subjects who had not initially related to adults gained this ability, and there were some gains in posture and locomotion in all but one subject. Improvement was attributed to a sensory motor training program specifically designed to increase awareness, stimulate movement, improve ability to manipulate the environment, and develop posture and locomotor skills.

Calder (1970) attempted to develop a method of determining the motor age of severely and/or profoundly mentally retarded children. It was concluded that functional abilities and patterns of exceptional children differed from those of normal children. Specific mention was made of the importance of looking at individual motor patterns and specific abilities of children rather than general trends based on such characteristics as chronological age, mental level, or diagnostic category.

Malony et al. (1970) tested the effectiveness of a gross motor approach (balance beam walking) for training attention control with severely and profoundly mentally retarded children. The authors reported that training enhanced attention control. This study, however, did not provide sufficient support that such transfer occurred. Auxter (1971) tested the effectiveness of a gross motor development program designed to enable profoundly mentally retarded persons to more adequately cope with their physical environment. Although no statistical analyses were reported, the program did yield positive results. With increased motor function, subjects engaged voluntarily in a variety of motor activities.

The present study identified the motor and behavioral responses of severely and/or profoundly mentally retarded children who had received training in gross motor skills through participation in an individualized physical education program. Subjects consisted of 5 children, ages 6 through 10 years, from a special education facility of the Grand Prairie Independent School District, Grand Prairie, Texas. They were

classified by the school district as severely and/or profoundly mentally retarded. The study period consisted of 5 20-minute sessions per week for 8 weeks during the spring of 1981. In addition, a post-posttest was administered at 10 weeks. The investigator served as the teacher for all subjects and met with each subject individually. Data were collected from available records and reports from the subjects' personal files, daily observations and anecdotal records, results from pretests, posttests, and post-posttests taken from the Curriculum and Monitoring System's (CAMS) motor placement tool, and results of observations based on the adaptation of the Developmental Assessment of the Severely Handicapped (DASH) social/emotional pinpoint scale. Based upon the data obtained, five case studies were developed with comparisons of pretest, posttest, and post-posttest results graphically illustrated. The placement test of the CAMS motor program was employed to detemine each subject's entrance level and starting point in the program. The CAMS' gross motor objectives served as the curriculum basis. Each subject's exit level determined their posttest score. A post-posttest was administered at 10 weeks to check for the retention of gross motor skills. These test scores were graphically presented in each case study's summary. Significant behavioral changes exhibited by the subjects were determined by the observations noted by both the investigator and classroom teacher on the social/emotional checklist. If a behavior were observed by both the investigator and classroom teacher for 3 consecutive weeks, and was not seen by either during the first 2 weeks of the study,

it was considered a significant behavioral change and was reported in the case study's summary.

The criteria established for the acceptance of the research questions were improvement in at least one gross motor skill or the noting of at least one behavioral change made by all five subjects. As all subjects fulfilled these criteria, the investigator answered the following questions:

1. Would individualized instruction in gross motor skills improve physical mobility in the severely and/or profoundly mentally retarded child? Yes.

2. Would individualized instruction in gross motor skills elicit behavioral changes in the severely and/or profoundly mentally retarded child? Yes.

Conclusion

Based upon the findings of this study, the following conclusion was drawn: Gross motor skills of severely and/or profoundly mentally retarded children are improved and retained through participation in an individualized physical education program. In addition, behavioral changes are elicited.

Discussion

Several factors affected the findings of this study. The most difficult problem was the subjects' lack of internal motivation. The investigator had the responsibility of providing that motivation through

a variety of means. In addition to providing for fun and success through daily, positive experiences, it was the investigator's task to discover and utilize those aids that best prompted the subject's participation. A wide variety of motivational aids, therefore, proved essential for the success of the subjects in this study. Their short attention spans, lack of eye contact, and distractibility hindered their ability to remain motivated. The subjects attended best when the investigator was able to maintain an aura of excitement. The subjects seemed to "feed off" the investigator's enthusiasm. It was very important, therefore, that she never allowed her own enthusiasm to dwindle.

The fact that this select population tends to be non-imitative created another major problem. The accomplishment of many of the objectives called for step criteria to be met after the skill had been demonstrated by the instructor. After demonstration, it was usually necessary for the investigator to manually manipulate the subject through the task. This had to be performed several times, in addition to whatever motivational technique was being utilized, before the subject understood what was expected of him.

Due to the vast differences in exposure, learning abilities, and educational experiences, it was impossible to follow the placement procedure as outlined by CAMS for this particular population. If the manual's procedure had been followed, the subject's entrance level would have been at the point at which he could not perform the next seven tasks. The subjects' performances did not correspond with this aspect

of the program. It was typical for a subject to be able to perform an objective, not be able to perform the next few, and then be able to perform three in a row. He might have been able to perform all of the 24-month-level objectives and none on the 18-month-level. For this reason, the investigator chose to enter each subject in the program at the level of the first gross motor skill he was unable to perform. If he could perform the following objective, it was skipped, and the next objective of his program was the first task thereafter that he was unable to perform. By following this course of action, when a subject exited the program at the 36-month-level, he had "filled in" those gross motor skills he had never learned, and his true developmental age was 3 years in terms of gross motor development.

As the program progessed, several positive outcomes emerged. The investigator noted a decrease in self-stimulatory behaviors, more cooperativeness, longer attention spans, better eye contact, better communication, more alertness, more enjoyment within the play environment, more responsiveness, more risk-taking behaviors, and more physical mobility.

Some additional findings of the study were also noted and considered significant. A 1:1 teacher/student relationship was a necessity in teaching gross motor skills to the severely and/or profoundly mentally retarded child. A 2:1 teacher/student relationship was sometimes preferable in teaching gross motor skills to this population. No one method of instruction was adequate for any one subject, and a

multi-sensory approach to learning was used to provide the optimum learning experience.

The CAMS motor program and placement test were found to be beneficial for use with this select population. The adaptation of the social/emotional pinpoint scale of the DASH was beneficial in the noting of behavioral changes in this population. The investigator, however, employed two observers to fill out the checklist on all subjects to ensure interrater reliability.

The case study method was beneficial in studying the effects of an individualized physical education program on severely and/or profoundly mentally retarded children. Because the subjects of this particular population possess many unique and individual characteristics, homogeneous grouping for instruction or research is not feasible.

Recommendations for Further Study

Further research is needed in the area of mobility training for the severely and/or profoundly mentally retarded. Recommendations for further study include the following:

1. A study comparing different techniques of teaching gross motor skills to severely and/or profoundly mentally retarded individuals.

2. A study of the relationship between the attainment of gross motor skills by severely and/or profoundly mentally retarded individuals and changes in IQ scores.

3. A longitudinal study, similar to the present study, to determine the long-range effects of a gross motor program on severely and/or

profoundly mentally retarded individuals.

4. A cinematographical study of changes in motor proficiency of severely and/or profoundly mentally retarded individuals.

5. A comparison study of the motor proficiency of institutionalized and non-institutionalized severely and/or profoundly mentally retarded children.

6. A comparison study of the motor proficiency of severely and/or profoundly mentally retarded children and multiply handicapped children.

7. A comparison study of motor proficiency improvement by severe and/or profound retardates after 1:1 instruction in physical education and small group instruction.

APPENDIX A

PROGRAMMING AIDS

Motivational Aids/Reinforcers

Attention

Applause

Appropriate Games

Smiles

Hugs/Kisses

Praise

Bubbles

Bells

Balloons

Fetch-it-Freddie

Red Yarn Ball

Raggedy Ann Doll

Red Brush

Sand Paper

Music Box

Play Dough

Musical Stuffed Animals

Music/Dance

Toy Harmonica

Toy Xylophone

Gum

Dukane Projector/Films

Enthusiasm

Fun

Success

Positive Experiences

Rope

Masking Tape

Inclined Board

Treadmill

Bean Bags

Wiffle Balls

Junior Gym

Subject's Favorite Toy

Partially Deflated Balls

Mini Trampoline

Inflated Innertube

Staircase

4", 8", 12", 18" Platforms

DAILY PLAN SHEET

DATE: _____

NAME: _____

OBJECTIVE: _____

STEPS: _____

Notes

Motor Program Summary Sheet

Name:	Session Date	Time (min.)	Total Yes	Total No
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
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Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				
Obj.___ Step___				

MONTHLY PROGRAM PLAN

NAME: _____

MONTH: _____

Monday	Tuesday	Wednesday	Thursday	Friday

APPENDIX B

CAMS MOTOR PROGRAM PLACEMENT TEST

☐☐☐

CAMS MOTOR PROGRAM
PLACEMENT TEST

Name: _____ Birthdate: _____

Address: _____ Test Date: _____

Phone: _____ Examiner: _____

This placement test is given to determine at what step the child should start in the program. The test items are the criteria from the final step of each of the program objectives.

Give the placement test individually to each child in a quiet room. Gather all required materials before starting the test in order not to distract the child and prolong the test. Be sure to score each of the child's responses as it is given. The criterion for each step is printed at the end of each test item. If the child meets the criterion, circle *YES*. If he does not, circle *NO*.

Start testing the child at a level below the child's actual age. The child may be presented with a task three times before a *NO* is scored on the item. Discontinue the test after the child has seven consecutive incorrect responses. The letters *G* and *F* which follow the item numbers indicate which items are gross motor skills and which are fine motor skills. When the test is over, print the numbers of the first three items to which the child responded incorrectly in the three boxes at the top of this page. These will be the first three objectives on which the child will work.

Materials for CAMS Motor Program Test Kit

The following items are needed in order to administer the CAMS Motor Program Placement Test. They should be collected in advance, and most of them can be stored in a small box or bag.

1. a lightweight inflatable ball, ten to twelve inches in diameter
2. a small ball, two to three inches in diameter
3. eight to ten one-inch blocks
4. three one-inch beads with a hole through the center
5. a shoe string with a tip which is one to one-and-one-fourth inches in length
6. an unbreakable cup
7. a child's book
8. a rattle
9. a roll of one-inch wide masking tape
10. a small unbreakable pitcher
11. a small pill bottle with a mouth which is three-quarters inch to one-inch in diameter
12. a tape measure (which is used to measure the heights of various objects in the testing area for the items where the child is required to jump from a specific height)
13. a tricycle
14. a ten-foot balance beam. (This can be a simple ten-foot piece of four-by-four-inch wood placed on the floor)

YES NO 1G. THE CHILD RAISES HIS HEAD OFF THE FLOOR FOR ONE SECOND WHILE ON HIS STOMACH (1 month).

Materials: a favorite toy
Procedure: Put the child on the floor on his stomach with his arms bent and his hands near his head (position 2). Sit in front of him and get his attention with a toy.
Criterion: The child raises his head for at least one second to look at the toy.

YES NO 2F. THE CHILD TURNS HIS HEAD FROM SIDE TO SIDE TO FOLLOW A TOY (2 months).

Materials: a bell or rattle
Procedure: Put the child on the floor on his back (position 3). Get his attention by ringing a bell 18 inches above his eyes. Move the bell to the child's right and tap it on the floor, 18 inches from his head. The child turns his head to the right. Slowly move the bell back to the left, maintaining an 18-inch distance from the child's eyes, as he follows the sound. Repeat the movement back to the right.
Criterion: The child turns his head from side to side to follow a toy.

YES NO 3F. THE CHILD MOVES HIS EYES ACROSS THE MIDLINE (2 months).

Materials: a favorite toy
Procedure: Put the child on his back on the floor and sit at his side. Hold a toy at least six inches above his face and move it across the midline from right to left and back.
Criterion: The child follows the toy with his eyes to the right and to the left and back again.

YES NO 4G. THE CHILD HOLDS HIS HEAD UP FOR FIVE SECONDS WHILE ON HIS STOMACH ON THE FLOOR (2 months).

Materials: a favorite toy
Procedure: Put the child on the floor on his stomach with his arms bent and his hands near his head (position 2). Sit to his side and get his attention with a toy.
Criterion: The child raises his head for five seconds.

5G. THE CHILD ROLLS FROM HIS SIDE TO HIS BACK (3 months).

Materials: a favorite toy
YES NO Procedure: A) Put the child on his right side facing away from you with his head bent forward, with his knees and hips bent (position 4). Wave a toy in front of his face and slowly move it back toward you.
Criterion: The child rolls from his right side to his back.
YES NO Procedure: B) Repeat the procedure, this time with the child on his left side.
Criterion: The child rolls from his left side to his back.

YES NO 6F. THE CHILD LOOKS AT HIS HANDS FOR THREE SECONDS (4 months).

Materials: none
Procedure: Put the child on his back (position 3). Sit to his side and tap his elbows to encourage him to raise his hands. Say, "Look at your hands."
Criterion: The child raises his hands and looks at them for three seconds.

YES NO 7G. THE CHILD HOLDS HIS HEAD STEADY WHEN SUPPORTED IN A SITTING POSITION (4 months).

Materials: a colorful toy
Procedure: Seat the child sideways on your lap (position 6). Support his lower back with your arm. Encourage him to hold his head up by showing him a colorful toy.
Criterion: The child lifts his head spontaneously and holds it steady for 15 seconds.

YES NO 8G. THE CHILD LIFTS HIS HEAD AND CHEST FOR FIVE SECONDS (4 months).

Materials: a favorite toy
Procedure: Put the child on his stomach with his arms bent and his hands near his head (position 2). Wave a toy in front of him and encourage him to lift his head and shoulders.
Criterion: The child lifts his head and upper chest for five seconds.

9G. THE CHILD ROLLS FROM HIS BACK TO HIS SIDE (4 months).

Materials: a favorite toy

YES NO Procedure: A) Put the child on the floor on his back with his knees bent (position 5). Get his attention with a toy, 18 inches directly above his eyes. Slowly move the toy to the right toward the floor.

Criterion: The child rolls from his back to his right side.

YES NO Procedure: B) Repeat the procedure, this time with the child rolling on his left side.

Criterion: The child rolls from his back to his left side.

10F. THE CHILD GRASPS A TOY WHEN TOUCHED ON FINGERS (4 months).

Materials: small rattle

YES NO Procedure: A) Put the child on his back (position 3). Sit to his side and tap a rattle on the backs of the fingers of his right hand between the knuckles and the fingernails.

Criterion: The child grasps the rattle with his right hand.

YES NO Procedure: B) Repeat the procedure, this time for the child's left hand.

Criterion: The child grasps the rattle with his left hand.

YES NO 11G. THE CHILD HOLDS HIS HEAD STEADY WHEN PULLED TO A SITTING POSITION (5 months).

Materials: none

Procedure: Put the child on the floor on his back with his knees bent against you to prevent his legs from slipping (position 7d). Grasp his hands and pull him to a sitting position.

Criterion: The child holds his head steady as he is pulled to a sitting position.

YES NO 12G. THE CHILD ROLLS FROM HIS RIGHT TO LEFT AND BACK AGAIN (5 months).

Materials: a favorite toy

Procedure: Put the child on his right side, facing away from you with his head bent forward and his hips and knees bent (position 4). Wave a toy in front of his face and begin to move it back toward you. The child turns his head and rolls to his left side. Move the toy back to the right, and the child turns his head and rolls back to his right side.

Criterion: The child rolls from his right side to his left side and back again.

13F. THE CHILD REACHES FOR AN OBJECT (5 months).

Materials: a favorite toy

YES NO Procedure: A) Put the child on his stomach on the floor (position 2). Sit to his right side, and put a toy six inches directly in front of his head and move it to get his attention.

Criterion: The child reaches for the toy and touches it or grasps it with his right hand.

YES NO Procedure: B) Repeat the procedure for the child's left hand.

Criterion: The child reaches for the toy and touches or grasps it with his left hand.

YES NO 14F. THE CHILD RAKES AND PICKS UP A BEAD (6 months).

Materials: one-inch bead

Procedure: Seat the child on the floor (position 8a). Sit behind him with your legs on either side of him for support. Put a bead on the floor in front of him within his reach. Encourage him to pick up the bead.

Criterion: The child reaches for and closes his fingers around the bead (position 8b).

YES NO 15G. THE CHILD ASSUMES AND MAINTAINS HIMSELF IN A CRAWLING POSITION ON HIS FOREARMS (6 months).

Materials: a favorite toy, a low stool

Procedure: Put the child on the floor on his stomach (position 2). Put a toy on a low stool in front of him. Encourage the child to raise his head, to look at the toy, and to prop himself up on his forearms.

Criterion: The child assumes and maintains a crawling position on his forearms for thirty seconds (position 9).

YES NO **16G. THE CHILD ROLLS FROM HIS STOMACH TO BACK (6 months).**

Materials: a favorite toy
Procedure: A) Put the child on the floor on his stomach with his arms bent, and his hands near his head (position 2). Get his attention with a toy held to his right side. Slowly move the toy behind his head so that he keeps moving his head to look at the toy.
Criterion: The child rolls to the right onto his back.
Procedure: B) Repeat the procedure to the child's left side.
Criterion: The child rolls to the left onto his back.

YES NO **17G. THE CHILD SITS ON FLOOR, LEANING ON HIS HANDS FOR THIRTY SECONDS WITH ASSISTANCE (6 months).**

Materials: none
Procedure: Put the child on the floor between your legs, with him leaning forward on his hands, with his elbows straight. Support his lower back with one hand (position 12f).
Criterion: The child sits in this position for thirty seconds.

YES NO **18G. THE CHILD PICKS UP AND HOLDS TWO SMALL BLOCKS (6½ months).**

Materials: two one-inch blocks
Procedure: Seat the child on the floor (position 8a). Sit behind him with your legs on either side of him. Pick up the blocks as the child watches. Put two blocks on the floor within his reach. Tell him to pick up the blocks.
Criterion: The child picks up and holds two small blocks.

YES NO **19G. THE CHILD LIFTS HIS HEAD FOR FIVE SECONDS WHILE ON HIS BACK ON THE FLOOR (7 months).**

Materials: a bell, rattle, or toy that makes sound
Procedure: Put the child on the floor on his back (position 3) and sit at his feet. Ring a bell near his feet so that he must raise his head in order to look in the direction of the sound.
Criterion: The child raises his head for five seconds.

YES NO **20G. THE CHILD MAINTAINS HIMSELF ON HIS STOMACH WITH HIS ELBOWS STRAIGHT AND LEGS STRAIGHT BEHIND (7 months).**

Materials: none
Procedure: Put the child on the floor on his stomach. Put his arms underneath with his elbows straight for support and his legs straight behind (position 11b).
Criterion: The child holds this position without assistance for 30 seconds.

YES NO **21G. THE CHILD SITS ALONE WHILE LEANING ON HIS ARMS FOR 30 SECONDS (7 months).**

Materials: a favorite toy
Procedure: Seat the child on the floor, with him leaning forward on his hands with his elbows straight (position 12d). Place a toy in front of him to hold his attention.
Criterion: The child sits alone for thirty seconds with his arms straight.

YES NO **22F. THE CHILD TRANSFERS A BLOCK FROM ONE HAND TO THE OTHER (7 months).**

Materials: two one-inch blocks
Procedure: Seat the child on the floor (position 8a). Sit behind the child with your legs on either side of him for support. Put a block on the floor in front of him within his reach. He picks up the block. Offer him a second block to the same hand and say, "Put the block in your other hand."
Criterion: The child transfers the first block to his other hand so he can pick up the second block.

YES NO 23F. THE CHILD REMOVES A BLOCK FROM A CUP (8 months).

Materials: an unbreakable cup, one one-inch block
Procedure: Seat the child on the floor (position 8a). Sit behind him with your legs on either side of him for support. Put a block in the cup, and put the cup on the floor in front of him within his reach. Tell him to take the block out of the cup.
Criterion: The child reaches into the cup and takes out the block.

YES NO 24G. THE CHILD STANDS BEARING WEIGHT ON LEGS FOR TEN SECONDS WITH ASSISTANCE AT HIS WAIST (8 months).

Materials: none
Procedure: Put the child on the floor in a standing position (position 13). Give assistance by holding him at his waist.
Criterion: The child stands and bears weight on his legs for ten seconds with your assistance for balance at his waist.

YES NO 25F. THE CHILD HITS TWO BLOCKS TOGETHER (9 months).

Materials: two one-inch blocks or two one-inch beads
Procedure: Seat the child on the floor (position 8a). Sit behind him with your legs on either side of him for support. Tap two blocks together as he watches. Offer him the blocks; he takes one block in each hand. Tell him to hit the blocks together.
Criterion: The child hits the two blocks together.

YES NO 26G. THE CHILD CRAWLS ON HIS FOREARMS FOR TWO FEET (9 months).

Materials: a favorite toy
Procedure: Put the child in a crawling position on his stomach (position 4). Put a toy two feet in front of him and tell him to get the toy.
Criterion: The child moves his body forward by pulling with his arms to crawl two feet to the toy.

YES NO 27G. THE CHILD ASSUMES AND MAINTAINS A CREEPING POSITION ON HIS HANDS AND KNEES (9 months).

Materials: a favorite toy
Procedure: Put the child on the floor on his stomach and forearms (position 9). Tell him to get up on his hands and knees and encourage him by holding a toy over his head.
Criterion: The child assumes a creeping position and holds it for 30 seconds.

YES NO 28G. THE CHILD MOVES FROM A CREEPING POSITION TO A SITTING POSITION (9 months).

Materials: a favorite toy
Procedure: Put the child in a hands and knees position (position 15c) and hold a toy overhead. Tell him to grasp the toy.
Criterion: The child moves to a sitting position by moving his hands back until he sits on his knees (position 16).

YES NO 29G. THE CHILD SITS ERECT FOR THIRTY SECONDS (9 months).

Materials: a small toy
Procedure: Seat the child on the floor with his legs straight, both hands on the floor, and his elbows straight (position 12d). Offer him a toy which requires him to grasp it with both hands. He grasps the toy with both hands and sits erect.
Criterion: The child sits erect for thirty seconds.

YES NO 30F. THE CHILD CLAPS HIS HANDS TOGETHER (10 months).

Materials: none
Procedure: Put the child on your lap (position 17) with his back to you. Clap your hands together as he watches. Encourage him to clap his hands and possibly recite the pat-a-cake rhyme.
Criterion: The child claps his hands together.

YES NO **31F. THE CHILD STANDS HOLDING ON TO A SUPPORT FOR 30 SECONDS (10 months).**

Materials: a table or playpen between the child's shoulder and waist level.
Procedure: Put the child standing in front of a stationary object which is between his waist and shoulder level (position 18). Place his hands on the support.
Criterion: The child stands at the table and holds on for 30 seconds.

YES NO **32F. THE CHILD PICKS UP A PELLET WITH HIS THUMB AND FOREFINGER (10 months).**

Materials: a pellet (size of raisin)
Procedure: Seat the child at a table appropriate to his size (position 14a). Sit beside him and pick up a pellet with your thumb and forefinger as he watches. Put the pellet on the table and tell the child to pick it up.
Criterion: The child picks up the pellet with his thumb and forefinger (position 14b).

YES NO **33F. THE CHILD CREEPS ON HIS HANDS AND KNEES FOR TWO FEET (10 months).**

Materials: a favorite toy
Procedure: Put the child on the floor on his hands and knees (position 15c). Sit beside him and put a toy two feet in front of him. Encourage him to get the toy.
Criterion: The child creeps two feet to the toy.

YES NO **34G. THE CHILD PULLS HIMSELF UP TO HIS KNEES (10 months).**

Materials: a chair or bench, a favorite toy
Procedure: Put the child sitting on his knees in front of a chair or bench which is about his shoulder height (position 19a). Sit behind him and put a toy in front of him out of his reach. Tell him to get the toy.
Criterion: The child pulls himself up to his knees (position 19b).

YES NO **35G. THE CHILD SITS ERECT AND REACHES FOR A TOY WITHOUT USING HIS HANDS FOR BALANCE (10 months).**

Materials: a favorite toy
Procedure: A) Seat the child on the floor (position 12c). Put a toy on the floor on the outside of his right thigh, out of his reach. Tell him to get the toy.
Criterion: The child reaches for the toy and returns to an erect sitting position without putting his hands on the floor for balance.

Procedure: B) Repeat the procedure this time to the child's left side.
Criterion: The child reaches for the toy and returns to an erect sitting position without putting his hands on the floor for balance.

YES NO **36G. THE CHILD PULLS HIMSELF UP TO STAND AT A STATIONARY OBJECT (11 months).**

Materials: a bench, chair, or playpen for the child to use in pulling up to standing position
Procedure: Place the child sitting on his knees in front of a stationary object, such as a bench, chair, playpen (position 19a). Sit behind him and encourage him to stand up.
Criterion: The child pulls up to his knees and then brings his legs forward and stands up.

YES NO **37G. THE CHILD STANDS WITH ONE HAND HELD FOR THIRTY SECONDS (11 months).**

Materials: none
Procedure: A) Kneel on the floor next to the child, who is standing. Hold his right hand as he stands.
Criterion: The child stands for thirty seconds while you hold his right hand.

YES NO
Procedure: B) Repeat the procedure, this time holding his left hand.
Criterion: The child stands for thirty seconds while you hold his left hand.

38G. THE CHILD SIDESTEPS AROUND FURNITURE TO THE RIGHT AND TO THE LEFT FOR AT LEAST FIVE STEPS (11 months).

Materials: an interesting toy, a table or couch which is between the child's shoulder and waist level

YES NO Procedure: A) Put the child at a table or couch which is between his shoulder and waist level. He stands holding on. Put a toy out of reach to his right. He moves his legs to step to the side and reach the toy (position 22b).

Criterion: The child takes at least five steps to the right.

YES NO Procedure: B) Repeat the procedure, this time placing the toy to the child's left side.

Criterion: The child takes at least five steps to the left.

YES NO 39G. THE CHILD WALKS WITH AID AT HIPS FOR AT LEAST TEN STEPS (11 months).

Materials: none

Procedure: Kneel on the floor behind the child who is standing. Grasp his hips (position 23) and shift his weight to the right. He brings his left leg forward. Shift his weight to the left, and the child brings his right leg forward. Continue to shift his weight until he takes ten steps.

Criterion: The child takes ten steps with your support at his waist for balance.

40F. THE CHILD FLINGS A BALL (12 months).

Materials: a ball which fits easily into the child's hand

YES NO Procedure: A) Seat the child on the floor and sit to his side. Place the ball in his right hand and encourage him to throw the ball.

Criterion: The child flings the ball with his right hand.

YES NO Procedure: B) Repeat the procedure, this time placing the ball in the child's left hand.

Criterion: The child flings the ball with his left hand.

YES NO 41F. THE CHILD PUTS A SMALL BLOCK INTO A CUP (12 months).

Materials: one one-inch block, an unbreakable cup

Procedure: Sit at a table next to the child (position 14a). Show him how to put a block into a cup. Put the block and the cup on the table, side by side within his reach. Tell him to put the block into the cup.

Criterion: The child grasps the block and puts it into the cup.

42G. THE CHILD WALKS WITH ONE HAND HELD FOR AT LEAST TEN STEPS (12 months).

Materials: none

YES NO Procedure: A) Kneel on the floor next to the child, who is standing. Hold his right hand. Tell him to walk.

Criterion: The child takes ten steps while his right hand is being held.

YES NO Procedure: B) Repeat the procedure, this time holding the child's left hand.

Criterion: The child takes ten steps with his left hand being held.

43F. THE CHILD RELEASES A TOY ON COMMAND (12 months).

Materials: a small, interesting toy

YES NO Procedure: A) Seat the child on the floor. Sit facing him and offer a toy to his right hand. He takes the toy. Say, "Give me the toy."

Criterion: The child gives you the toy with his right hand.

YES NO Procedure: B) Repeat the procedure, this time offering the toy to his left hand.

Criterion: The child gives you the toy with his left hand.

YES NO 44G. THE CHILD STANDS ALONE FOR AT LEAST THREE SECONDS (12 months).

Materials: a small, interesting toy

Procedure: Sit on the floor behind the child who is standing. Hold the waistband of his pants for balance. Give him a toy to look at. Remove your hand from his waistband.

Criterion: The child stands alone for three seconds.

YES NO **45F. THE CHILD BUILDS A TOWER OF TWO BLOCKS (15 months).**

Materials: two one-inch blocks
Procedure: Sit at a table next to the child (position 14a). Show him how to stack two blocks. Put one block on the table and offer the other block to the child. He takes the block between his thumb and forefinger. Say, "Put the block on top of the other one."
Criterion: The child builds a tower of two blocks.

YES NO **46F. THE CHILD SCRIBBLES ON PAPER WHEN SHOWN HOW (15 months).**

Materials: a dark colored crayon, a large sheet of paper
Procedure: Sit at a table next to the child (position 14a). Put a sheet of paper in front of him and scribble on the paper with a crayon as he watches. Offer him the crayon. He takes the crayon.
Criterion: The child scribbles on the paper.

YES NO **47G. THE CHILD TAKES FIVE STEPS UNASSISTED (15 months).**

Materials: a favorite toy
Procedure: Sit on the floor behind the child, who is standing. Put a toy about seven feet in front of him. Hold him by the waistband of his pants and help him begin walking. Remove your hand from his waistband.
Criterion: The child continues walking at least five more steps.

YES NO **48F. THE CHILD PUTS A PELLET INTO A BOTTLE (15 months).**

Materials: a pellet (size of raisin), a small medicine bottle (two or three inches high, and with a mouth three-quarters inch in diameter)
Procedure: Sit beside the child at a table (position 14a). Put a pellet into a bottle as he watches. Put the pellet and the bottle on the table. Encourage him to put the pellet into the bottle.
Criterion: The child uses his thumb and forefinger to pick up the pellet and put it into the bottle (position 14b).

YES NO **49F. THE CHILD CREEPS BACKWARD DOWN FIVE STEPS (15 months).**

Materials: a flight of stairs
Procedure: Put the child near the bottom of the stairs with his arms on the sixth to the last step and his legs on the fifth to the last step (position 24a). Sit beside him and coax him to crawl down the steps.
Criterion: The child crawls backward down five steps.

YES NO **50F. THE CHILD DUMPS A BLOCK FROM A CUP (15 months).**

Materials: an unbreakable cup, one one-inch block
Procedure: Sit at a table next to the child (position 14a). Put a block into a cup while he watches. Put the cup on the table. Encourage him to dump the block from the cup.
Criterion: The child dumps the block from the cup.

YES NO **51F. THE CHILD BUILDS A TOWER OF THREE BLOCKS (18 months).**

Materials: three one-inch blocks
Procedure: Sit at a table next to the child (position 14a). Show him how to stack three blocks. Put three blocks on the table. Tell him to build a tower.
Criterion: The child takes each block between his thumb and forefinger and builds a tower of three blocks.

YES NO **52G. THE CHILD CREEPS UP FIVE STEPS (18 months).**

Materials: a favorite toy, a set of stairs
Procedure: Put the child at the bottom of the stairs on his hands and knees. Place a toy on the sixth step. Encourage him to get the toy by creeping up the stairs.
Criterion: The child creeps up five steps.

YES NO 53G. THE CHILD STOOPS TO PICK UP A TOY OFF THE FLOOR AND STANDS UP (18 months).

Materials: a small, interesting toy
Procedure: Place a small toy on the floor in front of the child, who is standing. Encourage him to stoop and get the toy (position 28b).
Criterion: The child bends at his hips and knees and squats to pick up the toy and returns to the standing position without touching his hands to the floor for balance.

YES NO 54F. THE CHILD FILLS A CUP WITH BLOCKS (18 months).

Materials: an unbreakable cup, six to eight one-inch blocks to fill the cup
Procedure: Sit at a table next to the child (position 14a). Put a cup and six to eight blocks on the table. Encourage him to fill the cup.
Criterion: The child fills the cup with the blocks.

YES NO 55G. THE CHILD WALKS UP FIVE STEPS WITH ONE HAND HELD AND ONE HAND ON THE HANDRAIL (18 months).

Materials: a flight of stairs
Procedure: Put the child at the bottom of the stairs and place one of his hands on the handrail. Stand beside him and hold his other hand. Tell him to climb the stairs.
Criterion: The child climbs five stairs, by putting two feet on each step.

YES NO 56G. THE CHILD TAKES FIVE STEPS BACKWARD (18 months).

Materials: none
Procedure: Stand next to the child and take a few steps backward as he watches. Tell him to walk backward.
Criterion: The child takes at least five steps backward.

YES NO 57F. THE CHILD BUILDS A TOWER OF FIVE BLOCKS (21 months).

Materials: five one-inch blocks
Procedure: Sit at a table next to the child (position 14a). Show him how to stack five blocks. Put five blocks on the table and tell him to build a tower.
Criterion: The child takes each block between his thumb and forefinger and builds a tower of five blocks.

YES NO 58G. THE CHILD WALKS DOWN FIVE STEPS WITH ONE HAND HELD AND OTHER HAND ON THE HANDRAIL (21 months).

Materials: a flight of stairs
Procedure: Put the child standing on the stairs, five steps from the bottom, and place one of his hands on the handrail. Stand next to the child and hold his other hand. Tell the child to step down.
Criterion: The child walks down five steps, by putting two feet on each step.

YES NO 59F. THE CHILD TURNS THE PAGES OF A BOOK, ONE AT A TIME (24 months).

Materials: a picture book
Procedure: Put the child on your lap or sit beside him at a table (position 14a). Show him how to turn the pages of a book one at a time. Place the picture book in front of the child. Tell him to turn the page.
Criterion: The child turns three pages, one at a time.

60F. THE CHILD TAPS A BALL WITH HIS TOE (24 months).

Materials: a large lightweight ball
YES NO Procedure: A) Stand next to the child. Place a large ball in front of and almost touching his feet. Show him how to tap the ball lightly with his toe. Tell him to kick the ball as you point to his right foot
Criterion: The child taps the ball with his right foot.
YES NO Procedure: B) Repeat the procedure, this time pointing to the child's left foot.
Criterion: The child taps the ball with his left foot.

YES NO 61F. THE CHILD DRAWS A VERTICAL LINE WHEN SHOWN HOW (24 months).

Materials: a pencil and paper
Procedure: Sit at a table next to the child (position 14a). Put a piece of paper on the table and draw a vertical line on the paper with the pencil. Tell the child to make a line like it, and give him the pencil.
Criterion: The child draws a line within 30 degrees of vertical.

YES NO 62G. THE CHILD WALKS UP FIVE STEPS HOLDING THE HANDRAIL WITH ONE HAND (24 months).

Materials: a flight of stairs
Procedure: Put the child at the bottom of the stairs and put one of his hands on the handrail. Tell him to climb the stairs.
Criterion: The child climbs five steps by putting two feet on each step.

YES NO 63G. THE CHILD RUNS TEN STEPS (24 months).

Materials: none
Procedure: Stand next to the child and run forward ten steps. Tell him to run.
Criterion: The child runs forward ten steps.

YES NO 64F. THE CHILD ALIGNS TWO BLOCKS (MAKES A TRAIN) WHEN SHOWN HOW (24 months).

Materials: four one-inch blocks
Procedure: Sit beside the child at a table (position 14a). Put two blocks together (side-by-side) as he watches. Place two more blocks on the table. Tell him to put the blocks together to make a train.
Criterion: The child puts two blocks side-by-side, touching each other.

YES NO 65G. THE CHILD WALKS DOWN FIVE STEPS WHILE HOLDING THE HANDRAIL WITH ONE HAND (24 months).

Materials: a flight of stairs
Procedure: Put the child on the stairs, five steps from the bottom. The child holds the handrail with one hand. Stand on the step next to him. Tell him to walk down the stairs.
Criterion: The child walks down five steps by putting two feet on each step.

YES NO 66F. THE CHILD TURNS A DOOR KNOB TO OPEN A DOOR (24 months).

Materials: a door
Procedure: Place the child in front of a closed door. Tell him to open the door.
Criterion: The child opens the door by turning the door knob with one hand.

YES NO 67F. THE CHILD THROWS A BALL OVERHAND (24 months).

Materials: a ball which fits easily into the child's hand
Procedure: Stand next to the child. Give him the ball and tell him to throw it, starting with the ball held next to the child's ear.
Criterion: The child throws the ball overhand and forward.

YES NO 68F. THE CHILD DRAWS A CIRCLE WHEN SHOWN HOW (30 months).

Materials: a pencil, paper
Procedure: Sit at a table next to the child (position 14a). Put a sheet of paper on the table and draw a circle on the paper with a pencil as he watches. Tell him to make a circle like it and give him the pencil.
Criterion: The child draws a circle in imitation. (The circle can be any rounded, enclosed form.)

YES NO 69G. THE CHILD WALKS ON TIPTOES FOR FIVE STEPS (30 months).

Materials: none
Procedure: Stand on the floor next to the child. Walk on your tiptoes as he watches. Tell him to walk on his tiptoes.
Criterion: The child walks on his tiptoes at least five steps. (It may be necessary to remove his shoes.)

YES NO 70F. THE CHILD BUILDS A TOWER OF EIGHT BLOCKS (30 months).

Materials: eight one-inch blocks
Procedure: Sit at a table next to the child (position 14a). Put eight blocks on the table within his reach. Tell him to build a tower.
Criterion: The child takes each block between his thumb and forefinger and builds a tower of eight blocks.

YES NO 71F. THE CHILD STRINGS THREE LARGE BEADS (30 months).

Materials: a shoelace (with 1¼-to 1½-inch tip), three one-inch beads
Procedure: Sit at a table next to the child (position 14a). Demonstrate stringing three beads on a shoelace. Put the lace and beads on the table. Tell the child to string all three beads.
Criterion: The child strings three beads on the lace.

YES NO 72G. THE CHILD JUMPS IN PLACE WITH BOTH FEET (30 months).

Materials: none
Procedure: Stand on the floor, facing the child. Demonstrate jumping up and down on both feet. Tell the child to jump.
Criterion: The child jumps up and down on both feet without assistance.

73G. THE CHILD STANDS ON ONE LEG WITH ASSISTANCE (36 months).

Materials: none
YES NO Procedure: A) Stand facing the child and demonstrate standing on your right leg. Grasp the child's left hand, point to his left leg, and tell him to lift it
Criterion: The child stands on his right leg for ten seconds while holding your hand. (You may hold your hand two to three inches above the floor and tell the child to touch your hand with his foot.)
YES NO Procedure: B) Repeat the procedure, this time with the child standing on his left leg.
Criterion: The child stands on his left leg for ten seconds while holding your hand.

YES NO 74G. THE CHILD WALKS BETWEEN TWO PARALLEL LINES WHICH ARE EIGHT INCHES APART, FOR FIVE FEET (36 months).

Materials: two five-foot long pieces of masking tape on floor eight inches apart.
Procedure: Stand next to the child and demonstrate walking between the two parallel lines. Put the child at the beginning of the parallel lines and tell him to walk between the lines and not to step on them.
Criterion: The child walks between two parallel lines for five feet without stepping on the lines.

YES NO 75G. THE CHILD LEAPS FROM EIGHTEEN INCHES (36 months).

Materials: an eighteen-inch platform (may be a chair, small table, etc.)
Procedure: Stand next to the child on the platform. Jump down, leading with one foot. Tell the child to jump down.
Criterion: The child jumps down, leading with one foot.

YES NO 76G. THE CHILD WALKS UP FIVE STEPS WHILE HOLDING A HANDRAIL WITH ONE HAND AND ALTERNATING HIS FEET (36 months).

Materials: a flight of stairs
Procedure: Stand at the bottom of the stairs next to the child, who is holding the handrail with one hand. Show him how to walk up the stairs by placing only one foot on each step. Tell him to climb the stairs.
Criterion: The child climbs five steps putting only one foot on each step.

YES NO 77F. THE CHILD DRAWS A HORIZONTAL LINE WHEN SHOWN HOW (36 months).

Materials: a pencil and paper
Procedure: Sit at a table next to the child (position 14a). Put a sheet of paper on the table and draw a horizontal line on the paper with the pencil as the child watches. Tell the child to make a line like it and give him the pencil.
Criterion: The child draws a horizontal line on the paper. The line must be within 30 degrees of horizontal.

YES NO 78F. THE CHILD CATCHES A LARGE BALL WITH HIS ARMS HELD STRAIGHT (36 months).

Materials: a large ball, like a beachball, 12 inches to 18 inches in diameter
Procedure: Stand about four feet from the child. Tell him to watch the ball. Gently toss him the ball and tell him to catch it.
Criterion: The child catches the ball with his arms held straight.

YES NO 79G. THE CHILD RIDES A TRICYCLE BY PUSHING THE PEDALS (36 months).

Materials: a tricycle which is the child's size
Procedure: Put the child on the tricycle, and show him how to push the pedals.
Criterion: The child rides the tricycle by pushing the pedals, for at least five feet

YES NO 80G. THE CHILD WALKS ON A STRAIGHT LINE (ONE INCH WIDE) FOR 10 FEET (36 months).

Materials: a 10-foot piece of one-inch masking tape placed on the floor
Procedure: Stand next to the child, facing a 10-foot line on the floor. Demonstrate walking on the line without stepping off. Stand next to him and tell him to walk on the line and not to step off.
Criterion: The child walks a straight line (one inch wide) for 10 feet. (He may step off the line once.)

YES NO 81F. THE CHILD BUILDS A BRIDGE WITH BLOCKS WHEN SHOWN HOW (36 months).

Materials: six one-inch blocks
Procedure: Sit beside the child at a table (position 14a). Build a bridge with three blocks by placing two blocks on the table, closer than one block's width apart, but not touching. Then place a third block on top of the other two blocks to make a bridge. Leave your bridge standing and give the child three blocks. Tell him to make a bridge.
Criterion: The child builds a bridge.

YES NO 82G. THE CHILD JUMPS OFF A NINE-INCH PLATFORM WITH BOTH FEET (36 months).

Materials: a nine-inch platform (a step, a stool, a stack of magazines, etc.)
Procedure: Stand next to the child on the platform. Jump off the platform with both feet together and then tell the child to jump down.
Criterion: The child jumps down with both of his feet together.

YES NO 83F. THE CHILD USES SCISSORS TO CUT A PAPER SIX INCHES WIDE (36 months).

Materials: a child's pair of scissors, paper at least six inches wide
Procedure: Sit beside the child at a table (position 14a). Demonstrate how to cut a paper in half. Put the scissors and paper on the table in front of the child. Tell him to cut the paper in half.
Criterion: The child cuts in half a piece of paper six inches wide.

YES NO 84F. THE CHILD POURS WATER FROM A PITCHER (36 months).

Materials: a small, unbreakable pitcher
Procedure: Stand beside the child in front of a sink. He may stand on a stool if necessary. Demonstrate how to pour water from a pitcher into the sink. Give him the pitcher which is half-filled with water. Tell him to pour the water into the sink.
Criterion: The child pours water from the pitcher into the sink.

85G. THE CHILD STANDS ON ONE LEG FOR ONE SECOND (40 months).

Materials: none

YES NO
Procedure: A) Face the child and demonstrate standing on your right leg. Point to the child's left leg and tell him to lift it up.
Criterion: The child stands on his right leg for one second.

YES NO
Procedure: B) Repeat the procedure, this time with the child standing on his left leg.
Criterion: The child stands on his left leg for one second.

YES NO 86G. THE CHILD WALKS FIVE FEET ON A FOUR-INCH BALANCE BEAM (48 months).

Materials: five foot long, two-by-four-inch beam
Procedure: Stand next to the child facing the balance beam and demonstrate walking on the beam. Tell the child to walk on the beam and to look straight ahead
Criterion: The child walks for five feet on the beam. (He may step off the beam once.)

YES NO 87G. THE CHILD STEP-HOPS FOR FIVE FEET, AND SKIPS LAME-DUCK FASHION (48 months).

Materials: none
Procedure: Stand next to the child and demonstrate skipping slowly on one leg, lame-duck fashion (step on right, step on left, hop on left). Say, "Step, step, hop," as you skip. Tell the child to skip and repeat, "Step, step, hop; step, step, hop," as he skips.
Criterion: The child skips slowly on one leg for five feet (step on right, step on left, hop on left).

88G. THE CHILD STANDS ON ONE LEG FOR FIVE SECONDS (48 months).

Materials: none
YES NO Procedure: A) Stand facing the child and demonstrate standing on your right leg. Point to the child's left leg and tell him to lift it up.
Criterion: The child stands on his right leg without losing his balance for five seconds.
YES NO Procedure: B) Repeat the procedure, this time with the child standing on his left leg.
Criterion: The child stands on his left leg without losing his balance for five seconds.

YES NO 89G. THE CHILD JUMPS DOWN TWENTY-EIGHT INCHES WITH FEET TOGETHER (48 months).

Materials: a twenty-eight-inch platform (may be stool, table, etc.)
Procedure: Stand next to child on the platform. Jump off the platform with your feet together. Stand in front of child and tell him to jump down.
Criterion: The child jumps off the platform with his feet together.

YES NO 90G. THE CHILD BROAD JUMPS NINE INCHES (48 months).

Materials: two sheets of typing size paper (8½-by-11 inches)
Procedure: Stand next to the child. Put a sheet of paper in front of your toes and one in front of his toes. Jump over the width of the paper in front of you with both feet. Tell the child to jump over his paper.
Criterion: The child broad jumps over the width of the typing paper with his feet together.

91G. THE CHILD HOPS FIVE TIMES WITH ASSISTANCE (48 months).

Materials: none
YES NO Procedure: A) Face the child, who is standing on the floor. Demonstrate hopping on your right leg. Hold the child's left hand, point to his right leg, and tell him to hop on it.
Criterion: The child hops five times on his right leg as you hold his left hand.
YES NO Procedure: B) Repeat the procedure, this time with the child hopping on his left leg.
Criterion: The child hops five times on his left leg as you hold his right hand.

YES NO 92F. THE CHILD DRAWS A CROSS WHEN SHOWN HOW (48 months).

Materials: paper, a pencil
Procedure: Sit next to the child at a table (position 14a). Put a piece of paper on the table and draw a cross on the paper with a pencil as the child watches. Tell him to make a cross like yours and give him the pencil. He draws a cross on the paper.
Criterion: The child must draw two lines which intersect at some point and the lines must be within 30 degrees of vertical and horizontal.

YES NO 93F. THE CHILD COPIES A CIRCLE (48 months)

Materials: paper, a pencil
Procedure: Sit at a table next to the child. Put a paper and pencil on the table and show him a printed circle (Manual page 34). Tell him to use his pencil and paper to make a picture like the one in the book.
Criterion: The child copies a circle which must be an enclosed form.

94G. THE CHILD HOPS FORWARD FIVE TIMES (54 months).

Materials: none
YES NO Procedure: A) Stand next to the child and demonstrate hopping forward on your right leg. Point to his right leg and tell him to hop forward on it.
Criterion: The child hops forward five times on his right leg.
YES NO Procedure: B) Repeat the procedure, this time with the child hopping on his left leg.
Criterion: The child hops forward five times on his left leg.

YES NO 95F. THE CHILD DRAWS A SQUARE WHEN SHOWN HOW (54 months).

Materials: paper, a pencil
Procedure: Sit beside the child at a table (position 14a). Draw a square on the paper with a pencil as he watches. Put the paper in front of him, give him the pencil, and tell him to make a square like yours.
Criterion: The child draws a square, any figure with definite sides.

YES NO 96F. THE CHILD IMITATES A RIGHT DOWNWARD DIAGONAL (60 months)

Materials: a pencil, paper
Procedure: T sits at a table next to S (position 14a). T draws a right downward diagonal line on the paper with a pencil. T gives the pencil to S and tells S to draw a line like it.
Criterion: S draws a right downward diagonal on the paper.

YES NO 97F. THE CHILD IMITATES A LEFT DOWNWARD DIAGONAL (60 months)

Materials: a pencil, paper
Procedure: T sits at a table next to S (position 14a). T draws a left downward diagonal line on the paper with a pencil. T gives the pencil to S and tells S to draw a line like it.
Criterion: S draws a left downward diagonal on the paper.

YES NO 98G. THE CHILD SKIPS AT LEAST 10 FEET (60 months)

Materials: none
Procedure: T stands next to S and demonstrates skipping slowly. T repeats, "Step, hop, step, hop," as he skips. T tells S to skip and says, "Step, hop, step, hope," as S skips on alternating feet.
Criterion: S skips at least 10 feet.

APPENDIX C

CAMS MOTOR PROGRAM

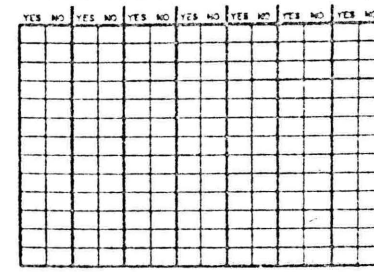
CAMS - Motor Program

Objective No. 8 - THE CHILD LIFTS HIS HEAD AND CHEST FOR FIVE SECONDS

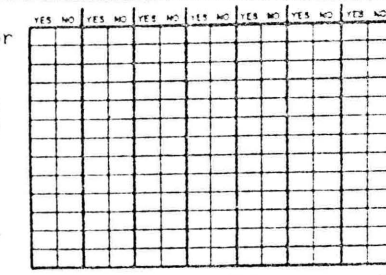
Students Name _____ **Date** _____

Materials A favorite toy

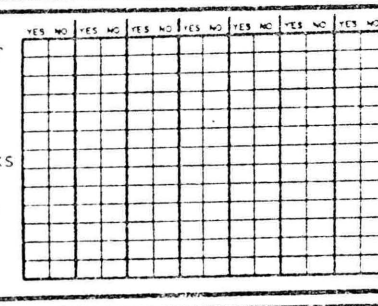
1.
SS: The child lifts his head for 5 seconds while lying on his stomach.
TP: Place the child on his stomach on the floor with his arms bent and his hands near his head (Pos. 2). Sit to the side, in front of, or astride him, and wave a toy in front of him to get his attention.
TC: The child lifts his head for 5 seconds while lying on his stomach.
SC: 4 yeses in 5 trials.

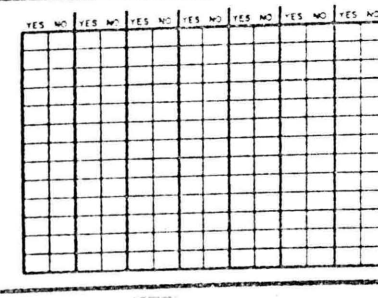


2.
SS: The child raises his head and upper chest off the floor with assistance.
TP: Place the child on his stomach on the floor with his arms bent and his hands near his head (Pos. 2). Wave a toy in front of him and encourage him to lift his head and shoulders. As he raises his head, help him raise his upper chest off the floor by putting your hand under his upper chest or by holding his shoulders and lifting gently.
TC: The child lifts his head and upper chest off the floor with assistance.
SC: 4 yeses in 5 trials.



3.
SS: The child raises his head and upper chest off the floor for 5 seconds.
TP: Place the child on his stomach on the floor with his arms bent and his hands near his head (Pos. 2). Wave a toy in front of him and encourage him to lift his head and shoulders. He lifts his head and shoulders and looks at the toy.
TC: The child lifts his head and upper chest for 5 seconds.
SC: 4 yeses in 5 trials.





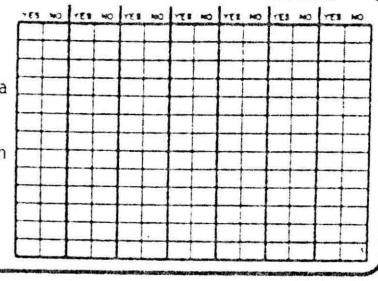
CAMS - Motor Program

Objective No. 9 - THE CHILD ROLLS FROM HIS BACK TO HIS SIDE

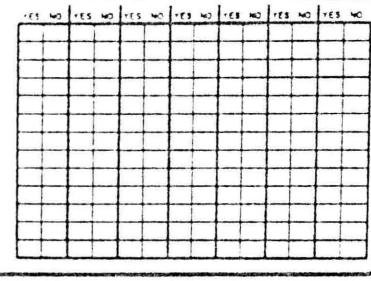
Students Name _____ **Date** _____

Materials A favorite toy

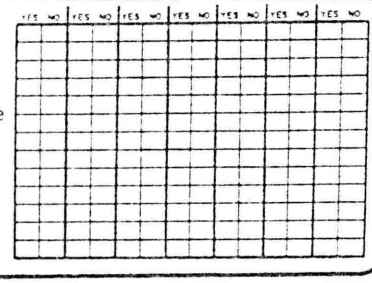
1.
SS: The child turns to his right with assistance at his shoulder and hip, and rolls to his right side.
TP: Place the child on his back on the floor with his hips and knees bent (Pos. 5). Get his attention by holding a toy 18 inches above his eyes, then move the toy to the right toward the floor. He turns his head to follow the toy while you help by turning his left shoulder and then left hip to the right.
TC: The child turns to his right with assistance at his shoulder and hip, and rolls to his right side.
SC: 4 yeses in 5 trials.



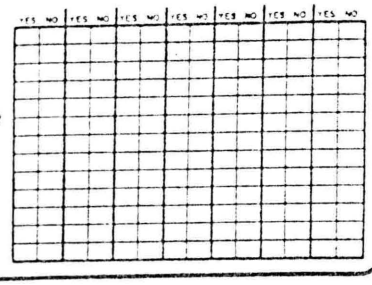
2.
SS: The child turns to the left with assistance at his shoulder and hip, and rolls to his left side.
TP: Place the child on his back on the floor with his hips and knees bent (Pos. 5). Get his attention by holding a toy 18 inches above his eyes, then move the toy to the left toward the floor. He turns his head to follow the toy while you help by turning his right shoulder and then right hip to the left.
TC: The child turns to the left with assistance at his shoulder and hip, and rolls to his left side.
SC: 4 yeses in 5 trials.



3.
SS: The child turns to the right with assistance at his shoulder, and rolls to his right side.
TP: Place the child on his back on the floor with his hips and knees bent (Pos. 5). Get his attention by holding a toy 18 inches above his eyes. Slowly move the toy to the right toward the floor. He turns his head to follow the toy while you help by turning his left shoulder to the right.
TC: The child turns to the right with assistance at his shoulder, and rolls to his right side
SC: 4 yeses in 5 trials



4.
SS: The child turns to the left with assistance at his shoulder, and rolls to his left side.
TP: Place the child on his back on the floor with his hips and knees bent (Pos. 5). Get his attention by holding a toy 18 inches above his eyes. Slowly move the toy to the left toward the floor. He turns his head to follow the toy while you help by turning his right shoulder to the left.
TC: The child turns to the left with assistance at his shoulder, and rolls to his left side.
SC: 4 yeses in 5 trials.

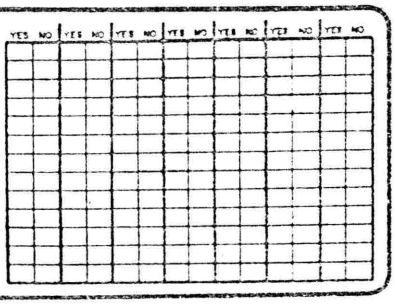


Objective No. 9 - THE CHILD ROLLS FROM HIS BACK TO HIS SIDE

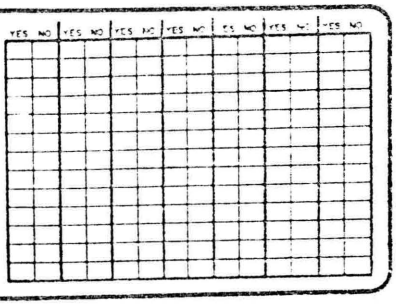
Students Name _____ **Date** _____

Materials A favorite toy

5.
SS: The child rolls from his back to his right side without assistance.
TP: Place the child on his back on the floor with his hips and knees bent (Pos. 5). Get his attention by holding a toy 18 inches above his eyes. Slowly move the toy to the right toward the floor. He turns his head and body to follow the toy and rolls to his right side.
TC: The child rolls from his back to his right side.
SC: 4 yeses in 5 trials.



6.
SS: The child rolls from his back to his left side without assistance.
TP: Place the child on his back on the floor with his hips and knees bent (Pos. 5). Get his attention by holding a toy 18 inches above his eyes. Move the toy to the left toward the floor. He turns his head and body to follow the toy and rolls to his left side.
TC: The child rolls from his back to his left side.
SC: 4 yeses in 5 trials.



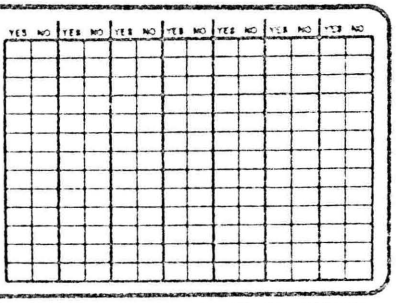
CAMS - Motor Program

Objective No. 12 - THE CHILD ROLLS FROM HIS RIGHT TO HIS LEFT AND BACK AGAIN

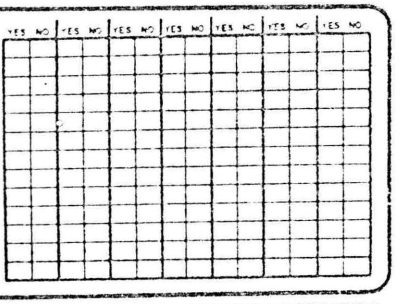
Students Name _____ Date _____

Materials A favorite toy

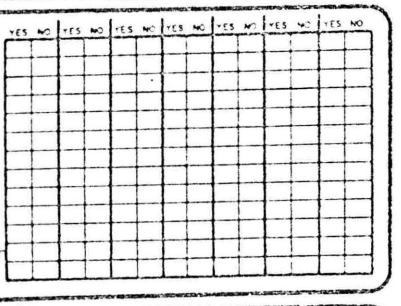
S: The child turns his head straight up while he is lying on his left side.
P: Place the child on his left side, facing away from you, with his head bent forward and his knees and hips bent (Pos. 4). Wave a toy in front of his face, and move it back slowly toward you until the toy is directly above the side of his head. He turns his face to the right to look up at the toy.
C: The child turns his head straight up while he is lying on his left side.
C: 4 yeses in 5 trials.



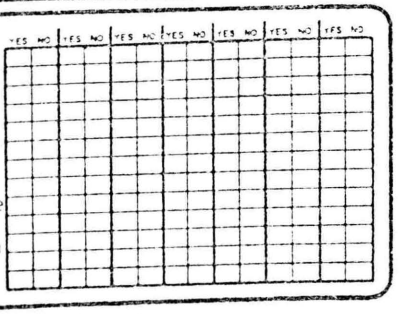
S: The child turns his head straight up while he is lying on his right side.
P: Place the child on his right side, facing away from you, with his head bent forward and his knees and hips bent (Pos. 4). Wave a toy in front of his face, and move it back slowly toward you until the toy is directly above the side of his head. He turns his face to the left to look up at the toy.
C: The child turns his head straight up while he is lying on his right side.
C: 4 yeses in 5 trials.



3.
S: The child rolls from his left side to his right side with assistance at his shoulders and hips.
P: Place the child on his left side, facing away from you, with his head forward and his knees and hips bent (Pos. 4). Wave a toy in front of his face, and move it back toward you. Grasp his right shoulder, then his hip, and help him roll onto his back. Change your grasp to his left shoulder and hip, and continue to help him make one continuous movement until he is on his right side.
C: The child rolls from his left side to his right side with assistance at his shoulders and hips.
C: 4 yeses in 5 trials.



4.
S: The child rolls from his right side to his left side with assistance at his shoulders and hips.
P: Place the child on his right side, facing away from you, with his head forward and his knees and hips bent (Pos. 4). Wave a toy in front of his face, and move it back toward you. Grasp his left shoulder, then his hip, and help him roll onto his back. Change your grasp to his right shoulder and hip, and continue to help him make one continuous movement until he is on his left side.
C: The child rolls from his right side to his left side with assistance at his shoulders and hips.
C: 4 yeses in 5 trials.



Objective No. 12 - THE CHILD ROLLS FROM HIS RIGHT TO LEFT AND BACK AGAIN

Students Name _____ **Date** _____

Materials A favorite toy

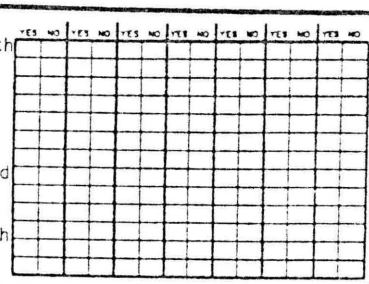
6.

SS: The child rolls from his left side to his right side with assistance only at his shoulders.

TP: Place the child on his left side, facing away from you, with his head forward and his knees and hips bent (Pos. 4). Wave a toy in front of his face, and move it back toward you. Grasp his right shoulder and help him roll onto his back. Change your grasp to his left shoulder and continue to help him make one continuous movement until he is on his left side.

TC: The child rolls from his left side to his right side with assistance only at his shoulders.

SC: 4 yeses in 5 trials.



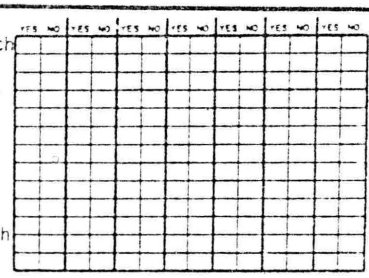
7.

SS: The child rolls from his right side to his left side with assistance only at his shoulders.

TP: Place the child on his right side, facing away from you, with his head forward and his knees and hips bent (Pos. 4). Wave a toy in front of his face, and move it back toward you. Grasp his left shoulder and help him roll onto his back. Change your grasp to his right shoulder and continue to help him make one continuous movement until he is on his left side.

TC: The child rolls from his right side to his left side with assistance only at his shoulders.

SC: 4 yeses in 5 trials.



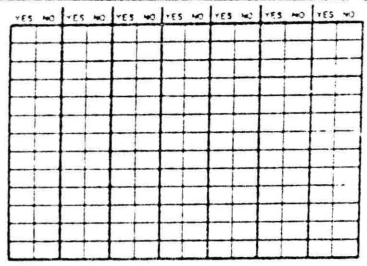
8.

SS: The child rolls from his right side to his left side and back again without assistance.

TP: Place the child on his right side, facing away from you, with his head bent forward and his knees and hips bent (Pos. 4). Wave a toy in front of his face, and begin to move it back toward you. He turns his head and rolls to his left side. Move the toy back to the right, and he turns his head and rolls back to his right side.

TC: The child rolls from his right side to his left side and back again.

SC: 4 yeses in 5 trials.



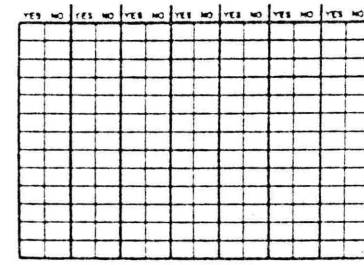
CAMS - Motor Program

Objective No. 15 - THE CHILD ASSUMES AND MAINTAINS A CRAWLING POSITION ON HIS FOREARMS

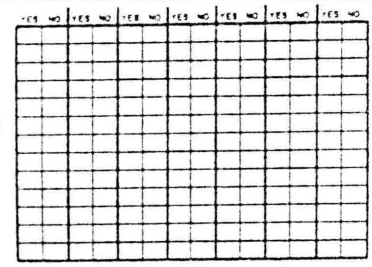
Students Name _____ Date _____

Materials A favorite toy, a low stool

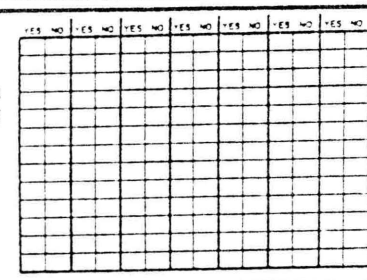
1.
SS: The child maintains himself in a crawling position on his forearms with assistance.
TP: Place the child on the floor on his forearms with his legs straight (Pos. 9). Place a toy on a low stool in front of him. Hold his forearms so that he must bear weight on them. He holds his head up and looks at the toy as you support his forearms.
TC: The child maintains himself in a crawling position on his forearms with assistance.
SC: 4 yeses in 5 trials.



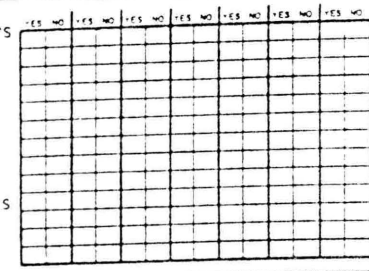
2.
SS: The child maintains himself in a crawling position on his forearms for 30 seconds.
TP: Place the child on the floor on his forearms with his legs straight (Pos. 9). Place a toy on a low stool in front of him. He holds this position without assistance as he looks at the toy.
TC: The child maintains himself in a crawling position on his forearms for 30 seconds.
SC: 4 yeses in 5 trials.



3.
SS: The child assumes a crawling position with assistance in moving his shoulders.
TP: Place the child on his stomach (Pos. 2). Place a toy on a low stool in front of him. Help him assume a crawling position by grasping and lifting one of his shoulders and sliding his forearm back until he bears weight on it (Pos. 10). Grasp his other shoulder and repeat the procedure until he assumes a crawling position.
TC: The child assumes a crawling position with assistance in moving his shoulders.
SC: 4 yeses in 5 trials.



4.
SS: The child assumes a crawling position when his shoulders are tapped.
TP: Place the child on his stomach on the floor (Pos. 2). Place a toy on a low stool in front of him. Tap one of his shoulders and tell him to pull his arm underneath himself. He pulls his arm into position. Tap his other shoulder and repeat the procedure until he assumes a crawling position (Pos. 9).
TC: The child assumes a crawling position when his shoulders are tapped.
SC: 4 yeses in 5 trials.



Objective No. 15 - THE CHILD ASSUMES AND MAINTAINS A CRAWLING POSITION ON HIS FOREARMS

Students Name _____ **Date** _____

Materials A favorite toy, a low stool

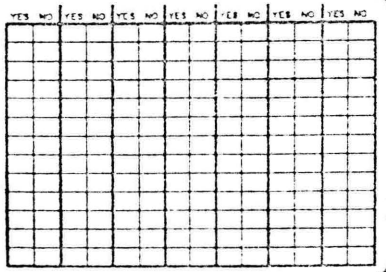
5.

SS: The child assumes and maintains a crawling position for 30 seconds without assistance.

TP: Place the child on his stomach on the floor (Pos. 2). Place a toy on a low stool in front of him and tell him to raise his head to look at the toy. He assumes and maintains a crawling position on his forearms (Pos. 9).

TC: The child assumes and maintains a crawling position on his forearms.

SC: 4 yeses in 5 trials.



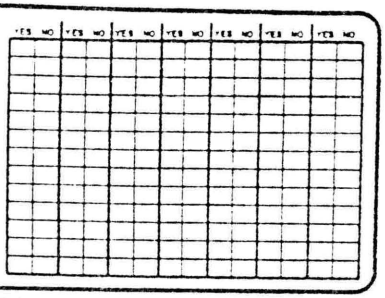
CAMS - Motor Program

Objective No. 27 - THE CHILD ASSUMES AND MAINTAINS A CREEPING POSITION ON HIS HANDS AND KNEES

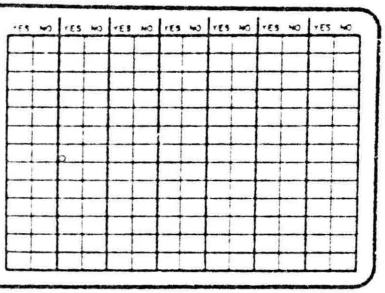
Students Name _____ **Date** _____

Materials A favorite toy

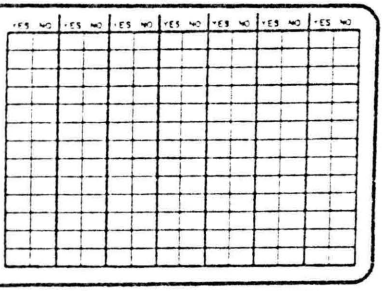
1.
SS: The child maintains a creeping position for 30 seconds with assistance at his shoulders and hips.
TP: Place the child on the floor in a hands and knees position (Pos. 15a). Sit or kneel behind him with your legs on either side of him for support. Grasp his shoulders and sit close enough to him so that you can lean forward and help support his hips.
TC: The child maintains a creeping position for 30 seconds with assistance at his shoulders and hips.
SC: 4 yeses in 5 trials.



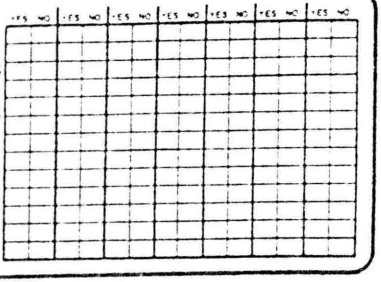
2.
SS: The child maintains a creeping position for 30 seconds with assistance at his hips.
TP: Place the child on the floor in a hands and knees position (Pos. 15b). Sit or kneel behind him with your legs on either side of him for support. Keep his attention by holding a toy in front of him. Continue to give support at his hips while he holds his arms straight.
TC: The child maintains a creeping position for 30 seconds with assistance at his hips.
SC: 4 yeses in 5 trials.



3.
SS: The child maintains a creeping position without assistance for 30 seconds.
TP: Place the child on the floor in a hands and knees position (Pos. 15c). Sit or kneel behind him with your legs on either side of him for support. Keep his attention by holding a toy in front of him.
TC: The child maintains a creeping position without assistance for 30 seconds.
SC: 4 yeses in 5 trials.



4.
SS: The child assumes a creeping position with assistance at his shoulders and hips.
TP: Place the child on the floor on his stomach and forearms (Pos. 9). Grasp his right elbow, lift his arm, and put his hand into a grasping position (Pos. 15d). Repeat with his left arm. Move his hands back alternately, until he is in a hands and knees position. As his hands are being moved, his hips will bend (Pos. 15e). Keep his feet from slipping by bracing them with your knees.
TC: The child assumes a creeping position with assistance at his shoulders and hips.
SC: 4 yeses in 5 trials.



Objective No. 27 - THE CHILD ASSUMES AND MAINTAINS A CREEPING POSITION ON HIS HANDS AND KNEES

Students Name _____ **Date** _____

Materials A favorite toy

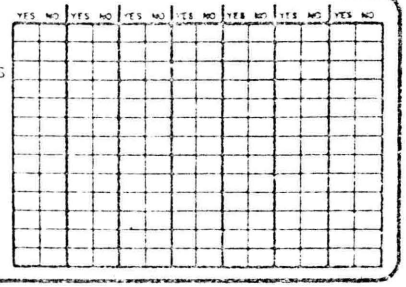
5.

SS: The child assumes a creeping position with minimal assistance at his shoulders.

TP: Place the child on the floor on his stomach and forearms (Pos. 9). Tap his right shoulder as he places his hand in a propping position (Pos. 15d). He should move his arms backward with your help at his shoulders until he is on his hands and knees. Keep his feet from slipping by bracing them with your knees (Pos. 15e).

TC: The child assumes a creeping position with minimal assistance at his shoulders.

SC: 4 yeses in 5 trials.



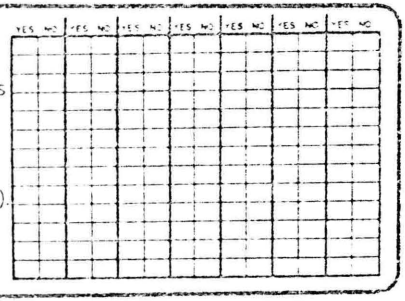
6.

SS: The child assumes a creeping position with assistance at his hips.

TP: Place the child on the floor on his stomach and forearms (Pos. 9). Help him to assume a hands and knees position by pulling back on his hips to help him bend them. He should move his arms into position while you help him with his hips. As he moves his hands, keep his feet from slipping by bracing them with your knees (Pos. 15e). Give him any verbal directions he may need.

TC: The child assumes a creeping position with assistance at his hips.

SC: 4 yeses in 5 trials.



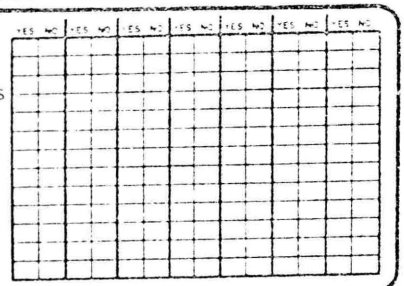
7.

SS: The child assumes and maintains a creeping position without assistance for 30 seconds.

TP: Place the child on the floor on his stomach and forearms (Pos. 9). Tell him to get up on his hands and knees, and encourage him by holding a toy over his head.

TC: The child assumes a creeping position and holds it for 30 seconds.

SC: 4 yeses in 5 trials.



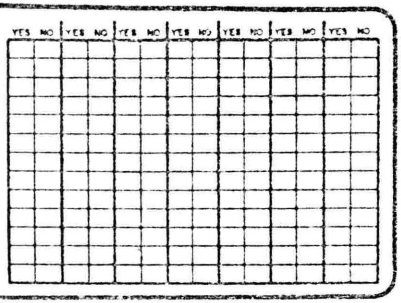
CAMS - Motor Program

Objective No. 29 - THE CHILD SITS ERECT FOR 30 SECONDS

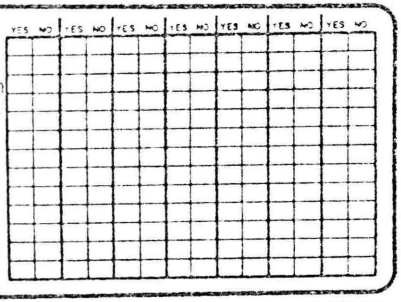
Students Name _____ **Date** _____

Materials A small toy

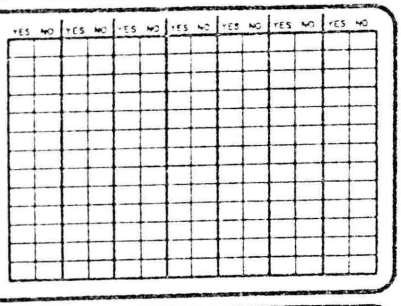
1.
SS: The child sits on the floor for 30 seconds and supports himself by having both hands on the floor.
TP: Place the child on the floor with his legs straight, both of his hands on the floor, and his elbows straight (Pos. 12b). Sit behind him with your legs on either side of him. Do not touch him.
TC: The child sits on the floor for 30 seconds and supports himself by having both hands on the floor.
SC: 4 yeses in 5 trials.



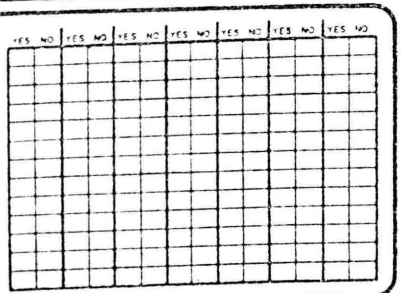
2.
SS: The child sits on the floor for 30 seconds and supports himself by having his right hand on the floor.
TP: Place the child on the floor with his legs straight, both of his hands on the floor, and his elbows straight (Pos. 12d). Sit behind him with your legs on either side of him. Do not touch him. Offer a small toy to his left hand. Assist him in grasping the toy. He sits with the support of his right hand only.
TC: The child sits on the floor for 30 seconds and supports himself by having his right hand on the floor.
SC: 4 yeses in 5 trials.



3.
SS: The child sits on the floor for 30 seconds and supports himself by having his left hand on the floor.
TP: Place the child on the floor with his legs straight, both of his hands on the floor, and his elbows straight (Pos. 12d). Sit behind him with your legs on either side of him. Do not touch him. Offer a small toy to his right hand. You may assist him in grasping the toy. He sits with support of his left hand only.
TC: The child sits on the floor for 30 seconds and supports himself by having his left hand on the floor.
SC: 4 yeses in 5 trials.



4.
SS: The child sits erect on the floor for 30 seconds with your hands at his lower back for support.
TP: Place the child on the floor with his legs straight, both of his hands on the floor, and his elbows straight (Pos. 12d). Sit behind him with him between your legs. Offer him a toy which requires him to grasp with both hands. Give him support by placing your hands at his lower back as he sits erect on the floor (Pos. 12e).
TC: The child sits erect on the floor for 30 seconds with your hands at his lower back for support.
SC: 4 yeses in 5 trials.



Objective No. 29 - THE CHILD SITS ERECT FOR 30 SECONDS

Students Name _____ **Date** _____

Materials A small toy

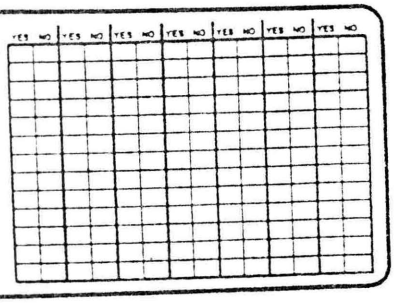
5.

SS: The child sits erect on the floor for 30 seconds without assistance.

TP: Place the child on the floor with his legs straight, both of his hands on the floor, and his elbows straight (Pos. 12d). Offer him a toy which requires him to grasp with both hands. He grasps the toy with both hands and sits erect without assistance (Pos. 12f).

TC: The child sits erect for 30 seconds.

SC: 4 yeses in 5 trials.



Objective No. 29 - THE CHILD SITS ERECT FOR 30 SECONDS

Students Name _____ **Date** _____

Materials A small toy

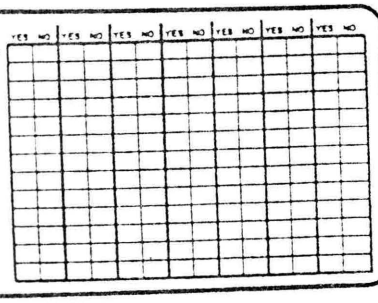
5.

SS: The child sits erect on the floor for 30 seconds without assistance.

TP: Place the child on the floor with his legs straight, both of his hands on the floor, and his elbows straight (Pos. 12d). Offer him a toy which requires him to grasp with both hands. He grasps the toy with both hands and sits erect without assistance (Pos. 12f).

TC: The child sits erect for 30 seconds.

SC: 4 yeses in 5 trials.



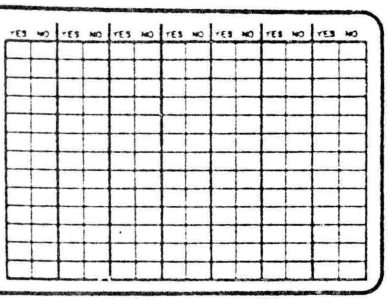
CAMS - Motor Program

Objective No. 62 - THE CHILD WALKS UP FIVE STEPS HOLDING THE HANDRAIL WITH ONE HAND

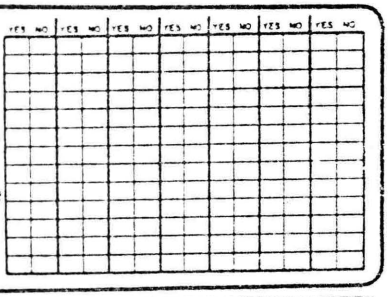
Students Name _____ **Date** _____

Materials A flight of stairs

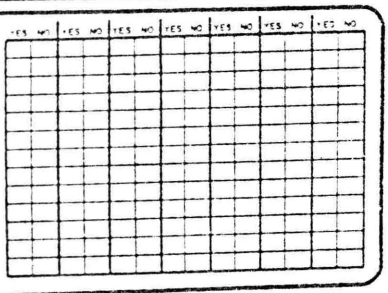
1.
SS: The child climbs two steps with assistance in moving his legs.
TP: Put the child at the bottom of the stairs with his right hand on the rail. Kneel beside him and hold his hips (Pos. 30). Say, "Step up." Shift his weight to the left and help him put his right leg on the first step. Keep your left hand on his left hip. Shift his weight to the right and help him put his left leg on the first step. Repeat.
TC: The child climbs two steps with assistance in moving his legs.
SC: 4 yeses in 5 trials



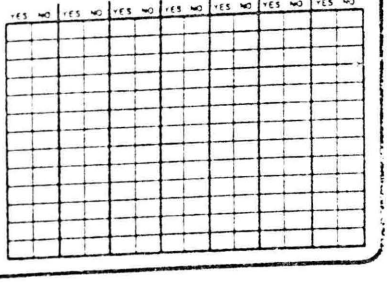
2.
SS: The child climbs five steps with assistance in moving his legs.
TP: Put the child at the bottom of the stairs with his right hand on the rail. Kneel beside him and hold his hips (Pos. 30). Say, "Step up." Shift his weight to the left and help him put his right leg on the first step. Keep your hand on his left hip. Shift his weight to the right and help him put his left leg on the first step. Continue to
TC: The child climbs five steps with assistance in moving his legs.
SC: 4 yeses in 5 trials



3.
SS: The child climbs two steps when his thighs are tapped.
TP: Put the child at the bottom of the stairs with his right hand on the rail. Do not put your hands on his hips. Say, "Step up." as you tap the backs of his thighs to show him which leg to move next as he climbs the stairs. Repeat.
TC: The child climbs two steps when his thighs are tapped.
SC: 4 yeses in 5 trials



4.
SS: The child climbs five steps when his thighs are tapped.
TP: Put the child at the bottom of the stairs with his right hand on the rail. Do not put your hands on his hips. Say, "Step up." as you tap the backs of his thighs to show him which leg to move next as he climbs the stairs. Continue to the fifth step.
TC: The child climbs five steps when his thighs are tapped.
SC: 4 yeses in 5 trials.

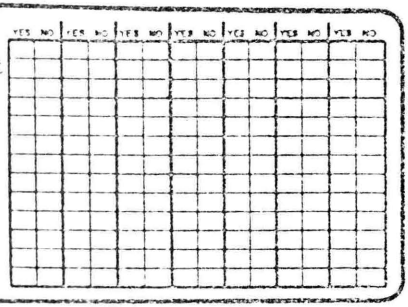


Objective No. 62 - THE CHILD WALKS UP FIVE STEPS HOLDING THE HANDRAIL WITH ONE HAND

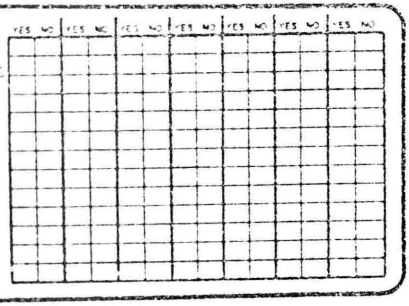
Students Name _____ **Date** _____

Materials A flight of stairs

5.
SS: The child climbs two steps without assistance.
TP: Put the child at the bottom of the stairs with his right hand on the rail. Tell him to climb the stairs. The child puts both feet on each step.
TC: The child climbs two steps without assistance.
SC: 4 yeses in 5 trials.



6.
SS: The child climbs five steps without assistance.
TP: Put the child at the bottom of the stairs with his right hand on the rail. Tell him to climb the stairs. He puts both feet on each step.
TC: The child climbs five steps by putting two feet on each step.
SC: 4 yeses in 5 trials.

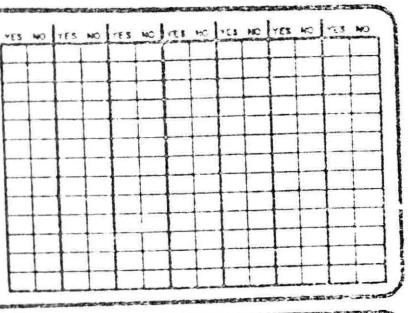


Objective No. 63 - THE CHILD RUNS TEN STEPS

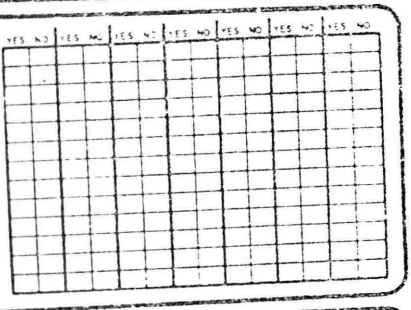
Students Name _____ **Date** _____

Materials None

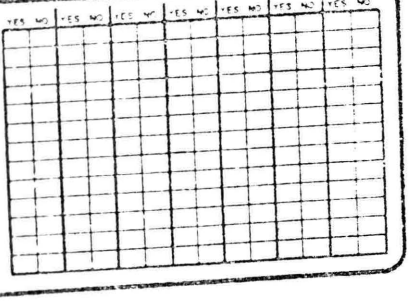
5.
SS: The child runs forward slowly 10 steps while holding your hand.
TP: Stand next to the child and run forward slowly. Then grasp one of his hands and tell him to run. Run slowly with him.
TC: The child runs forward slowly 10 steps while holding your hand.
SC: 4 yeses in 5 trials.



6.
SS: The child runs forward slowly 10 steps without assistance.
TP: Stand next to the child and run forward slowly. Then tell him to run.
TC: The child runs forward slowly 10 steps without assistance.
SC: 4 yeses in 5 trials.



7.
SS: The child runs forward 10 steps without assistance.
TP: Stand next to the child and run forward faster. Then tell him to run.
TC: The child runs forward 10 steps.
SC: 4 yeses in 5 trials.



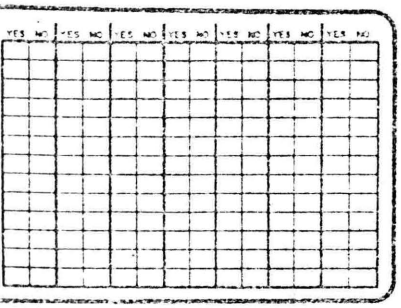
CAMS - Motor Program

Objective No. 65 - THE CHILD WALKS DOWN FIVE STEPS WHILE HOLDING THE RAIL WITH ONE HAND

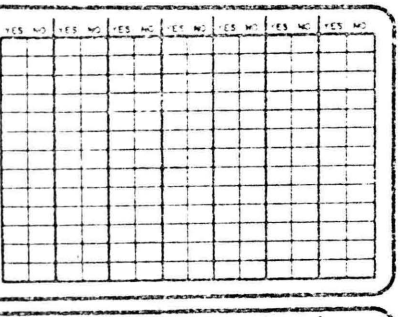
Students Name _____ **Date** _____

Materials A flight of stairs

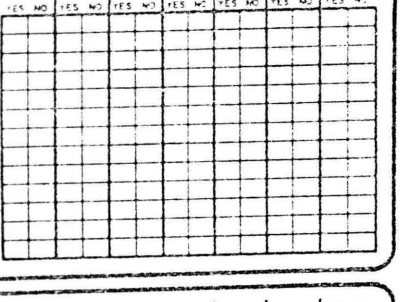
1.
SS: The child walks down two steps with assistance in moving his legs.
TP: Put the child on the stairs, two steps from the bottom, and put his right hand on the rail. Stand or sit on the step next to him and hold his hips (Pos. 31). Say, "Step down." Shift his weight to the left, put his right leg on the next step and keep your left hand on his left hip. Shift his weight to the right, and put his left foot on the next step. Repeat.
TC: The child walks down two steps with assistance in moving his legs.
SC: 4 yeses in 5 trials.



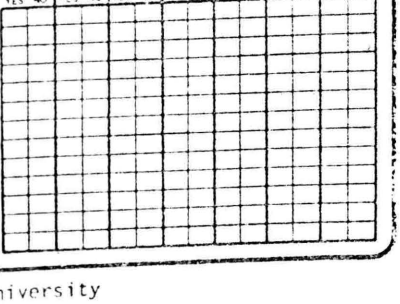
2.
SS: The child walks down five steps with assistance in moving his legs.
TP: Put the child on the stairs, five steps from the bottom, and put his right hand on the rail. Stand or sit on the step next to him and hold his hips (Pos. 31). Say, "Step down." Shift his weight and help him move his legs as above. Continue for five steps.
TC: The child walks down five steps with assistance in moving his legs.
SC: 4 yeses in 5 trials.



3.
SS: The child walks down two steps when his thighs are tapped.
TP: Put the child on the stairs, two steps from the bottom, and put his right hand on the rail. Stand or sit on the step next to him. Take your hands off his hips. Tell him to go down the stairs and tap the backs of his thighs to show him which leg to move next.
TC: The child walks down two steps when his thighs are tapped.
SC: 4 yeses in 5 trials.



4.
SS: The child walks down five steps when his thighs are tapped.
TP: Put the child on the stairs, five steps from the bottom, and put his right hand on the rail. Stand or sit on the step next to him. Take your hands off his hips. Tell him to go down the stairs and tap the backs of his thighs to show him which leg to move next.
TC: The child walks down five steps when his thighs are tapped.
SC: 4 yeses in 5 trials.

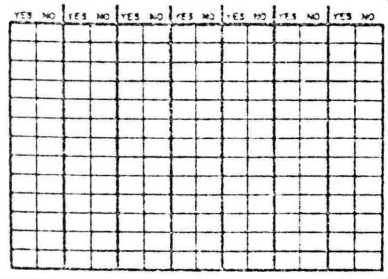


Objective No. 65 - THE CHILD WALKS DOWN FIVE STEPS WHILE HOLDING THE RAIL WITH ONE HAND

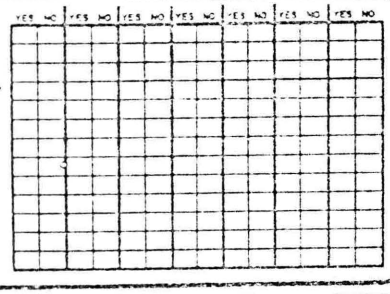
Students Name _____ Date _____

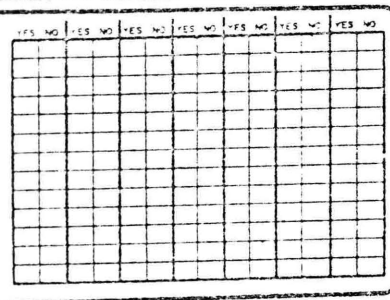
Materials A flight of stairs

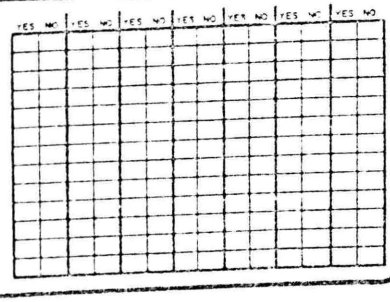
5.
SS: The child walks down two steps while holding the rail without assistance.
TP: Put the child on the stairs, two steps from the bottom, and put his right hand on the rail. Stand or sit on the step next to him. Tell him to go down the stairs. He should put both feet on each step as he walks down.
TC: The child walks down two steps while holding the rail without assistance.
SC: 4 yeses in 5 trials.



6.
SS: The child walks down five steps while holding the rail without assistance.
TP: Put the child on the stairs, five steps from the bottom, and put his right hand on the rail. Stand or sit on the steps next to him. Tell him to go down the stairs. He should put both feet on each step as he walks down.
TC: The child walks down five steps by putting two feet on each step.
SC: 4 yeses in 5 trials.







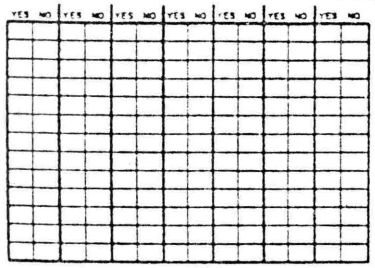
CAMS - Motor Program

Objective No. 69 - THE CHILD WALKS ON TIPTOES FOR FIVE STEPS

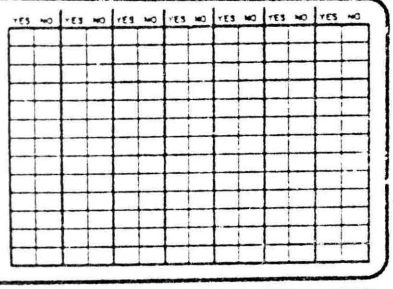
Students Name _____ **Date** _____

Materials None

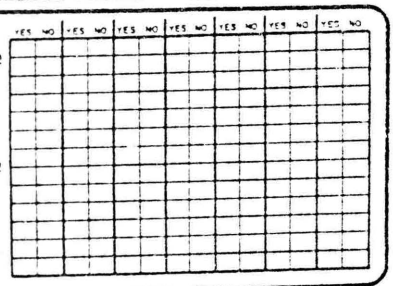
1.
SS: The child pushes up on his toes with assistance for balance.
TP: Stand on the floor facing the child. Stand on your tiptoes as he watches. Then hold his hands to help him balance, as you tell him to stand on his tiptoes.
TC: The child pushes up on his toes with assistance for balance.
SC: 4 yeses in 5 trials.



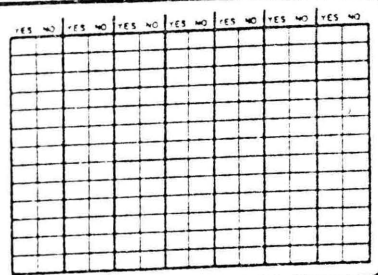
2.
SS: The child stands on his tiptoes for three seconds with assistance for balance.
TP: Stand on the floor facing the child. Stand on your tiptoes as he watches. Then hold his hands to help him balance, as you tell him to stand on his tiptoes.
TC: The child stands on his tiptoes for three seconds with assistance for balance.
SC: 4 yeses in 5 trials.



3.
SS: The child walks on his tiptoes at least five steps while holding your hand for balance.
TP: Stand on the floor facing the child. Walk on your tiptoes as he watches. Tell him to walk on his tiptoes. Allow him to hold your hand for balance.
TC: The child walks on his tiptoes at least five steps while holding your hand for balance.
SC: 4 yeses in 5 trials.



4
SS: The child walks on his tiptoes without assistance at least five steps.
TP: Stand on the floor facing the child. Walk on your tiptoes as he watches. Tell him to walk on his tiptoes.
TC: The child walks on his tiptoes at least five steps. (It may be necessary to remove his shoes.)
SC: 4 yeses in 5 trials.



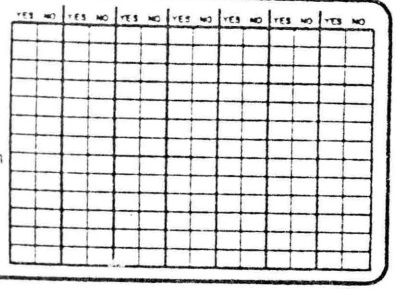
CAMS - Motor Program

Objective No. 72 - THE CHILD JUMPS IN PLACE WITH BOTH FEET

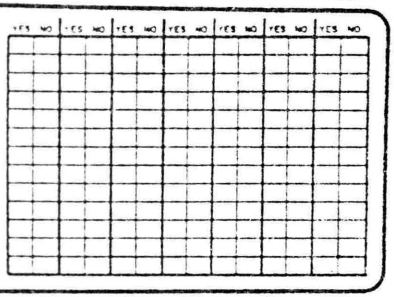
Students Name _____ **Date** _____

Materials A bed, mattress, or small trampoline

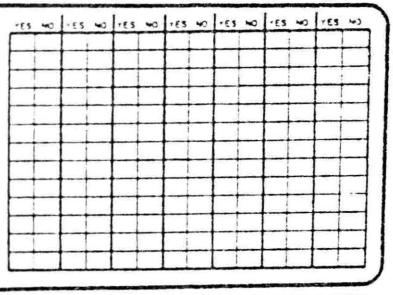
1.
SS: The child jumps up and down with both feet on a bed with assistance at his waist.
TP: Stand on the floor facing the child, who is standing on a bed or on a small trampoline. Jump up and down with both feet as he watches. Grasp his waist, tell him to jump up and down and help him do so.
TC: The child jumps up and down with both feet on a bed with assistance at his waist.
SC: 4 yeses in 5 trials.



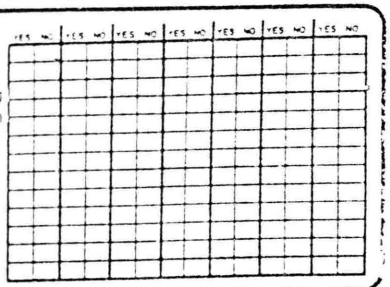
2.
SS: The child jumps up and down with both feet three times on a bed with you holding his hands.
TP: Stand on the floor facing the child, who is standing on a bed or on a small trampoline. Jump up and down with both feet as he watches. Grasp his hands, tell him to jump up and down and help him do so.
TC: The child jumps up and down with both feet three times on a bed with you holding his hands.
SC: 4 yeses in 5 trials



3.
SS: The child jumps three times on a bed without assistance.
TP: Stand on the floor facing the child, who is standing on a bed or on a small trampoline. Jump up and down with both feet as he watches. Tell him to jump up and down.
TC: The child jumps three times on a bed without assistance.
SC: 4 yeses in 5 trials.



4.
SS: The child straightens his legs forcefully with assistance.
TP: Stand on the floor facing the child, who is also standing on the floor. Bend your knees to a slightly bent position and then quickly straighten your knees, as he watches. Help him to bend his knees and then hold his waist. Tell him to straighten his knees as you assist at his waist.
TC: The child straightens his legs forcefully with assistance.
SC: 4 yeses in 5 trials.

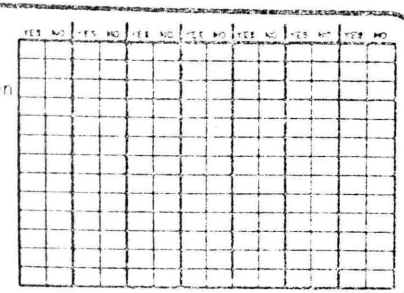


Objective No. 72 - THE CHILD JUMPS IN PLACE WITH BOTH FEET

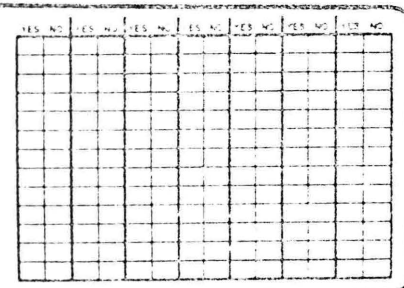
Students Name _____ **Date** _____

Materials A bed, mattress, or small trampoline

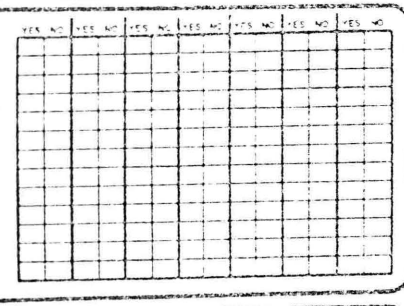
5.
SS: The child straightens his legs quickly.
TP: Stand on the floor facing the child. Bend your knees to a slightly bent position and then quickly straighten your knees, as he watches. Tell him to bend his knees and then to quickly straighten them.
TC: The child straightens his legs quickly.
SC: 4 yeses in 5 trials.



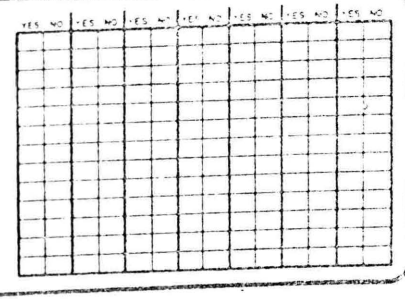
6.
SS: The child jumps three times with both feet with assistance at his waist.
TP: Stand on the floor facing the child. Jump up and down with both feet as he watches. Tell him to jump up and down. Stoop to grasp his waist and help him jump up and down.
TC: The child jumps three times with both feet with assistance at his waist.
SC: 4 yeses in 5 trials.



7.
SS: The child jumps three times with both feet with you holding his hands.
TP: Stand on the floor facing the child. Jump up and down with both feet as he watches. Grasp his hands and tell him to jump up and down.
TC: The child jumps three times with both feet with you holding his hands.
SC: 4 yeses in 5 trials.



8.
SS: The child jumps three times with both feet without assistance.
TP: Stand on the floor facing the child. Jump up and down with both feet as he watches. Tell him to jump up and down.
TC: The child jumps up and down on both feet without assistance.
SC: 4 yeses in 5 trials.



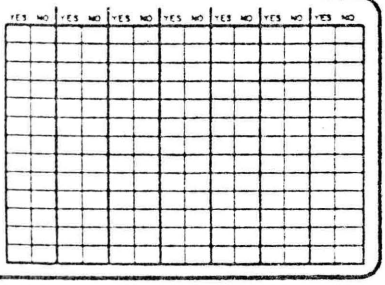
CAMS - Motor Program

Objective No. 73 - THE CHILD STANDS ON ONE LEG WITH ASSISTANCE

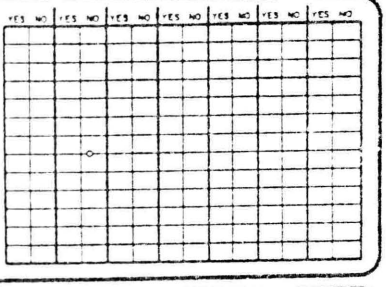
Students Name _____ **Date** _____

Materials None

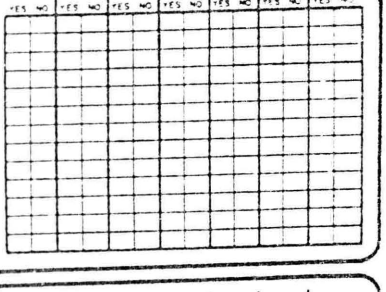
1.
SS: The child stands on his right leg for 3 seconds with assistance holding up his left leg.
TP: Stand facing the child and stand on your right leg as he watches. Then grasp his hands and tell him to stand on one leg. Point to his left leg and tell him to lift it. You may hold his left leg off the floor.
TC: The child stands on his right leg for 5 seconds with assistance holding up his left leg.
SC: 4 yeses in 5 trials.



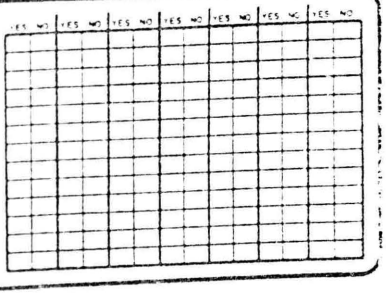
2.
SS: The child stands on his left leg for 5 seconds with assistance in holding up his right leg.
TP: Stand facing the child and stand on your left leg as he watches. Then grasp his hands and tell him to stand on one leg. Point to his right leg and tell him to lift it. You may hold his right leg off the floor.
TC: The child stands on his left leg for 5 seconds with assistance in holding up his right leg.
SC: 4 yeses in 5 trials.



3.
SS: The child stands on his right leg for 10 seconds with assistance for balance.
TP: Stand facing the child and stand on your right leg as he watches. Then grasp his hand, point to his left leg and tell him to lift it up.
TC: The child stands on his right leg for 10 seconds with assistance for balance.
SC: 4 yeses in 5 trials.



4.
SS: The child stands on his left leg for 10 seconds with assistance for balance.
TP: Stand facing the child and stand on your left leg as he watches. Then grasp his hands, point to his right leg and tell him to lift it up.
TC: The child stands on his left leg for 10 seconds with assistance for balance.
SC: 4 yeses in 5 trials.

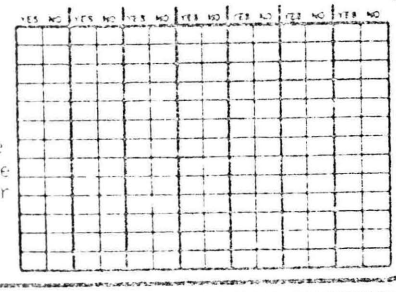


Objective No. 73 - THE CHILD STANDS ON ONE LEG WITH ASSISTANCE

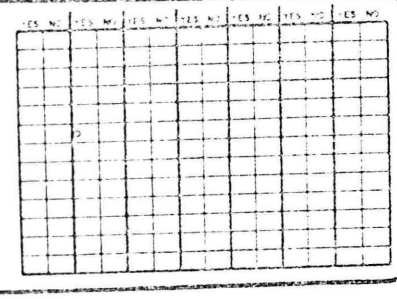
Students Name _____ Date _____

Materials None

5.
SS: The child stands on his right leg for 10 seconds with minimal assistance for balance.
TP: Stand facing the child and stand on your right leg as he watches. Then grasp his left hand, point to his left leg, and tell him to lift it.
TC: The child stands on his right leg for 10 seconds while holding your hand. (You may hold your hand two to three inches above the floor and tell the child to touch your hand with his foot.)



6.
SS: The child stands on his left leg for 10 seconds with minimal assistance for balance.
TP: Stand facing the child and stand on your left leg as he watches. Then grasp his right hand, point to his right leg, and tell him to lift it.
TC: The child stands on his left leg for 10 seconds while holding your hand.
SC: 4 yeses in trials.



CAMS - Motor Program

Objective No. 74 - THE CHILD WALKS BETWEEN TWO PARALLEL LINES WHICH ARE 8 INCHES APART

Students Name _____ **Date** _____

Materials Two five-foot long pieces of masking tape or floor twelve inches apart and eight inches apart

1.
SS: The child walks between two parallel lines 12 inches apart for five feet while holding your hand.
TP: Stand next to the child. Walk between the parallel lines as he watches. Put him at the beginning of the parallel lines and grasp one of his hands. Tell him to walk through the lines and not step on them.
TC: The child walks between two parallel lines 12 inches apart for five feet while holding your hand.
SC: 4 yeses in 5 trials.

YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

2.
SS: The child walks between two parallel lines 12 inches apart for five feet.
TP: Stand next to the child. Walk between the parallel lines as he watches. Put him at the beginning of the parallel lines and tell him to walk through the lines and not step on them.
TC: The child walks between two parallel lines 12 inches apart for five feet.
SC: 4 yeses in 5 trials

YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

3.
SS: The child walks between two parallel lines 8 inches apart for five feet while holding your hand.
TP: Stand next to the child. Walk between the parallel lines as he watches. Put him at the beginning of the parallel lines and grasp one of his hands. Tell him to walk through the lines and not step on them.
TC: The child walks between two parallel lines 8 inches apart for five feet while holding your hand.
SC: 4 yeses in 5 trials

YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

4.
SS: The child walks between two parallel lines 8 inches apart for five feet.
TP: Stand next to the child. Walk between the parallel lines as he watches. Put him at the beginning of the parallel lines and tell him to walk through the lines and not step on them.
TC: The child walks between two parallel lines for five feet without stepping on the lines.
SC: 4 yeses in 5 trials

YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

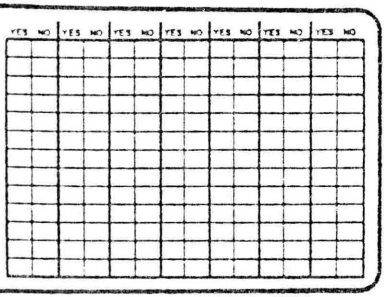
CAMS - Motor Program

Objective No. 76 - THE CHILD WALKS UP 5 STEPS HOLDING A RAIL AND ALTERNATING HIS FEET

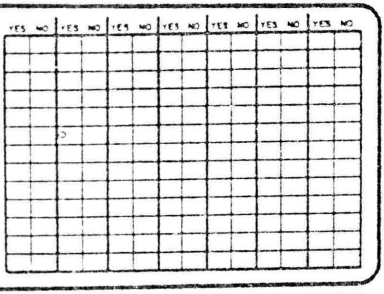
Students Name _____ **Date** _____

Materials A flight of stairs

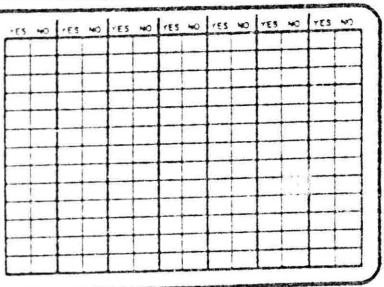
1.
SS: The child climbs five steps while holding the rail with one hand.
TP: Stand at the bottom of the stairs next to the child. He holds the rail with one hand. Tell him to walk up the steps. He puts both feet on each step as he climbs up.
TC: The child climbs up five steps while holding the rail with one hand.
SC: 4 yeses in 5 trials.



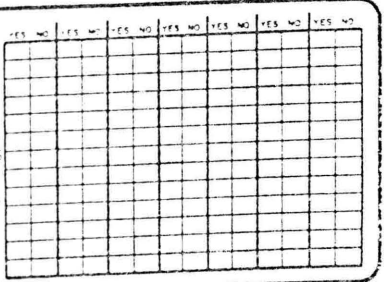
2.
SS: The child climbs two steps by alternating his feet while holding the rail and your hand.
TP: Stand at the bottom of the stairs next to the child. Walk up the stairs by alternating your feet as he watches. He holds the rail with one hand and holds your hand with the other. Tell him to walk up the steps by alternating his feet. After he takes the first step, tap the back of his opposite leg and tell him to put it on the next step. Repeat.
TC: The child climbs two steps by alternating his feet while holding the rail and your hand.
SC: 4 yeses in 5 trials.



3.
SS: The child climbs five steps by alternating his feet while holding the rail and your hand.
TP: Stand at the bottom of the stairs next to the child. Walk up the stairs alternating your feet as he watches. He holds the rail with one hand and holds your hand with the other. Tell him to walk up the steps by alternating his feet. After he takes the first step, tap the back of his opposite leg and tell him to put it on the next step. Repeat.
TC: The child climbs five steps by alternating his feet while holding the rail and your hand.
SC: 4 yeses in 5 trials.



4.
SS: The child climbs two steps by alternating his feet while holding the rail and with assistance at his hip.
TP: Stand at the bottom of the stairs next to the child. Walk up the stairs by alternating your feet as he watches. He holds the rail with one hand. Tell him to walk up the steps by alternating his feet. After he takes the first step, tap the back of his opposite leg and tell him to put it on the next step. Repeat for two steps.
TC: The child climbs two steps by alternating his feet while holding the rail and with assistance at his hip.
SC: 4 yeses in 5 trials.



Objective No. 76 - THE CHILD WALKS UP 5 STEPS HOLDING A RAIL AND ALTERNATING HIS FEET

Students Name _____ Date _____

Materials flight of stairs

6.
SS: The child climbs five steps by alternating his feet while holding the rail and with assistance at his hip.
TP: Stand at the bottom of the stairs next to the child. Walk up the stairs by alternating your feet as he watches. He holds the rail with one hand. Tell him to walk up the steps by alternating his feet. After he takes the first step, tap the back of his opposite leg and tell him to put it on the next step. Repeat.
TC: The child climbs five steps by alternating his feet while holding the rail and with assistance at his hip.
SC: 4 yeses in 5 trials.

YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO

9.
SS: The child climbs five steps while alternating his feet and holding the rail.
TP: Stand at the bottom of the stairs next to the child. He holds the rail with one hand. Tell him to climb up the steps
TC: The child climbs five steps putting only one foot on each step
SC: 4 yeses in 5 trials.

YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO

APPENDIX D

DASH--ADAPTED SOCIAL-EMOTIONAL PINPOINT SCALE

DASH--Adapted Social-Emotional Pinpoint Scale[a]

	Weeks									
	1	2	3	4	5	6	7	8	9	10
1. Shows more activity than previously when left alone--gross motor, eyes, hand, movement, etc.; 0-1 month.										
2. When touched or talked to, makes quick smile-like response; 0-1 month.										
3. Reacts within 2 seconds to sudden loud noise (hand clap, door slam) by rapid abduction-extension of arms and/or movement in other parts of body; 0-1 month.										
4. Fixes eye contact for 3 seconds on person or object; 0-1 month.										
5. Smiles in response to pleasant stimulus (i.e., spoken to, patting, stroking, tickling, kissing, etc.); 0-2 months.										
6. Responds to adult voice by increasing body movements or by ceasing crying within 10 seconds of hearing sound; 0-2 months.										
7. Smiles, without coaxing when pleased; 0-5 months.										
8. Smiles and vocalizes in response to direct verbal or physical interaction with caregiver; 3 months.										
9. Increases actions at sight of toy; 4 months.										
10. Claps hands in front of body in play; 4 months.										
11. Smiles, vocalizes, and reaches for caregiver; 0-6 months.										
12. Ceases or interrupts activity in response to command, "No"; 6-12 months.										
13. Resists (i.e., cries, sits down, or crawls away from, etc.) any pressure to do something he/she doesn't want to do; 6-12 months.										
14. Reaches for and attempts to grasp a small object placed in front of him/her (i.e., toy, diaper, etc.); 6-12 months.										
15. Reaches for, pats, hugs, or kisses familiar caregiver; 6-12 months.										

Weeks

1	2	3	4	5	6	7	8	9	10

16. Squeezes or shakes appropriate toys to produce sound after demonstration of toy; 6-12 months.

17. Seeks eye contact during the first 2-3 minutes of attention from caregiver-makes attempts to see face; 6-12 months.

18. Vocalizes when receiving direct attention; 6-12 months.

19. Imitates patterns of caregiver observed playing; 6-12 months.

20. Tracks with eyes the movements of an adult for at least 20 seconds as adult moves from room; 7 months.

21. Protects self by moving away, holding up hands, etc.; 9 months.

22. Points to one named body part on request (i.e., nose, mouth, etc.); 10-18 months.

23. Imitates actions of adults; 10 months.

24. Seeks another for play or interactions; 12-13 months.

25. Performs opposite of what is asked frequently--1 out of 3 basic requests is complied with (i.e., "Come here."); 21 months.

26. Initiates own activities for play; 24 months.

27. Cooperates with caregiver's request; 1 out of 2 requests; 24-36 months.

28. Requests complete assistance or demands independence, alternately during play; 30-35 months.

29. Locates and names fingers, toes, stomach, back, and knees on request (i.e., "Show me your toes."); 36 months.

30. Waits to be recognized visually or verbally before speaking; 48 months.

31. Participates in competitive exercise games; 48-60 months.

	Weeks									
	1	2	3	4	5	6	7	8	9	10
32. Follows rules when playing games and shows good sportsmanship; 60-71 months.										
33. Participates in imaginative play of "Let's pretend that . . ."; 66-71 months.										
34. Accepts criticism without crying, pouting, refusing to continue, etc.; 78 months.										
35. Knows and follows rules for at least 3 games (i.e., May I, Tag, Follow the Leader); 84 months.										

[a]Note. "X" indicates skill observed at least 50% of the time.

BIBLIOGRAPHY

BIBLIOGRAPHY

Altman, R., Talkington, L. W., & Cleland, C. C. Relative effectiveness of modeling and verbal instructions on severe retardates' gross motor performance. Psychological Reports, 1972, 31, 695-98.

American Alliance for Health, Physical Education, and Recreation. Physical education and recreation for impaired, disabled and handicapped individuals . . . past, present, and future. Washington, D.C.: AAHPER Publications, 1976.

Auxter, D. Motor skill development in the profoundly retarded. Training School Bulletin, 1971, 60, 5-9.

Calder, J. E. A motor age for severely and profoundly retarded children. Unpublished master's thesis, University of Connecticut, 1970.

Casto, G. Curriculum and monitoring system. New York: Walker Education Book Corp., 1979.

Dykes, M. Developmental assessment for the severely handicapped: Social-emotional pinpoint scale. Austin, Texas: Exceptional Resources, Inc., 1980.

Good, C. V. Essentials of educational research. New York: Appleton-Century-Crofts, 1966.

Grossman, H. J. Manual on terminology and classification in mental retardation (Rev.). Washington, D.C.: American Association on Mental Deficiency, 1977.

Haring, N. G. Developing effective individualized education programs for severely handicapped children and youth. Washington, D.C.: Department of Health, Education and Welfare, Office of Education, Bureau of Education for the Handicapped, 1977.

Howe, C. A comparison of motor skills of mentally retarded and normal children. Exceptional Children, 1959, 25, 352-54.

Jenkins, K. N. The relationship between participation in physical education instruction and the gross motor performance of institutionalized trainable mentally retarded boys. Unpublished master's thesis, Texas Woman's University, 1968.

Maloney, M. P., & Charrette, H. Note on the effects of gross-motor approach to training attention control on discriminating learning in mentally retarded. Perceptual and Motor Skills, 1970, 31, 41-2.

Moran, J. M. Why motor proficiency for the severe/profound retardate? Proceedings of International Congress in Physical Education Symposium on Motor Skills: Major Instrument for the Total Education of the Mentally Retarded, 1981, in press.

Moran, J. M. The effects of the front crawl swimming stroke on trainable mentally retarded children. Unpublished doctoral dissertation, University of Utah, 1971.

Moran, J. M., & Kalakian, L. H. Movement experiences for the mentally retarded or emotionally disturbed child. Minneapolis: Burgess Publishing Co., 1977.

Rarick, G. L., & Francis, R. Motor characteristics of mentally retarded. Journal of Mental Deficiency, 1959, 63, 792-811.

Robinson, N. M., & Robinson, H. B. The mentally retarded child (2nd ed.). New York: McGraw-Hill Inc., 1976.

Santa Cruz County Office of Education. Behavioral characteristics progression. Santa Cruz, Cal.: Author, 1973.

Siedentos, D. Physical education: Introductory analysis. Dubuque, Iowa: Wm. C. Brown Co., 1967.

Sontag, E., Smith, J., & Sailor, W. The severely/profoundly handicapped: Who are they? Where are they? The Journal of Special Education, 1977, 11, 5-11.

State of Wisconsin. Questions about mental retardation. Madison, Wisc.: Wisconsin Department of Public Instruction, Bulletin No. 0-59, 1972.

Stouffer, S. Social research. New York: Free Press of Glencoe, 1962.

Tuley, B. Aquatic intervention with severely mentally retarded children: Four case studies. Unpublished master's thesis, Texas Woman's University, 1981.

U.S. Government Department of Health, Education, and Welfare. Education of handicapped children, implementation of part B of the Education of the Handicapped Act. Federal Register, 1977, 42, 42475-42515.

Van Dalen, D. B. Understanding educational research: An introduction (4th ed.). New York: McGraw-Hill Book Co., 1979.

Webb, R. C. Sensori-motor training of the profoundly retarded. American Journal of Mental Deficiency, 1969, 74, 283-94.

Wilson, K. S. Aquatics for the multiply handicapped: Six case studies. Unpublished master's thesis, Texas Woman's University, 1980.