Pre and post assessment of locomotive skills of the Special Olympics: Developmental Sports Skills Program for severely and profoundly disabled young adults

Tami L. Brundige
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PRE AND POST ASSESSMENT OF LOCOMOTIVE SKILLS OF THE SPECIAL OLYMPICS DEVELOPMENTAL SPORTS SKILLS PROGRAM FOR SEVERELY AND PROFOUNDLY DISABLED YOUNG ADULTS

A thesis
Presented to the
Department of Counseling and Special Education and the
Faculty of the Graduate College
University of Nebraska

In Partial Fulfillment of the Requirements for the Degree Master of Arts
University of Nebraska at Omaha

by
Tami L. Brundige
April, 1988
THESIS ACCEPTANCE

Accepted for the faculty of the Graduate College, University of Nebraska, in partial fulfillment of the requirements for the degree Master of Arts, University of Nebraska at Omaha.

Committee

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<td>A</td>
<td>CSE</td>
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Sandra L. Squires
Chairman

April 19, 1988
Date
ABSTRACT

This study was constructed to determine the validity of the Special Olympics Developmental Sports Skill Program for the severely and profoundly disabled, as compared to a general motor training program, and a nonintervention approach. Twelve severely and profoundly disabled students were randomly assigned to one of two groups. The first group was given specific locomotor training as outlined in the Special Olympics Developmental Sports Skills Program Level III, Locomotor. The second group received no intervention. After three weeks the groups were posttested. Following the posttest, the second group who had received no intervention, received general motor training for three weeks. At the end of this time, they were posttested using the Special Olympics Developmental Sports Skill Assessment.

Using the Chi-square test of homogeneity there were no significant differences in the pre and post motor skills performance of the severely and profoundly disabled students who received no training (p=1.00), general training (p=.9999), and specific training (p=.9998).
ACKNOWLEDGEMENTS

I want to express my appreciation to my mother Barb Brundige, for teaching me the meaning of dedication. I also want to state my appreciation to Brad Peterson for the incredible inspiration which he gave me.
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Chapter I

Introduction

Goldberger (1980) has suggested that curiosity spurs rapid motor development in infants. They explore their environment thereby stimulating their senses, and at the same time learning how to control their motor movements. Adults use their motor movements to accomplish everyday tasks. "Each time people are faced with adding to their movement repertoires they must go through the same basic steps of skill acquisition and refinement." (Goldberger, 1980, p. 4).

Many mentally handicapped children show a delay in motor development which further hinders their ability to explore as children (Bender, 1978). Grosse (1981) states that there is a critical need for an effective motor development program. Such a program should benefit children in several ways by improving the physiological functioning, development of motor ability, cognitive growth, mobility, functional motor skills, ability to follow simple directions, and social interactions. She goes on to say that a motor development program can also reduce negative and interfering behaviors.

The Problem
The Kennedy Foundation has recently formulated a developmental sports program for Special Olympics. It has been field tested in six states involving 2,000 students with limited motor abilities (Joseph P. Kennedy Jr. Foundation, 1986). The program was field tested and subsequently revised before its recent dissemination. Accompanying the sports program is a set of suggested experiences for training specific skills for each motor area. Additional research needs to be conducted in order to validate the assessment and training suggested in this sports program for limited motor skill students.

Limitations

This study consists only of the locomotor section of level three in the Special Olympics Developmental Sports Skill Program. It cannot be assumed that the entire program is reflective of the section studied.

The Purpose

The purpose of this study is to examine the effects of different types of training on motor performance of subjects who are labeled severely/profoundly handicapped. This study will compare what type, if any, training affects the overall performance of participants in selected Special Olympic events.

Hypotheses
Null Hypotheses

1. There will be no significant difference in pre and post motor skills performance of severely/profoundly handicapped students who received the specific motor training.
2. There will be no significant difference in pre and post motor skills performance of severely/profoundly handicapped students who received general motor training.
3. There will be no significant difference in pre and post motor skills performance of severely/profoundly handicapped students who received no training.
4. There will be no significant difference between the mean post test scores of those receiving specific skill training to those receiving general training.
5. There will be no significant difference between the mean post test scores of those receiving specific skill training to those receiving no training.
6. There will be no significant difference between the mean post test scores of those receiving general skill training to those receiving no training.

Terms to be Defined

Motor development: Development relating to movement of the muscles.

Profoundly disabled: Pupils who may exhibit one or more of the following characteristics: Use no means of communication beyond effect responses or use an augmented
communication system that is not a standard symbol system to indicate needs and wants; Are dependent in mobility or require supervision in order to meaningfully traverse between points in the environment; Are dependent in all daily living activities; Have minimal social interaction skills and may exhibit severe maladaptive behaviors; Have mental, physical or sensory handicaps; and have fragile medical conditions, including seizures. (Iowa Department of Public Instruction, 1985.)

Severely disabled: Pupils with any severe disability including pupils who are profoundly multiply handicapped. (Iowa Department of Public Instruction, 1985.)

Moderately disabled: Those people who have acquired basic skills of self care, social adjustment of the home and neighborhood, oral communication, and a degree of economic usefulness in sheltered situations. (Johnson & Londeree, 1976, p. 1.)

Mildly disabled: Those people who have the capacity to acquire basic academic skills, moderate degree of social adjustment, and satisfactory ability for self support. (Johnson & Londeree, 1976, p. 1.)

Psychomotor: Muscular activity associated with mental processes. (Morris, 1980, p. 968.)
Gross motor: Movement of muscles involving the entire body.

Fine motor: Movement involving a small, precise number or muscles.
Chapter II

Review of Related Literature

Motor Development of the Mentally Disabled

This review of literature will address three areas: motor skill development, assessment, and training of the mentally disabled. Motor development of mentally disabled persons is a complex issue, about which there is not a significant body of research.

Theories

Psychomotor taxonomies are an increasingly popular method of sequencing the complexity of motor development skills. Coleman & Skeen (1985) defined a taxonomy as a structure which classifies things according to a natural order. There are numerous psychomotor taxonomies available (Coleman & Skeen, 1985; Goldberger, 1980; Harrow, 1972; and Jewett, 1974) which classify motor development of infants through early adulthood. Each taxonomy starts with a stage similar to the reflexive stage, during which movements are automatic, and carry little relevance. The final stages are similar since they result in successful movement.

Goule and Glyn (1982) studied the symbolic representational theory which maintains that when an individual observes a demonstration of a motor skill, he or
she formulates a mental symbolic representation of that skill which later acts as a blueprint to reproduce the skill.

In motor learning, the distinction between generality and specificity is a controversial issue. Battinelli (1984) described the different theories in connecting general and specific motor learning. One view describes motor ability as general in the beginning while becoming more specific with practice. The other approach is that motor ability is viewed only as a specific skill.

The area of motor development becomes more complex when dealing with a handicapped individual. Gross (1981) found that motor development in multiply impaired children paralleled that of their non-impaired peers with two differences: development is slower, and there are many gaps in the progression of motor skills due to physical impairments.

Lishman (1985) stated that mentally disabled persons are indeed less physically fit than their normal peers; however an estimated 10% of the mentally disabled can achieve equal motor abilities if exposed to adequate or superior programs of physical education. Guess, Warren, and Rues (1978) believed that delays and deficiencies in motor development may begin in infancy and continue through maturity. Lishman (1985) suggests that these delays were due to limited sensory awareness and incidental learning.
resulting from limited exploration because of their motor deficits. Vandenberg (1985) also observed early exploration to be a factor related to mental disabilities when comparing normal to mentally disabled children. He found the disabled children explored less and sought assistance more frequently than their normal peers.

Research is being done relating intelligence to motor skills. Rider, Mahler, and Ishee (1983) found static balance in both legs significantly lower for handicapped in comparison to nonhandicapped which confirmed the relationship between motor proficiency and intelligence. D'Amato and Herr (1982) observed that learning disabled children had more difficulty inhibiting movement than did children judged to be normal.

Numerous studies have also been done to determine whether a correlation exists between motor proficiency and other positive traits. Motor proficiency was found to be directly related to exploration, intelligence, and the ability to inhibit movement (Simpson & Meaney 1979). Sontag (1985) found passivity to be associated with declining I.Q.. Maccoby, Dowlet, Hagen & Degerman, (1965) found aggressiveness, competitiveness, independence, and self-initiative (all active traits) to be associated with higher I.Q.s. Beasley (1982) found a fitness program for mildly and moderately mentally disabled children improved their work performance. In an earlier study, Murphy (1962)
reported a positive correlation between activity level and the capacity to cope with the environment. Simpson and Meaney (1979) found a physical activity program improved the self-concept of moderately disabled children.

Specific Studies

Researchers have been studying possible reasons for the differences between the mentally disabled and the normal child (French, 1979). Grosse (1981) compared mentally disabled to normal children in a program she devised for stimulating gross motor movement in handicapped and normal preschool, elementary, and secondary students. She found that motor development in the mentally disabled children paralleled that of normal developing children. Motor development in the disabled was slower, with many gaps due to physical impairments, than motor development in normal children.

Vandenberg (1978) compared the exploratory behavior of 43 mildly mentally disabled children to two groups of normal children. One group of normal children was matched on chronological age to a group of children who were mentally disabled. The second group of normal children was matched to the mentally retarded group on mental age. Results showed that retarded children were less exploratory and more prone to seek adult assistance than were their normal chronological-age peers. When the retarded children
were compared to their mental-age peers, retardation was not found to be a factor in determining exploration. Vandenberg concluded that delays in exploratory behaviors in retarded children are developmental in nature, and not the result of the retardation.

Rider (1983) compared 31 mildly mentally disabled children to 31 non-handicapped children in static balance on left and right legs. Total balance time was significantly higher for the non-handicapped children than the handicapped children. This suggests that motor proficiency is related to intelligence.

D'Amato and Herr (1982) compared 36 learning disabled children with 17 normal children matched on mental age. They measured the subjects ability to inhibit hand movement on two motor tasks. Results showed that mentally retarded persons had more difficulty than their normal peers in inhibiting hand movement.

Beasley (1982) studied the cardiovascular fitness and work performance of two groups of mentally disabled adults. The experimental group received a jogging program of approximately 30 minutes per day, and the control group received no special training. Results favored the experimental group who increased both cardiovascular fitness and work performance.

Simpson and Meaney (1979) measured the self-concept of a group of moderately mentally disabled students before and
after a five-week ski program. Significant changes in self-concept were measured after participation in the ski program for the moderately mentally disabled children.

Assessment of Motor Development of the Mentally Disabled

Bird (1982) states that the major efforts to study emerging motor behavior occurred in the first half of this century. At this time, prediction from infancy was not possible (Erickson, 1968). Early studies showed no significant correlation between infant test scores below age two and later I.Q.s. The severely and profoundly handicapped individual frequently functions at or below the two year level in developmental skills (Bird, 1982). Erickson goes on to say that within the results of the assessments, large discrepancies were found between the child's abilities (i.e. communication and fine motor skills), which also verified the worthlessness of these earlier assessments. Erickson stated many reasons for this testing discrepancy which included content of the tests, the impact of heredity on growth patterns, error of measurement, and environmental influences. Currently, instruments developed for younger children or infants are used to assess the abilities of severely and profoundly handicapped children. The validity of infant assessment instruments is of questionable value for use with the severely and profoundly handicapped population. The
assumptions made in developing an assessment for infants are not met when the instrument is applied to an older population of severely and profoundly disabled students (Simeonson, 1980). Ramsay & Fitzhardinge (1977) compared two infant scales, the Bayley Scales of Infant Development (Bayley, 1969) and the Griffiths (Griffiths, 1970). Scores for the Griffiths scales were consistently higher than those of either the mental or motor scale of the Bayley. In a different study by Eippert & Azen (1978) there were differences found in the way in which developmental lags in the mental and motor domains were reflected by the two instruments. Among other differences, the mental and motor lags obtained with the Bayley were found to be significantly larger than those of the Gessell Developmental Scheduals (Gessell, 1970).

Jansma (1980) recognizes that there are few tests that measure the fitness levels of the severely and profoundly handicapped and states a number of different events which have collectively surfaced to promote a change in emphasis on assessments. These events include political action leading to federal and state legislation; formation of a professional organization, the Association for the Severely Handicapped; and funding directed toward the needs of severely and profoundly handicapped individuals (Jansma, 1980).
Training Motor Skills to Mentally Disabled

"Findings do indicate that considerable progress has been made during the past several decades in teaching meaningful skills to many low-functioning profoundly mentally disabled persons" Stainback and Stainback (1983). Two types of motor skill training, general and specific, will be covered in this review of literature.

General Training Methods

Murphy and Doughty (1977) described the primary intent of earlier studies. They were to determine what operant procedures would best evoke responses from profoundly disabled persons.

Fuller (1949) conducted one of the earliest studies on the training of a profoundly disabled individual. Fuller accelerated right arm raising behavior from a near zero rate to three per minute in four 20-minute training sessions by using a system of cues and prompts. Later in the century, a similar study was successfully conducted by Rice, McDaniel, Stallings, and Gatz (1967) by using food as a reward and using food deprivation as punishment.

Throughout the past decade motor skills and how they relate to the severely and profoundly mentally disabled has been studied. Rider and Candeletti (1982) conducted an eight week experiment with eight multihandicapped children
who practiced motor skills for a total of 48 hours. His findings showed that simple, continuous tasks, presented repetitively appeared to contribute most to student retention.

Other studies have examined modes of teaching motor skills. Jenkins and Fewell (1983) compared two groups of moderately disabled children after receiving a general motor skills program. One group received one-to-one instruction, and the other received small group instruction. They found no difference following treatment.

Beasley (1982) studied the cardiovascular fitness and work performance of mentally disabled adults who were employed at a workshop. A 30-minute a day jogging program was administered. Results showed positive effects in increasing cardiovascular fitness and work performance.

Specific Training Methods

Lishman (1985) states that because no two mentally disabled children are identical, no single system can be satisfactory. Goldberger (1980) pointed out the need for individualization in planning a physical education program for the severely and profoundly handicapped. He emphasizes the need to evaluate the physical and motoric capabilities and limitations of each student. French (1979) stressed the idea that such a program for this population must be
based on the needs, limitations, capabilities, and interests of each profoundly disabled student.

Sheffield (1961) filmed demonstrations of motor tasks and showed it to mildly mentally disabled adults. He found that demonstrations facilitated learning, but that they were insufficient in regard to providing complete learning of a complex motor task. Similar research was done by Bender (1978) who studied severely mentally disabled children. A program incorporating a visual instruction method was followed by imitation to teach psychomotor tasks, he found that imitation was a successful way to teach these skills.

Several basic studies have been done focusing on teaching a physical mobility skill to low-functioning children. Winkler, Arnold, and Russell (1986) studied seven profoundly disabled children to find a method of providing mobility. They implemented a 20 month individualized mobility program using specific exercises to increase sitting, crawling, and walking behaviors. They also used utility carts as adaptive devices to provide students with more independent moving. These carts were used in place of a wheeled walker for balance and coordination. All seven students made direct gains in distance walking with assistance. O'Brien, Azrin, and Bugle (1972) designed a program to increase the ease and speed of walking, by restraining crawling behavior, and
rewarding walking behavior. Auxter, Morar, Carrey, and Curley (1985) compared the training of a severely mentally disabled girl to that of an 86-year old man in developing the skill of standing from a sitting position. This program required using a chaining technique on the skills needed of standing to develop the prerequisite strength needed in the hip and knee extensors. The disabled girl took longer than the 86-year old man to develop the prerequisite strength needed.

Studies have been done on motor skills of the mentally disabled with regard to increasing independence and overall work performance of those employed at workshops. Mitra and Rowland's studies (1979) indicated that increasing mobility influenced other areas of life (i.e. social) for two severely and profoundly disabled subjects who lived in a group home and worked at a sheltered workshop. Mitra and Rowland (1979) assessed the needs of the subjects, and implemented individualized gross motor programs which gave them increased mobility skills. Gains were made over the course of a year in social skills and work performance.

Task analysis has been very successful in teaching motor skills. Haavik and Altman (1977) used the application of positive consequences in the form of social reinforcers, and broke down the behavior into a task analysis for shaping purposes. Through this method Haavik and Altman were able to increase five severely and
profoundly disabled children's ability to walk. Cuvo, Ellis, Wisotzek, Davis, Shilling, and Bechtal (1983) identified the procedures needed to teach athletic skills to moderately and severely disabled students. They were able to teach the subjects the standing long jump and the 50 yard dash, using task analysis and a training program. Results showed acquisition and maintenance of the athletic skills. Cuvo et al., (1983) commented that despite legislative mandates for physical education, and the value of such a program, few validated programs have been published to teach complex gross motor skills to the mentally disabled. He further stated that even as late as 1983, no research had been published on the teaching of track and field skills to severely handicapped students.

Summary

The theories of motor development are being researched to design increasingly more effective programs. The need for these programs becomes significantly greater when dealing with severely and profoundly handicapped persons.

Frequently, assessments designed for infants are being used on the severely and profoundly mentally disabled. However, the validity of these assessments for the severely and profoundly handicapped are uncertain.
Chapter III

Methodology

Introduction

The Special Olympics Developmental Sports Skills program is a training and assessment program designed for the severely and profoundly handicapped. Because of the need for an effective gross motor assessment and training program for the severely and profoundly disabled this study will examine the effect of specific, general, or no training on tasks from the Level III Locomotion tasks of the program.

Subject Selection

Initially twelve students were pretested using the Level III Locomotion section of the Special Olympics Sports Skill Assessment which consists of a checklist of sports skill tasks. This researcher and two other adults observed the athletes as they performed each task and rated their performance. If rater disagreement existed, they convened to determine their decision. Subjects were then randomly assigned into one of two groups. The experimental group received the specific skill training as outlined in the Level III Locomotion section of the Special Olympics Sports Skill Manual for three weeks. Their individual training was based on their level of functioning and the degree of
their physical and mental involvement. The control group received no intervention at this time. Both groups were posttested after three weeks using this same assessment and the same procedures.

During the following three weeks, the same subjects used in the control group, participated in the intervention of general skills training. These included training on range of motion, rolls, stretches, walking, and running. The individual training was based on the functioning levels of the subjects involved. Following this intervention, this group was posttested using the Special Olympics Sports Skill Assessment and the same procedures noted above.

Research Design

The design used was a modification of the randomized control group pretest-posttest design. Students were randomly assigned to one of two groups from two classrooms for severely and profoundly disabled students. There were a total of 12 subjects who are between 12-21 years of age. Each group was pre and posttested using the assessment tool provided in the Special Olympics Developmental Sports Skill Manual, Level III, Locomotion.

The experimental group received the specific training recommended in the Special Olympics Developmental Sports Skill Manual for three weeks. Concurrently the control group received no training. At the end of the three weeks the two groups were posttested. Starting the fourth week,
the control group received general motor skills training for a period of three weeks, followed by a second posttest at the end of this second three week period.

Intervention either general or specific training, occurred five times a week for three weeks for a minimum of 20 minutes per session.

The general skills that were taught were selected before the students were randomly assigned to groups. These general skills were individualized according to subjects' strengths and weaknesses.

**Characteristics of the Study Population**

The subjects for this study were 12 students classified severely and profoundly handicapped and who were between 12 to 21 years of age. Ten of the subjects were long term residents of a residential facility. Nine subjects had lived in their natural homes as infants and small children until they were placed in this residential facility. One subject had lived in a foster home before coming to the residential center.

The remaining two subjects were siblings who commuted 80 miles daily. They had lived in institutions but had been in their natural home for over two years.

Four of the twelve subjects exhibited autistic-like characteristics, two had severe physical involvement and needed assistance in walking. None exhibited violent
behavior although many had difficulty staying on task which interfered with their learning. A description of each subject is in the appendix.

**Description of Specific, General, and No Intervention Training**

The specific and general training consisted of one to five specific tasks per student. Training tasks were chosen from tasks subjects were unable to perform during the pretest. A consideration in choosing the tasks were safety factors. For example, the researcher would not choose training in running for a physically involved child who had difficulty standing.

Students were placed on a daily schedule with a specific amount of time allotted for teaching each task. All adjustments to this schedule were successfully made after the first session met. Table II presents the General Skills Training Schedule for each subject. An example of general skills training was subject #8 who alternated her schedule every other day. Day one included 13 minutes of walking, 2 minutes of running, and 5 minutes of stretches. Day two was the same except the 5 minutes of stretches was substituted for 5 minutes of tumbling exercises.

Table III presents the Specific Skills Training Schedule for each subject in that group. An example of
specific skills training was subject #2 who practiced 17 minutes of fitness walking and 3 minutes of side-step-slide ambulation. See appendix for an individual description of training provided to each subject.

The tasks used for the Special Olympic Developmental Sports Skill Level III Locomotion Program presented on page 50 of the Special Olympics Developmental Sports Manual were:

1. Walks for fitness
2. Ambulates in side-step-slide motion
3. Performs a forward roll
4. Performs a backward roll
5. Jogs with assistance
6.Varies speed while running
7. Walks up stairs without falling
8. Changes direction on command

The tasks used for the general skills training program were:

1. Walking
2. Running
3. Tumbling (forward, backward, and side rolls)
4. Mat skills (crawling and rolling over)
5. Range of motion
6. Stretches

The nonintervention program was consisted of making no changes in their current program. All 12 subjects were
involved in a general recreation program at the school which met once a week for 25 minutes. No specific skill training was taught during this particular three week period.

Location of the Study

The twelve subjects for this research were in two different classrooms for the severely and profoundly mentally disabled located at the Shelby-Tennant Community Schools, in Shelby, Iowa.

Statistical Analysis

The data from the Special Olympics Sports Skill Assessment was tested using the Wilcoxon matched-pairs, signed-ranks test on specific sub-test items, and using a Chi-square test of homogeneity comparing the expected to the observed frequencies of the assessment scale.
Chapter IV

Results

Introduction

The purpose of this study was to answer the question: is the Special Olympics Developmental Sports Skill program a superior approach to motor training when compared to a general motor training program or one without intervention?

The hypotheses in this study were tested to determine whether there is statistically different significance of the Special Olympics Developmental Sports Skill training program, a general motor training, and one without intervention.

Hypotheses

The hypotheses tested were:

Null Hypotheses

1. There will be no significant difference in pre and post motor skills performance of severely/profoundly handicapped students who received the specific motor training.

2. There will be no significant difference in pre and post motor skills performance of severely/profoundly handicapped students who received general motor training.

3. There will be no significant difference in pre and post motor skills performance of severely/profoundly handicapped students who received no training.
4. There will be no significant difference between the mean post test scores of those receiving specific skill training to those receiving general training.
5. There will be no significant difference between the mean post test scores of those receiving specific skill training to those receiving no training.
6. There will be no significant difference between the mean post test scores of those receiving general skill training to those receiving no training.

Findings

Using the Chi-square test of homogeneity there were no significant differences in the pre and post motor skills performance of severely and profoundly handicapped students who received, no training (p=1.00), general motor training (p=.9999), and specific training (p=.9998). These findings support the null hypotheses. On one sub-test item walking, using the Wilcoxon signed ranks test, there was a significant change between the pre and post scores for both general and specific training at the .10 level.

Assessment Scores

Table I, shows the percentage of change between pre and post assessments for each of the three groups. Assessment items 1-8 involved walking, 9 and 10 involved tumbling, and 11-18 involved running. The walking items showed the greatest degree of skill acquisition. Five of
the 12 subjects passed one of the assessment items on the posttest which they had not passed on the pretest.

The non-intervention group showed no difference in skill acquisition as measured by the Special Olympics Developmental Sports Skill Assessment.

The single item on which the greatest change occurred was on fitness walking (item 4). None of the subjects demonstrated a skill on fitness walking on the pretest in any of the three training groups, general, specific, and no intervention. The post test showed a 33.33% difference in after general and specific training. There was no increase in the control group.

Fitness walking was the only skill that changed between the pre and post test scores for the general training program. The specific training group increased on two other items on the pre and post test scores. These items were the forward rolls, and side-step ambulating, which both showed a positive improvement of 16.6%.
TABLE I

TRAINING RESULTS

<table>
<thead>
<tr>
<th>Assessment Items</th>
<th>General Training</th>
<th>Specific Training</th>
<th>No Intervention</th>
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<tbody>
<tr>
<td>1. Attempts to walk</td>
<td>Pre Test 100</td>
<td>Post Test 100</td>
<td>Pre Test 100</td>
</tr>
<tr>
<td>2. Walks with assistance</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>3. Walks in desired direction</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>4. Walks for fitness</td>
<td>0</td>
<td>33.3</td>
<td>0</td>
</tr>
<tr>
<td>5. Ambulates in side-step-slide</td>
<td>50</td>
<td>50</td>
<td>33.3</td>
</tr>
<tr>
<td>6. Walks up steps assisted</td>
<td>83.8</td>
<td>100</td>
<td>83.3</td>
</tr>
<tr>
<td>7. Walks up steps independently</td>
<td>83.3</td>
<td>100</td>
<td>83.3</td>
</tr>
<tr>
<td>8. Walks up steps without falling</td>
<td>83.3</td>
<td>83.3</td>
<td>83.3</td>
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<tr>
<td>9. Performs a forward roll</td>
<td>16.6</td>
<td>33.3</td>
<td>50</td>
</tr>
<tr>
<td>10. Performs a backward roll</td>
<td>16.6</td>
<td>16.6</td>
<td>16.6</td>
</tr>
<tr>
<td>11. Jogs with assistance</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>12. Jogs independently</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>Runs with assistance</td>
<td>66.6</td>
<td>66.6</td>
</tr>
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<td>Runs independently</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>15.</td>
<td>Runs without falling</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>16.</td>
<td>Varies speed while running</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17.</td>
<td>Runs around obstacles</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>18.</td>
<td>Changes direction</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>
Chapter V

Summary, Discussions, Conclusions, and Recommendations

Summary

This study was conducted to determine the impact of specific skill training for the Special Olympics Developmental Sports Skill Program Level III, Locomotion tasks, for severely and profoundly mentally disabled, as compared to a general motor training program, and a no intervention approach. Two groups of six students each labeled severely and profoundly disabled were the subjects of this study. One group was given a specific skills intervention as outlined in the Level III, Locomotion tasks of the Special Olympics Developmental Sports Skill Manual. The control group received no training for the first three weeks of the study. Following post-testing, the control group served as a second control group which received general motor skills training. The groups were pre and post tested using the Special Olympics Developmental Sports Skill Assessment.

Using the Chi-square test of homogeneity, there were no significant differences in the pre and post motor skills performance of severely and profoundly handicapped students who received no training, general motor training, and specific training. There was a significant difference found in one area of the training, fitness walking. This
difference could be attributed solely to the student understanding the task and memorizing the route, not because of an actual physical skill acquired through training. The skill was not learned, but the independence was acquired.

**Discussions**

Because education for the severely and profoundly disabled has only recently come into existence, it is appropriate that a sports skill program such as the Special Olympics Developmental Sports Skill Program be designed for this population. Only through much research will such a program be refined.

A major finding of this study is that while the Special Olympics Developmental Sports Skill Program's instrument provided for Locomotion at Level III, eight of the eighteen assessment skills (44%) were not even addressed in the training program. The researcher did not expect changes in any of the areas which were not included in the Special Olympics Developmental Sports Skill training program. Simply stated, the instrument for assessment and recommended training did not address the same skills in the portion of the program studied here.

A second flaw was found in the gradation of the assessment skills. When training severely and profoundly mentally disabled students, the acquisition of a single
step can be a significant accomplishment. The assessment did not recognize small, but measurable improvements, thereby not allowing the student to be credited with improvement until an entire skill could be performed.

Present assessments (Mulligan et al., 1980) need to break down the behavioral sequences leading to accomplishment of the motor skill into small enough steps. There is a need for greater precision to specifically study the lags in development. Mulligan et al. (1980) believed that identifying these lags early is essential so treatment can take place immediately, thereby eliminating unnecessary delays.

This lack of specificity probably contributed to the high agreement among the three judges on the assessment instrument on both the pre and post measures. The interpretation was relatively easy because the skill difference required was significant to demonstrate the student's skill in performing each skill.

The fitness walking skill was accomplished by 4 of the 12 subjects. However, the researcher felt that the training outlined in the Special Olympics Developmental Sports Skill Program was not the reason for its success. The researcher believed that it was the understanding of the objective, not the specific training itself, that increased its skill acquisition. This belief is supported by the research results, as an equal number of students
gained the skill in the general training program, as did in
the specific training program.

Two of the students involved in the training program
were frightened by the tumbling task. Both persons failed
to hold their heads down properly and refused to attempt
the task a second time.

Conclusion

The results of this study indicate justification for
the following conclusion:
1. The findings of this study showed that students who are
severely and profoundly disabled did not demonstrate
significant differences in motor training between the
Special Olympics Developmental Sports Skill specific
instruction, general training, or no intervention on the
Level III Locomotion tasks.

Recommendations
1. The researcher recommends that the Special Olympics
Developmental Sports Skill Program should devise an
assessment instrument that corresponds only to those items
outlined in the training.
2. The researcher recommends that the Special Olympics
Developmental Sports Skill Program should devise an
assessment instrument that breaks down the behavioral
sequences leading to accomplishment of the motor skills provided in the program training.

3. The researcher recommends that the tumbling section of the Special Olympics Developmental Sports Skill Program be removed for safety reasons.

4. The researcher recommends that further research be conducted on the entire Special Olympics Developmental Sports Skill Program to determine its validity since this investigation examined only one component of Level III.
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APPENDIX A
DESCRIPTION OF SUBJECTS
Description of Subjects

Subject #1
Subject #1 is a 21 year old female who lived at home most of her life. She can interpret many hand signs, and has a functional receptive vocabulary. She is cooperative and follows directions well. Her I.Q. is measured in the lower thirties by the Stanford-Binet.

Subject #2
Subject #2 is an 18 year old verbal male who has a functional vocabulary. At the age of two, he became a ward of the state. He has good gross motor skills and follows directions well. He has a mental age of approximately three years, according to the Vineland Adaptive Behavior Scale.

Subject #3
Subject #3 is a 17 year old verbal male who lives at a residential facility. He functions within the range of 15 to 25 months, according to the Vineland Adaptive Behavior Scales. He shows aggressive behaviors, but they do not occur frequently.

Subject #4
Subject #4 is a 19 year old nonverbal male who has scoliosis and wears a scoliosis jacket. He is severely physically involved and is able to walk, but needs assistance as he loses his balance often. He has a mental age of below one year, seven months, according to the Stanford-Binet.
Subject #5

Subject #5 is a 16 year old nonverbal male who spent most of his life in institutions and residential facilities. He is diagnosed as having autism. According to the Vineland Adaptive Behavior Scale, his average adaptive behavior is at approximately 21 months.

Subject #6

Subject #6 is a 14 year old male with a good functional vocabulary. He lived with his family for the first few years of his life, until eight years of age, when he was admitted to a residential facility. He has good gross motor skills and follows directions well. His I.Q., as measured by the Stanford-Binet, is in the lower thirties.

Subject #7

Subject #7 is a 21 year old nonverbal female. She makes and interprets several functional hand signs. She lived at home for the first half of her life, and in a residential facility the second half. She displays stubborn behaviors when she wants attention. On the Stanford-Binet, her I.Q. is measured in the upper twenties.

Subject #8

Subject #8 is an 18 year old nonverbal male who was diagnosed as mentally disabled and autistic. He has good gross and fine motor skills. He has a very low attention span which appears to interfere with his learning. The
Vineland Adaptive Behavior Scale shows his functioning level to be equivalent to a mental age of about two years.

**Subject #9**

Subject #9 is an 18 year old nonverbal female. She is able to make and interpret several hand signs. She has functional gross motor skills. Her intellectual functioning averages slightly higher than two years.

**Subject #10**

Subject #10 is a 13 year old nonverbal, physically involved, female. She has mental retardation measured in the profound range. She has scoliosis and wears leg braces. She uses a wheelchair as a primary source of ambulation, and a walker as a secondary source of ambulation. She frequently exhibits lazy behaviors when frustrated and has refused to do an activity.

**Subject #11**

Subject #11, a 17 year old nonverbal female, is able to make and interpret numerous hand signs. She has good gross motor skills, but is inactive and overweight. Her I.Q., as measured by the Stanford-Binet, is in the upper twenties. She frequently behaves in a stubborn way when she is irritated by others.

**Subject #12**

Subject #12 is a 15 year old nonverbal male. He has lived in a residential facility for most of his life. He does not attend to his environment very well and enjoys
moving about the room. The Vineland Adaptive Behavior Scales measures functioning level to be between six months and one year.
APPENDIX B

DESCRIPTION OF SPECIFIC, GENERAL, AND NO INTERVENTION TRAINING
Description of Specific, General, and No Intervention Training

Subject #1 received specific skill training which consisted of 20 minutes of walking for fitness as outlined in the Special Olympics Developmental Sports Skill Manual.

Subject #2 received specific skill training as outlined in the Special Olympics Developmental Sports Skill Manual which consisted of 15 minutes of walking daily around a track. After walking, he spent five minutes practicing backward rolls on a tumbling mat.

Subject #3 received specific skill intervention according to the Special Olympics Developmental Sports Skill Program which included 17 minutes in a side-step-slide motion daily. During training, subject #3 would repeatedly refuse to walk and it took much prompting to get him to practice. The side-step-slide motion was practiced with the trainer using a hand-over-hand technique to get him through the sequence of steps. This guidance was then faded to the minimum needed to get him to perform.

Subject #4 is severely physically involved. He is able to walk, but has an extremely difficult time doing so. His training was specific according to the Special Olympics Developmental Sports Skill Program and was divided into two days. On day one, he would practice 20 minutes of walking
days. On day one, he would practice 20 minutes of walking for fitness. He usually made it about one fourth of a mile. This walk involved much physical assistance. On day two, he would practice fitness walking for 15 minutes, and practice walking up stairs for the remaining 5 minutes.

Subject #5 received specific training and practiced three exercises as outlined in the Special Olympics Developmental Sports Skill Manual. His schedule was divided into two days also. On day one, he walked for fitness using a track, for 15 minutes, and practiced forward rolls for the remaining 5 minutes. On day two he walked for fitness for 17 minutes and practiced ambulating in a side-step-slide motion for 3 minutes.

Subject #6 practiced three exercises as outlined in the Special Olympics Developmental Sports Skill Program. His schedule was divided into two days. On day one he practiced fitness walking on a track for 17 minutes, and practiced ambulating in a side-step-slide motion for an additional 3 minutes. On day two he walked for fitness for 17 minutes, and practiced backward rolls on a mat for 3 minutes.

Subject #7 received general training which consisted of four different activities. On day one she walked for 13 minutes with two, one minute intervals interspersed.
Afterwards she practiced basic stretches. There were three types of stretches included in this program. The first was stretching the arms as high as possible, and as low as possible. The second was sitting on the floor and touching the toes with legs kept straight. The third was sitting on the floor and twisting the trunk of the body from side to side.

Subject #8 received general training with the same schedule as student number seven.

Subject #9 received general training in three areas. On day one she walked for 15 minutes, and practiced the three types of rolls (forward, backward, and side rolls), for 5 minutes. On day two she walked for the same amount of time and practiced 5 minutes of stretches as described in student #7's program.

Subject #10 received general training in three areas. On day one she received 16 minutes of walking (she used a walker), and 4 minutes of range of motion exercises. This was done by having her lay on her back while the trainer moved her arms and legs around in a circular motion. Day two consisted of 16 minutes of walking and 4 minutes of rolling and crawling on the mat. These exercises consisted of getting the student to pull herself around on the mat.
while laying on her stomach, and of rolling over from front to back.

Subject #11 received general training in four areas. On day one she walked for 11 minutes, ran four, one minute intervals, and practiced rolls (forward, backward, and side rolls), for 5 minutes. On day two she walked for 11 minutes, ran four, one minute intervals, and practiced stretches for 5 minutes. These stretches were the same as described for student number seven.

Subject #12 received general training in three different areas. Each day he walked for 13 minutes with two, one minute intervals of running interspersed. He also practiced forward, backward, and side rolls for 5 minutes daily.
<table>
<thead>
<tr>
<th>Student Number</th>
<th>Days of the Week</th>
<th>Training in Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Day 1</td>
<td>13 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Running</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Tumbling skills</td>
</tr>
<tr>
<td></td>
<td>Day 2</td>
<td>13 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Running</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Stretches</td>
</tr>
<tr>
<td>8</td>
<td>Day 1</td>
<td>13 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Running</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Stretches</td>
</tr>
<tr>
<td></td>
<td>Day 2</td>
<td>13 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Running</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Tumbling skills</td>
</tr>
<tr>
<td>9</td>
<td>Day 1</td>
<td>15 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Rolls</td>
</tr>
<tr>
<td></td>
<td>Day 2</td>
<td>15 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Stretches</td>
</tr>
<tr>
<td>10</td>
<td>Day 1</td>
<td>16 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Range of motion</td>
</tr>
<tr>
<td></td>
<td>Day 2</td>
<td>16 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Rolls and crawling on mat</td>
</tr>
<tr>
<td>11</td>
<td>Day 1</td>
<td>11 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Running</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Rolls</td>
</tr>
<tr>
<td></td>
<td>Day 2</td>
<td>11 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Running</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Stretches</td>
</tr>
<tr>
<td>12</td>
<td>Day 1</td>
<td>13 Walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Running</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Rolls</td>
</tr>
</tbody>
</table>

*This was the group that received no intervention training for the first three weeks.
### TABLE III

**SPECIFIC SKILLS TRAINING**

<table>
<thead>
<tr>
<th>Student Number</th>
<th>Days of the Week</th>
<th>Training Time (in Minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All Days</td>
<td>20 Fitness walking</td>
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<tr>
<td>2</td>
<td>All Days</td>
<td>15 Fitness walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Backward rolls</td>
</tr>
<tr>
<td>3</td>
<td>All Days</td>
<td>17 Fitness walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Side-step-slide ambulation</td>
</tr>
<tr>
<td>4</td>
<td>Day 1</td>
<td>20 Fitness walking</td>
</tr>
<tr>
<td></td>
<td>Day 2</td>
<td>15 Fitness walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 walking stairs</td>
</tr>
<tr>
<td>5</td>
<td>Day 1</td>
<td>15 Fitness walking</td>
</tr>
<tr>
<td></td>
<td>Day 2</td>
<td>17 Fitness walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Side-step-slide ambulation</td>
</tr>
<tr>
<td>6</td>
<td>Day 1</td>
<td>17 Fitness walking</td>
</tr>
<tr>
<td></td>
<td>Day 2</td>
<td>17 Fitness walking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Backward rolls</td>
</tr>
</tbody>
</table>