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ABSTRACT

In the final report on the project to develop programed instruction in orientation and mobility for use by teachers of multiply impaired blind children, the development of the evaluation scales and programed instruction in four basic areas of precane training, the results of field testing, and the dissemination activities are described. An introductory section covers a review of the literature, results of a pilot study involving nine multiply handicapped blind children (4-11 years old), and an overview of the project. Explained are the steps taken in developing the revised Peabody Mobility Scale which provides information on six basic orientation and mobility skills: sighted guide, seating, trailing, turning and maintaining orientation, utilization of discriminable landmarks, and environmental travel. It is noted that the programed instructional system was developed to correspond to the Peabody scale in the same four components--motor development, sensory skills, concept development, and orientation and mobility skills. Described in detail are the steps involved in implementing the field test study in terms of site and subject selection (23 facilities and a total of 42 Ss, 5-13 years old), materials, assessment and intervention procedures, results, and discussion of the results. The results of the field test study are reported as suggesting that the Peabody Mobility Project resulted in an effective instructional product which had fulfilled the project's principal goal. The bulk of the document consists of appendixes which include raw statistical data, sample profiles, excerpts from the scale and instructional materials, and sample teacher evaluation forms. (SBH)

Final Report

Project No. 44 3CH50214

Grant No. G007500596

# The Development of a Program in Orientation and Mobility for Multiply Impaired Blind Children

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Bureau of Education for the Handicapped

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Hope School
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Murdock Center
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## Introduction

In recent years a demand has grown for extending basic orientation and mobility instruction to include multiply impaired blind children. Some teachers have felt that the basic skills necessary for sighted-guide and independent travel can be learned successfully by low functioning multiply impaired children who have a variety of handicapping conditions. This report represents a detailed description of the events and activities of a project funded by the Bureau of Education for the Handicapped over a one year period to develop programmed instruction in orientation and mobility for use by teachers of multiply impaired blind children. The report will describe the development of the scales and the programmed instruction in four basic areas of precane instruction, the results of field testing, and the dissemination activities.

## Review of the Literature

A review of the literature was undertaken to determine the basis for developing a scale and programmed instruction appropriate for the target population. The identification of the skills needed by multiply impaired children in orientation and mobility and the construction of an instrument to measure these skills was considered to be a first step in designing appropriate instruction for these children.

The literature indicated that some effort has been made to define the areas in mobility instruction needed by low functioning blind children and youth. Eichorn and McDade (1969) reported on a three year project, at Walter E. Fernald State School, in teaching orientation and mobility skills to an institutionalized blind mentally retarded population from age 10 to 59. An evaluation instrument was constructed with 120 items grouped into 12 units

in areas such as body concept, environmental forms, environmental patterns, positions, textures, dimensions, geographical relationships and sighted guide techniques. They concluded that the same basic skills needed by the "normal" blind population are applicable, with some adaptations, to blind residents of institutions for the mentally retarded. The most important differences are the level and methods of presentation and the amount of time needed to learn the skills. Seelye and Thomas (1966) reported a successful mobility program with a blind girl having leg braces and crutches; a low functioning deaf/blind girl; and a low functioning blind boy. These children learned orientation and basic routes in their school building, and some outdoor travel. Areas of instruction included trailing, protective techniques, tactual discrimination, concept development, sighted guide and cane techniques. Improvement was noted in self-image, interaction with the environment, and ability to acquire information from it.

Scales have been developed to measure orientation and mobility competency in young blind children. Lord (1966:1969) used a developmental task approach to develop a scale for appraisal of orientation and mobility skills in young blind children. Significant and appropriate developmental tasks were taken from child development data and lists of skills compiled from experienced teachers. The scales included self-help skills, precane orientation and mobility skills such as movement in space, use of sensory cues in travel, and use of directions and turns in travel. Consisting of 26 subscales incorporating 124 items, these scales were standardized on 173 blind children from ages three to twelve.

The Lord scales are designed so that an individualized program in orientation and mobility can be designed for a young visually impaired child. Guldager (1970) designed a body image scale for multiply handicapped rubella

children based on the child's abilities to imitate body movement and to demonstrate object concepts as expressed in the theories and observations of Jean Piaget.

Programmed instruction and precision teaching have apparently been sweeping the country in special education, but very little research or actual practice using operant conditioning techniques has been reported in the literature in relation to multiply impaired blind children. Larsen (1970) suggested the use of operant techniques in sensory assessment. Hart (1969) reported using behavior modification and programmed instruction for young multiply impaired children of ages three to nine years in a pilot study emphasizing self-help skills, motor skills, language and speech skills, and adaptive behavior. Bricker and Bricker (1970) described a sequenced behavior modification training program aimed at remediating language deficits in severely handicapped children.

Programmed instruction based on task analysis has been useful in providing parents and teachers with manuals on how to teach handicapped children self-help skills. Project MORE at George Peabody College has provided easy to follow instructions in how to tie shoes, brush teeth, wash hands and many other areas of daily living skills (Lent & McLean, 1976). Larsen and Bricker (1968) developed a manual for parents and teachers of severely and moderately retarded young children in which behavior modification principles and methods for non-sensorily impaired low-functioning children are applied to deaf and visually impaired children. The manual is divided into two parts, the first oriented toward behavior modification and the second toward programmed activities such as pulling on socks, brushing teeth, eating correctly, and toilet training.

A manual to help parents and teachers in the development of self-help skills in multiply impaired children was developed by Hart (1971). The

systematic sequential steps in the teaching of basic skills in dressing, eating, toileting and grooming are outlined in detail. Evaluation of behavior for each skill is provided by extensive checklists, with a rating scale for each task.

In summary, the review of the literature revealed that very little research had been undertaken in orientation and mobility with multiply impaired blind children. The most helpful research was the development of the scales for use in measuring orientation and mobility precane skills in young blind children by Lord (1969).

Pilot Study

A pilot study by Harley, Wood, and Merbler (1975) was completed prior to the beginning of this project. The objectives of the pilot were to determine the feasibility of programmed instruction in orientation and mobility for the use of teachers of multiply impaired blind children; to develop a scale; and to prepare a program of instruction. The sample, from the Nashville area, was a small group of multiply impaired blind children who functioned in social maturity at a preschool level.

Those subscales developed by Lord (1969) which were deemed appropriate were administered to the selected population. After administration and scoring, the subscales were adapted or completely revised to suit the needs of multiply impaired children.

The revised items were reviewed by a panel of special consultants consisting of orientation and mobility specialists and experienced teachers of multiply impaired children. Based on the recommendation of these professionals a decision was reached concerning the basic locomotor skills, sensory training areas, and most important concepts needed by these children in order to travel independently within their environment. In addition, five basic

mobility skills were felt to be important and within the capabilities of low functioning blind children. These areas included use of a sighted guide, seating, trailing, protective skills and route travel.

The revised scale was again administered to the multiply impaired children. Video tapes were made of the administration with selected children in order to help standardize the new instructional procedure. The revised scale (Peabody Mobility Scale) was used as the basis for programmed instruction in orientation and mobility for multiply impaired blind children.

Programmatic instruction was designed for each item in the subscales. Each lesson was divided according to the purpose, task objective, materials needed, pretest, and suggested educational program. Enrichment activities were listed at the end of many of the lessons not only to provide variation but to insure sufficient practice to obtain the desired skill. Each lesson was programmed in small sequential steps and flow charts were diagrammed with directions to the teacher showing when to give commands, when to reinforce, when to repeat cycles, and when to proceed to the next step.

The subjects in this pilot study were multiply impaired blind children with special mobility problems who were selected from the Tennessee School for the Blind, Clover Bottom Hospital and School, St. Bernard Academy, and a public school program located in the Experimental School of the John F. Kennedy Center for Human Development at George Peabody College. There were five girls and four boys in the group. The nine multiply handicapped children ranged in age from four to eleven and were all severely visually impaired. One child who was non-ambulatory and traveled in a wheelchair, also was hearing impaired. All of the remaining children were developmentally delayed in speech and language, but all of the children had sufficient receptive language ability to carry out simple commands.

A pretest using the Peabody Mobility Scale (P.M.S.) was administered to all nine subjects and profiles of abilities were charted for each child according to the results of the subscales. Specific approaches for the teachers were outlined based on the profiles. These individualized instructional programs were implemented by the children's classroom teachers over a 15 week intervention period. The five head teachers and their assistants participated in a special introductory meeting at the beginning of the project and were supervised individually by project staff members over the entire period. Teachers were asked to keep a daily log and to make weekly evaluations of activities used with each child. Near the completion of the training period, teachers were invited to a second meeting with the project staff to discuss problems, share ideas, and make recommendations. The recommendations were recorded, to be used in the future revision of the manual.

The results of the pilot study tentatively supported the hypothesis of the experimentors and fulfilled the purposes of the investigation which was to test the feasibility of the programmed instruction in orientation and mobility with low-functioning blind children.

The following points emerged as the most important conclusions from the pilot study:

1. The identification of gains among the subjects indicated that programmatic instruction in orientation and mobility may be feasible for use by teachers of multiply impaired blind children.

2. The development of a scale in orientation and mobility for use with low-functioning multiply handicapped blind children seemed to be helpful in diagnosing particular weaknesses which need instruction.

3. The instructional program used in this study should be helpful in designing prescriptive programs of instruction for similar children.

4. Further research with a larger sample using experimental and control groups was needed.

Overview of Project

The objectives of this project were to develop, to refine, and to validate a revised and improved manual in orientation and mobility for multiply impaired blind children. The manual was to consist of assessment and programmed instruction components designed to be used by classroom teachers and parents. The assessment instrument was to be designed to evaluate children's developmental levels in the areas of: motor, sensory, concept, orientation and mobility skills. The programmed instruction component was to be designed so that purpose, task objectives, pretest, materials, educational program and enrichment activities were provided for each subscale Each lesson was to be programmed in small sequential steps with directions to the teacher or parent showing when to give commands, reinforce, repeat cycles, or proceed to the next steps.

The scales and programmed instruction were to be validated using experimental and control groups of multi-impaired blind children with pre- and post-intervention testing for summative program evaluation and continuous data collection on an individual basis for formative evaluations. Dissemination of the manual and the results of the study were to occur upon the completion of the study.

The following sections will describe in detail the development of the scale, the programmed instruction, the field testing, and the dissemination activities of the project.

## THE DEVELOPMENT OF THE REVISED PEABODY MOBILITY SCALE

During the Peabody Mobility Project's pilot research (Harley, Wood, and Merbler, 1975), the Peabody Mobility Scale (P.M.S.) was found by the investigators to be a useful instrument for assessing the orientation and mobility skills of multiply impaired blind children. The Scale yielded reliable information on a child's developmental level in several behaviors related to independent travel. Furthermore, the overall structure of the Scale (i.e., division into four discrete behavioral domains of motor, sensory, concept and mobility) seemed functional. However, after extensive experience administering this original instrument, the investigators decided that several aspects of the P.M.S. could benefit from substantial revisions. These revisions centered on item content, developmental ordering of the items and scoring format and were designed to increase the Scale's breadth, accuracy and ease of administration.

The first step in developing the revised edition of the Peabody Mobility Scale was to redefine the Scale's item content. Content redefinition occurred in two phases. The first phase dealt exclusively with the mobility section of the Scale. Information for revising the content of the mobility section of the P.M.S. came from three sources: the research literature on orientation and mobility; direct, informal observation of lower functioning children who were proficient travelers to determine what mobility skills they demonstrated; and the joint experience of the investigators in providing mobility instruction to low functioning children.

Through these sources of information six basic orientation and mobility skills were identified. These skills included: 1) sighted guide; 2) seating; 3) trailing; 4) turning and maintaining orientation; 5) utilization of discriminable landmarks; and 6) environmental travel. These six basic skills

comprise the Mobility Section of the Revised P.M.S.

The second phase of the redefinition of the item content of the P.M.S. pertained to the prerequisite skill domains, specifically, the motor, sensory and concept sections of the original scale. Inputs for these revisions included the research literature and task analysis of the criterion behaviors essential for independent travel. Table 1 summarizes the final product of these revisions and presents the complete item content of the revised P.M.S.

The second step in developing the revised edition of the P.M.S. was to translate the identified content of the Scale into an assessment format. The format for the revised P.M.S. was designed to adhere to four guidelines. The first guideline was that the Scale would be a criterion referenced instrument with scores based on direct observation of the behaviors of interest. The primary concern when using the criterion referenced approach is whether the child performs a specified behavior with an acceptable level of proficiency rather than how well he performs a behavior relative to his peers.

The second guideline was to devise a scale which could be administered with minimal verbal interaction between the examiner and the child. Consequently, whenever practical, a "match to sample" response mode was adopted to provide a child without expressive language a nonverbal means of communicating his response. This provision for a nonverbal response mode was crucial if the Scale was to be suitable for lower functioning children.

The third guideline was that the items would be arranged in developmental order with each item partitioned into five developmentally sequenced sub-items. The goal of this guideline was achieved through task analyzing each of the items and consulting relevant literature on the developmental progression of the behavior to be assessed.

TABLE 1

PEABODY MOBILITY SCALE

CATEGORY AND ITEMS

I. MOTOR DEVELOPMENT

1.1 Basic Movement
1.2 Creeping
1.3 Standing
1.4 Walking
1.5 Ascending Stairs
1.6 Descending Stairs
1.7 Running
1.8 Jumping
1.9 Climbing

II. SENSORY SKILLS

2.1 Sound Localization
2.2 Tactual Discrimination (Hands)
2.3 Tactual Discrimination (Feet)
2.4 Olfactory Discrimination

III. CONCEPT DEVELOPMENT

3.1 Body Image
3.2 Spatial Relations (Front/Back; Up/Down; On/Under)
3.3 Left-Right Discrimination
3.4 Shape Discrimination
3.5 Size Discrimination
3.6 Organization

IV. MOBILITY SKILLS

4.1 Sighted Guide
4.2 Seating
4.3 Turning and Maintaining Orientation
4.4 Trailing
4.5 Utilization of Discriminable Landmarks
4.6 Environmental Travel

The fourth guideline was to develop an instrument which could be administered easily by teachers or parents. Consequently, very explicit instructions were provided and the criterion behaviors for passing each sub-item were clearly defined in observable terms.

Samples of the final product of this developmental effort, items from the revised P.M.S., are presented in the Addendum to this Final Report. The number code (e.g., 1.4.1.P.) provides an index of the item's location in the scale. The first digit is the scale section (1 = Motor, 2 = Sensory, 3 = Concept, 4 = Mobility), the second digit is the item's sequential position within a section, the third number denotes the particular sub-item of an item, and the letter (P or S) denotes whether an instruction describes an administration procedure or a scoring criterion. The administration procedures are carefully described for each item and sub-item, including position of the examiner and the child, context, materials, and presentation procedures. In the scoring section, the criterion behavior is precisely defined and a scoring grid is provided for recording the examiner's evaluations. Five scoring options are available as follows: 1) NP = not performed - the child does not demonstrate the criterion response; 2) NA = not applicable - the child is unable to demonstrate the criterion response due to a physical impairment; 3) I = independent - the child demonstrates the criterion response; 4) WA = with assistance - the child demonstrates the criterion response with mild assistance; 5) O = observed - the teacher or other informant reports that the child can perform the criterion response, although the response was not demonstrated during the testing session.

The general assessment procedure consists of the examiner presenting the tasks to a child, observing the child's response, rating this response and recording his rating on the test protocol. The administration time for the P.M.S. varies between approximately one-half hour and two hours. The exact amount of time required for assessment depends upon the particular child's attention span and functional level. A complete kit of materials has been developed to accompany the assessment instrument.

Several statistics have been computed on various parameters of the revised P.M.S. Interrater-reliability, which provides a measure of how well the criterion behaviors are defined in observable terms, was computed using a percentage of agreement method. An examiner and second observer simultaneously and independently rated a group of 10 multiply impaired blind children as the children were administered the revised P.M.S. The examiner and observer were both experienced at providing mobility instruction to lower functioning children. The obtained percentage of agreement was 92% which indicates that the revised P.M.S. has high interrater-reliability.

A multiple linear regression analysis was computed on the P.M.S. to determine the validity of the assumption that the motor, sensory, and concept sections of the Scale measure behaviors which are, in fact, prerequisites for mobility. The logic of this analysis was that if motor, sensory and concept skills are prerequisites for mobility, then a child's score on the mobility section of the Scale would be predictable on the basis of his scores on the first three sections of the P.M.S. For the purpose of this analysis, the four sections of the P.M.S. were treated as four discrete scales. The mobility section of the Scale was the criterion measure, and the motor, sensory, and concept sections were used as predictor variables. The P.M.S. scores of 40 multiply impaired blind children were used as data for the regression analysis. These scores had been obtained during the

pretesting phase of the Peabody Mobility Project. A detailed description of the subjects and assessment procedures has been published (Harley, 1976).

The results of the analysis of variance performed on the regression data is presented in Table 2 . The results of the analysis indicated that a child's performance on the motor, sensory and concept portions of the P.M.S. was a good predictor of his performance on the mobility section of the scale. This supports the contention that motor, sensory and concept skills are precursors to proficient independent travel.

Additional research is currently underway on the revised P.M.S. One study will evaluate the test-retest reliability of the instrument. Further research will investigate the relationship between the motor section of the P.M.S. and other popular scales of fine and gross motor development. The final product of this further research and development effort should be a reliable, easily administered instrument for assessing Orientation and Mobility skills in multiply handicapped children.

Table 2

SUMMARY

ANALYSIS OF VARIANCE
FOR P.M.S. REGRESSION DATA

| SOURCE | SUM OF SQUARES | DEGREES OF FREEDOM | MEAN SQUARE | F |
|---|---|---|---|---|
| REGRESSION | 7001.05 | 3 | 408.68 | 11.998* |
| ERROR | 1226.05 | 36 | 34.06 | |
| TOTAL | 8227.10 | 39 | | |

*p = .01 SIGNIFICANCE LEVEL

## DEVELOPMENT OF THE PROGRAMMED INSTRUCTION

The programmed instructional system is organized into the same four separate components as the P.M.S.: motor development, sensory skills, concept development and orientation and mobility skills. All of the items within each area of the program are divided into 5 sub-items which also correspond to the Scale. The overall design is intended to provide the teacher with a beginning point for the child after assessment.

The tasks in the program are sequenced developmentally which facilitates the child's progress from the entry point to the terminal objective through successive approximations. The entire program is based on behavior modification procedures, using positive reinforcement exclusively. Reinforcers are selected by the child's teacher, based on the response level of the child.

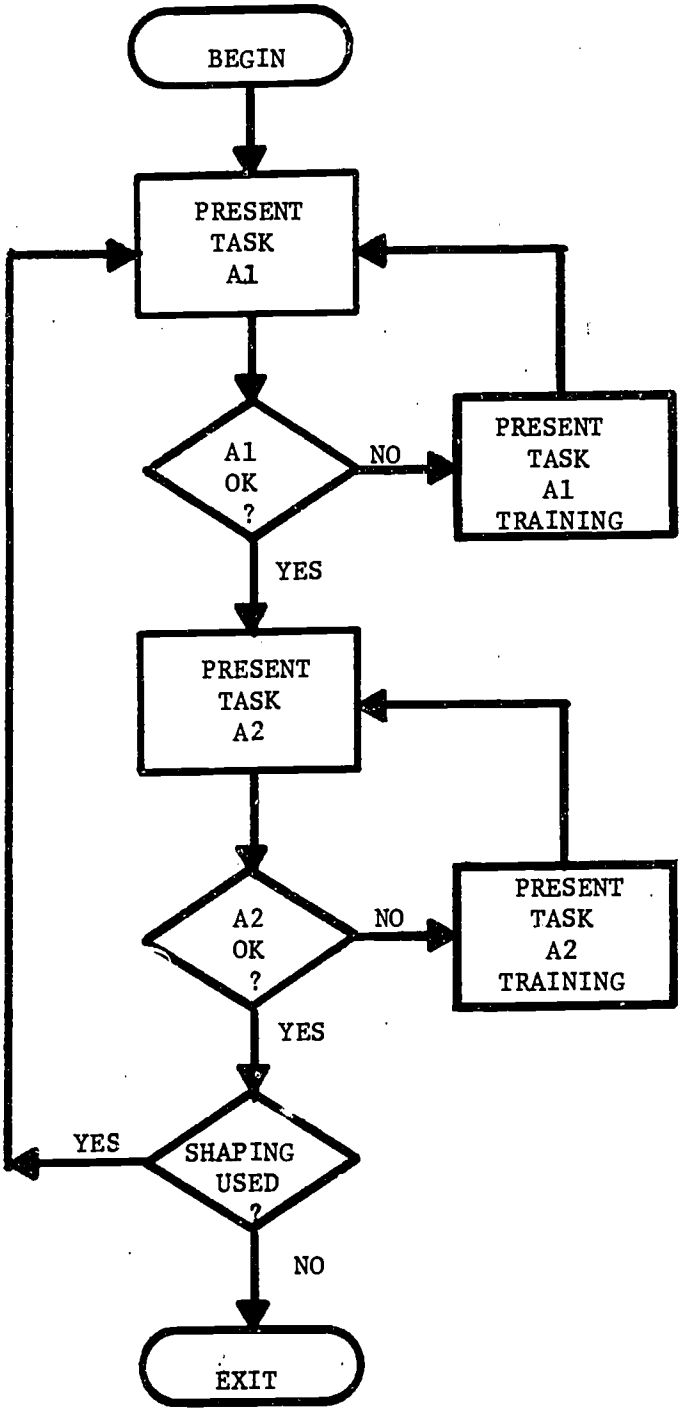
The numbering system used in the programmed instruction corresponds to the one used in the P.M.S. For example, the first number (1,2,3,4) refers to the section (motor development, sensory skills, etc.). The second number (1,2,3...) refers to item and the third number (1,2,3,4 or 5) designates the sub-item.

Each lesson was divided according to purpose, task objective, materials needed, pretest, and suggested educational program. Enrichment activities were listed at the end of many of the lessons not only to provide variation but to insure sufficient practice to obtain the desired skill. Samples of the intervention program are presented in Appendix E of this report.

Some of the lessons in the programmed instruction were designed to follow a particular system of logic. This system is illustrated in Figure 1. This system involves presenting the child with the task and proceeding with

FIGURE 1

INTERVENTION SYSTEM LOGIC



the instruction according to the child's response. The tasks included in the programmed instruction system were designed to be developmentally sequenced. This developmental sequencing was maintained both within lessons (e.g., progressive stages of learning to walk) and between lessons (e.g., crawling lesson before walking lesson).

After pretesting with the Peabody Mobility Scale it was determined that some of the tasks were too complex even at entry level for many of the children. This phenomenon brought about a decision to develop prerequisite training activities for certain lessons. The major purpose of the prerequisite activities was to build a specific response into the child's repertoire and to attempt to bridge the gap between the child's existing developmental level and the beginning point of the programmed instructional materials. Samples of the prerequisite skills are presented in Appendix E of this report.

Although several of the tasks utilize a match to sample response mode, the tasks are structured in a way that does not preclude a verbal response. A continuum of acceptable responses was included in the intervention materials to insure the compatability of the materials with groups of students functioning on diverse developmental levels. The provision of nonverbal responding was critical in view of the severe verbal language dificits which are frequently associated with lower functioning children. However, higher functioning, verbal students are not penalized or limited by a less efficient response mode.

## Introduction

Following the development of the programmed instructional system, the next phase of the Peabody Mobility Project consisted of field testing this system to determine its effectiveness as the basis for a teacher implemented basic orientation and mobility program for severely handicapped blind children. This section of the Final Report describes in detail the steps involved in implementing the field test study including: site and subject selection, materials, assessment and intervention procedures, results, and discussion of the results.

## Method

### Site Survey

A total of 23 facilities (see Table 3) serving visually impaired and/or developmentally delayed children within a 500 mile radius of Nashville, Tennessee, were surveyed early in September, 1975. They were asked to respond with the number of children enrolled in their programs who were both visually impaired and demonstrated at least one additional handicapping condition. The results of this survey indicated nine facilities which seemed to have a substantial number of children who qualified for inclusion in the instructional materials field testing program. These facilities are designated by asterisks in Table 3. The nine facilities included: four state residential schools for the blind; four developmental centers; and one public school program.

### Subjects

A total of 110 children enrolled in the nine selected facilities were screened as potential subjects for the instructional materials field test. The final experimental population was constituted on the basis of five

Table 3. Site Survey

| Site | Location |
|---|---|
| A.L. Bowen Children's Center | Harrisburg, Ill. |
| *Alabama School for the Blind | Talledega, Ala. |
| Arkansas School for the Blind | Little Rock, Ark. |
| Arlington Developmental Center | Arlington, Tenn. |
| *Ellisville State School | Ellisville, Miss. |
| Georgia Academy for the Blind | Macon, Ga. |
| *Governor Morehead School | Raleigh, N.C. |
| Green Valley Developmental Center | Green Valley, Tenn. |
| *Hope School | Springfield, Ill. |
| *Illinois Braille and Sight Saving School | Jacksonville, Ill. |
| *Indiana School for the Blind | Indianapolis, Ind. |
| *Jackson Public Schools | Jackson, Miss. |
| Kentucky School for the Blind | Louisville, Ky. |
| Memphis Public Schools | Memphis, Tenn. |
| Midland's Developmental Center | Columbia, S.C. |
| Mississippi School for the Blind | Jackson, Miss. |
| *Murdock Center | Butner, N.C. |
| Muscatatuck State Hospital and Training Center | Butlerville, Ind. |
| *Silver Crest Chronic Disease Facility | New Albany, Ind. |
| South Carolina School for the Deaf and the Blind | Spartanburg, S.C. |

| | |
|---|---|
| Western Carolina Center | Morganton, N.C. |
| Whitten Village | Clinton, S.C. |

* = Site included in field test study

criteria. These criteria included:

1. Range in chronological age from 4 years to 13 years, 11 months.
2. Possess a visual handicap of light perception or less (i.e., functioning non-visually in the environment).
3. Possess one additional handicapping condition.
4. Function on the preschool level between the ages of 2 and 6 years as measured on the Maxfield-Buchholz Social Maturity Scale.
5. Respond to verbal or manual communication.

Of the pool of 110 children, a total of 42 met the selection criteria. The preponderance of the children who were not selected were rejected on the basis of Criterion 2. Subject status relative to Criterion 2 was determined through informal observation by the experimenters and anecdotal reports by the children's classroom teachers and/or houseparents. Six children of the 42 selected were withdrawn from the experimental population during the course of the study due to chronic illness and extended absence. Table 4 presents the chronological ages, social maturity scores (as determined by the Maxfield-Buchholz), facility placement and additional handicapping conditions of the remaining 36 subjects. The mean chronological age (CA) of the subjects was 10 years, 8 months, with a range of 5 years, 2 months, to 13 years, 9 months. The social ages of the subjects ranged from 1.92 to 5.79 with a mean of 4.00.

Participating Teachers

Nine classroom teachers located at the sites from which the subjects were selected provided instruction in basic mobility skills to the experimental subjects using the programmed instructional materials. The teachers were selected on the basis of administrative feasibility with the stipulation that they had not had any formal mobility training.

Three of the teachers were physical education specialists for multiply

TABLE 4. DEMOGRAPHIC CHARACTERISTICS OF EXPERIMENTAL POPULATION

| Subject Code No. | CA | SA | Additional Handicapped | Facility Placement |
|---|---|---|---|---|
| 11 | 5-9 | 4.34 | MR/PL | Ala |
| 12 | 12-11 | 5.06 | MR | Ala |
| 13 | 13-3 | 4.86 | MR | Ala |
| 14 | 10-9 | 4.63 | MR | Ala |
| 15 | 13-4 | 3.87 | MR | Ala |
| 16 | 5-8 | 4.43 | MR | Ala |
| 17 | 5-2 | 2.11 | MR | Ala |
| 08 | 11-4 | 4.30 | MR | Mur |
| 09 | 12-5 | 5.73 | MR/NI | Mur |
| 010 | 11-9 | 1.92 | MR | Mur |
| 011 | 13-9 | 4.83 | MR | Mur |
| 012 | 11-9 | 2.87 | MR | Mur |
| 114 | 7-8 | 4.63 | MR/BD | Ind |
| 115 | 5-9 | 4.40 | MR | Ind |
| 116 | 8-8 | 3.23 | MR | Ind |
| 117 | 7-3 | 4.53 | MR | Ind |
| 118 | 8-7 | 3.03 | MR | Ind |

TABLE 4 (con't)

| Subject Code No. | CA | SA | Additional Handicapped | Facility Placement |
|---|---|---|---|---|
| 119 | 6-2 | 4.38 | MR | Ala |
| 020 | 8-3 | 2.07 | MR/LP | Silver |
| 021 | 7-10 | 4.63 | MR/NI | Silver |
| 122 | 11-6 | 2.97 | MR | IBSSS |
| 123 | 7-9 | 3.53 | MR | IBSSS |
| 124 | 9-5 | 3.40 | MR | IBSSS |
| 125 | 10-7 | 4.33 | MR | IBSSS |
| 026 | 11-10 | 4.93 | MR | Hope |
| 027 | 13-7 | 4.83 | MR | Hope |
| 028 | 10-4 | 4.50 | MR/LP | Hope |
| 029 | 8-9 | 2.47 | MR | Hope |
| 030 | 13-8 | 5.00 | MR | Hope |
| 031 | 11-9 | 3.77 | MR | Hope |
| 032 | --- | 3.20 | MR | Ellis |
| 033 | | 3.94 | MR | Ellis |
| 034 | | 2.58 | MR/deaf | Ellis |
| 135 | 10-1 | 5.46 | MR | NCS |
| 136 | 9-9 | 5.63 | MR | NCS |

TABLE 4 (con't)

| Subject Code No. | CA | SA | Additional Handicapped | Facility Placement |
|---|---|---|---|---|
| 137 | 12-5 | 5.30 | MR | NCS |
| 138 | 6-1 | 4.70 | MR | NCS |
| 139 | 8 | 4.83 | MR | NCS |
| 240 | 13-6 | 2.94 | MR/deaf | Jack. |
| 241 | 13-3 | 2.40 | MR/BD | Jack. |

Key to Facility Placement:

Ala - Alabama School for the Blind

Mur - Murdoch Center

Ind - Indiana School for the Blind

Silver - Silvercrest Disability and Chronic Disease Facility

IBSSS - Illinois Braille and Sight Saving School

Hope - The Hope School

Ellis - Ellisville State School

NCS - North Carolina School for the Blind

Jack - Jackson Public School Program

handicapped children, one teacher was a mathematics instructor for high functioning blind children, and the remaining four participants were classroom teachers for multiply handicapped children. All of the teachers had a minimum of two years of classroom teaching experience.

Materials

The Peabody Mobility Scale was used for the assessment of the subject's level of skill development in motor, sensory, concept and basic mobility domains. The P.M.S. was described earlier.

The Maxfield-Buchholz Social Maturity Scale for Preschool Blind Children (Maxfield-Buchholz,1957) was used to assess the subject's general level of functioning. The Scale is an adaptation of the Vineland Social Maturity Scale (Doll,1937) and follows an interview format. It consists of 95 items arranged according to the developmental year level of expected item fulfillment within the skill categories of a) Self help General, b) Self help Dressing, c) Socialization, d) Locomotion, and e) Occupation. The Maxfield-Buchholz Scale yields a Social Age (SA) which is the sum of the number of months credit a child earned as a function of the number of items he passed, and a Social Quotient (SQ) which is the ratio of a child's chronological age to his Social Age.

The Peabody Programmed Instruction System in Orientation and Mobility (Harley,Wood,Merbler,unpublished) was used as the basis of the training program to determine its instructional effectiveness. A detailed description of this training system is included later in this report.

Experimental Design

A schematic diagram of the experimental design used in the present study is presented in Figure 2. The present study employed one experimental group

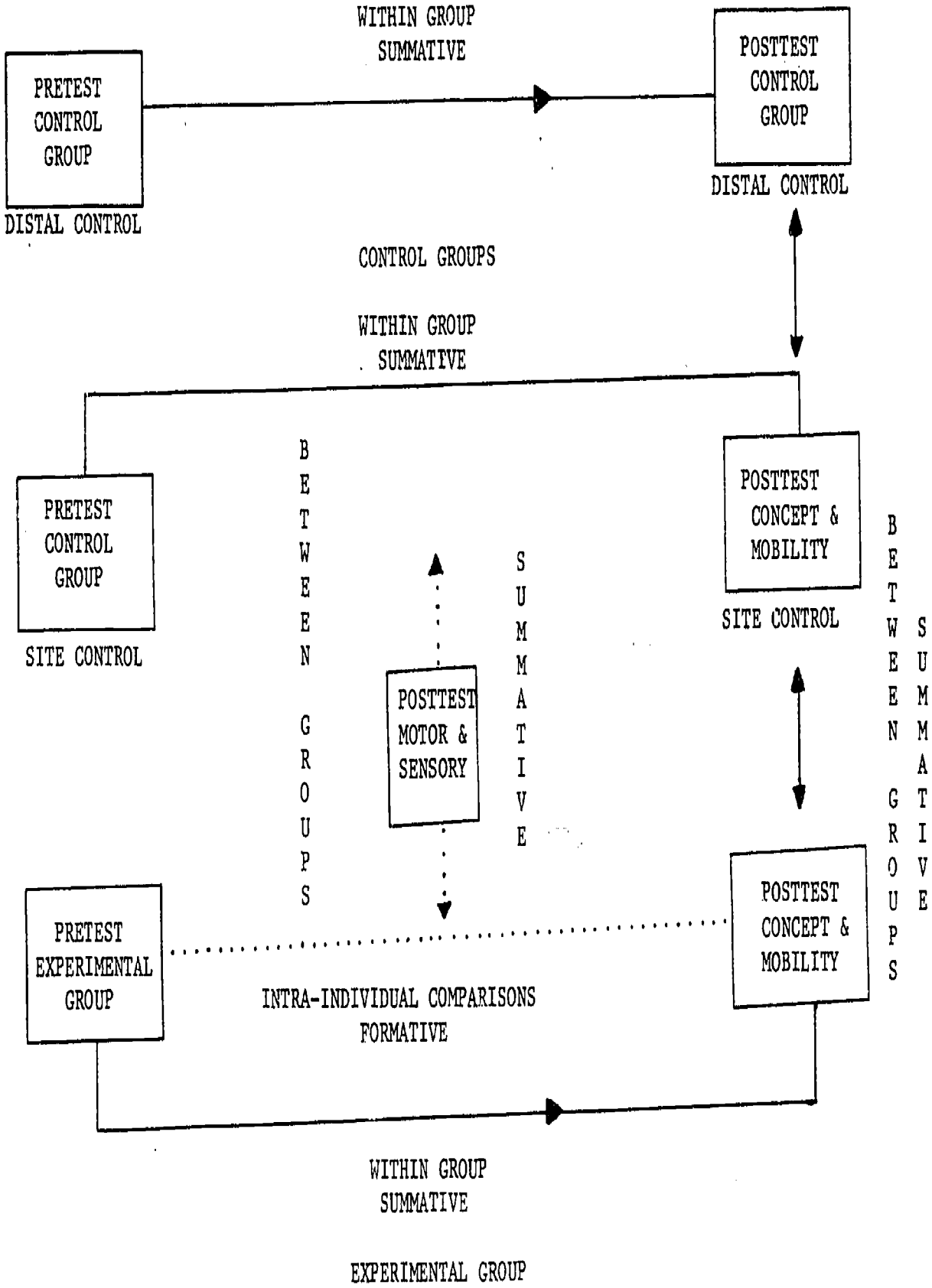



FIGURE 2. SCHEMATIC REPRESENTATION OF EXPERIMENTAL DESIGN

and two control groups within a pre-post test design. The subjects in the experimental group received daily intervention using the programmed orientation and mobility instruction materials. In contrast, children in the control groups continued their daily educational routines without special intervention programming based on the experimental intervention system. The content of the educational programs of the control children varied considerably over subjects as a function of the developmental level of each subject and his particular placement facility. Several control children were receiving instruction in skill areas very similar to those included in the experimental instructional materials while other control children were receiving maintenance care (e.g., toileting, feeding, etc.) in an unstructured ward program.

Two types of control groups were employed in the study. The two groups were distinguished on the basis of their proximity to the Experimental group subjects. The first control group consisted of subjects located within the same classrrom as the experimental group subjects. The purpose of this "Site Control" group was to facilitate equation of the experimental and control subjects on the critical, potentially confounding variable of teacher and/or site effects. The need for equation of experimental and control conditions for teacher and site effects was demonstrated by the results of previous research by the investigators (Harley,Wood, and Merbler,1974) which indicated wide variation in teacher qualifications and extensiveness of programming both within and between facilities serving multiply handicapped visually impaired children. The presence of control children within the same classrooms as experimental children insured that both experimental and control children within sites had essentially identical educational opportunities with the exception of programmed intervention on orientation and mobility using the experimental instructional materials.

Although the use of on-site control children minimized the effect of a potentially very powerful confounding variable, it simultaneously increased the possibility of a second confounding event -- specifically, control group contamination as a result of proximity to the experimental treatment.

To reduce the likelihood of experimental-control condition contamination, a second "distal" control group was employed in the study. Distal control group subjects were located at three sites at which no experimental intervention was planned. Hence, subjects in the distal conditions were totally isolated from the effects of the experimental treatments. The inclusion of this group provided a baseline against which experimental-site control contamination could be readily detected and measured.

The experimental and control groups were constituted through two levels of randomization. The distal control sites were chosen at random from among the nine facilities participating in the study. Within each of the remaining six facilities, subjects were randomly assigned to either the experimental or on-site control conditions. Eighteen children were assigned to the experimental group, and nine children were included in each of the two control conditions.

The primary data analyzed in the field test study were the scores the subjects attained on the P.M.S. Although the P.M.S. is not designed for a global score evaluation of a pupil's mobility proficiency, it was necessary to quantify the behaviors a subject demonstrated during assessment to expedite analysis and evaluation of the effects of the intervention system. Consequently, each behavioral description was point weighted as follows:

| | | |
|---|---|---|
| Independent (I) | = | 2 points |
| With Assistance (WA) | = | 1 point |
| Not Performed (NP) | = | 0 points |
| Not Applicable (NA) | = | -- |

The points a subject earned for each item (5 sub-items per item equaled a possible score range of 0 to 10 points per item) were tallied over each sub-section (e.g., motor, sensory). The sub-section totals were then summed to obtain a full scale P.M.S. score.

Teacher evaluations of the instructional materials were solicited to supplement the empirical validation of the effectiveness of the intervention system. Two types of information were obtained including: 1) teacher recommendations for modifications of specific training sequences; and 2) overall rating of training sequence effectiveness. A copy of each of the two forms used for these evaluation purposes are included in Appendix F. The teachers were requested to complete these evaluation forms after using each training sequence.

The teachers also collected continuous data on the student's progress as the students worked through the instructional materials. These data consisted of records of the number of trials a student passed and failed during each training session based on the instructional materials. The teachers transmitted the completed data forms to the project staff on a weekly basis. Their data served two functions: 1) project staff monitoring of teacher intervention activities; and 2) teacher and project staff monitoring of the progress of the children. No formal statistical analysis was conducted on those data.

Assessment Procedures

The P.M.S. assessments were conducted in accord with the general guidelines for its administration (Harley,Merbler,Wood, 1975). Each subject was assessed in all P.M.S. content areas which were applicable given his handicapping conditions. However, modifications were made in assessment procedures

on the basis of special handicaps. For example, a subject with a suspected severe hearing loss (as indicated by school records) was administered the first sub-item of the sound localization item. If the subject failed to demonstrate even a minimal response to sound, assessment of sound localization skill was terminated and assessment continued with the next scale item. Scale items (e.g., walking, shape discrimination) were administered until a subject achieved his developmental level for a particular skill. For example, if a subject passed the first two sub-items in walking, but failed the third sub-item, the subject's assessment for "walking" was terminated with this third sub-item and he received credit for the first two sub-items he had passed. Assessment for a particular skill was also terminated if a subject received a score "With Assistance" for a sub-item. In these instances, a subject received full credit for all previous sub-items he did pass within the skill item and partial credit for the sub-item for which he had required assistance.

The results of each subject's pretesting were graphed on special score profiles which provided a convenient visual summary of a subject's strength and weakness across the various P.M.S. content areas. An example of a score profile is presented in Appendix C. Instructional program prescriptions were developed for each subject on the basis of his demonstrated developmental level in each skill comprising the P.M.S. Instruction was planned for those skills in which a subject scored lower than 6 points (i.e., failed to meet criteria for the first three sub-items for a given skill).

The post intervention assessments were concluded following the same procedures used during pretesting. However, unlike the pretesting sessions, posttesting of the experimental and site control groups was conducted in

two phases, corresponding to the two phases of intervention. The experimental and site control groups were posttested on motor and sensory skills in March, 1976 and on concept and mobility in May, 1976. The distal control subjects were posttested in all content areas (i.e., motor, sensory, concept, and mobility) in May, 1976.

## Intervention Procedures

The field testing of the programmed instructional materials was conducted during a 16 week period beginning in January, 1976 and extending through May, 1976. During January, the Project Coordinator and Research Analyst visited each experimental site to orient the subject's classroom teachers to the use of the instructional materials, interpretation of the experimental subject's individual instructional prescription, and the data collection system. Teacher orientation was accomplished through both verbal description of the materials and answering of specific teacher concerns regarding procedures. These questions of the teachers were recorded for later use for the purpose of improving the clarity of the general directions for the use of the instructional materials. In addition to the January orientation meetings, the teachers were invited to telephone or write the Project staff regarding any questions which arose to them during the intervention period.

The 16 week field testing period was divided into two eight week phases. The first 8 week period focused on sensory and motor components of the instructional materials. During this first phase, the teachers worked on an individual basis with the experimental subjects in their classrooms on the motor and sensory skill deficiencies indicated in the subject's instructional prescriptions. The teachers worked on two programmed lessons a day -- one motor and one sensory. The teacher spent a mean time of 20 minutes per lesson

per day. In some instances, the teachers delegated responsibility for implementation of the lessons to their classroom aides. The second 8 week period was devoted to the concept and mobility portions of the instructional materials and followed the same general procedures used during the first phase of the field testing.

Subjects were posttested on motor and sensory skills at the completion of the first eight week period. Posttesting on concept and mobility skills occurred at the completion of the second eight week period.

## Results

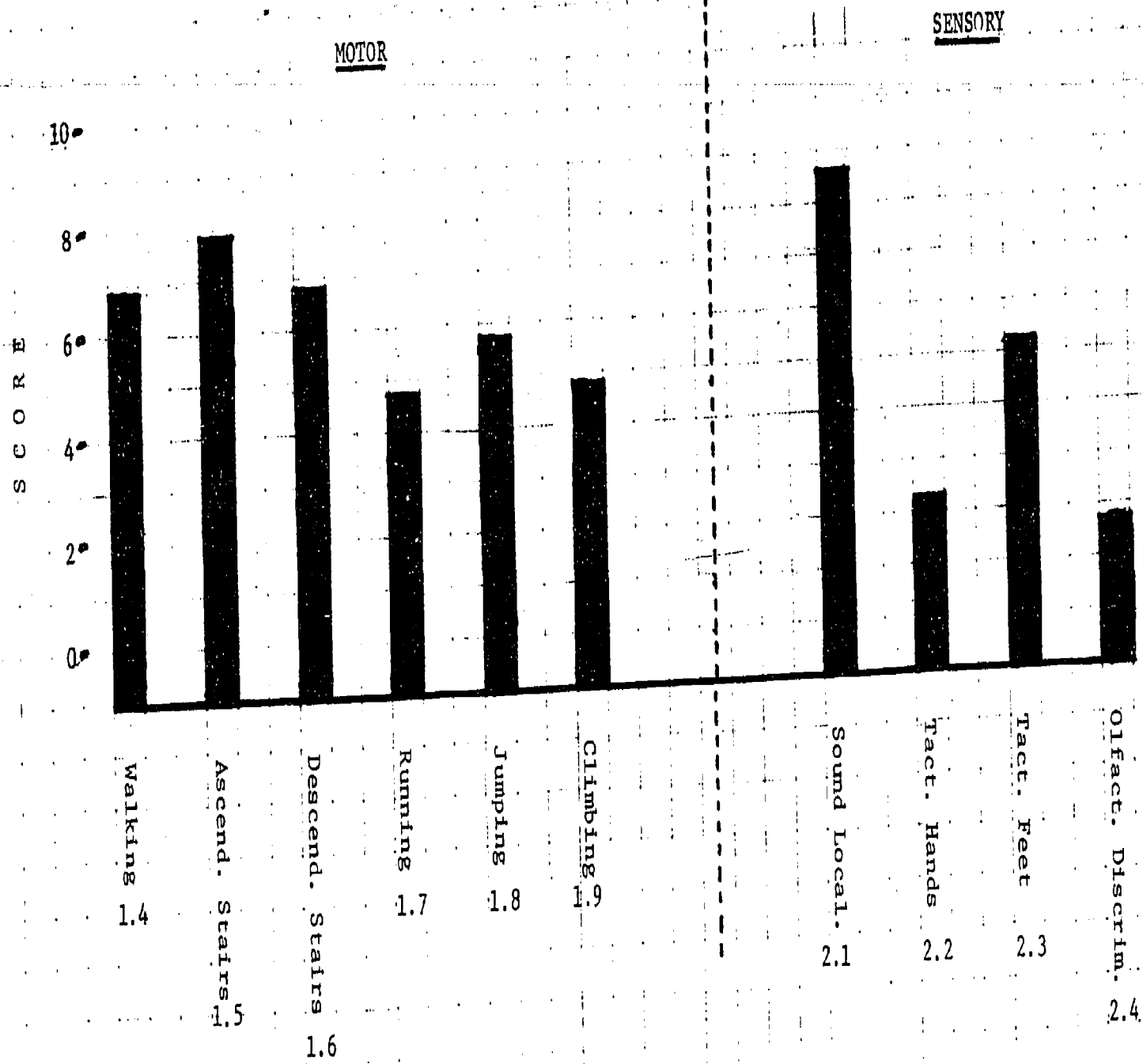
### Pretest Results

The mean pretest scores for the experimental and control group subjects for the motor, sensory, concept, and mobility sections of the P.M.S. are presented in graphic form in Figures 3 and 4. Figure 3 does not show the mean scores for the first three items of the motor development section of the P.M.S. which includes Basic Movement (1.1), Creeping (1.2), and Standing (1.3). These items were omitted during pretesting since all of the subjects tested were proficient in these skills. Inspection of Figures 3 and 4 indicates that most subjects demonstrated a relatively high level of skill development in Sound Localization (2.1) and Seating (4.2). The subjects demonstrated a relatively low level of skill development in several of the skills included in the sensory, concept and mobility areas.

### Pre-Posttest Results

The raw data resulting from the P.M.S. assessments are presented in Appendix A. Table 5 presents the pre and posttest means for the site and distal control groups. An inspection of Table 5 indicates that the performances of the two control groups were equivalent. This finding suggests that no experimental site control group contamination occurred during the intervention period.

FIGURE 3




Note: Items 1.1,1.2,1.3, and 2.1 have been omitted since all subjects tested reached criteria on those items.

FIGURE 4

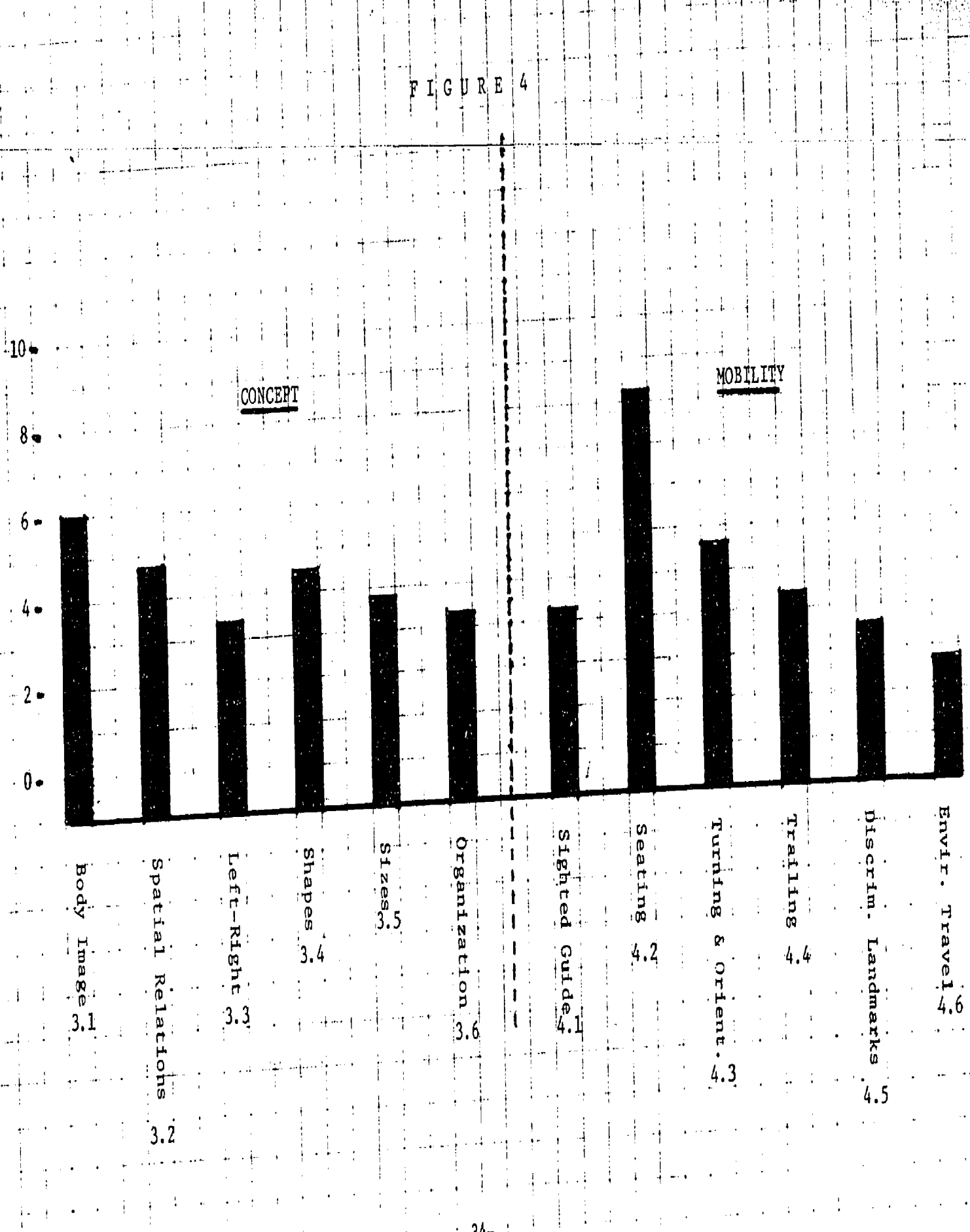

10
8
6
4
2
0
CONCEPT
MOBILITY
Body Image 3.1
Spatial Relations 3.2
Left-Right 3.3
Shapes 3.4
Sizes 3.5
Organization 3.6
Sighted Guide 4.1
Seating 4.2
Turning & Orient. 4.3
Trailing 4.4
Discrim. Landmarks 4.5
Envir. Travel 4.6

Table 5

The Pre and Posttest Means for the Site and Distal Control Groups

| Group | Pretest Mean | Posttest Mean |
|---|---|---|
| Site Control | 94.22 | 96.33 |
| Distal Control | 91.77 | 94.11 |

Although the groups were constituted at random, the mean pretest scores of the groups were markedly different (see Table 6). Consequently, an analysis of covariance (Winer,1971) was conducted on the P.M.S. scores to statistically equate the experimental and control groups. The SA's of the subjects were used as the covariate to adjust both the pre- and posttest means. Social age was selected as the covariate because of the high positive correlation between the subject's total P.M.S. scores and their assessed social age (r= .87). Table 6 presents the adjusted and unadjusted means for the pre- and posttest conditions for the experimental and control groups (collapsing over the distal and site control subjects). Inspection of Table 6 indicates that the adjustment of the group means on the basis of Maxfield-Buchholz social age scores substantially reduced the initial disparity between the pretest means of the two groups.

Table 6

Experimental and Control Group Adjusted and Unadjusted Means

| | Unadjusted Means | | Adjusted Means | |
|---|---|---|---|---|
| Groups | pretest | posttest | pretest | posttest |
| Experimental | 125.50 | 162.22 | 113.92 | 150.65 |
| Control | 90.77 | 95.22 | 104.67 | 106.89 |

The results of the 2x2 analysis of covariance are summarized in Table 7. The significant main effect for the groups factor (F= 7.33, 1/33 d.f., p= .05) indicates that the P.M.S. scores of the experimental group subjects were

Table 7

SUMMARY OF COVARIANCE ANALYSIS

| SOURCE | ADJUSTED SUMS OF SQUARES | DEGREES OF FREEDOM | MEAN SQUARE | F |
|---|---|---|---|---|
| A | 10774.298 | 1 | 10774.298 | 7.33** |
| Subj. W.A. | 48488.37 | 33 | 1469.34 | |
| B | 6825.01 | 1 | 6825.01 | 87.83* |
| AB | 5356/125 | 1 | 77.70 | 68.93* |
| Residual | 2564.361 | 33 | | |

*p < .01

**p = .05

higher than those of the control group subjects. A significant F ratio was also obtained for the test condition factor (F= 87.83, 1/33 d.f., p = .01). This significant finding indicates that the post intervention scores of the subjects were significantly higher than their preintervention P.M.S. scores.

Although the main effects for treatment conditions and groups were significant, they are relatively meaningless in light of the significant F ratio which was obtained for the interaction of groups x test conditions. A graph of this interaction is presented in Figure 5. This graph suggests that the experimental group subjects attained significantly higher P.M.S. scores following intervention with the programmed instructional materials than did the control group subjects who had not received intervention. Further inspection of Figure 5 also indicates that the control group subjects demonstrated only a slight change in performance level from the pretest to the posttest (i.e., pretest mean - 104.67, posttest mean = 106.89).

Table 8 presents the results of t tests performed on the pre- and post-intervention scores of the experimental group subjects for the motor, sensory, concept, and mobility components of the programmed instructional materials. Significant t statistics were found for motor (t= 5.34, 18 d.f., p= .01), sensory (t= 6.46, 18 d.f., p= .01), concept (t= 5.31, 18 d.f., p= .01), and mobility (t= 6.72, 18 d.f., p= .01) instructional components. These findings indicated that substantial post intervention performance improvements were demonstrated by the subjects across all intervention system content areas.

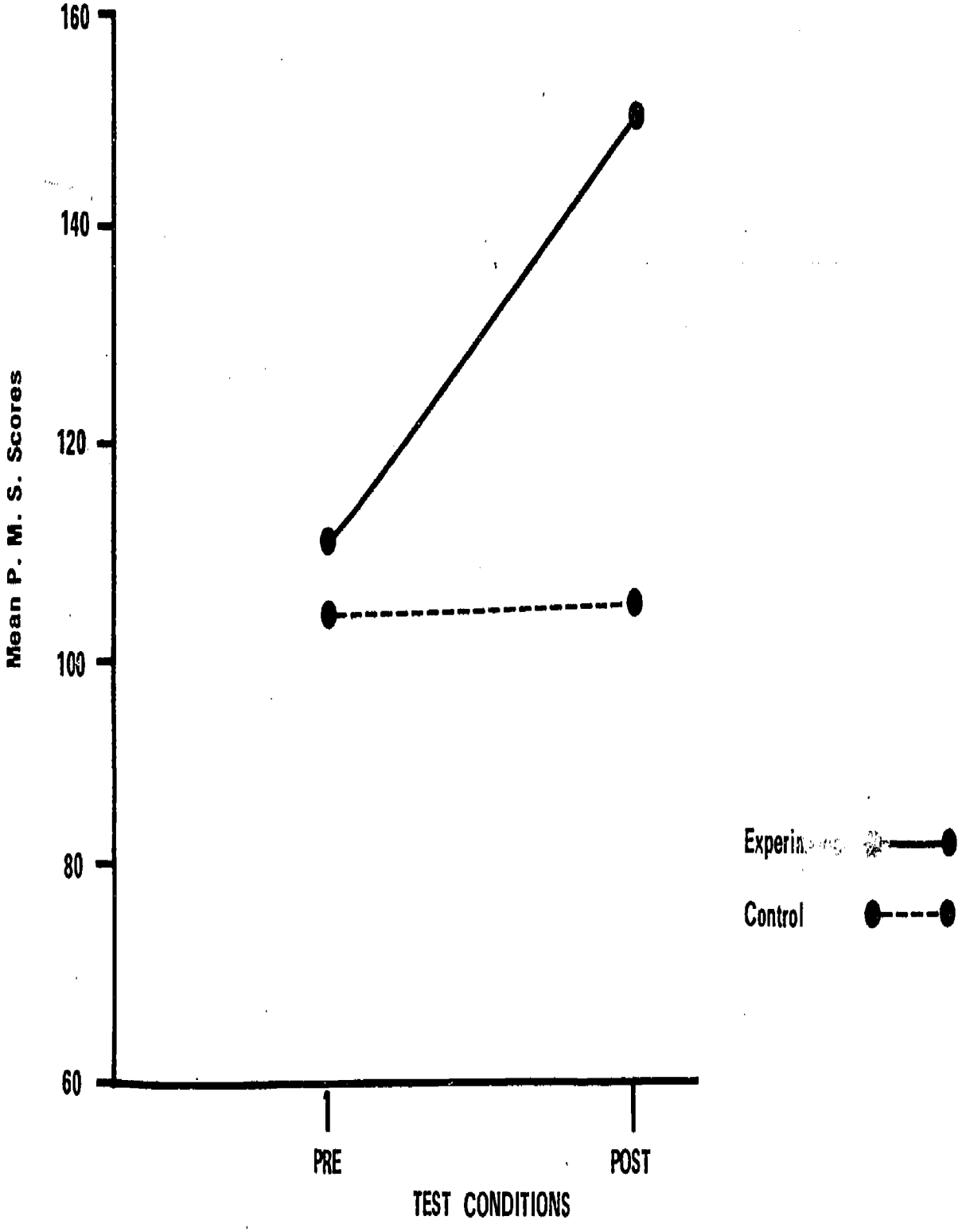



Figure 5. Group performance over test conditions.

Table 8

t Test Results for Pre-Posttest Differences in the Four Skill Areas for the Experimental Group

| Instructional Area | Pre-Post Mean P.M.S. Score Difference | t* observed |
|---|---|---|
| Motor | 6.05 | 5.34 |
| Sensory | 7.29 | 6.46 |
| Concept | 9.83 | 5.31 |
| Mobility | 14.11 | 6.72 |

*$p < .01$

Discussion

The purpose of this study was to develop an effective programmed intervention system in orientation and mobility for multiply handicapped blind children. The very positive results of the field test study indicated that this objective has been fulfilled. The children in this study who received instruction based on the programmed intervention system demonstrated significant overall performance gains as indicated by the results of the analysis of covariance. The significant F ratio obtained for the groups x test conditions interaction indicated that the difference in performance between the pre- and post intervention period measures was higher for the experimental group compared to the control group. Since other extraneous factors such as teacher or site effects were controlled (i.e., through the site control group), the most plausible explanation of this differential performance between the groups was the intervention the experimental subjects received. The results of the individual t tests indicated that the four instructional areas of the intervention system (i.e., motor, sensory, concept, and mobility) were all effective as a basis for a training program.

An unexpected problem in this field test study concerned the inequality of the mean P.M.S. pretest scores for the experimental and control groups. This inequality was apparently an artifact of the randomization process. Although the adjustment of the subject's P.M.S. scores on the basis of their Maxfield-Buchholz scores did not result in complete mean pretest score equality, the similar adjustment of posttest P.M.S. scores, in conjunction with the magnitude of the difference between the posttest mean P.M.S. scores of the experimental and control groups, provides incontrovertable evidence for superior experimental group postintervention performance beyond any mild to moderate initial performance discrepancy between the groups.

The children who served as subjects in this study represented a fairly good cross pattern of handicapping conditions which can be encountered when providing training services to multiply handicapped blind children and youth. Children included in the experimental population demonstrated severe developmental (cognitive) delays, physical impairments, behavioral problems, severe expressive receptive language deficits, auditory impairments, and of course, blindness. Although it was impossible to include every potential constellation of multiple impairments, the breadth of the field test sample should insure the general applicability of the intervention system for children classified as multiply handicapped blind. Further, since the preponderance of skills included in the assessment and training materials are also necessary for non-visually impaired children, sections of the intervention system (e.g., motor and concepts) may be useful for training, for example, trainable level retarded children.

In addition to validating the intervention system, the results of the field test study also provided information on several relevant educational issues concerning multiply handicapped blind children. First, the significant performance gain demonstrated by the experimental group subjects indicates

that severely multiply handicapped blind children can learn basic motor, sensory, concept and mobility skills. The optimal instructional approach for training these skills seems to be through the use of carefully programmed training sequences. This contention is supported by the failure of the control group children to demonstrate significant progress despite the fact that many of these control subjects (both site and distal) were receiving daily training in basic motor, sensory and concept skills in a less structured manner as a part of the teacher's normal cuuriculum.

The results of the field test study also indicated that classroom teachers can effectively train multiply handicapped blind children in basic orientation and mobility skills if they are provided with programmed instruction. Thus, it would seem that classroom teachers could function as prinipal basic mobility trainers for multiply handicapped blind children if their particular programs lacked a mobility specialist, or could supplement the mobility instruction services of an on site specialist.

Several additional areas for refinement of the intervention system were suggested by the data and participating teachers. First, although the intervention system was designed for use with multiply handicapped blind children, several adaptations were nonetheless required for specific handicaps. For example, for physically impaired children restricted to wheelchairs, several of the motor tasks were not applicable. Similarly, if a physically limited child used a "walker" to support himself while walking, instructional criteria such as "walks with a cross pattern of arm movement" had to be modified. Two of the children included in the study had severe hearing impairments which required that the teachers adapt the verbal instruction to a manual communication mode. Consequently, although the programmed materials provided precise training sequences, some teacher initiative and creativity for actual training implementation were necessitated by the individual needs of the children.

In addition to the necessity for procedural adaptation of the instructional materials, it was also necessary to adjust the intervention system for the wide variation in general development level which is a characteristic of the multiply handicapped blind population. The training sequences (e.g., shape discrimination) were designed for children functioning developmentally at a point slightly below the middle of a developmental continuum which ranged from severe to mild developmental delays. To further lower the minimum developmental entry level for the intervention system, prerequisite training lessons (e.g., development of match to sample responses) were also provided. However, despite the provision of these supplemental lessons, some children were still functioning at a level too low for direct entry into the training program. These children were nonverbal and lacked even rudimentary communication skills. In these instances, the classroom teachers devised additional prerequisite lessons and attempted to develop a simple communication system with the children.

The addition of prerequisite lessons as opposed to modifications of the training sequences was selected as the most efficient means of lowering the general developmental entry level of the intervention system since this approach left the main training sequences intact and probably more generally applicable across developmental levels. This view was also expressed by participating teachers of moderate to mild developmentally delayed children. These teachers felt that attempting to lower the developmental entry level for the main training sequences to accomodate very low functioning children would make the sequences less effective and efficient with higher functioning multiply handicapped blind children.

Another concern which arose during the field test study was a need for providing activities to insure the generalization to new contexts of the

concepts and skills the children acquired during the training program. The training sequences emphasized the learning of concepts and skills within a relatively restricted set of behavioral exemplars and activities. Consequently, supplemental training sequences have subsequently been designed to promote generalization of skills acquired through the programmed intervention system. The structure of these generalization training sequences consists of providing the trainee with a series of activities in which each activity in the series is progressively farther removed from the original training task. For example, the underlying developmental progression for the generalization of spatial organization skills includes: a) organization of items within a limited space (e.g., self care utensils on a table); b) organization of locations within rooms (e.g., self care area); and c) organization of rooms within a hallway or building (e.g., the child's classroom in relation to the restroom).

The teachers who participated in the field test study reported that they had found the overall approach of the intervention system effective and efficient. The P.M.S. yielded accurate profiles of each child's skill strengths and deficiencies. Further, the training sequences were generally effective for remediating skill deficiences. Some of the teachers experienced slight initial confusion with the programmed instruction format. However, the general instructions for using the materials have been subsequently expanded through illustrations and examples and should eliminate any similar difficulties for teachers who use the materials in the future. In addition, the format of the scale and instructional materials have been simplified in the final editing phase. The new format has eliminated nonessential, redundant directions and procedures, and the procedural operations are now arranged into "Do", "Say", and "Observe" steps. Although these format changes have occurred without altering or compromising the content of the

intervention system, several prototypic copies of the materials will be distributed to the field test sites for an informal, final field evaluation.

The goal of the Peabody Mobility Project was to develop a set of teacher implemented instructional materials to train severely multiply handicapped blind children to travel more independently in their daily environments. This undertaking was formidable and ambitious in two ways. First, it necessitated careful task analysis of a body of skills and instructional procedures (i.e., basic orientation and mobility skills) which had not been readily accessable to classroom teachers. Second, these procedures had to be presented in an instructional format which would facilitate the learning of these skills by multiply handicapped blind children. The results of the field test study suggest that the Peabody Mobility Project has resulted in an effective instructional product which had fulfilled the Project's principal goal.

The scale and programmed instruction material has been carefully edited for submission to a publisher. Provision has been make for designing the layout of the materials in a manner which can be easily understood by the consumer. Graphic illustrations are also planned for simplification of directions. Excerpts from the scale and the programmed instruction can be found in Appendices D and E.

An effort will be made to secure an agreement with a publisher to print, publish, distribute, market and disseminate the scales and programmed instruction for the full term of any copyright authorized by U.S.O.E.

Three papers on the study have already been given at the C.E.C. national convention in Chicago in April of 1976 and these papers have been submitted for publication in the proceedings of the convention. Two papers pertaining to the project were presented at the Fifth Annual Southeastern Orientation and Mobility Conference in Tallahassee, Florida in February, 1976. A paper will be written for the C.E.C. journal Exceptional Children summarizing the results of the research in this study.

The teachers at the nine research field sites have already been trained and provided with kits of materials which include the scale, the programmed instruction and the supplementary materials. In addition, a number of copies of the scale and programmed instruction have been distributed to field readers around the country who have assisted in the evaluation of the materials.

Copies of the final report will be made available to interested professionals who are interested in the results of the study. A number of requests have been received already from those who attended the C.E.C. convention or who read the two publications on the pilot study of the scale

and the programmed instruction which appeared in the Association for Education of the Visually Handicapped Journal and the New Outlook for the Blind during 1975.

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Appendix A

Raw Data

## Experimental Group

| | | Pre | | | | | Post | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Subject | SA | LM | S | C | M | T | LM | S | C | M | T |
| 11 | 4.34 | 25 | 22 | 28 | 20 | 95 | 40 | 32 | 43 | 52 | 167 |
| 12 | 5.06 | 50 | 30 | 42 | 35 | 157 | 57 | 38 | 58 | 54 | 207 |
| 13 | 4.86 | 46 | 28 | 55 | 27 | 156 | 46 | 36 | 58 | 48 | 188 |
| 14 | 4.63 | 58 | 26 | 34 | 33 | 151 | 58 | 30 | 58 | 52 | 198 |
| 15 | 3.87 | 39 | 24 | 37 | 37 | 137 | 48 | 32 | 57 | 45 | 182 |
| 16 | 4.43 | 42 | 32 | 45 | 35 | 154 | 49 | 39 | 58 | 52 | 198 |
| 08 | 4.30 | 40 | 12 | 15 | 17 | 84 | 45 | 14 | 26 | 47 | 132 |
| 09 | 5.73 | 54 | 30 | 60 | 56 | 200 | 60 | 40 | 60 | 58 | 218 |
| 010 | 1.92 | 17 | 0 | 0 | 1 | 18 | 27 | 4 | 0 | 3 | 34 |
| 011 | 4.83 | 50 | 34 | 55 | 46 | 185 | 59 | 40 | 60 | 59 | 218 |
| 115 | 4.40 | 36 | 24 | 49 | 29 | 138 | 39 | 30 | 44 | 49 | 162 |
| 116 | 3.23 | 33 | 20 | 28 | 22 | 103 | 34 | 30 | 35 | 32 | 131 |
| 117 | 4.53 | 48 | 28 | 52 | 41 | 169 | 50 | 36 | 58 | | 194 |
| 118 | 3.03 | 34 | 20 | 18 | 30 | 102 | 34 | 30 | 40 | | 136 |
| 021 | 4.63 | 33 | 26 | 43 | 32 | 134 | 49 | 40 | 53 | | 188 |
| 124 | 3.40 | 46 | 10 | 4 | 13 | 73 | 50 | 14 | 17 | | 105 |
| 125 | 4.33 | 44 | 17 | 22 | 25 | 108 | 51 | 18 | 32 | | 146 |
| 030 | 5.00 | 34 | 14 | 13 | 34 | 95 | 39 | 18 | 20 | 39 | 116 |

Control Group

| | | Pre | | | | | Post | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Subject | SA | LM | S | C | M | T | LM | S | C | M | T |
| 17 | 2.11 | 28 | 4 | 6 | 12 | 50 | 32 | 5 | 18 | 10 | 65 |
| 012 | 2.87 | 24 | 14 | 8 | 13 | 59 | 28 | 14 | 14 | 14 | 70 |
| 013** | | 32 | 10 | 0 | 8 | 50 | | | | | |
| 114 | 4.63 | 45 | 38 | 58 | 38 | 179 | 48 | 38 | 52 | 49 | 187 |
| 119 | 4.38 | 42 | 22 | 54 | 33 | 151 | 46 | 22 | 52 | 40 | 160 |
| 020** | | NA* | 5 | 3 | 2 | 10 | NA* | 6 | 5 | 1 | 12 |
| 122 | 2.97 | 30 | 10 | 1 | 16 | 57 | 28 | 10 | 0 | 7 | 45 |
| 123 | 3.53 | 35 | 18 | 27 | 21 | 101 | 32 | 16 | 22 | 17 | 87 |
| 029 | 2.47 | 34 | 2 | 1 | 7 | 4 | 33 | 2 | 0 | 4 | 39 |
| 031 | 3.77 | 27 | 2 | 3 | 11 | 43 | 28 | 2 | 3 | 14 | 47 |
| 026 | 4.93 | 40 | 28 | 54 | 42 | 164 | 42 | 28 | 55 | 42 | 167 |

## Distal Control Group

| | | Pre | | | | | Post | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Subject | SA | LM | S | C | M | T | LM | S | C | M | T |
| 032 | 3.20 | 31 | 0 | 5 | 13 | 49 | 30 | 0 | 0 | 14 | 44 |
| 033 | 3.94 | 33 | 10 | 10 | 14 | 67 | 33 | 10 | 8 | 11 | 62 |
| 034 | 2.58 | 30 | 0 | 0 | 10 | 40 | 27 | 0 | 0 | 8 | 35 |
| 135 | 5.46 | 48 | 34 | 57 | 39 | 178 | 56 | 32 | 58 | 50 | 196 |
| 136 | 5.63 | 56 | 32 | 56 | 56 | 200 | 56 | 38 | 55 | 43 | 192 |
| 137 | 5.30 | 47 | 32 | 56 | 52 | 187 | 50 | 32 | 58 | 53 | 193 |
| 138 | 4.70 | 39 | 18 | 25 | 30 | 112 | 42 | 20 | 32 | 33 | 127 |
| 139 | 4.83 | 45 | 16 | 33 | 26 | 120 | 42 | 1[illegible] | 34 | 30 | 122 |
| 240 | 2.94 | 31 | 0 | 0 | 9 | 40 | 29 | [illegible] | 0 | 10 | 39 |
| 241 | 2.40 | 16 | 1 | 0 | 3 | 20 | 24 | 1 | 0 | 5 | 30 |

*Not Applicable

**Dropped

[1]SA= Social Age

LM= PMS Motor Score

S= PMS Sensory Score

L= PMS Concept Score

M= PMS Mobility Score

T= PMS Total Score

Appendix B

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Appendix C

Sample Profiles

FIGURE 3

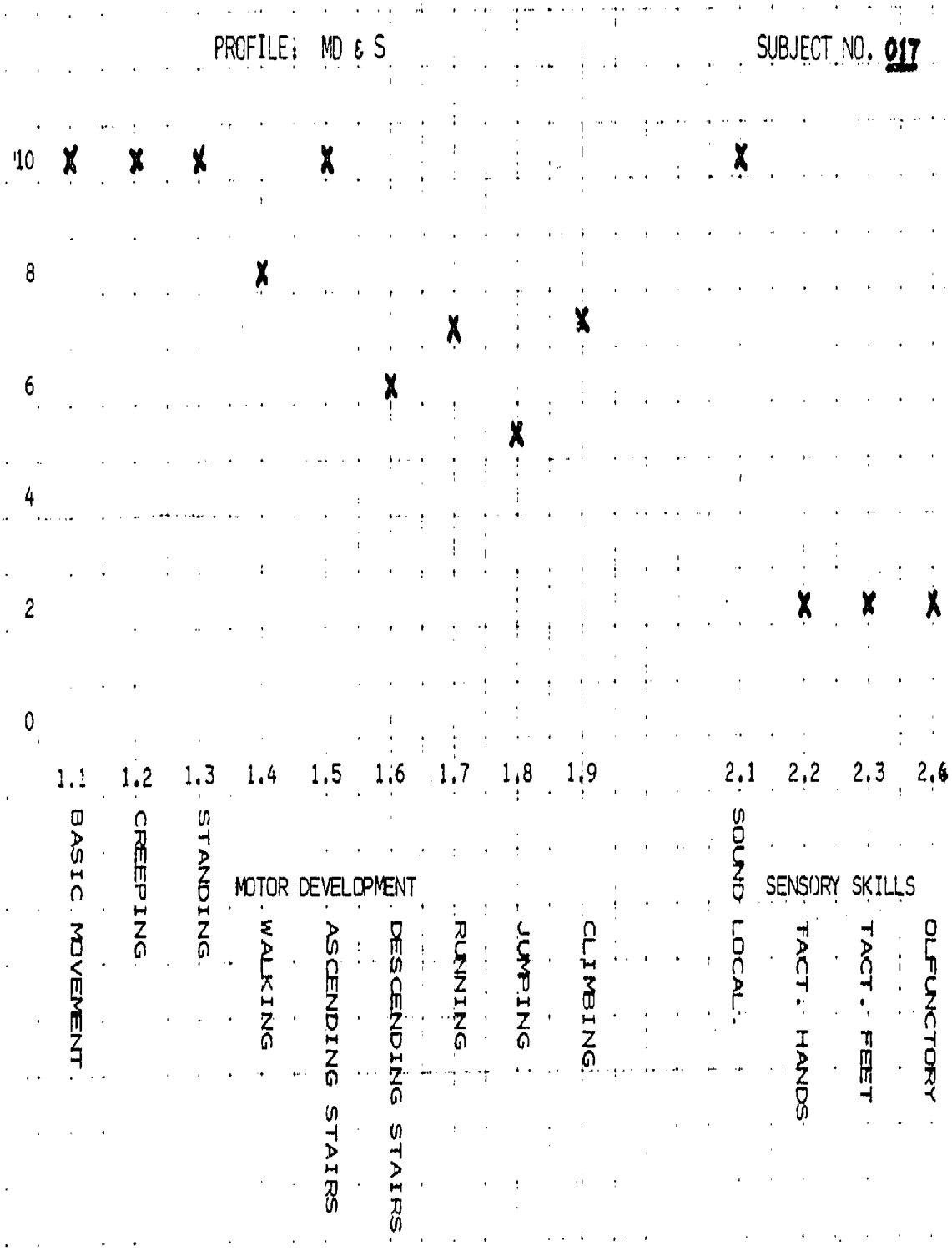
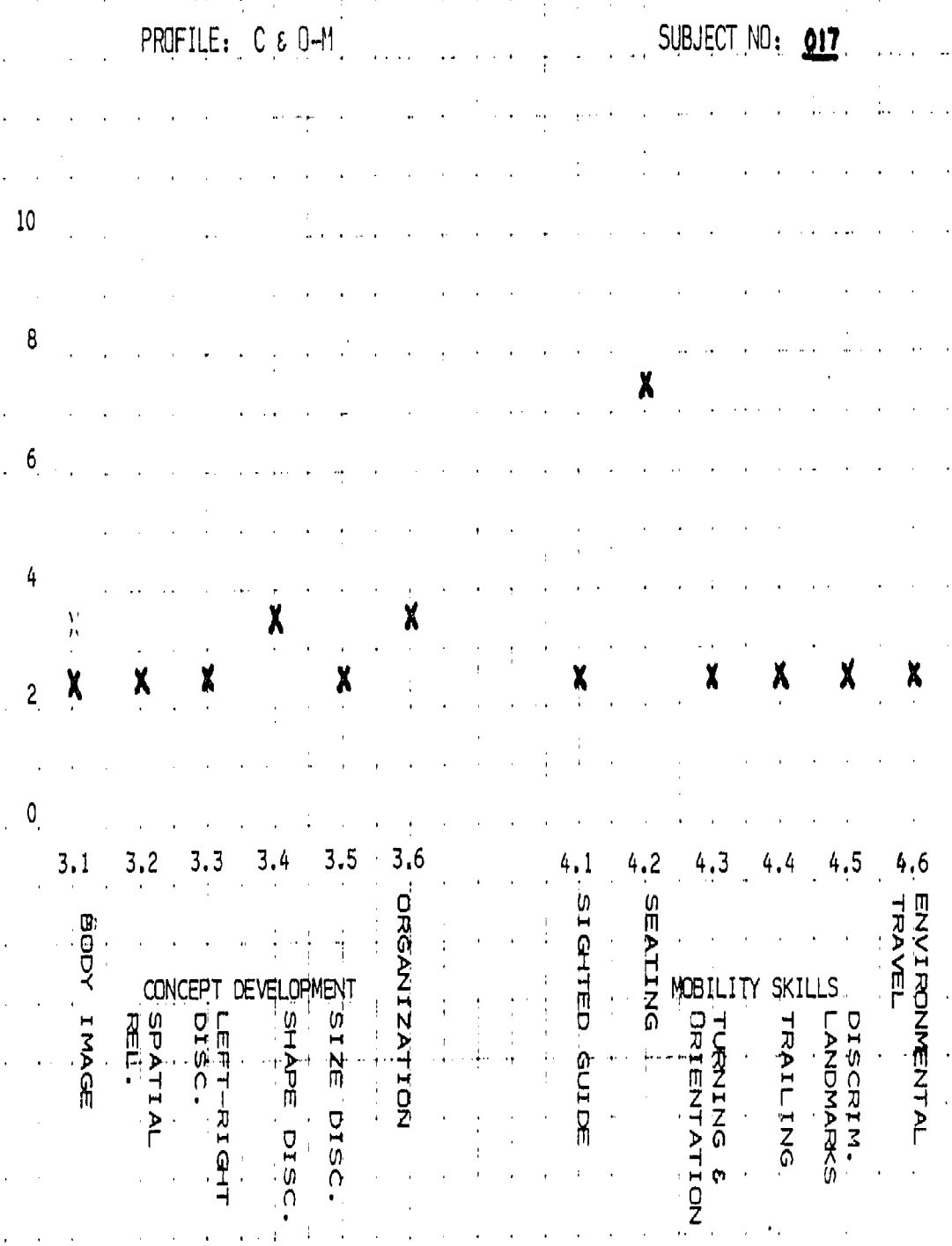

PROFILE: MD & S
SUBJECT NO. 017
10
8
6
4
2
0
1.1 BASIC MOVEMENT
1.2 CREEPING
1.3 STANDING
1.4 WALKING
1.5 ASCENDING STAIRS
1.6 DESCENDING STAIRS
1.7 RUNNING
1.8 JUMPING
1.9 CLIMBING
MOTOR DEVELOPMENT
2.1 SOUND LOCAL.
2.2 TACT. HANDS
2.3 TACT. FEET
2.4 OLFUNCTORY
SENSORY SKILLS

FIGURE 4


PROFILE: C & O-M
SUBJECT NO: 017
10
8
6
4
2
0
3.1
3.2
3.3
3.4
3.5
3.6
4.1
4.2
4.3
4.4
4.5
4.6
BODY IMAGE
CONCEPT DEVELOPMENT
SPATIAL REL.
LEFT-RIGHT DISC.
SHAPE DISC.
SIZE DISC.
ORGANIZATION
SIGHTED GUIDE
SEATING
MOBILITY SKILLS
TURNING & ORIENTATION
TRAILING
DISCRIM. LANDMARKS
ENVIRONMENTAL TRAVEL

Appendix D

Peabody Mobility Scale Excerpts

1.1 Basic Movement

Procedure: Place the child on a flat surface such as the floor or a mat. Follow the procedures for each item. Only minimal prompting is permissible (as directed in item).

ASSESSMENT: Provide only as much assistance as necessary and score appropriately. If extensive prompting is required (such as guiding the child through the entire response beyond an initial demonstration), score the item "NP".

1. Not performed
2. Not applicable
3. With assistance
4. Independent
5. Observed

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 1.1.1.P. With the Child lying on his back, the Examiner prompts him either verbally or physically to get him to roll on his side (e.g., E. tells him "roll over" or claps his hands next to the Child's hand or rings a bell by the Child's side). If the Child responds correctly to this item, proceed to 1.1.2.P. Otherwise, proceed to 1.2. | 1.1.1.S. Child "rolls his body over from back to side in either direction. | | | | | |
| 1.1.2.P. With the Child lying on his back, the Examiner repeats the basic prompting procedures used in 1.1.1.P. E. observes whether the Child rolls his body from back to stomach and stomach to back. If the Child responds correctly to this item, proceed to 1.1.3.P. Otherwise, proceed to 1.2. | 1.1.2.S. Child "rolls" his body from back to stomach and from stomach to back making one complete rotation in either direction. | | | | | |
| 1.1.3.P. With the Child lying on his back or in a sitting position, the Examiner verbally or physically prompts the Child to move toward him (e.g., E. kneels two or three feet in front of the Child and rings a bell or says "come to me" or uses similar prompts). E. observes whether the Child "scoots" on his back or buttocks. If the Child responds correctly to this item, proceed to 1.1.4.P. Otherwise, proceed to 1.2. | 1.1.3.S. Child "scoots" across flat surface making contact with his back or buttocks. | | | | | |

1.1 Basic Movement (con't)

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 1.1.4.P. With the Child lying on his stomach, the Examiner repeats the basic procedures of 1.1.3.P. E observes whether the Child crawls, either homologously (moving both arms, then both legs) or homolaterally (moving arm and leg on same side of body). If the Child responds correctly to this item, proceed to 1.2. | 1.1.4.S. Child "crawls" across flat surface making contact with his stomach moving both arms, then both legs (homologously) or arms and legs on same side of body (homolaterally). | | | | | |
| 1.1.5.P. The Examiner repeats the basic procedures of 1.1.4.P. E observes whether the Child crawls with a cross pattern. Upon completion of this item, proceed to 1.2. | 1.1.5.S. Child "crawls" across flat surface making contact with his stomach moving in cross pattern using arms and legs together - left arm, right leg, etc. (reciprocally). | | | | | |

COMMENTS: _____

_____

1.4 Walking

Procedures: The Examiner takes the Child to an open area or hallway. E. demonstrates to the Child (by holding his hand and walking or moving with him) that there is nothing in his way. Follow the procedures for each item. Only minimal physical prompts are permissible such as a slight touch on the shoulder, etc.

ASSESSMENT: Provide only as much assistance as necessary and score appropriately. If extensive physical prompting is required, score the item "NP".

1. Not performed
2. Not applicable
3. With assistance
4. Independent
5. Observed

| | | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|---|
| 1.4.1.P. | The Examiner supports the Child under the Child's armpits and says "show me how you walk" (or a similar prompt). E. observes whether the Child makes walking movements with his legs. If the Child responds correctly to this item, proceed to 1.4.2.P. Otherwise, proceed to 1.5. | 1.4.1.S. Child makes walking movements with support from another person (e.g., grasping Child under armpits). | | | | | |
| 1.4.2.P. | The Examiner places the Child next to a table or chair which he can use for support. The Examiner stands about 3 feet in front of the Child and says "walk to me" (or a similar prompt). If the Child responds correctly to this item, proceed to 1.4.3.P. Otherwise, proceed to 1.5. | 1.4.2.S. Child makes "walking" movements with support of furniture. | | | | | |
| 1.4.3.P. | The Examiner stands about 4 feet in front of the Child and says "walk to me" (or a similar prompt. If the Child responds correctly to this item, proceed to 1.4.4.P. Otherwise, proceed to 1.5. | 1.4.3.S. Child "walks" without support of objects using a wide base (feet turned out) with arms outstretched. | | | | | |

| | | | NP | EA | VA | I | O |
|---|---|---|---|---|---|---|---|
| 1.4.4.P. | Repeat the procedures of 1.4.3.P. Observe scoring criteria outlined in 1.4.4.S. If the Child responds correctly to this item, proceed to 1.4.5.P. Otherwise, proceed to 1.5. | 1.4.4.S. Child "walks" with erect posture, weight evenly distributed with toes pointed in direction of travel. | | | | | |
| 1.4.5.P. | The Examiner stands about 8 feet in front of the Child and says "walk to me" (or a similar verbal prompt). Upon completion of this item, proceed to 1.5. | 1.4.5.S. Child "walks" with a cross pattern with arms swinging at sides. | | | | | |

COMMENTS: _____

1.9 Climbing

Procedure: The Examiner takes the Child to a playground slide (or other ladder). Follow the procedures for each item listed below. Only minimal assistance should be provided (e.g., a slight upward push to start the Child off).

ASSESSMENT: Provide only as much assistance as necessary and score appropriately. If considerable prompting is necessary (e.g., lifting the Child's leg), score the item "NP". The Examiner should provide one demonstration of each item response administered.

1. Not performed
2. Not applicable
3. With assistance
4. Independent
5. Observed

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 1.9.1.P. With the Child facing the ladder, the Examiner says "climb up the ladder and go down the slide." E. observes whether the Child makes proper climbing movements (i.e., lifts leg, flexing at knee). If the Child responds correctly to this item, proceed to 1.9.2.P. Otherwise, proceed to 2.1. | 1.9.1.S. Child makes climbing movements with his legs (i.e., lifts leg, flexing at the knee). | | | | | |
| 1.9.2.P. The Examiner repeats the procedures in 1.9.1.P., but this time observes whether the Child climbs the ladder one step at a time placing both feet on each step. If the Child responds correctly to this item, proceed to 1.9.3.P. Otherwise, proceed to 2.1. | 1.9.2.S. Child climbs the ladder one step at a time placing both feet on each step. | | | | | |
| 1.9.3.P. The Examiner has the Child climb to the top or near the top of the ladder and says "come back down" or "climb down." E. observes whether the Child descends the ladder one step at a time placing both feet on each. If the Child responds correctly to this item, proceed to 1.9.4.P. Otherwise, proceed to 2.1. | 1.9.3.S. Child descends the ladder one step at a time placing both feet on each step. | | | | | |

1.9 Climbing (con't)

| | | NP | SS | WA | I | O |
|---|---|---|---|---|---|---|
| 1.9.4.P. With the Child facing the ladder, the Examiner says "climb up the ladder and go down the slide." E. observes whether the Child climbs the ladder alternating his forward foot, placing one foot per step. If the Child responds correctly to this item, proceed to 1.9.5.P. Otherwise proceed to 2.1. | 1.9.4.S. Child climbs the ladder alternating his forward foot, placing one foot per step. | | | | | |
| 1.9.5.P. The Examiner has Child climb to the top or near the top of the ladder and says "come back down climb down." E. observes whether the Child descends the ladder alternating his forward foot, placing one foot per step. Upon completion of this item, proceed to 2.1. | 1.9.5.S. Child descends the ladder alternating his forward foot, placing one foot per step. | | | | | |

COMMENTS: _____

## 2.1 Sound Localization

Procedure: The Examiner takes the Child into an open room which is free of distractions and has the Child stand (or sit if necessary) in the middle of the room.

Materials: A small bell.

ASSESSMENT: Provide only as much assistance as necessary to score appropriately. *Accept any response which clearly indicates that the Child can localize the sounds.

1. Not performed
2. Not applicable
3. With assistance
4. Independent
5. Observed

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 2.1.1.P. Positioned 2 feet directly in front of the Child, the Examiner rings the bell several times. If the Child shows no response, E. places the bell in the Child's hands; then rings the bell close to the Child a second time. If the child responds, proceed to 2.1.2.P. Otherwise, proceed to 2.2 | 2.1.1.S. Child gives any response which indicates he can localize the general direction of the sound. | | | | | |
| 2.1.2.P. Moving 6 feet to the left or right of the Child, the Examiner rings a small bell and says "Turn toward the bell." If the Child makes no response, E. says "Where's the bell?" and rings the bell a second time. If the Child responds correctly, proceed to 2.1.3.P. Otherwise, proceed to item 2.2 | 2.1.2.S. Child locates the directional position of a stationary sound from one direction in relation to his body by *turning his head and/or body until he is facing the source of the sound. | | | | | |
| 2.1.3.P. Walking around the Child, E. stops at each of 4 cardinal positions (i.e., front, back, left, right) at a distance of 4 to 6 feet from the Child. At each point, E. rings the bell and says "Turn toward the bell." If the Child responds correctly, proceed to 2.1.4.P. Otherwise, proceed to item 2.2 | 2.1.3.S. Child locates the directional position of a stationary sound from the 4 cardinal points in relation to his body (i.e., front, back, right, left) by *turning his head and/or body until he is facing the source of the sound. | | | | | |

| | | NP | NA | WA | I | C |
|---|---|---|---|---|---|---|
| 2.1.4.P. Moving 8 to 10 feet to the left or right of the Child, E. rings the bell and says "Find the bell now...come to me now." E. repeats this task on the opposite side of the child. If the Child responds correctly, proceed to 2.1.5.P. Otherwise, proceed to Item 2.2 | 2.1.4.S. Child locates the directional position of a more distant stationary sound by *turning his head and/or body and facing the source of the sound and making physical contact with the source of the sound. | | | | | |
| 2.1.5.P. The Examiner moves around the periphery of the room staying about 4 feet from the Child. While continually ringing the bell, E. says "Follow the sound of the bell." The Child should follow the bell in a similar path to the Examiner, and the pa. should include at least 3 turns. Upon completion of this item, proceed t Item 2.2. | 2.1.5.S. Child locates directional position of a moving sound and track the path of the sound by *moving toward and following the source of the sound (i.e., path of sound olves straight and turning ...vements.) | | | | | |

COMMENTS: _____

_____

_____

## 2.2 Tactual Discrimination (Hands)

Procedure: Seat the Child at a table that is a comfortable size for him. The Examiner seated directly across from the Child. The samples of material are arranged on the template according to the procedures for each item and placed in front of the Child. E. familiarizes the Child with the materials by placing his hands in contact with each sample. It is recommended that E. verbally and/or physically encourages the Child to compare the sample in his hand with the samples on the template.

Materials: 2 samples each of brick, smooth cork, smooth wood, smooth tile, rough sandpaper and wall paper. The materials should all be the same size (approximately 3¼ x 3½ inches).

ASSESSMENT: Provide only as much assistance as necessary and score appropriately. *Accept any response which clearly indicates that the Child can distinguish between the materials.

1. Not performed
2. Not applicable
3. With assistance
4. Independent
5. Observed

| | | NP | SA | WA | I | O |
|---|---|---|---|---|---|---|
| 2.2.1.P. The Examiner places a sample of brick at template position B and a sample of smooth cork at template position C on the table in front of the Child and familiarizes the Child with each sample. E. hands the Child a second sample of brick and says "Find one just like this." E. administeres 3 additional trials arranging the materials as follows:<br>Trial 2: Brick at template position C; Cork at template position B<br>Trial 3: Brick at template position C; Cork at template position B<br>Trial 4: Brick at template position B; Cork at template position C<br>If the Child responds correctly in 3 of the 4 trials, proceed to 2.2.2.P. Otherwise, proceed to 2.3. | 2.2.1.S. Child distinguishes between a sample of brick and a sample of smooth cork by matching* a sample of brick with the first sample of brick. | | | | | |
| 2.2.2.P. The Examiner places a sample of smooth wood at template position B and a sample of smooth tile at template position C on the table in front of the Child and familiarizes the Child with each sample. Hand the Child a second sample of smooth wood and say "Find one just like this." E. follows the same procedure as in 3.2.1.P. using a second sample of smooth wood for matching. If the Child responds correctly in 3 of the 4 trials, proceed to 2.2.3. Otherwise, proceed to 2.3. | 2.2.2.S. Child distinguishes between a sample of smooth wood and smooth tile by matching* a second sample of smooth wood with the first sample of smooth wood. | | | | | |

2.2 Tactual Discrimination (Hands) (con't)

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 2.2.3.P. The examiner places a sample of brick at template position A, a sample of smooth tile at template position B and a sample of rough sandpaper at template position C on the table in front of the Child and familiarizes the Child with each sample. E. hands the Child a second sample of smooth tile and says "Find one just like this." E. administers 3 additional trials arranging the materials as follows:<br><br>Trial 2: Brick at template position B; Tile at template position C; Sandpaper at template position A<br>Trial 3: Brick at template position C; Tile at template position A; Sandpaper at template position B<br>Trial 4: Same as Trial 2<br><br>If the child responds correctly in 3 of the 4 trials, proceed to 2.2.4.P. Otherwise, proceed to 2.3. | 2.2.3.S. Child distinguishes between samples of brick, smooth tile and rough sandpaper by matching* a sample of smooth tile with the first sample of smooth tile. | | | | | |
| 2.2.4.P. The Examiner places a sample of smooth tile, a sample of smooth wood and a sample of wall paper on the table in front of the Child and familiarizes the Child with each sample. E. follows the same procedure as in 2.2.3.P. using a second sample of wall paper for matching. If the Child responds correctly in 3 of the 4 trials, proceed to 2.2.5.P. Otherwise, proceed to 2.3 | 2.2.4.S. Child distinguishes between samples of smooth tile, smooth wood and a piece of wall paper by matching* a second sample of wall paper with the first sample of wall paper. | | | | | |

2.2 Tactual Discrimination (Hands) (con't)

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 2.2.5.P. The Examiner places a sample of smooth tile at template position A, a sample of smooth wood at template position B, a sample of brick at template position C and a sample of wall paper at template position D on the table in front of the Child and familiarizes him with each sample. E. hands the Child a second sample of smooth wood and says "Find one just like this." E. administers 3 additional trials arranging the materials as follows:<br><br>Trial 2: Tile at template position B; Wood at template position C; Brick at template position D; Wall paper at template position A<br>Trial 3: Tile at template position C; Wood at template position D; Brick at template position A; Wall paper at template position B<br>Trial 4: Same as Trial 2<br><br>Upon completion of this item, proceed to item 2.3. | 2.2.5.S. Child distinguishes between samples of smooth tile, smooth wood, brick and a piece of wall paper by matching* a second sample of smooth wood with the first sample of smooth wood. | | | | | |

COMMENTS: _____

4.1 *Sighted Guide

Procedure: The Examiner walks with the Child over an indoor route which is familiar to the Child. The route involves open areas, turns, doors, and stairways.

ASSESSMENT: Provide only as much assistance as necessary and score appropriately.

1. Not performed
2. Not applicable
3. With assistance
4. Independent
5. Observed

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 4.1.1.P. The Examiner approaches the Child, and signals for the Child to stand. The Examiner places the Child's hand (thumb on outside, fingers on inside) on his arm (C's left on E's right) or hand (depending on size of Child) and says "Let's take a walk." The Examiner slowly walks one-half step in front of the Child and proceeds through an open area or down a long hallway - a minimum distance of 25 feet. If the Child responds correctly, proceed to 4.1.2.P. Otherwise, proceed to 4.2. | 4.1.1.S. Child maintains contact with guide (Examiner) using proper grip (thumb on on outside, fingers on inside of guide's arm) and position. (Child maintains one-half step behind guide) while walking in an open area. | | | | | |
| 4.1.2.P. Using the same procedure as in 4.1.1.P., the Examiner proceeds through at least 3 doorways or narrow passageways. At each doorway or narrow passage, the Examiner moves his guiding arms slightly behind him and says "We are going through a narrow space." If the Child responds correctly, proceed to 4.1.3.P. Otherwise, proceed to 4.2. | 4.1.2.S. Child travels with the guide (Examiner) through doorways and narrow passages without making contact with environment. | | | | | |
| 4.1.3.P. Using the same procedure as in 4.1.1.P., the Examiner approaches an ascending stairway at a right angle to the bottom step, pauses 6 inches in front of the bottom step and says "We are going to walk up the stairs." The Examiner, one step in front of the Child, proceeds slowly with the Child up the stairs and stops on the landing at the top. The Examiner's expectations for the Child should correspond to the stairway performance in 1.5. If the Child responds correctly, proceed to 4.1.4.P. Otherwise, proceed to 4.2. | 4.1.3.S. Child travels with the guide (Examiner) on ascending stairways, smoothly, without tripping or falling and remaining one step behind the guide until the landing is reached. | | | | | |

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 4.1.4.P. Using the similar procedure as in 4.1.3.P., the Examiner approaches a descending stairway at a right angle to the top step and stops at the edge of the top step. The Examiner says "Find the top step with your foot." When the Child is properly aligned, the Examiner says "We are going to walk down the steps." The Examiner proceeds, one step in front of the Child, very carefully and slowly down the stairs and stops at the landing. The Examiner's expectations for the Child should correspond to the stairway performance in 1.6. If the Child responds correctly, proceed to 4.1.5.P. Otherwise, proceed to 4.2. | 4.1.4.S. Child travels with guide (Examiner) on descending stairways smoothly, without tripping or falling and remaining one step behind the guide until the landing is reached. | | | | | |
| 4.1.5.P. Using the same procedure as in 4.1.1.P. and 4.1.2.P., the Examiner proceeds through at least 3 doorways having doors which are hinged on the right and require opening and closing. The Examiner initially says "We are going to walk through some doors...I want you to help me open and close the doors." At the first door, the guide (examiner) places Child's free hand (right) in contact with the door knob and prompts the Child to open and close the door. At the second and third door, the Child may be given verbal prompts only. If the Child responds correctly, approach a door hinged on the left. E. says "Now the door is on the other side... help me open and close it." This part of the item is not scored but should be noted under "Comments." Upon completion of this item, proceed to 4.2. | 4.1.5.S. Child uses guide's (Examiner's) positional cues in traveling through doorways and assists guide in the opening and closing of doors, hinged on the right. | | | | | |

* Omit with nonambulatory children; however, procedures can be modified for children on crutches or in wheel chairs.

COMMENTS: _____

_____

## 4.6 Environmental Travel

Procedure: The Examiner takes the Child into an indoor area in which he is somewhat familiar which includes a hallway and an open area. The area used should be free fo distractions.

ASSESSMENT: Provide only as much assistance as necessary and score appropriately.

1. Not performed
2. Not applicable
3. With assistance
4. Independent
5. Observed

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 4.6.1.P. The Examiner takes the Child to the wall of a long hallway next to a door or other landmark. E. places the Child's trailing hand against the wall and walks with the Child to a point approximatly 30 feet in distance to an object such as a chair placed next to the wall. E. familiarizes the Child with the chair (object), then walks back to the initial starting point with the Child. E. says "Go to the chair and come back to me." Verbal and physical prompts are permissible to help get the Child started. If the Child responds correctly to this item, proceed to 4.6.2.P. Otherwise, stop. | 4.6.1.S. Child travel 30 feet along a wall to an object and returns to the original starting point in which the Child maintains contact with the wall using any method. | | | | | |
| 4.6.2.P. The Examiner follows the same procedure as in 4.6.1.P., and, in addition, places the Child's hand in the proper trailing position (see 4.4.4.S.) and says "Follow the wall, find the chair (object) and come back to me." If the Child responds correctly to this item, proceed to 4.6.3.P. Otherwise, stop. | 4.6.2.S. Child travels 30 feet along a wall to an object and returns to the original starting point using trailing procedure (see 4.4.3.S.). | | | | | |
| 4.6.3.P. The Examiner takes the Child to an open room and places the Child's back against one wall. E. walks directly across the room (a distance of 20 feet) to a specific object with the Child, familiarizes the Child to the object and returns with the Child to the starting point. Then E. says "Go to the _____ (object) and come back to me." It is permissible to give the Child verbal or physical prompts to get him started. If the Child responds correctly to this item, proceed to 4.6.4.P. Otherwise, stop. | 4.6.3.S. Child walks across an open space and returns to the original starting point using any method. (Note: Child receives full credit if he reaches a point within 3 feet of either side of the original starting point (examiner). | | | | | |

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 4.6.4.P. The Examiner follows the same procedures as in 4.6.3.P., and, in addition, does the following: with the Child standing with his back to the wall, E. places the Child's left arm downward across the mid-line of his body. E. places the Child's right arm across the upper part of his body so that it is shoulder high, bent at the elbow, forearm parallel to the floor and palm turned out. E. says "Hold your arms like this...Go to the _____(object) and come back to me." It is permissible to give the Child verbal or physical prompts to get him started. If the Child responds correctly, to this item, proceed to 4.6.5.P. Otherwise, stop. | 4.6.4.S. Child walks across an open space and returns to the original starting point using protective skills described in 4.6.4.P.  | | | | | |
| 4.6.5.P. The Examiner walks with the Child (allowing the Child to trail with free hand) over an "L" shaped route (one turn) which terminates at a familiar object. Then, E. walks back to the original starting point with the Child. E. places the Child's right hand against the wall and places his left arm across the mid-line of his body and says "Go to the _____(object) and come back to me." It is permissible to give the Child verbal or physical prompts to get him started. Upon completion of this item, stop. | 4.6.5.S. Child travels over an "L" shaped route using trailing skills described in 4.4.4.S. and protective skills described in 4.6.4.S. and returns to original starting point (examiner). | | | | | |

COMMENTS: _____

_____ _____

## 3.1 Body Image

Procedure: The Examiner takes the Child into an open room which is free of distractions.

ASSESSMENT: Provide only as much assistance as necessary and score appropriately. *Accept any response which clearly indicates that the Child can distinguish between the body parts.

1. Not performed
2. Not applicable
3. With assistance
4. Independent
5. Observed

| | | NP | NA | WA | I | O |
|---|---|---|---|---|---|---|
| 3.1.1.P. The Examiner stands 2 feet directly in front of the Child and gives the following commands:<br>a. Touch your head<br>b. Touch your arm.<br>c. Touch your leg.<br>d. Touch your hand.<br>e. Touch your foot.<br>If the Child responds correctly, proceed to 3.1.2.P. Otherwise, proceed to 3.2 | 3.1.1.S. Child demonstrates awareness of body image by touching* his:<br>a. Head<br>b. Either Arm<br>c. Either leg<br>d. Either hand<br>e. Either foot | | | | | |
| 3.1.2.P. The Examiner stands 2 feet directly in front of the Child and gives the following commands:<br>a. Touch your mouth.<br>b. Touch your nose.<br>c. Touch your eyes.<br>d. Touch your ears.<br>e. Touch your hair.<br>If the Child responds correctly, proceed to 3.1.3.P. Otherwise, proceed to 3.2 | 3.1.2.S. Child demonstrates awareness of body image by touching* his:<br>a. Mouth<br>b. Nose<br>c. Eyes<br>d. Ears<br>e. Hair | | | | | |

3.1 Body Image (con't)

| | | NP | SA | WA | I | O |
|---|---|---|---|---|---|---|
| 3.1.3.P. The Examiner stands 2 feet directly in front of the Child and gives the following commands:<br><br>a. Touch your neck.<br>b. Touch your fingers.<br>c. Touch your knees.<br>d. Touch your waist.<br>e. Touch your chest.<br><br>If the Child responds correctly, proceed to 3.1.4.P. Otherwise, proceed to 3.2. | 3.1.3.S. Child demonstrates awareness of body image by touching* his:<br><br>a. Neck<br>b. Fingers<br>c. Knees<br>d. Waist<br>e. Chest | | | | | |
| 3.1.4.P. The Examiner stands 2 feet directly in front of the Child and gives the following commands:<br><br>a. Touch my (Examiner's) head.<br>b. Touch my (Examiner's) arm.<br>c. Touch my (Examiner's) leg.<br>d. Touch my (Examiner's) hand.<br>e. Touch my (Examiner's) foot.<br><br>If the Child responds correctly, proceed to 3.1.5.P. Otherwise, proceed to 3.2. | 3.1.4.S. Child demonstrates awareness of body image by touching* the Examiner's:<br><br>a. Head<br>b. Either arm<br>c. Either leg<br>d. Either hand<br>e. Either foot | | | | | |
| 3.1.5.P. The Examiner stands 2 feet directly in front of the Child and gives the following commands:<br><br>a. Touch my (Examiner's) neck.<br>b. Touch my (Examiner's) fingers.<br>c. Touch my (Examiner's) knees.<br>d. Touch my (Examiner's) waist.<br>e. Touch my (Examiner's) chest.<br><br>Upon completion of this item, proceed to 3.2. | 3.1.5.S. Child demonstrates awareness of body image by touching* the Examiner's:<br><br>a. Neck<br>b. Fingers<br>c. Knees<br>d. Waist<br>e. Chest | | | | | |

COMMENTS: _____

_____

# Appendix E

## Excerpts from Programmed Instructional Materials

## 1.1 Basic Movement

Purpose: To help the child who has not achieved walking skills learn to move independently in his environment.

Terminal Objective: At the completion of this activity, the child will move independently in a cross pattern across a flat surface.

Materials/Setting: Floor or mat (if available), bell, (bells) or other sound toys (e.g. music box, toy horn, etc.).

Prerequisite: The child must be able to turn his head (right and left). See (Prerequisite Skill M-I) to improve this ability. The child must be able to stretch his arms forward in midline area. If the child has difficulty, work on exercises to develop this ability. (See Prerequisite Skill M-II).

Activity Objective:

1.1.1.A. At the completion of this activity the child will voluntarily roll from his back to his side (either side) and return, then roll from his stomach to his side (either side) and return.

Recording Procedure:

No. of trials: 20

Definition of trial: One trial consists of presenting the child with the ortunity to roll over from back to right side or left side. Example: in rolling over to right side, the child's arm should be stretched upward under his head and his face should be turned to the right side. The child's leg is bent and comes in contact with the floor. on the right side (reverse for rolling over to left side).

Criteria: If the child makes a complete roll (back to side) independently score a "+" for the trial. If a complete cycle is not made, score the trial "-".

Training Activity:

1.1.1.T. a) Place the child on his back on the floor or mat. The trainer should sit or kneel next to the left side of the child and shake a sound object next to the child's right side a few inches from the child's head. The trainer should touch the sound object to the child's hand to make the child aware that there is something to reach for. The object should be placed near the child's head and then the trainer should say "get the toy." The trainer should also use scund cues to get the child to return to the position on his back. If the child responds to the use of sound cues, continue the procedure until the child completes six consecutive correct trials. Then proceed to step (c). If the child does not respond, proceed to step (b).

b) The trainer should touch the toy to the child's hand and physically prompt the child by turning the child's head then his hips to the right side which should bring about a spontaneous roll. The trainer should continue to roll the child to his right side and

Training Activity: (con't)

1.1.1.T. return him to the position on his back. (Reverse this procedure to get the child to return to the position on his back.) Reward the child for each roll movement to his side and return him to his back. Continue this activity, gradually reducing assistance until the child rolls over to his right side and returns to the position on his back independently in six consecutive trials. Then proceed to step (c).

c) To have the child roll to the left, use the same procedure outlined in step (a) presenting the sound cue on the child's left. If the child responds to sound cues, continue this procedure until the child completes six consecutive correct trials. Then proceed to step (e). If the child does not respond proceed to step (d).

d) Repeat the procedures outlined in step (b) substituting left side for right side. When the child responds independently in six consecutive trials, proceed to step (e).

e) Place the child on his stomach on a floor or mat. Follow procedures outlined in step (a) and (b) to get the child to move from the position on his stomach to his right side. Reverse procedures to get the child to return to his stomach. When the child responds correctly in six consecutive trials, proceed to step (f).

f) Follow procedures outlined in step (e) to get the child to roll from stomach to left side and return to position on stomach. When the child independently

Training Activity: (con't)

1.1.1.T. rolls from his back and stomach to either side and returns to the original position in six consecutive trials, proceed to 1.1.2.T.

Activity Objective:

1.1.2.A. At the completion of this activity the child will "roll" his body from back to stomach and from stomach to back making one complete rotation in either direction.

Recording Procedure:

No. of trials: 20

Definition of trial: One trial consists of presenting the child with an opportunity to complete a cycle of rolling (e.g. from back to stomach to back).

Criteria: If the child independently rolls his body in a complete rotation score a "+". Otherwise score a "-".

Training Activity:

1.1.2.T. a) The trainer should place the child on his back on a decline surface. The trainer should stand in front of the child on the decline in order to protect the child as he rolls. Encourag the child to roll over by presenting a sound object to him then moving it when the child turns to the side and begins to roll over. If the child only rolls to his side, the trainer should physically prompt the child until the child's stomach rests on the surface, then reward him for the movement. Reward the child for the correct movement and

reduce the physical assistance until the child independently moves his body from back to stomach. Proceed to step (b).

b) The trainer should present the sound toy farther from the chil on the decline. Encourage the child to reach for it. If there is no response, the trainer should increase the angle of the decline. The trainer should verbally encoura the child to roll over and get the object. If the child does not maintain momentum when he rolls, the trainer should physically assist him so that the child's body rolls from the upper end of the decline to the bottom. Gradually reduce this assistance until the child independently rolls his body. Reward the child for rolling from back to stomach to back. Continue this procedu until the child responds correctly in six consecutive trials Then proceed to step (c).

Training Activity: (con't)

1.1.2.T. c) The trainer should spread a blanket on the floor next to the child and verbally encourage the child to roll on to it. If the child does not respond use a sound toy as a cue and say "get the toy". Then say "roll on the blanket". If the child makes no response, physically assist the child by rolling him on to the blanket and then reward him. Reduce assistance until the child independently rolls on to the blanket. If the child continues to have difficulty, roll him up in the blanket and use sound cues to get him to " "unroll" the blanket. Reward the child for complete rotations of his body. When the child makes a complete rotation in six consecutive trials, proceed to step (d).

d) The trainer should position the child next to a wall and verbally encourage the child to roll toward him. The trainer should kneel a short distance away from the child and say "roll over to me". Reward the child for correct movement. Gradually reduce physical assistance until the child independently rolls on command. Continue this procedure until the child independently "rolls" from back to stomach and from stomach to back making one complete rotation in either direction, in six consecutive trials. Then proceed to 1.1.3.

NOTE: 1.1.3.A. Scooting: (Movement across a flat surface on back or buttocks) It is not recommended that this motor pattern be reinforced or that formal instruction be provided. When the pattern of "scooting" is integrated into the child's motor repertoire it is difficul

Training Activity: (con't)

1.1.2.T. to eliminate this behavior which may interfere with development of more advanced gross motor skills.

Proceed to 1.1.4.T.

Activity Objective:

1.1.4.A. At the completion of this activity the child will independently move forward crawling homolously (arms, then legs) or homolaterally (right arm, right leg; then left arm, left leg, etc.).

Recording Procedure:

No. of trials: 20

Definition of trial: One trial consists of presenting the child with the opportunity to extend his arms forward then both of his legs forward; or the child will move his right arm and right leg forward then his left arm and left leg forward.

Criteria: If the child makes independent forward crawling movements a minimum distance of 5 feet, score a "+". Otherwise score a "-".

Prerequisite:

The child must be able to raise his head and maintain head control. If the child lacks these skills proceed to Prerequisite Skill M-I (Head Control).

Training Activity:

1.1.4.T. a) Place the child on his stomach on the floor or mat. Roll up a pillow and tightly secure it with cord. The trainer should present a sound toy above the child's head and verbally encourage him to raise it. If the child does not independently raise his head, the trainer should proceed to Prerequisite Skill M-I (Head Control). The trainer should sit beside the child and firmly grasp the child's thigh-pelvis area, then rock him forward and backward. The trainer should move the child's body so it completely moves over the pillow then back. Have the child to independently move his body forward by providing sound cues. Reward the child for the correct movement. Proceed to step (b).

b) The trainer should place the child so that the pillow is about one foot in front of him. Position the pillow so it is next to the child's head and encourage him with the toy to reach toward the pillow. Reward the child for the correct movement. Then proceed to step (c).

c) The trainer should encourage the child to move his arms forward. Present a sound toy within arms reach from the child. If the child does not respond the trainer should move the child's hands alternately to the object. Reward the child and repeat the activity gradually reducing physical assistance until the child independently moves his arms forward then proceed to step (d).

d) The trainer should massage the child's back and legs while he

Training Activity: (con't)

1.1.4.T. is lying on the floor and the trainer's knee should be positioned against one of the child's feet. The child's leg should be bent. The trainer should put his hand against the child's other foot and gently apply pressure so the child's body slides forward. Reward the child for reaching forward with his arms. Encourage the child to independently move his arms and legs and reward him for correct responses. Continue this procedure until the child begins to move forward by sliding his body. Then proceed to step (e).

e) Place the child with his stomach resting on a scooter board (or sturdy board with wheels on it). The trainer should place the child's hands flat on the floor surface and allow the child to experience the board moving backward and forward. Encourage the child to use his hands to move the board independently. Encourage the child to reach with his arms forward contacting the surface with flat palms. Reward the child for moving across the surface. Then, proceed to step (f).

f) Place the child on his stomach in contact with the floor or mat. Use a sound toy or other auditory cues to encourage the child to move toward you. Reward the child for independent moving on his stomach a distance of one foot. Gradually reduce assistance until the child independently moves a distance of at least 5 feet in six consecutive trials. Then proceed to 1.1.5.T.

Activity Objective:

1.1.5.A. At the completion of this activity the child will move independently in a cross pattern (left arm, right leg; then right arm left leg,etc.) across a flat surface.

Recording Procedure:

No. of trials: 20

Definition of trial: One trial consists of presenting the child with the opportunity to move forward on his stomach moving his right arm and left leg, then left arm and right leg.

Criteria: If the child correctly moves in a cross pattern record a "+". Otherwise a "-".

Prerequisite:

The child must be able to reach and push with his arms forward, support himself on his elbows, flex and extend his legs and maintain control of his head and trunk. If the child lacks these skills, proceed to the appropriate prerequisite skill activities.

Training Activity:

1.1.5.T. a) With the child on his stomach the trainer should kneel 2 feet in front of the child and say "Come to me". If the child does not respond the trainer should grasp the child's right wrist or lightly tap on his right wrist and guide the child's hand while an assistant simultaneously pushes the child's left foot forward. Touch a sound toy to the child's right hand then move it ten inches in front of the child and say "Get the toy". If the child still does not respond, the trainer should grasp the child's right upper elbow area from behind and move it forward. An assistant should simultaneously move the child's left foot then alternate to the child's right foot when the trainer moves the child's left arm forward. Reward the child and gradually reduce physical assistance until the child begins moving forward in a cross pattern. Gradually increase the distance that the object is placed from the child. Gentle patting on the back of the arms and shoulder and verbal encouragement may help motivate the child to move his arms and legs. When the child begins to move independently, proceed to step (b).

b) The trainer should securely tape a 5 foot length of garden hose to the floor. Then measure the distance between the frontal section of the child's right and left knees. Place another length of hose that distance from the first one. The child should be positioned between the "hose track" and should be allowed to examine the hose. The

Training Activity: (con't)

1.1.5.T. trainer should repeat the proceeding steps and guide the child's right hand to reach forward to contact the hose while the assistant simultaneously pushes against the child's left foot so the child's left knee contacts the hose track. Gradually physical assistance should be reduced until the child independently moves forward in a cross pattern a distance of one foot. Reward the child and proceed to step (e).

e) Continue these procedures until the child independently moves in a cross pattern a minimum of 5 feet in six consecutive trials.

## 2.1 Sound Localization

Purpose: To help the child learn to locate the source of sounds in the environment.

Terminal Objective: At the completion of this activity the child will locate the directional position of a moving sound and track the sound by moving toward it.

Materials/Setting: A large open room/ a small bell or other sound producing object.

Prerequisites: The child must have adequate hearing in both ears in order to complete this activity. For a child with a mild or moderate loss, the loudness of the sound source should be increased.

Activity Objective:

2.1.1.A. At the completion of this activity, the child will face, reach for, or otherwise localize the direction of a sound.

Recording Procedure:

No. of trials: 20

Definition of trial: Presenting the child with an opportunity to respond to a sound.

Criteria: If the child turns toward, reaches for or otherwise indicates that he can localize a sound, score a "+" for the trial. Otherwise, score a "-".

Training Activity:

2.1.1.T. a) Guide the child to the center of a large room that is free of obstacles and have him stand or sit. Stand 2 feet directly in front of the child and ring a small bell. Say "Where is the bell....find the bell." If the child reaches for, points to or turns toward the bell or the trainer's voice, reward him. Continue this procedure until the child responds correctly in six consecutive trials, then proceed to 2.1.2.T. If the child does not respond proceed to step (b).

b) Stand close to the child, repeat the procedure in step (a) above and continue ringing the bell until he shows some response. If the child still does not respond, place the bell in the child's hands and help him ring it. Then remove the bell from the child's hands and ring it about one foot in front of him. Say "Where is the bell, find the bell." If the child responds correctly return to step (a) and repeat procedures. If the child does not respond, proceed to step (c).

c) Use various sound objects other than a bell which may hold higher stimulus value for the child such as the trainer's own voice, a beeper, transistor radio, etc. until the child

Training Activity: (con't)

| | |
|---|---|
| 2.1.1.T. | begins to show some response to the sound. When the child begins to make a response, return to step (a) and repeat procedures. If the child still makes no response, proceed to prerequisite activity- Response to Sounds. |

Activity Objective:

2.1.2.A. At the completion of this activity, the child will locate the position of a stationary sound from the right and left of his body by turning his head and/or body until he is facing the sound.

Recording Procedure:

No. of trials: 20

Definition of trial: Presenting the child with an opportunity to respond to a sound.

Criteria: If the child locates the position of a stationary sound from the right and left of his body, score a "+" for the trial. Otherwise score a "-".

Training Activity:

2.1.2.T. a) Guide the child to the center of a large room that is free of obstacles. The child should be standing if possible. Stand 6 feet directly in front of the child and ring a small bell. Say "Where is the bell... find the bell." If the child indicates the position of the bell by moving toward it or reaching for it proceed to step (b). If the child does not indicate the location of the sound source, return to 2.1.1.T.

b) Move six feet to the right side of the child and ring the bell. Say "Now where is the bell?.... find the bell now!" If the child responds correctly, continue this procedure until he is successful in six consecutive trials, then proceed to step (d). If the child does not indicate the location of the bell proceed to step (c).

c) The trainer should stand one foot in front of the child on the child's right side and ring the bell. Move closer to the child and say "Now where is the bell...find the bell now!" Then gradually move away from the child one foot at a time until a distance of six feet is reached. If the child does still not respond, stand about 3 feet away on the child's right side and ring the bell. Have an assistant turn the child toward the direction of the sound and then move the child toward the trainer until physical contact is made. Reward the child. Continue this procedure until the child independently turns toward the sound. Reward the child for each correct response. Repeat these procedures on the left side. When the child responds

Training Activity: (con't)

correctly in six consecutive trials, return to step (b).

d) Move six feet to the left side of the child and ring the bell. Say "Now where is the bell.... find the bell now!" If the child responds correctly, continue this procedure until he is successful in six consecutive trials, then proceed to step (e).

e) Alternate moving to the child's right then left and ringing the bell until he responds correctly in six consecutive trials. Then proceed to 2.1.3.T.

2.1 Sound Localization (con't)

Activity Objective:

2.1.3.A. At the completion of this activity the child will locate the position of a stationary sound from the 4 cardinal points in relation to his body by turning his head and/or body until he is facing the source of the sound.

Recording Procedure:

No. of trials: 20

Definition of trial: Presenting the child with an opportunity to respond to a sound.

Criteria: If the child locates the directional position of a stationary sound from the 4 cardinal points in relation to his body score a "+" for the trial. Otherwise score a "-".

Training Activity:

2.1.3.T. a) Guide the child to the center of a large room that is free of obstacles and have him stand if possible. Walk around the child and stop at each of the four cardinal points (i.e. left, right, front and back) and ring the bell. The trainer should stand at about 4 to 6 feet from the child while ringing the bell. At each cardinal point, ring the bell and say "Where is the bell?....find the bell now!" If the child responds correctly by turning toward the sound or reaching for it, proceed to the next cardinal point and continue this procedure until he is successful in six consecutive trials, then proceed to 2.1.4.T. If the child has difficulty or does not respond proceed to step (b).

b) Stand one to two feet in front of the child and ring the bell. If the child responds correctly move to the child's left side and ring the bell then behind the child and finally on the child's right side. If the child makes no response, have an assistant turn the child toward the sound each time the trainer rings the bell from a different position. Continue this procedure until the child responds independently and upon completion of six consecutive trials, proceed to 2.1.4.T. If the child continues to have difficulty return to 2.1.2.T.

Activity Objective:

2.1.4.A. At the completion of this activity the child will locate the position of a more distant (8-10 feet) stationary sound by turning his head and/or body and facing the sound then moving to the source of the sound.

Recording Procedure:

No. of trials: 20

Definition of trial: Presenting the child with an opportunity to respond to a sound.

Criteria: If the child turns and faces the sound and moves toward it until he makes physical contact with the sound source, score a "+" for the trial. Otherwise, score a "-".

Training Activity:

2.1.4.T. a) Guide the child to the center of a large room and have him stand if possible. Stand 8 feet in front of the child, ring the bell and say "Come to me....find the bell." If the child moves toward the bell and makes physical contact with the bell or trainer, move to the child's left side and repeat this procedure. If the child continues to respond correctly, repeat this procedure standing behind the child and on the child's right side. When the child responds correctly in six consecutive trials, proceed to 2.1.5.T. If the child is unresponsive, proceed to step (b).

b) Stand one foot in front of the child and ring the bell. Say "Come to me....find the bell." If the child does not move toward the bell, have an assistan guide the child to the bell and reward him. Continue this procedure until the child begins to respond independently. Then begin to increase the distance between the sound source and the child until he will make contact with the trainer from a distance of 8 feet. Repeat this procedure for each of the 4 cardinal points around the child. When the child begins to respond without physical prompting return to step (a) and repeat procedures.

Note: If the child does not respond to the sound of a bell or if the bell does not provide high stimulus value, a different sound should be substituted.

Activity Objective:

2.1.5.A. At the completion of this activity the child will locate the position of a moving sound and track the path of the sound by moving toward and following the source of the sound.

Recording Procedure:

No. of trials: 20

Definition of trial: Presenting the child with an opportunity to respond to a sound.

Criteria: If the child moves toward the direction of a moving sound and follows the path of the sound which includes at least 3 turns, score a "+" for the trial. Otherwise score a "-".

Training Activity:

2.1.5.T. a) Guide the child to the center of a large room and have him stand if possible. Stand two feet in front of the child, ring the bell and say "Come to me...find the bell." If the child responds correctly by making contact with the trainer or bell proceed to step (b). If the child does not respond, return to 2.1.4.T.

b) Stand about three feet from the child, ring the bell and say "Follow me...see if you can find the bell." When the child proceeds toward the bell, begin to move slowly backward in a straight line of direction while continuing to ring the bell. After the child has walked five feet or more, stop and allow the child to make physical contact with the bell. Reward the child. Continue this procedure, gradually increasing the distance the child has to follow the sound to 10 feet or more. When the child can successfully follow the straight line of the sound in six consecutive trials, proceed to step (c).

c) Repeat the procedures of step (b) making right angle turns to form the pattern of a square. When the child is able to follow this pattern, reward him and reverse the direction. If the child has difficulty with this activity return to step (b).

Upon successful completion of six consecutive trials, proceed to 2.2.

## 3.1 Body Image

Purpose: To help the child learn to identify basic body parts as a beginning for spatial orientation.

Terminal Objective: At the completion of this item, the child will identify simple and complex parts on his own body and those on another person.

Materials/Setting: Two chairs.

Prerequisite: The child should be able to respond to basic verbal commands or signals such as "touch" or "find" your_____.

Activity Objective:

3.1.1.A. At the completion of this activity the child will identify the following body parts on his own body: head, arm, hand, leg, and foot.

Recording Procedure:

No. of trials: 20

Definition of trial: One presentation of an opportunity to touch or identify a specific body part.

Criteria: Score a "+" for the trial if the child makes the correct response independently. Otherwise, score a "-".

Training Activity:

3.1.1.T. a) Seat the child in a chair that is a comfortable size for him. The trainer should seat himself close to the child, face him and say "Touch your head...where is your head?" If the child responds correctly, reward him and repeat this procedure with a command for him to touch his arm, hand, leg, and foot. If the child touches each part correctly in six consecutive trials, proceed to 3.1.2.T. If the child does not respond correctly, proceed to step (b).

b) Prompt the child by placing his hand on his own head while giving him the command "touch your head." then reward him.

Continue this procedure gradually reducing assistance until the child responds correctly and independently in six consecutive trials. Then proceed to step (c).

Training Activity: (con't)

c) Repeat procedures outlined in step (b) to train the child to touch his arm, hand, leg, and foot. When the child touches each of the body parts listed in this lesson correctly in six consecutive trials, for five consecutive days, proceed to 3.1.2.T.

Activity Objective:

3.1.2.A. At the completion of this activity the child will identify the following parts of his own body: mouth, nose, eyes, ears, and hair.

Recording Procedure:

No. of trials: 20

Definition of trial: One presentation of an opportunity to touch or identify a specific body part.

Criteria: Score a "+" for the trial if the child makes the correct response independently. Otherwise, score a "-".

Training Activity:

3.1.2.T. a) Seat the child in a chair that is a comfortable size for him. The trainer should seat himself close to the child, face him and say "touch your mouth... where is your mouth?" If the child responds correctly, reward him and repeat this procedure with a command for him to touch his nose, eyes, ears, and hair. When the child touches each part correctly in six consecutive trials, proceed to 3.1.3.T. If the child does not respond correctly proceed to step (b).

b) Prompt the child by placing his hand on his own mouth while giving him the command, then reward him. Continue this procedure gradually reducing assistance until the child responds correctly and independently. Continue until the child touches his mouth independently in six consecutive trials. Then proceed to step (c

c) Repeat procedures outlined in step (b) to train the child to touch his nose, eyes, ears, and hair. When the child touches each of the body parts listed in this lesson correctly in six consecutive trials for five consecutive days, proceed to 3.1.3.T.

Activity Objective:

3.1.3.A. At the completion of this activity the child will identify the following parts of his own body: neck, fingers, knees, waist, and chest.

Recording Procedure:

No. of trials: 20

Definition of trial: One presentation of an opportunity to touch or identify a specific body part.

Criteria: Score a "+" for the trial if the child makes the correct response independently. Otherwise, score a "-".

Training Activity:

3.1.3.T. a) Seat the child in a chair that is a comfortable size for him. The trainer should seat himself close to the child, face him and say "touch your neck... where is your neck?" If the child responds correctly, reward him and repeat this procedure with a command for him to touch his fingers, knees, waist, and chest. When the child touches each part correctly in six consecutive trials, proceed to 3.1.4. If the child does not respond correctly, proceed to step (b).

b) Prompt the child by placing his hand on his own neck while giving him the command "touch your neck" then reward him. Continue this procedure gradually reducing assistance until the child responds correctly and independently. Continue until the child touches his neck independently in six consecutive trials. Then proceed to step (c).

c) Repeat procedures outlined in step (b) to train the child to touch his fingers, knees, waist, and chest. When the child touches each of the body parts listed in this lesson correctly in six consecutive trials for five consecutive days, proceed to 3.1.4.T.

Activity Objective:

3.1.4.A. At the completion of this activity the child will identify the following parts on the trainer: head, arm, hand, leg, and foot.

Recording Procedure:

No. of trials: 20

Definition of trial: One presentation of an opportunity to touch or identify a specific body part.

Criteria: Score a "+" for the trial if the child makes the correct response independently. Otherwise score a "-".

Training Activity:

3.1.4.T. a) The trainer should seat himself and have the child stand about 2 feet in front of him. Proceed to step (b).

b) Make contact with the child by touching his waist or shoulders and say, "touch my head.... where is my head?" If the child responds correctly, proceed by having the child touch the trainer's arm, leg, hand and foot until the child can touch each of these parts on command in six consecutive trials. If the child touches his own head, say "No, where is my head; find my head." If the child continues to touch his own head, grasp the child's hand and say, "This is your head." Then move his hand to your head and say, "This is my head." Continue prompting the child to touch your head until he will respond independently and correctly. When the child responds correctly in six consecutive trials, proceed to step (c).

c) Repeat the procedures outlined in step (b) to train the child to touch the trainer's arm, hand, leg, and foot. When the child touches each of the body parts listed in six consecutive trials, for five consecutive days, proceed to 3.1.5.T.

Activity Objective:

3.1.5.A. At the completion of this activity the child will identify the following body parts on the trainer: neck, fingers, knees, waist, and chest.

Recording Procedure:

No. of trials: 20

Definition of trial: One presentation of an opportunity to touch or identify a specific body part.

Criteria: Score a "+" for the trial if the child makes the correct response independently. Otherwise, score a "-".

Training Activity:

3.1.5.T. a) The trainer should seat himself and have the child stand about 2 feet in front of him. Proceed to step (b).

b) Make contact with the child by touching his waist or shoulders and say, "touch my neck.... where is my neck?" If the child responds correctly, proceed by having the child touch the trainer's fingers, knees, waist and chest until he can touch each of these parts on command in six consecutive trials. If the child touches his own neck, say "No, where is my neck; find my neck." If the child continues to touch his own neck, say "This is your neck." Then move his hand to your neck and say, "This is my neck." Continue prompting the child to touch your neck until he will respond independently and correctly. When the child responds correctly in six consecutive trials, proceed to step (c).

c) Repeat procedures outlined in step (b) to train the child to touch the trainer's [illegible] neck, fingers, knees, waist and chest, requiring the child to respond correctly in six consecutive trials for each part When the child touches each of the body parts listed in six consecutive trials for five consecutive days, proceed to 3.1.5

## 4.6 Environmental Travel

Purpose: To help the child learn to follow basic routes to specified destinations in his environment.

Terminal Objective: At the completion of this activity, the child will follow an "L" shaped route to a specified object and return to his starting point.

Materials/Setting: A large, uncluttered room, and a long hallway with at least one intersecting corridor.

Activity Objective:

4.6.1.A. At the completion of this activity the child will demonstrate environmental travel skills by traveling 30 feet along a wall to an object and returning to the original starting point while maintaining contact with the wall in any manner.

Recording Procedure:

No. of trials: 20

Definition of trial: One trial consists of having the child travel the specified route.

Criteria: If the child completes the route and demonstrates all the required behaviors specified in the activity objective, score a "+" for the trial. Otherwise, score a "-".

Training Activity:

4.6.1.T. a) Guide the child to a long hallway and position him along the wall next to a door or other landmark. Say "You are going to learn to travel about the building using your hand against the wall for help." Place the child's trailing hand against the wall and say "Put your hand against the wall and walk along the wall until I tell you to stop." Then guide the child to a point approximately 15 feet in distance to an object such as a chair placed next to the wall. Familiarize the child with the chair and its location, then return to the original starting point with the child. Proceed to step (b).

b) Say "We walked along the wall until we found a chair...then we turned around and walked back to this door." Then place the child's trailing hand on the wall and say "Go to the chair and come straight back to me." If the child completes the route, reward him and repeat this procedure until he locates the chair and returns in six consecutive trials. Then proceed to step (d). If the child does not respond, or does not complete the route, proceed to step (c).

c) Reduce the distance of the route from 15 feet to 6 feet and repeat the basic procedures of step (b) several times. Then say "Go to the chair and come straight back to me."

Training Activity: (con't)

4.6.1.T. Walk with the child and prompt him to stop at the chair, turn around, and return to the starting point. Reward the child. Gradually reduce assistance as the child begins to perform independently. When the child can complete a 6 foot route, (i.e. six consecutive correct trials), increase the distance from the starting point to the chair to 10 feet. When the child has mastered a route of 10 feet (i.e. six consecutive correct trials), increase the distance to 15 feet. When the child successfully completes the 15 foot route in six consecutive trials, proceed to step (d).

d) Repeat the basic procedures of steps (a-c), however, increase the distance of the route (starting point to chair) to 30 feet. If the child completes the route successfully, reward him, and continue this procedure until he responds correctly in six consecutive trials. Then proceed to 4.6.2.T.

If the child does not respond correctly, return to step (c). Increase the initial route distance indicated in step (c) to 20 feet. When the child can complete the 20 foot route, increase the distance to 25 feet, and finally 30 feet. When the child successfully completes the 30 foot route (i.e. travels to the chair and returns) proceed to 4.6.2.T.

Activity Objective:

4.6.2.A. At the completion of this activity the child will demonstrate environmental travel skills by traveling 30 feet along a wall to an object and returning to the original starting point using proper trailing technique (i.e. constant contact with the back of his hand, which is at waist height and slightly ahead of his body as he travels, and maintaining parallel distance.)

Recording Procedure:

No. of trials: 20

Definition of trial: One trial consists of having the child attempt to travel a specified route demonstrating proper trailing technique.

Criteria: If the child completes the route and demonstrates proper trailing technique, score a "+". Otherwise score a "-".

Prerequisite:

The child should be able to trail efficiently. If he lacks these skills, return to 4.4.

Training Activity:

4.6.2.T. This lesson is an exact replication of 4.6.1.T. with one exception. The child is required to complete the task demonstrating proper trailing technique. Follow the procedures prescribed in 4.6.1.T.

If the child has difficulty with trailing procedures, return to 4.4.

Activity Objective:

4.6.3.A. At the completion of this activity the child will walk straight across a room a distance of 20 feet to an object (e.g. chair) and then return to the starting position.

Recording Procedure:

No. of trials: 20

Definition of trial: One trial consists of having the child attempt to travel the specified route.

Criteria: If the child completes the route and demonstrates all required behaviors specified in the activity, objective, score a "+" for the trial. Otherwise score a "-".

Prerequisite:

The child must be able to travel a straight line to be successful with this lesson. If the child lacks these skills, proceed to Prerequisite Skill .

Training Activity:

4.6.3.T. a) Guide the child to a wall of an open room and say "Stand with your back against the wall." Then say "Walk across the room with me and help me find the _____(object or chair)" and guide the child directly across the room (a distance of 20 feet) to specific object (e.g. a chair) Familiarize the child with the object and return to the original starting point. Repeat this procedure then proceed to step (b).

b) Say "Go straight to the chair and come back to the wall." If the child completes the route successfully (walks to the object and returns), reward him. It is important that the trainer position himself close enough to the child to prevent injury (bumping objects, etc.). Continue this procedure until the child walks to the object and returns correctly in six consecutive trials. Then proceed to 4.6.4.T. If the child fails to complete the route because he cannot walk in a straight line, go to Prerequisite Lesson III on walking in a straight line. If the child walks to the chair and does not stop, proceed to the Activity 4.5 (Utilization of Discriminable Landmarks). If the child stops at the chair and does not return, proceed to step (c).

c) Repeat the basic procedures of steps (a) and (b). Walk with the child from the wall to the chair and when he reaches the chair, reward him. Continue this procedure gradually reducing assistance until the child reaches the chair independently in six consecutive trials. Then proceed to step (d).

Training Activity: (con't)

4.6.3.T. d) Walk with the child from the chair back to the wall, reward him and continue this procedure gradually reducing assistance until the child reaches the wall independently in six consecutive trials. Then return to step (a).

Activity Objective:

4.6.4.A. At the completion of this activity, the child will walk straight across a room a distance of 20 feet to a chair (or other object) and return to his starting point. The child will use bodily protective skills consisting of positioning one arm downward across the midline of his body and his other arm across the upper part of his body so that it is shoulder high, bent at the elbow, forearm parallel to the floor and palm turned out.

Recording Procedure:

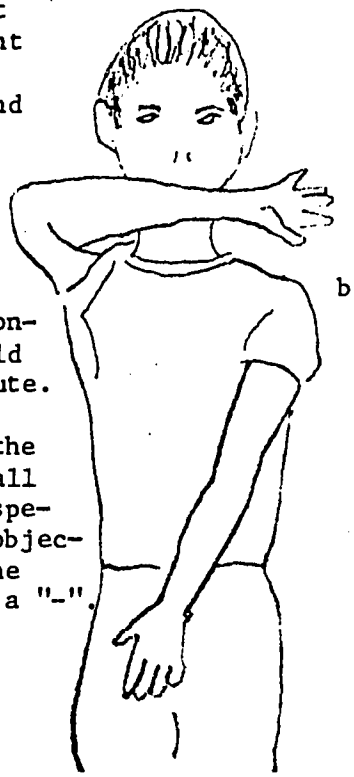
No. of trials: 20

Definition of trial: One trial consists of having the child travel the specified route.

Criteria: If the child completes the route and demonstrates all the required behaviors specified in the activity objective, score a "+" for the trial. Otherwise score a "-".

Training Activity:

4.6.4.T. a) Guide the child into the hallway and position him so that his back is against the wall and he is facing across the hallway. Say "You are going to learn how to hold your arms when you walk so you wont get hurt." Position the child' arms as follows: left arm extended downward across the midline of the child's body; right arm held across the upper part of the body so that it is shoulder high, bent at the elbow; forearm parallel to the floor and palm turned out, (see diagram). Proceed to step (b).



b) Reward the child for holding his arms in the prescribed position and say "Walk across the hall." Prompt the child to get him started and walk with him until he reaches the other side of the hallway. Reward the child and position him so his back is against the wall facing the starting point. Continue this procedure until the child begins to hold his arms in the prescribed position independently. Then guide the child to a large open room and position him with his back against the wall. Guide the child across the room to an object such as a chair. Familiarize him with the chair, then guide him back to the original starting point. Reposition the child with his back against the wall and place his arms in the position described in step (a). Say "Hold your arms like this and walk across the room to the chair, then come back to me." If the child walks across the room and returns to the original starting point holding

Training Activity: (con't)

4.6.4.T. his arm and hand in the specifie position. Reward him. Then continue this procedure and when the child is successful in six consecutive trials, proceed to step (e). If the child has difficulty, proceed to step (c).

c) Position the child with his back against the wall of the room and place his arms in the prescribed position. Say "Hold your arms like this." Reward the child and continue to position the child's arms until he will keep them in position independently. Then say "Walk across the room and find the chair." Prompt the child to get him started, and assist him in holding his arms in the prope position. Gradually reduce assistance until the child begins to hold his arms in the prescribed position and walks across the room independently. Repeat the above procedures and when the child crosses the room correctly, holding his arms in position in six consecutive trials, proceed to step (d).

d) Follow procedures outlined in step (c) having the child start at the chair and walk to the original starting point. When the child walks to the original starting point, holding his arms in the prescribed position in six consecutive trials, return to step (b).

e) Return to step (a) and repeat this lesson having the child use his opposite arms positioned in the protective technique (i.e. right arm extended downward across midline; left arm across upper part of body). When the child meets criteria specified in step (b), proceed to 4.6.5.T.

Activity Objective:

4.6.5.A. At the completion of this activity, the child will travel over an "L" shaped route to a chair or other familiar object using the trailing skills described in 4.6.4.A., and will return to his starting point. See the figure on the following page.

Recording Procedure:

No. of trials: 20

Definition of trial: One trial consists of having the child travel the specified route.

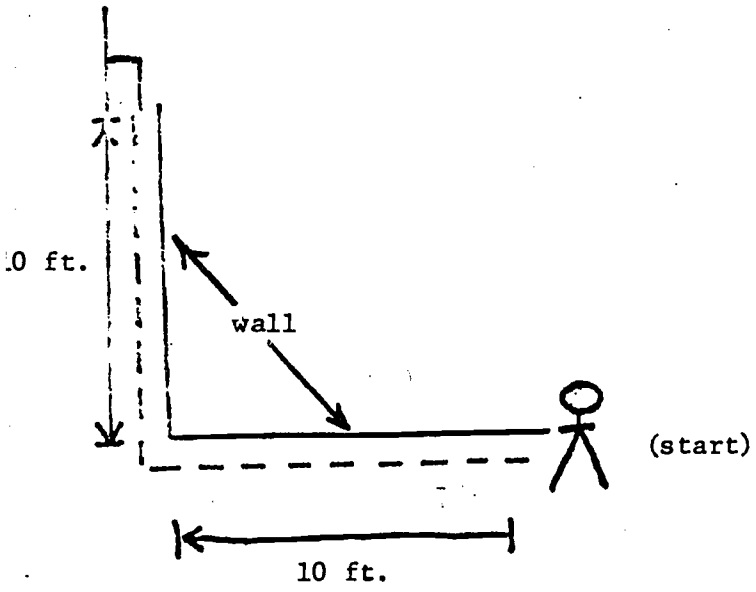
Criteria: If the child completes the route and demonstrates all the required behaviors specified in the activity objective score a "+" for the trial. Otherwise score a "-".

Training Activity:

4.6.5.T. a) Guide the child to a hallway which has intersecting corridors (or a similar area which permits an "L" shaped route). Place the child so that the wall is on his right. The total distance of the route should be about 20 to 30 feet (i.e. about a distance of 10 feet to the turn point, and another 10 feet to the chair). Proceed to step (b).

b) Place the child's right hand against the wall in a trailing position as described in 4.4.2. Guide the child along the route encouraging him to continue trailing. When the child reaches the turning point, say "Turn this way (to your right, left)", prompt the child through the turn and then guide the child to the chair. Familiarize the child with the chair then return to the starting point with the child along the same route. Repeat the procedures in step (b) without using the guide technique. Have the child extend his left arm downward across the midline of his body in the protective position as described in 4.6.4. Proceed to step (c).

c) Place the child in the same position as in step (a) and say "Follow the wall until it ends, turn and follow the wall until you find the chair...then come back to me." If the child completes the route maintaining constant contact with the wall and using prescribed protective techniques, reward him and repeat this procedure until he responds correctly in six consecutive trials. Then proceed to step (e). If the child has difficulty following the route, proceed to step (d).




Training Activity: (con't)

4.6.5.T. If the child has difficulty in utilizing trailing skills, return to 4.4. If the child has difficulty using protective skills, return to 4.6.4.

NOTE: The child will have to use opposite arms on the return route. That is, the arm with which he was protecting his body will be used for trailing and vice versa.

d) Repeat the basic procedures of steps (b) and (c) several times while verbally and physically prompting the child to complete the route. It may be helpful to review activities 4.5 on utilizing discriminable landmarks Gradually reduce assistance until the child begins to respond independently. When the child successfully completes the route independently in six consecutive trials, proceed to step (e).

e) This activity completes the programmed instruction on basic orientation and mobility skills. The child should be provided with frequent practice on these skills until they become a natural aspect of his daily living.

Prerequisite Lesson: Walking in a Straight Line

Purpose: To help the child learn to walk in a straight line without veering.

Terminal Objective: At the completion of this item, the child will walk at least 8 feet in a straight line between two reference points without deviating off the line.

Materials/Setting: Two 2x4" strips of wood approximately 8 feet in length.

Activity Objective:

At the completion of this activity the child will walk a straight line for 8 feet or more without prompts, devices or auditory cues.

Recording Procedure:

No. of trials: 20

Definition of trial: Providing the child one opportunity to walk in a straight line.

Criteria: If the child walks a straight line for a distance of 8 feet or more, score a "+" for the trial. Otherwise, score a "-".

Training Activity:

a) Guide the child to an open room or hallway and position the child with his back against a wall. The trainer should stand 2 feet in front of the child and verbally prompt the child to walk toward him. Say "Walk to me." If necessary a bell or other auditory device may be used to motivate the child to walk forward. When the child walks toward the trainer reward him. If the child does not walk toward the trainer, use physical prompts to get him started. Continue this procedure gradually increasing the distance at 1 foot intervals. When the child walks a distance of 4 to 6 feet without deviating away from the line of travel in six consecutive trials, proceed to step (b). If the child cannot walk a straight line using auditory and physical prompts, proceed to step (c).

b) Position the child according to the procedures outlined in step (a). The trainer should give the child a command to walk toward him (i.e. "Come to me"). A physical prompt may be given initially to get the child started but all other prompts (verbal and physical) should be reduced. The distance the child walks should be increased by 1 foot intervals until the child walks 6 to 8 feet without deviating away from the line of travel in six consecutive trials. Then return to the regular program. If the child has difficulty, return to step (a).

c) Set wooden guide strips parallel and four feet apart, perpendicular to the wall. Position the child with his

Training Activity: (con't)

back against the wall at one end of the guide strips and centered between them. Have the child walk between the strips to the other end. The trainer should walk immediately in front of the child verbally and/or physically prompting him to walk to the end of the guide strips. If the child walks between the two strips without deviating from a straight line (i.e. does not make contact with the guide strips), proceed to step (d). If the child does deviate and makes contact with the guide strips (i.e. kicks, scrapes, or otherwise touches them), the trainer should return the child to the starting point and provide another trial. As the child walks between the strips, the trainer should touch the child's shoulder or otherwise prompt him to walk in a straight line. Initially, the child should walk a distance of four feet without deviating (and be rewarded), then six feet (and be rewarded), etc. Gradually all physical and verbal prompts should be reduced. When the child walks a distance of eight feet between two guide strips spaced four feet apart, proceed to step (d).

d) Set the wooden strips parallel and 3.5 feet apart. Repeat the basic procedures of step (c) with this new width. When the child walks 8 feet without making contact with the guide strips narrow the space between guides until the child can walk between strips placed 3 feet apart without making contact with them. When this criteria is reached return to step (a).

## Appendix F

## Teacher Evaluation Forms

George Peabody College
O & M Research Project

Record Form
Score "+" for correct response
Score "-" for incorrect response

CHILD'S NAME _____ TRAINING ACTIVITY NO. _____

TRAINER _____ Week of _____

| TRIAL | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
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| 22. | | | | | |
| 23. | | | | | |
| 24. | | | | | |
| 25. | | | | | |

Comments: Use back of page.

ORIENTATION AND MOBILITY RESEARCH PROJECT

Weekly Reporting Form

Trainer _____

Week of _____

Activity No. _____

Please fill out this form on each lesson each week. Please answer yes or no; Please make recommendations regarding any questions answered no.

1. Does the child show interest in the materials? Yes_____ No_____
2. Do you find these materials interesting to work with? Yes_____ No_____
3. Do you feel this lesson is adequately designed to reach the desired objectives? Yes_____ No_____
4. Do you feel the lesson objectives are relevant and realistic? Yes_____ No_____
5. Do you feel this lesson is properly task analyzed (i.e. small sequential steps and proper ordering)? Yes_____ No_____
6. Do you feel that the instructional procedures are clearly presented? Yes_____ No_____
7. Do you feel that the recording procedures are clear? Yes_____ No_____
8. Have a sufficient number of trials been provided for this lesson? Yes_____ No_____
9. How much time have you spent on this lesson this week?
10. Was the entry level of this lesson sufficiently low to reach the child? Yes_____ No_____
11. Are more prerequisites lessons needed? Yes_____ No_____
12. Are there additional areas of instruction not included in this program that are needed by the child? Yes_____ No_____

COMMENTS: _____

_____

_____

_____

_____