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ABSTRACT

Described are the development and field testing of programed instruction in orientation and mobility for 41 multiply handicapped blind students. Based on initial assessment on the Peabody Mobility Scale, it is explained that the students were prescribed individualized tasks in the areas of motor development, sensory skills, concept development and orientation and mobility skills. Examples are provided of the sequence formats which provide information on purpose, terminal objective, materials, prerequisites, activity objective, training activity, and recording procedures. It is reported that preliminary analyses of pretest/posttest differences in motor and sensory performance indicated a significant improvement by the experimental group using the programed instruction. (CL)

THE DEVELOPMENT OF PROGRAMMED INSTRUCTION IN ORIENTATION AND MOBILITY FOR MULTIPLY HANDICAPPED BLIND CHILDREN

Thomas A. Wood

The general approach to programmed instruction in orientation and mobility for multiply handicapped blind children consists of a program designed to be implemented with individual children based on the results of the assessment with the Peabody Mobility Scale. Each subject was individually tested with the PMS at the beginning of the project by two examiners. In addition, the Social Maturity Scale for Blind Preschool Children (Maxfield Buchholz, 1957) was administered to an informant such as a teacher or houseparent who was familiar with the child. The mean Social Age (SA) score for 41 subjects tested was 3.66 years. Subjects in the Experimental group had a mean SA of 4.26 and subjects in the "On Site" Control group had a mean SA of 3.18. A mean SA of 4.10 was obtained for subjects in the Distal Control group.

The mean scores for the Motor Development and Sensory Skills sections of the PMS are represented in figure 1 and the Concept Development and Mobility Skills sections in figure 2. Figure 1 does not show the mean scores for the first three sections of the Motor Development section which includes Basic Movement (1.1), Creeping (1.2), and Standing (1.3). These sections were omitted since all of the subjects tested were proficient in these areas.

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insert figures 1 and 2 about here

From the individual scores on the PMS, profiles were plotted for each subject as a starting point for the programmed instruction. Figures 3 and 4 illustrate a typical subject profile.

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insert figures 3 and 4 about here

The programmed instructional system is organized into the same four separate components as the PMS: 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 subitems 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 termianl 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 PMS. 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 subitem.

The following exerpt from a lesson from the motor development section illustrates the general format used within the programmed instruction:

Ascending Stairway
1.5

Purpose: To help the child learn to ascend a stairway independently.

Terminal Objective: The child will ascend a stairway independently alternating feet (one foot per tread) or marking time (two feet per tread) with the use of a handrail.

Materials/Setting: A stairway with a handrail and at least 5 steps. Boxes, pillows, a ladder, a coke case, toys, a model set of low wooden steps with railing.

Prerequisites:

The child must have sufficient balance for this activity.

Help him to step over objects, empty shoe boxes, ropes, etc., to improve balance and develop skills.

Prepare the child for ascending a stairway by having him "creep" over an object such as a box or a pillow to give him the idea of moving on and off an object.

The program for each subitem is organized by Activity Objective, Recording Procedure and Training Activity. The following illustrates the program for teaching the skills for ascending stairways:

Activity Objective:

1.5.1.A. At the completion of this activity, the child will ascend steps on all fours, or use creeping or scooting movements to ascend a stairway.

Recording Procedures:

No. of trials: 20

Definition of trial: One trial consists of presenting the child the opportunity to ascend a stairway.

Criteria: If the child ascends the steps on all fours, or uses creeping or scooting movements independent of physical assistance, acore a (+). If the child does not respond or excessive physical prompting is necessary score a (-).

Training Activity:

1.5.1.T. Using a model set of low wooden steps, the trainer should assist the child in creeping up the steps on his hands and knees. The trainer should place one of the child's knees on the first step and then encourage him to pull himself up. Physical and/or verbal prompts and reinforcement should be provided as needed.

The trainer should guide the child's hands over the first two steps to give him the idea that the stairs are going up. The child should be physically and verbally prompted through the experience of creeping up the steps. Positive reinforcement should be given after each step. The child should be encouraged to ascend the steps independently by continuing to prompt him physically and verbally, gradually fading the prompts as

the child gains in independent movement.

Motivate the child to ascend the steps by placing a favorite toy or edible reinforcer on the first step. The trainer should continue raising the reinforcer to the next step until the child is able to ascend independently from the bottom to the landing. When the child places both his arms and legs on the steps, it may be necessary to provide some initial assistance in guiding his legs.

Upon successful completion of six consecutive trials, proceed to 1.5.2.T.

Some of the lessons in the programmed instruction were designed to follow a particular system of logic. This system is illustrated in figure 5.

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insert figure 5 about here

This system involves presenting the child with the task and proceeding with the instruction according to the child's response. If the lesson involves two or more tasks, the instruction follows the same format for each task and continues until the child is cycled through the lesson independently.

For the most part, the tasks in the programmed instruction are arranged logically and developmentally, however field testing is expected to be the primary means for evaluation.

After pretest with the Peabody Mobility Scale it was determined that some of the tasks were too complex for many of the children even at entry level. This phenomenon brought about a decision to develop prerequisite training activities for certain lessons. The major purpose of the prerequisite acti-

vities is to build a specific response into the child's repertoire and to attempt to bridge the gap between the child's existing development level and the beginning point of programmed instructional program.

The following is an exerpt from a prerequisite activity program for developing matching skills or a "match to sample" response.

Prerequisite Skill II: Match to Sample Response

Purpose: To help the child learn to match identical objects on cue of "find one like this".

Terminal Objective: At the completion of this item the child will demonstrate an awareness of the similarity of two objects (3 dimensional shapes) by matching two identical objects on command.

Materials/Setting: Table and chair, and the following objects: 2 blocks (at least 2 inch), and 2 balls (at least 2 inches around).

Recording Procedures:

No. of trials: 20 per session

Definition of trial: One presentation of materials with verbal instruction "find one like this".

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

Training Sequence:

a) Seat the child at a table and tell him he is going to learn how to find things that are alike.

b) Place a block on the table in front of the child and help him find and feel it. Verbally describe the block to the child.

c) With the child's one hand on the block on the table, have him feel a second identical block with his free hand. Tell him to hand you a block just like the first block. If he hands or pushes the 2nd block on the table to you, reward him immediately and go to step g.

d) If the child does not respond by pushing or handing the block on the table to you, help him grasp the block on the table and hand it to you. Immediately reward the child when you take possesion of the block.

e) Repeat the procedures of steps c and d, very gradually requiring the child to respond more independently. This may require many trials. Similarly, begin to reward the child only for increasingly independent responses. However, this "tapering" of reward must be done gradually over many trials.

f) When the child reliable hands you the block on the table when presented with a second block, the revised procedure in step g should be followed.

A majority of the children in the study functioned at a level which made it difficult for them to verbalize about the task, label materials or even give the trainer a verbal response.

Although the tasks are structured in a way that does not preclude a verbal response, the lessons are designed to provide the child with an opportunity to respond to the task by discriminating between materials by matching the stimulus object with one that's the same.

In some cases, even the prerequisite skill activities were not programmed at a level low enough to meet the child's needs. For example, the initial stage of the "match to sample" response prerequisite lesson involves training the child to discriminate between two basic objects such as a ball and a block, but a few of the children, even with normal hearing and limited receptive language, were not able to respond. They had not reached the point of picking up objects, manipulating them and then handing the objects to the trainer on command.

The intervention period or field testing of the programmed instruction was established at 16 weeks. Since all of the instructional materials required time for development the programmed instruction for the motor development and sensory skills sections was tested for the first eight weeks and the concept development and mobility skills sections were examined for the last eight weeks of the intervention period.

Consulting teachers were selected for the project who had not had formal mobility training. The rationale for teacher selection was based on a need to have an evaluation of the directions and teaching procedures of the instruction. This evaluation was critical in order to insure that the programmed instruction could be utilized by classroom teachers. The teachers were provided with instructional materials and individual programs for each child, and they were given an orientation session prior to the intervention period.

Each teacher was asked to employ one lesson from each of the two sections for each day. A minimum of 20 trials or six consecutive correct responses completed a lesson. A data collect system was employed which assisted the teachers in making instructional decisions and helped the research staff in monitoring the project on a week by week basis. In addition, telephone communication was maintained between research staff and consulting teachers regarding any problem or modification required. At the end of the first eight weeks, a posttesting session was conducted with the experimental and control "on site" groups using the motor development and sensory skills sections of the programmed instruction.

A preliminary analysis of pretest - posttest I differences between these two groups using a t test showed significant improvement by the Experimental Group on motor performance ($t_{obs.} = 5.344$, d.f. = 18) and sensory performance ($t_{obs.} = 6.46$, d.f. = 18). These t statistics were significant beyond the .01 level. The pretest - posttest I differences on motor and sensory performance for the "on site" control group were not significant at the .05 level. This preliminary analysis indicated that the experimental group of children benefited from the intervention activities. A more elaborate and precise analysis using analysis of variance procedures will be conducted when the final post testing has been completed.

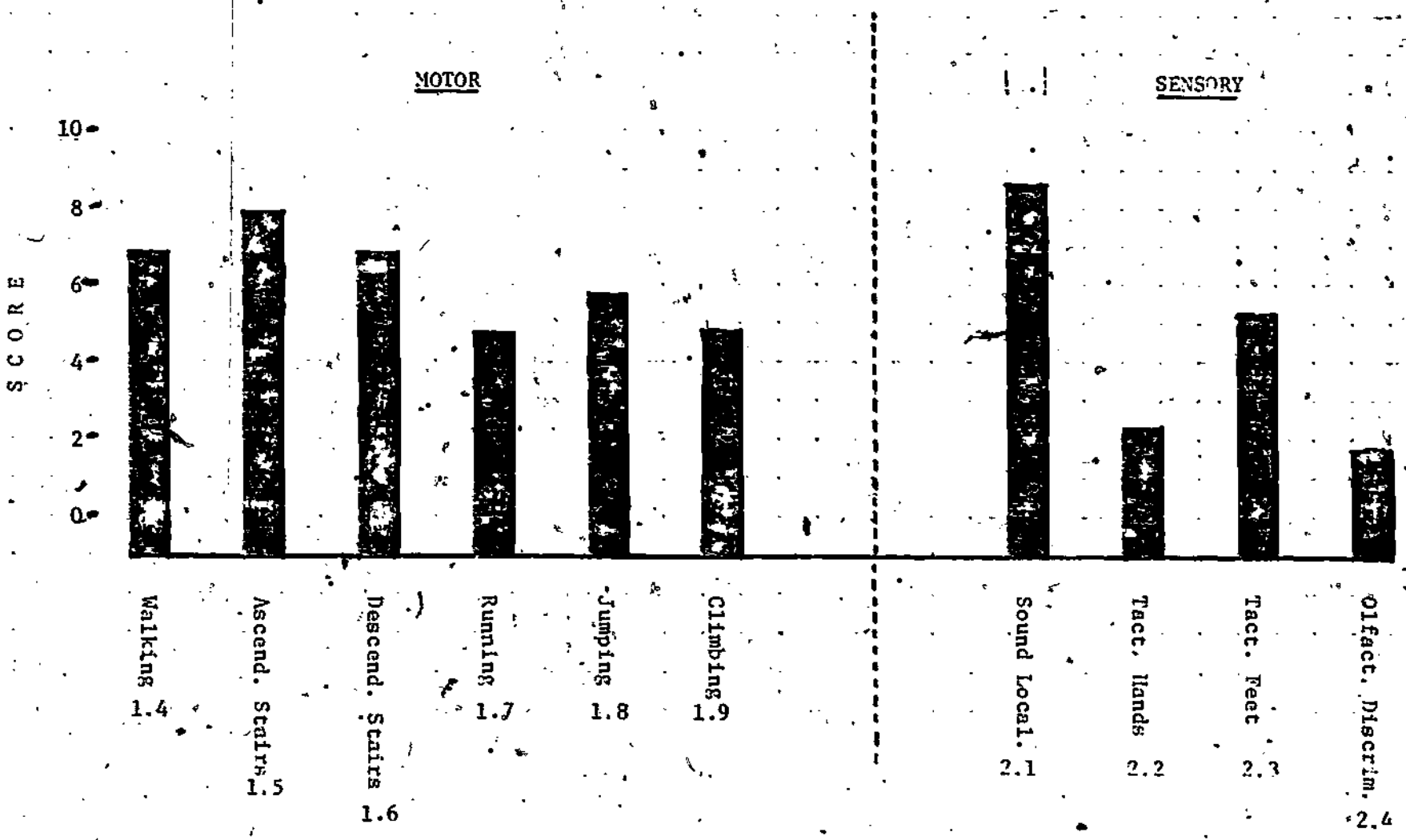
The problems encountered during this project were related primarily to the short project testing period. The development of an assessment instrument and an intervention program and subsequent implementation of field testing procedures conducted by a small staff created an extremely tight schedule.

In addition to the short field testing period, subject absence and attrition limited the exposure time to the programmed instruction for some children.

The results of the first post testing sessions indicate that even in view of these problems, substantial progress was made and the programmed instruction was effective. It seems justifiable to conclude that the programmed instruction from the motor and sensory sections could be useful in the teaching of orientation and mobility to multiply impaired children.

Plans for the near future will involve further development and refinement of the programmed instructional program. This program will be reproduced in a form that can be easily disseminated to interested professionals at the end of the project.

FIGURE 1



Note: Items 1.1, 1.2, 1.3, and 2.1 have been omitted since all subjects tested met criterion on these items.

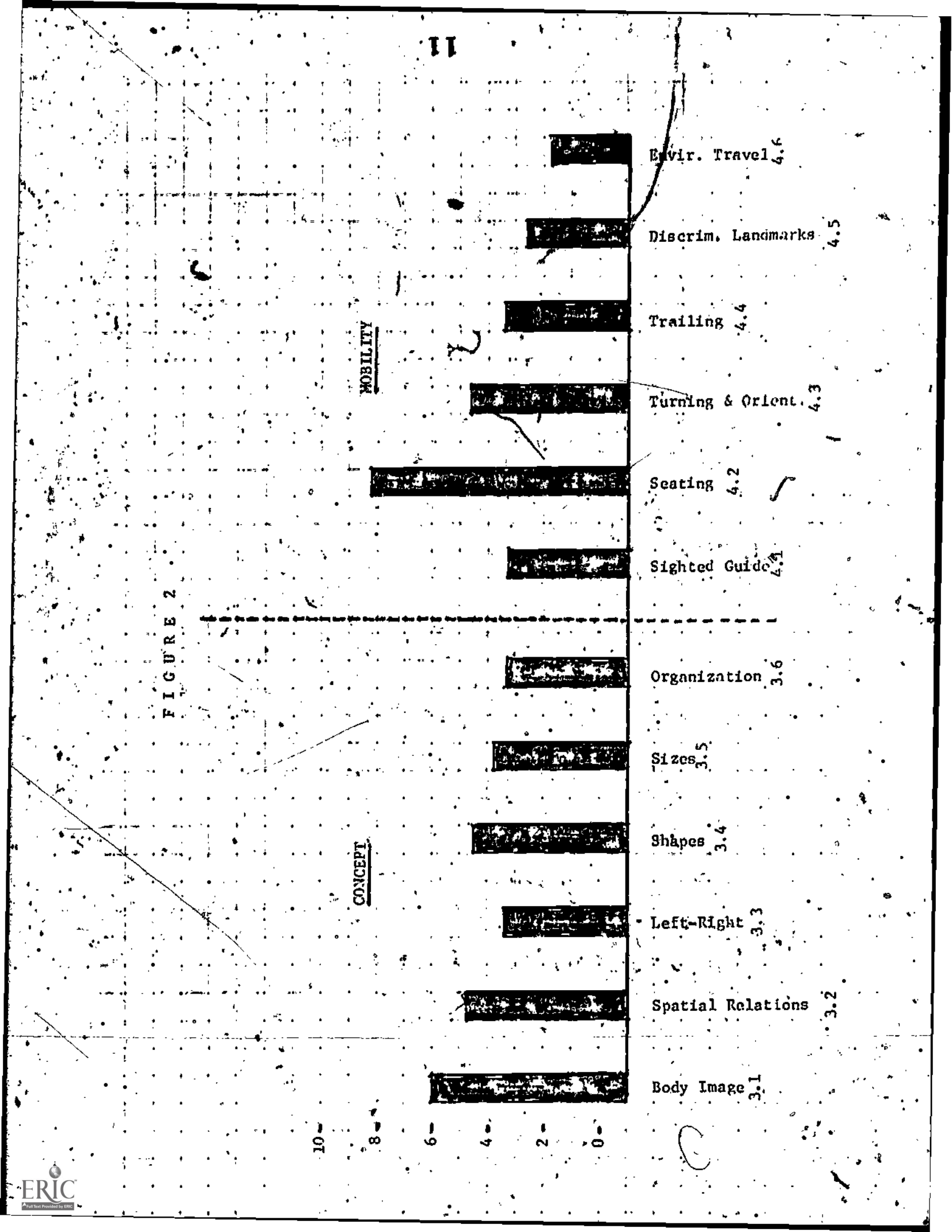

MOBILITY
Envir. Travel 4.6
Discrim. Landmarks 4.5
Trailing 4.4
Turning & Orient. 4.3
Seating 4.2
Sighted Guide 4.1
CONCEPT
Organization 3.6
Sizes 3.5
Shapes 3.4
Left-Right 3.3
Spatial Relations 3.2
Body Image 3.1
10
8
6
4
2
0

FIGURE 2

SUBJECT NO. 017
PROFILE: HQ & S
FIGURE 3
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

SUBJECT NO: 017

PROFILE: C & P-M

FIGURE 4

		4.6	ENVIRONMENTAL TRAVEL
		4.5	DISCRIM. LANDMARKS
	MOBILITY SKILLS	4.4	TRAILING
		4.3	TURNING & ORIENTATION
		4.2	SEATING
		4.1	SIGHTED GUIDE
		3.6	ORGANIZATION
		3.5	SIZE DISC.
	CONCEPT DEVELOPMENT	3.4	SHAPE DISC.
		3.3	LEFT-RIGHT DISC.
		3.2	SPATIAL REL.
		3.1	BODY IMAGE

10 8 6 4 2 0

FIGURE 5

INTERVENTION SYSTEM LOGIC