AN ABSTRACT OF THE THESIS OF

Paul A. Maguire, Jr. for the degree of Doctor of Philosophy in Education presented on August 8, 1985.

Title: The Effects of Supplemental Home Instruction by Parents Utilizing the Data Based Gymnasium Instructional Model on the Performance of Selected Motor Skills with Moderately and Severely Mentally Retarded Children

Redacted for privacy

Abstract approved: _____
John M. Dunn

The purpose of this study was to determine if parents of students could improve the motor performance of their moderately and severely mentally retarded children through the implementation of the Data-Based Gymnasium (DBG) Instructional Model as a supplement to the school program. The DBG Instructional Model is an individualized system designed to provide successful physical education experiences for moderately and severely handicapped students (Dunn, 1980). A total of 45 children, ages 3-9, with moderate and severe mental retardation from the states of Oregon and Washington took part in this study. Each child was randomly selected to participate in one of three groups based upon baseline data gathered for the three tasks: underhand roll, catch, overhand throw. During the eight-week treatment period, subjects in experimental group one received DBG instruction in school and at home, subjects in experimental group two received DBG instruction in school only, and subjects in the control

group participated in the physical education program offered in their respective special education settings. The analysis of covariance was used to test the null hypothesis. The .05 level of significance was selected for use in this study. The null hypothesis that there was no significant difference between children who received DBG instruction in the home and school (E_1) and those who received school DBG instruction only (E_2) or no DBG instruction (C) was rejected on the basis of an obtained F value of 33.847. Application of the Student-Newman-Keul's Multiple Comparison's procedure across groups (E_1, E_2, and C) revealed that E_1 and E_2 were not statistically different ($E_1 = E_2$) and that E_1 and E_2 were statistically different from the control group ($E_1 \neq C$, $E_2 \neq C$). An examination of the raw and adjusted mean gain data for E_1, E_2, and C groups revealed a trend favoring the utilization of parents with the implementation of home instruction as a supplement to the school program.

The Effects of Supplemental Home Instruction by Parents Utilizing the Data Based Gymnasium Instructional Model on the Performance of Selected Motor Skills with Moderately and Severely Mentally Retarded Children

by

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A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Doctor of Philosophy

Completed August 8, 1985

Commencement June 1986

APPROVED:

Redacted for privacy

Professor of Physical Education

Redacted for privacy

Chair, Department of Physical Education

Redacted for privacy

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Dean, Graduate School

Date thesis is presented August 8, 1985

Typed by Express Typing Service for Paul A. Maguire, Jr.

DEDICATION

This thesis is dedicated to the memory of my father, Paul A. Maguire, Sr. His perseverence in the pursuit of excellence in his roles as father, husband, physical educator and coach will remain with me always.

Some men value their silver
Others put their trust in gold
But he believed in love, family
and friendship
Because those things never grow old.

- Author unknown

ACKNOWLEDGEMENTS

This study was initiated and completed with the constant support of my mother, Kitty, whose excellent spiritual example and sense of humor consistently aided my effort to maintain a healthly perspective. A loving thank-you is extended to my other constant sources of support, my brothers, Kevin, Patrick, Michael, Shawn, and Stephen, and sisters, Theresa Ann, Maureen, Colleen, and Mary Anne.

Thanks are extended to my special friends Dr. Joseph Huber, Steven Wright, and Steven Dempsey for their unique contributions and support during the development and implementation of this study.

Additional thanks are extended to the volunteers and parents who participated in this study and to my friends Debbie Howard, Bob Conceison, Steve LaMarca, B. Maguire, Jack Hamrock, and Keith Kensinger.

Special appreciation is extended to the following individuals who have positively influenced my professional development and contributed to my academic preparation: Prof. Jo Smith, Prof. Cay Comeau, Dr. Lane Goodwin, Dr. Jerry Ball, Mrs. Susan Parks, and Dr. H. D. "Bud" Fredericks.

I wish to thank Dr. John M. Dunn for his commitment to excellence with my preparation of this thesis and for his positive contribution to my personal and professional growth and development. Additional thanks are extended to my graduate committee members: Dr. Tom Grigsby, Dr. Kathleen Heath, Dr. Marie Boarman, Dr. Charles Langford, and Dr. Clara Pratt.

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CHAPTER 1

INTRODUCTION

In the United States parents have the right to pursue a variety of educational placements for their children. This right is limited only by society's insistence that these placements adhere to basic standards for buildings, materials, curriculum, and staff competence. Public schools in the United States are not intended to be creations of the state with teachers and school administrators functioning as legal parent substitutes. Rather, public schools belong to the people and, more specifically, to parents who support them as taxpayers. Helping parents to understand and accept this right is a major task for educators.

In the 1960's and 1970's the involvement of parents with their handicapped children's education underwent a shift from passive to active participation. Federal legislation, specifically Public Law 94-142, mandates the placement of handicapped children and youth into the least restrictive environment. Additionally, PL 94-142 mandates the involvement of parents in educational decisions, including their participation in the development of the individualized educational plan (IEP). Since the inception of PL 94-142, parents of exceptional children have received considerable attention from school personnel (Beale & Beers, 1982). Articles, speeches, and inservice workshops

have all asserted the importance of parent involvement and have described goals and related methods for making parents part of ongoing school activities (McWhirter, 1976; Shearer & Shearer, 1972; Sonnenschein, 1981).

PL 94-142 also mandates that physical education services be an integral component of each child's academic program. Physical education is included within the definition of special education (Federal Register, Aug. 23, 1977, 121a.14). The report of the House of Representatives on PL 94-142 includes the following statement regarding physical education:

> Special Education as set forth in the committee bill includes instruction in physical education, which is provided as a matter of course to all non-handicapped children enrolled in public elementary and secondary schools. The committee is concerned that although these services are available to and required of all children in our school systems, they are often viewed as a luxury for handicapped children.
>
> The committee expects the Commissioner of Education to take whatever action is necessary to assure that physical education services are available to all handicapped children, and has specifically included physical education to make clear that the committee expects such services, specially designed where necessary, to be provided as an integral part of the educational program of every handicapped child. (House Report 94-332, 1975, p. 9).

The right of handicapped children to a free, appropriate public education, including physical education has been supported by professional organizations. The American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) established a "Bill of Rights" (French & Jansma, 1982) for young people involved with physical education and sport. Included in the bill are the rights to participate regardless of ability level and to be properly prepared

for participation. The American Academy of Pediatrics' joint committee on Physical Fitness, Retardation and Sports Medicine (1974) advocates regular exercise and physical activity as a means to foster wholesome growth in mentally retarded persons. The Committee recognizes that engaging in physical education and sport develops motor skills and improves physical fitness. Through sport, individuals learn to engage in competition with peers and to play within the rules and structure of an activity (French & Jansma, 1982). Additionally, involvement in physical education experiences may result in improved social interaction, concentration skills, and goal setting for self-improvement (French & Jansma, 1982).

Despite the legislative mandate for physical education and the value of physical activity, few validated programs have been established to teach complex gross motor skills to mentally retarded students. Currently, physical educators are seeking effective instructional strategies to incorporate in school physical education programs for handicapped children. Parent involvement as an intervention strategy is an approach being considered by educators of special students.

There is evidence to suggest that home based-instruction may positively influence the motor performance of selected handicapped children (Horvat, 1980; Paciorek, 1981). Previous studies, however, have not required parents to implement a specific instructional model, but instead have directed parents to provide a variety of movement opportunities in specific motor areas.

Dunn, Morehouse, Anderson, Fredericks, Baldwin, Blair and Moore (1980) developed an instructional model to teach the moderately and severely mentally retarded population physical and motor fitness skills. The Data Based Gymnasium (DBG) Instructional Model provides a systematic instructional approach utilizing a special curriculum designed for the moderately and severely mentally retarded individuals. Dunn et al. (1980) recognize the importance of parental intervention by encouraging parents to implement the DBG Instructional Model as a supplement to school instruction. However, there is no evidence to suggest that parents of moderately and severely mentally retarded children can implement the DBG Instructional Model and enhance the motor performance of children beyond those gains obtained in the school physical education program.

Purpose of the Study

The purpose of this study was to determine whether or not parents of moderately and severely mentally retarded children could improve the motor performance of their children through the implementation of a specific systematic program (DBG Instructional Model) as a supplement to the school program. Educators and parents of moderately and severely handicapped children and youth recognize the value of reinforcing school programs with instruction in the home (Bucher & Reaume, 1979). The continuation of educational programming during school vacations, including the traditional summer break, maximizes the opportunity for the child with moderate and severe mental retardation to maintain old skills and learn new tasks. The parent

can assist with this effort by supplementing instruction during the school year and continuing to complement school programming for their child year-round. The relationship of parent/child as teacher/learner is best described by the staff at the Teaching Research Infant and Child Center in Monmouth, Oregon:

> Our experience is that many parents, especially parents of severely handicapped children, are interested in doing the most they can for their children and consequently are willing to undertake home programs. Moreover, as the success of the school program increases, parents become more eager to want to help their child. Frequently they have been discouraged about their child until the school demonstrates some success, at which time the parents' discouragement is replaced by optimisim and a desire to contribute to their child's new found growth pattern. Therefore, as educators we need to be responsive to these desires of the parents and teach them the skills to teach their own child. (Fredericks, Baldwin, Moore, Templeman, Grove, Moore, Gage, Blair, Alrick, Wadlow, Fruin, Bunse, Makohon, Samples, Moses, Rogers, & Toews, 1979).

This study may assist parents and physical educators in recognizing the value of parental involvement in educational programming for children and youth with moderate and severe mental retardation.

Definition of Terms

For the purpose of clarification, the following definitions, or explanations, of terms have been adopted for use in this study:

Parent/Guardian: One who is the major caretaker of a child and is responsible for the child's health and well-being (Michaelis, 1980).

Moderately Mentally Retarded: A mentally retarded school-aged child whose IQ range is 36 to 51 on the Stanford-Binet Intelligence Test, or 40 to 54 on the Wechsler Test of intelligence, and who concurrently displays deficits in adaptive behavior which is manifested during the developmental period. This individual has some potential for learning

to care for personal needs, for social adjustment in a group, and for economic usefulness (Fait & Dunn, 1984).

Severely Mentally retarded: A mentally retarded school-aged child whose IQ range is 20 to 35 on the Stanford-Binet Intelligence Test, or 25 to 39 on the Wechsler Test of intelligence, and who concurrently displays deficits in adaptive behavior which is manifested during the developmental period. This individual is totally dependent and is incapable of being trained for economic usefulness, social participation, or total self-care (Fait & Dunn, 1984).

Data Based Gymnasium: An individualized data-based instructional system designed to provide successful physical education experiences for moderately and severely handicapped students (Dunn et al., 1980).

Learning: A relatively permanent change in performance resulting from practice, past experience, or teaching/learning behavior (Kerr, 1982).

Motor Skills: Movements that are dependent on practice and experience for their execution, as opposed to being genetically defined (Schmidt, 1982).

Placement: The assessment given to a student on a series of physical education tasks to determine the specific tasks a student already has and those that he/she does not have (Dunn et al., 1980).

Baseline: Pinpoints specifically what sub-tasks within each task the student does or does not have (Dunn et al., 1980).

Criterion: A designated level of success (Fredericks et al., 1979).

Time-Out: Removal of a student quietly and gently from a room to a designated area. The purpose of time-out is to remove the student from a setting that appears to possess positively reinforcing elements (Fait & Dunn, 1984).

Criterion-Reference Test: A criterion or level of mastery of certain information or skills which is arbitrarily established for each item of the test or for the test as a whole (Fait & Dunn, 1984).

Reinforcer:	Any condition or event following a response that increases the probability that the response will be repeated (Dunn et al., 1980).
Volunteer Observation Form:	Data keeping system designed to measure the accuracy of the volunteer's implementation of one-to-one instruction in the Data Based Gymnasium Instructional Model (Fredericks et al., 1979).
Update:	Daily examination of the data, determining if a change in a program is necessary and recording the program for the next day (Dunn et al., 1980).
Supplemental Instruction:	Instruction at home in addition to the school program.
Classroom Aides:	Individuals trained to implement the DBG model, including paid aides, volunteers, and Oregon State University students.

Statement of the Problem

The purpose of this study was to determine if parents of selected moderately and severely mentally retarded children could influence the motor performance of their children. The following question was analyzed in this study: Can parents enhance the motor performance of their children beyond those gains associated with school programs?

Delimitations of the Study

The study was delimited to 45 moderately and severely mentally retarded students who received public school instruction in the states of Oregon and Washington and who displayed similar deficiencies in the following tasks: catch, overhand throw, and underhand roll. The Data Based Gymnasium Instructional Model was used as the criterion

measure of motor performance of children. Home instruction was provided by a parent trained in the DBG Instructional Model.

Limitations of the Study

The study was subject to the following limitations:

1. The sample may not have been representative of the school-aged moderately and severely mentally retarded population in the states of Oregon and Washington.

2. The investigator served as the parent trainer for training Experimental Group one and Experimental Group two.

3. The frequency of instruction and accuracy of data recording by parents, volunteers and teachers involved with this study relied on a self-report system.

4. No information was obtained relative to the intellectual and physical ability of the parents to participate and contribute to the study.

CHAPTER 2

REVIEW OF RELATED LITERATURE

There are several rationales supporting parental involvement in the schools, including (a) the concept of education as a parent responsibility, (b) professional perceptions of parent involvement, and (c) the dominant trend of contemporary research on types of parent involvement.

Current research overwhelmingly supports the value of parent involvement in special education program (Kelly, 1978). Presented in this chapter is a review of studies and programs which have analyzed the effect of parent training on the academic, motor, and physical fitness of handicapped and non-handicapped students. This review is organized into three major areas: Parent Training in Special Education, Parent Training in Physical Education, and Parent Training Methodology.

Parent Training in Special Education

The studies reporting information on parent training in special education programming vary in scope. The spectrum of interests ranges from training abusive parents (Wolfe & Sandler, 1981) to training a parent to train a spouse (Adubato, Adams, & Budd, 1981). The intent of this phase of the survey of literature is to report studies and programs which have focused on the effects of parent intervention and instruction on the education of handicapped children. This review of

parent training of disabled youngsters is divided into five sections: blind, hearing-impaired, and speech-impaired; mental retardation; orthopedically and neurologically impaired; learning disabled; and behavior disorders.

Blind, Hearing-Impaired, and Speech-Impaired

A program for ten blind infants was conducted by Failberg, Smith and Adelson (1969) at the University of Michigan. The program focused on the first 18 months of a child's life, the "initial period of ego formation." A worker trained either in psychoanalysis or clinical psychology made home visits twice monthly to work with mother and child. Areas emphasized in working with the mother included interpersonal response, discovery of objects, prehension, and locomotion. In a concluding statement the authors stressed the importance of promoting "love bonds" between a blind infant and his/her parents. They noted that intimate objects must be mediated through the relationship with "significant others." This then leads to the infants' investment in objects for their own sake.

Luterman (1967) reported on a program for parents and their deaf preschool children at the Robbins Speech and Hearing Center in Boston. Sixteen families participated over a one-year period. The children (18 to 42 months of age) took part in an informal nursery school program which stressed language stimulation in free-play situations. Two hearing children were enrolled in the program as the control group. At the conclusion of the program, progress was apparent, with most of the children able to do specific lip reading and to use speech in a meaningful manner.

In speech pathology, Tracy (1974) reported the results of a community education program that included both bilingualism and individualized parent education in its preschool program. Test results showed significant gains from pre-to-post test. When the parents were rated as to their degree of participation, it was found that the correlation was high between the degree of parent cooperation and the children's posttest scores. Generally, the children of parents who participated most achieved higher scores on the test at the end of the year.

Andersland (1961) reported two case studies that addressed the effect of parent recording of speech production of developmentally delayed preschoolers. Specifically, the studies tested whether parents in a parent-training early intervention program provide more effective speech training when using a recording of their child's speech as an aid. The first study utilized a multiple baseline design across participants and settings with four Down's Syndrome children (age range 32 to 35 months). All of the children displayed increases in speech production when their parents began to record speech. In the second study, a multiple settings generalization probe design was employed with a 26-month old child who had developmental delays of unknown etiology. The child showed a generalized increase in speech production after her mother began to record home speech production. The findings are interpreted as a result of cueing and making parents accountable for their children's progress.

In a study conducted by Weitz (1982), the mothers and fathers of 11 preschool autistic children were taught operant procedures used in

teaching speech to nonverbal children. The children's speech skills were assessed before and after their parents implemented the operant procedures. At post-treatment, the children showed significant gains in prespeech and speech skills as measured by a 21-step hierarchy of speech behaviors. Those children who had acquired at least verbal imitative skill before parent instruction began made greater progress during the eight-week treatment than those who had not received parent instruction. Although all 11 children maintained their gains in a follow-up assessment one year later, there was no evidence of significant improvement beyond that achieved at the end of treatment. The importance of support for parents in continuing to do formal "teaching" after the treatment period ended was stressed by the investigators.

In the studies of England, Fudala and Ganoung (1972); Sommers, Furlong, Rhodes, Fichter, Bowser, Copetas and Saunders (1964); and Tufts and Holliday (1959), mothers trained in basic speech-correction methods were able to significantly improve their children's acquistion of articulated sounds. With other speech handicaps, counseling approaches alone have been the more effective form of intervention (Webster, 1968).

The Home Demonstration Teaching Program for Parents of Very Young Deaf Children (Horton, 1968) was developed at the Bill Wilkerson Center in Nashville, Tennessee. The program served children between the ages of six months and three years with severe, but not profound, hearing loss. No attempt was made to assess intelligence; mean social quotient on the Vineland Scale of Social Maturity was 90. Parent

education was the primary focus of the program, while a secondary objective was to accommodate the special needs of the children. While no objective evaluation of the program was made, feedback suggested that the program had distinct assets.

Jackson, Evenson and Ekey (1971) conducted an experimental project for preschool multiply handicapped, post-rubella children. The program was designed to involve parents in work with their children. Criteria for admission included severe impairment in both hearing and vision. Over a two-year period, the program served 15 children, whose ages ranged between 3 years 6 months and 5 years 3 months. A special rating scale completed by mothers and teachers was used for periodic evaluation of the children. Self-help, gross-motor skills, and activities which stimulated visual and auditory responses were the focus of the program. Individualized tutoring in language, audition, and eye-hand coordination was also provided. Parents participated in the program in a variety of ways: home visits from teachers, assisting in the classroom once a week, and working as paid aides. Some degree of cognitive gain was evident at the conclusion of the program, although the authors acknowledged that it was hard to know whether the gain was attributable to maturation or to the program.

Mental Retardation

Successful parent involvement has been noted in programs for individuals with mental retardation. A variety of studies have investigated parent-child interactions and responses to each other outside of an instructional setting (Buckhalt, Rutherford, and

Goldberg, 1978; Peniston, McLean, and Eugene, 1980; Spiker, 1982). Few investigators have addressed the parent-child dyad in a teacher-learner situation. Filler (1976) studied the effects of maternal teaching style on the performance of mentally retarded preschool-age children. Twenty-one mothers and their mentally retarded preschool-age children were observed during six teaching sessions. Following the first three sessions, each mother-child dyad was assigned to one of the three groups. Groups were matched on measures of mother and child behavior and on measures of mother and child background. Prior to the last three teaching sessions, mothers received instructions to modify certain aspects of their teaching styles. The results indicated that children whose mothers had been instructed to present the materials systematically obtained significantly higher academic performance scores during training than did children whose mothers either had received no instruction or had been told to increase positive feedback for correct responses. Further, six of seven children whose mothers had altered the manner in which they presented the materials showed improvement on a test administered after training. These results suggest that nonverbal activities which precede response are critical aspects of teaching style.

Cheseldine and McConkey (1979) studied the effects of parental speech to elementary school-aged Down's Syndrome children. Parents with Down's Syndrome children who were at the one-two word stage of expressive language development were given a language objective to work towards with their children, but no instructions on how to attain

this goal. The parents spontaneously altered their language strategies. Their strategies differed. Parents who used target words in shorter "statement" utterances were most successful. Parents who used a questioning or imitating strategy were less successful. The less successful parents were then shown how to alter their language strategies to produce a greater improvement in their children's use of the target words.

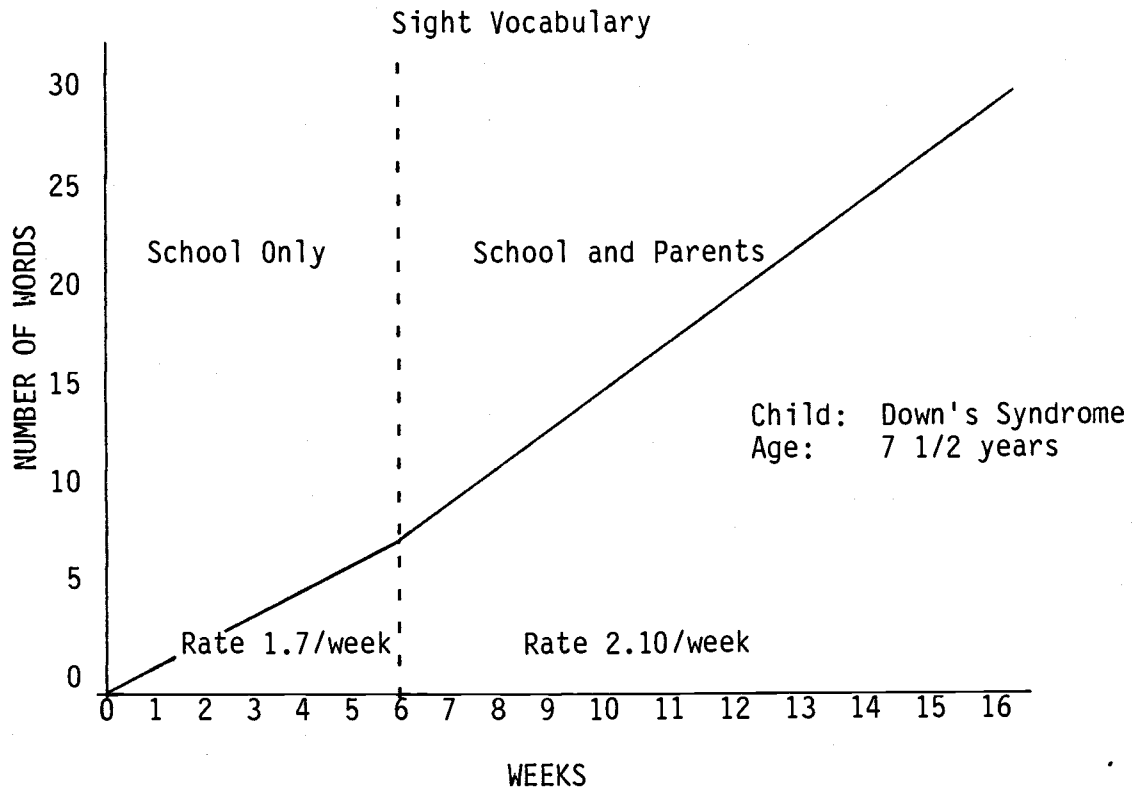
Santostephano and Stayton (1967) trained focal attention in a home-based program for 31 moderately and severely mentally retarded children with mean chronological ages between 5 and 6 years. The researchers hypothesized that this "unique form of nuture" might make the children more amenable to instruction by others. A pre-post battery of tests (object sort, and an adaptation of the picture-discrimination task from the Stanford-Binet) was administered to evaluate the results of the program. Experimental subjects performed significantly better than controls on four out of five of the tasks.

The Shield Institute for Retarded Children in The Bronx, New York (Hunter & Schueman, 1967) developed a program for mentally retarded infants and their mothers. The program emphasized the mental health of the family and a multi-disciplinary training program for mother and child. Ninety-four children under 3 years of age, with mean IQ of 41 and mental retardation levels ranging between mild and profound, participated in the program. The parent program included individual counseling and psychotherapy as well as weekly counseling groups and monthly lecture or discussion groups. The curriculum emphasized

self-care skills, social adaptation, sensory training and communication skills. On the basis of pre-post evaluation by teachers, it was concluded that the home-training program had a beneficial effect. However, the investigators noted that this interpretation was tempered by the absence of a control group.

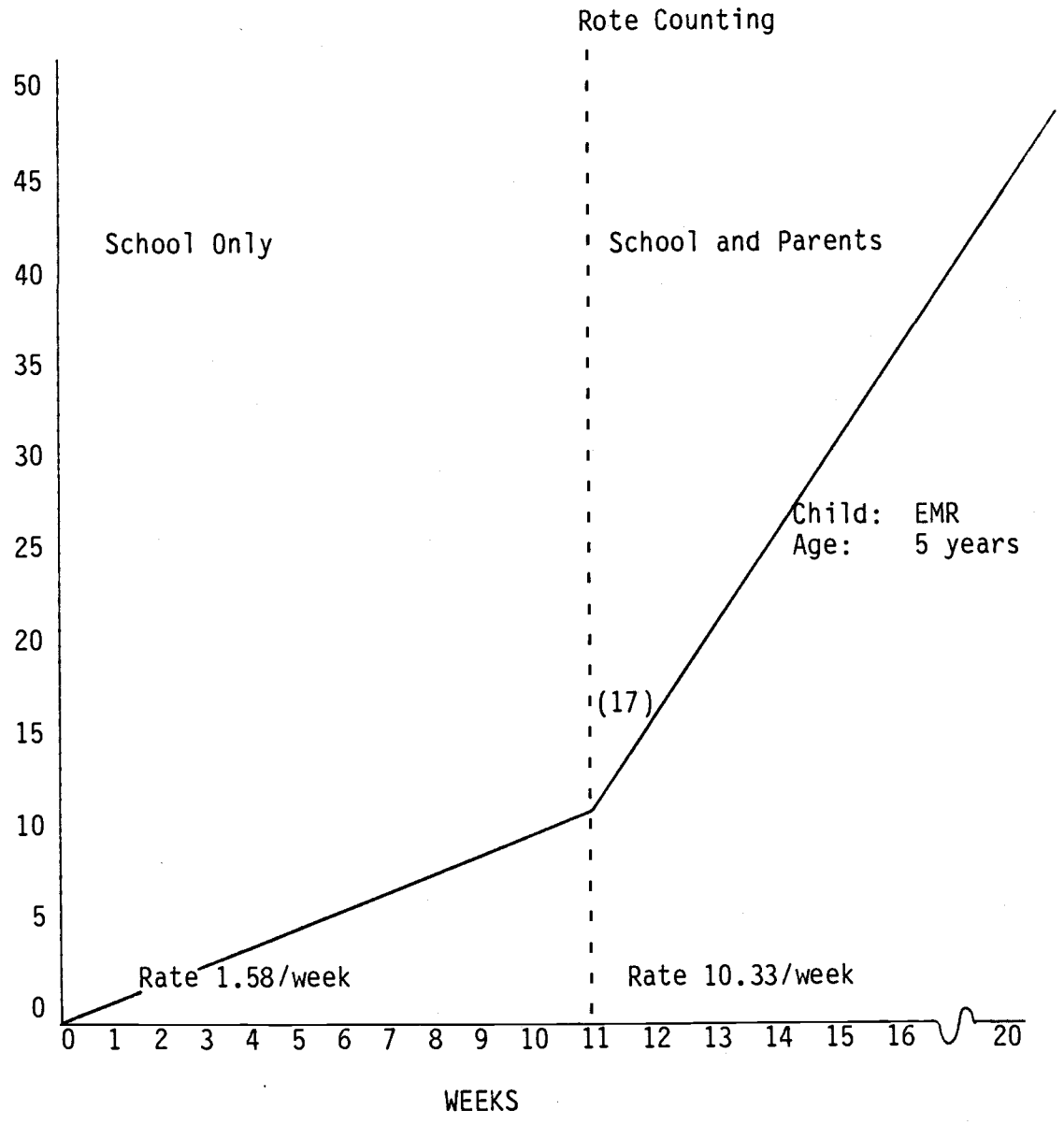
A project at the West Suburban Special Education Center in Cicero, Illinois (Benson & Ross, 1972) used parents as volunteer aides in the classroom. There were 13 trainable mentally retarded children with an age range of 5 to 8 years. Some had orthopedic or visual handicaps. The training of parents had a twofold aim: to provide more individualized instruction for the children and to promote parent involvement so that parents could work better with their children. The school staff observed social and emotional growth on the part of the children. The mothers reported a great decrease in their own tensions, and the development of better understanding of their children's potential.

Fredericks et al. (1979) suggested that parents should be approached to conduct at least one home-training program. In emphasizing their position, the authors identified two major points. First, the increased rate at which the child can acquire skills should be demonstrated to the parents by specific examples (see Fig. 2.1 and 2.2). Second, the necessity for the generalization of learning, especially in the areas of self-help skills, toilet training, and language acquisition in the home environment should be stressed (p. 172). The system emphasizes the importance of proper preparation of the parent to implement the home program, as well as the parent



Source: Fredericks et al., 1979.

Fig. 2.1. Progress of a child in a home/school program.



Source: Fredericks et al., 1979.

Fig. 2.2. Progress of a child in a home/school program.

and instructor agreeing on the skill(s) to be taught. Additionally, the researchers suggest that the skill(s) to be taught at home be success-oriented (reasonable), task-analyzed, and reinforced in the school environment.

Orthopedically Handicapped and Neurologically Impaired

Public school involvement with parents of orthopedically handicapped and neurologically impaired children in the past involved almost exclusively counseling approaches (Barsch, 1961; Baus, Letson & Russell, 1958; Burgess, 1955). However, awareness of the need for more parent involvement in this area appears to be growing. Connor, Wald and Cohen (1970) noted that the teacher has "the responsibility for helping parents assume active roles in programming for their children and must constantly keep in mind the need to interpret realistic goals to parents (p. 10)."

A one-year project at United Cerebral Palsy of Queens evaluated the effects of an intervention program on neurologically impaired children and their families (Wider & Hicks, 1970). Although the major focus was on parent counseling, an early intervention program for children was also provided. Twenty-three children, aged 9 to 44 months, were divided into two classes and attended group sessions twice weekly. The children in class 1 received services from the project and parent intervention; those in class 2 received parent intervention only. An experimental rating scale was used for purposes of pre-and-post treatment evaluation of the children's physical, social, and intellectual growth. Although there was no formal evaluation of the two classes, the staff agreed that class 1 functioned more effectively.

The Portage Project used a behavior-modification approach with multiply handicapped children and their mothers in a rural area of Wisconsin (Shearer & Shearer, 1972). The children ranged in age between newborn and six years. During the first year of the project, an initial three-month period was devoted to preservice training of professional home trainers. Topics included orientation to the project and training in assessment techniques and instructional strategies. The home trainers also attended a university Extension course which focused on learning theory, child development, evaluation, and parent training. They continued to receive inservice training throughout the duration of the program. The curriculum was based on a set of 363 curriculum cards devised by the staff and designed to accompany a checklist of desired skills. Each card described one of the skills in behavioral terms, then outlined teaching techniques and materials needed for implementation. Home trainers visited the homes weekly to work with the child and mother. The professionals who assumed this role the first year were supplemented by several para-professionals during the second year. The home trainer reviewed the results of the previous week's prescription with the mother, making revisions, if necessary. The home trainer worked with the child to demonstrate the new prescription to be carried out during the week. The parent then practiced the prescription under the guidance of the home trainer, who also guided the mother in recording and reporting procedures. At the end of the first year, the children were evaluated on the basis of unspecified tests and developmental scales. Results from the study led the author

to conclude that the average child had progressed 13 months over an eight-month period.

Learning Disabled

A number of studies have indicated that parents can facilitate the remedial instruction of their learning-disabled children. Shaffer (1957) and Studholme (1964) noted that parent group counseling on practical aspects of child management significantly improved reading achievement among disabled readers. More direct involvement through parental extension of school remedial programs has also had favorable results (Calvert, 1971; Della-Piana et al., 1967; Kingsley, 1971; Smith & Brache, 1963).

A program in a New York State suburban community (Slater, 1971) focused on kindergarten children with learning disabilities and their mothers. The program had three primary aims: to develop an inventory for the identification of potential learning problems, to initiate a program involving parents in the instruction of their children, and to study the effects of intervention on later school progress. An initial readiness inventory was administered to 254 kindergarten children. The results suggested that 80 of them were potentially learning disabled. Letters were then sent to parents of these children requesting their participation in a remedial program. Thirty-three mothers agreed to participate and the remaining 47 families were used as controls. Post-test results indicated that children whose mothers were in the training group did significantly better than the control group on the Bender-Gestalt test; however, the groups did not differ in performance on the Metropolitan Readiness Test or on a human-figure drawing test.

Behavior Disorders

The majority of studies reported in the literature focusing on behavior disorders address behavior management as an appropriate intervention strategy. Some of these studies focus on the effect of parental implementation of various behavior management systems on the behavior of children with a variety of handicapping conditions in addition to the behavioral disability, including mental retardation and emotional disturbance. Whitman, Hurley, Johnson, and Christian (1978) examined the direct and generalized effects of a parent-administered, positive-reinforcement, and physical-restraint procedure upon the inappropriate behavior of an institutionalized severely mentally retarded boy. The boy's mother was trained to administer the training package contingent upon three of her son's responses during a play situation conducted within the institutional setting. Results indicated that the procedures were effective in directly increasing the child's instruction-following behavior and decreasing his noncompliance and inappropriate play responses. Morever, a correlated reduction in the boy's untreated aggression and clothes stripping was observed. Follow-ups conducted over a four-month period indicated that all treatment effects were maintained over time.

Fowler, Johnson, Whitman, and Zukatynski (1978) studied the effects of parental implementation of behavior management skills with the mother of a 24-year-old, noninstitutionalized, profoundly mentally retarded woman who was noncompliant and aggressive. Through the use of written instructions and verbal feedback, the mother was trained to

apply a positive reinforcement and time-out program. The instructional program contained extensive sequential directions that enabled the mother to apply the procedures systematically in teaching her daughter basic self-help and preacademic skills, including hair brushing, tooth brushing, face washing, bead stringing, and ring stacking. Results of the study indicated that the program was successful in reorienting the mother's behavioral "style" in interaction with her daughter, in increasing the daughter's compliance, and in decreasing her noncompliance and aggressive responses during self-help and preacademic training.

Wahler (1980) studied 18 mother-child dyads who were referred for psychological help because of the children's oppositional behaviors and the mothers' aversive reactions to the children. All dyads were from low-income families in which the mothers reported themselves to be relatively isolated from social contact in their communities. Following a baseline phase, the mothers were trained to modify their children's oppositional behaviors through time-out and a point system. Fourteen of the dyads were observed in three phases of the study: baseline, parent training or treatment, and one-year follow-up period. In phases one and two, child opposition and mother aversive reactions to the children were measured twice weekly in the home setting by professional observers. During phase three (follow-up), these observations occurred twice per month. In addition, the mothers' self-reported contacts with people in their communities were obtained immediately after each observation. Results of the study revealed significant improvement in reducing the mother-child problems during

the parent training (treatment) phase. However, the problems returned to baseline levels during the follow-up phase. The self-report findings indicated that the number of mother contacts with friends was an inverse predictor of these problems. On days marked by high proportions of friend contacts, mother-child problems were lower in frequency than on days marked by low proportions of friend contacts. These correlational findings suggest that a mother's extrafamilial social contacts may influence her child-interaction patterns at home. This possibility may be a factor in the long-term success of parent training as a treatment strategy.

Bernal, Klinnert, and Schultz (1980) addressed the question of how effective is parent training in reducing conduct problems in children in comparison to client-centered parent counseling. A secondary question concerned the relative effectiveness of the two treatment groups in comparison to a control group that went untreated during the eight-week period of treatment provided the other groups. Thirty-six families with children ranging in age from 5 to 12 years and having conduct problems were screened and randomly assigned to treatment groups; however, assignment to the control group depended on therapist availability. Supervised graduate student therapists conducted ten treatment sessions for each family. Parent reports, and paper and pencil tests of child deviance and parent satisfaction, showed a superior outcome for behavioral over the client-centered and control groups, but no differences between the latter two groups. At follow-up, there was no maintenance of the superiority. Home observation data showed no advantage of behavioral

over client-centered treatment, and these two groups did not improve significantly more than the control group.

Strain, Steele, Ellis, and Timm (1982) reported follow-up data that represent a long-term (three to nine years out of treatment) evaluation of 40 children who were clients of the Regional Intervention Program (RIP) from 1969 to 1978. As three-, four-, and five-year olds, the youngsters had exhibited severe and prolonged tantrums, continual opposition to adults' requests and commands, and physical aggression toward parents. Each child and mother participated in a standardized intervention package modeled after Wahler's Opposition Child Treatment. Results from school and home-based follow-up showed that (a) commands, demands, or requests made by parents were likely to be followed by former clients' compliance; (b) former clients' social interactions in the home were overwhelmingly positive and their nonsocial behavior was by and large appropriate; (c) parent behavior in the home was consistent with the child management skills taught in prior years; (d) there were no differences between the compliant, on-task, social interaction, and appropriate/inappropriate nonsocial behaviors of former clients and randomly selected class peers; (e) there were no differences in teachers' commands, negative feedback, positive social reinforcement, and repeated commands directed toward either former clients or randomly selected class peers; (f) both teachers' and parents' ratings of former clients on the modified Walker Problem Behavior Checklist were highly correlated; (g) there were no differences in teachers' rating of former clients and class peers; and (h) of all the studied

demographic variables, only age at which treatment began and family intactness were related to current levels of behavior.

Lobitz and Johnson (1975) examined the ability of parents to bias home-observation data by influencing their children's behavior in socially desirable and undesirable directions. Parents of 12 deviant and 12 nondeviant boys, aged 4 to 8, were given the response set to present their children as "good," "bad," and usual (normal) during six 45-minute observations of family interaction. Deviant and nondeviant children showed significantly more deviant behavior under the bad condition as compared with normal, whereas under good and normal conditions they did not differ. Positive and negative parental behaviors were related to changes in deviant behavior of their children. Positive and commanding parental behaviors were related to changes in deviant behavior for the nondeviant sample. Parent self-report of behavior change was generally consistent with the observation data. The results suggest implications for naturalistic observations of families and for parents to provide intervention for child behavior change.

Parent Training in Physical Education

Paciorek (1981) measured the effects of a home-based, parent intervention motor development program on developmentally delayed children. The major question considered was the following: Is there any difference in gross and fine motor scores obtained on the Peabody Development Motor Scales (Field Test Edition) received by (a) those

children who participated in the program and (b) those children who did not participate in such a program? Twenty children, ages 4.6 to 6.6 years, classified as Developmentally Delayed, were the target population. Subjects were randomly assigned from this group to an experimental group (n = 10) and comparison group (n = 10). Subjects were pretested on the scales to determine gross and fine motor development ages. The eight-week program was administered by the subjects' parents or guardians and was based on a series of developmental activities accompanying the Peabody Scales, designed to teach each skill included in the scales. The program was monitored and adjusted bi-weekly by visits to the home by the examiner. An analysis of the data revealed that gross motor scores of the comparison group improved significantly with fine motor scores of both groups showing significant improvement.

Horvat (1980) investigated the effect of a structured gross motor home learning program on the balance proficiency of elementary school-aged learning disabled students. Fifty-seven learning disabled students from two elementary schools in Salt Lake City, Utah, were evaluated on balance components of the Six Category Gross Motor Survey. Forty-four of the students evaluated scored one standard deviation below the mean compared to normal children of the same chronological age and sex on overall (static and dynamic), static, and dynamic balance tests. From this sample, ten parents of students, who volunteered to conduct a home learning program, were assigned to one of two experimental groups based on each subject's pretest scores. Parents in Experimental Group 1 (E_1) implemented a home learning

program which consisted of static and dynamic balance tasks, while Experimental Group 2 (E_2) conducted a home learning program consisting of fine motor and academic tasks. Each home learning program was conducted three days a week for 30 minutes per session (12 weeks).

A Control Group (C) was also selected from the original sample and matched on pretest scores with the two Experimental groups. All groups then participated for 12 weeks in a physical education program conducted twice weekly by a master's degree student in Special Physical Education. Prior to the start of the investigation, an initial training session was utilized to familiarize parents in E_1 and E_2 with the home learning program. One phone call to each family per week was utilized by the investigator to answer parents' questions regarding the implementation of the home learning program.

A Mann Whitney U Test was used to determine significant differences between groups on overall, static, and dynamic balance scores. Based on the comparisons of E_1 and E_2, and E_1 and C, significant differences were found for overall balance ($p < .01$), static balance ($p < .01$), and dynamic balance ($p < .05$), while the comparisons of E_2 and C found no significant differences ($p > .05$) in overall, static, or dynamic balance.

In addition, a Wilcoxon Matched-Pairs Signed Ranks Analysis was applied to compare pre-test and post-test scores between groups. Based on the results of this analysis, performance was shown to have improved significantly on overall static and dynamic balance ($p < .05$), while for pre-test and post-test comparisons of E_2 and C, no significant differences ($p > .05$) were found on any of the

dependent variables. As a result of this investigation, it was concluded that parents can significantly enhance the balance proficiency of elementary school-aged learning disabled students by implementing a structured gross motor training program in the home.

Parent Training Methodology

Sanders and Glynn (1981) examined the generalization and maintenance effects of three phases of parent training (Instruction Plus Feedback and two Self-Management Training phases) on levels of disruptive child behavior and the accuracy with which parents implemented programs. The Instructions Plus Feedback phase involved instructing parents to use a range of behavior management procedures and provided home-based feedback concerning the accuracy of the program implementation. Self-Management Training phases involved training parents in goal setting, self monitoring, and planning skills specific to their performance of appropriate parenting skills in generalized settings. Data were collected from five families in three main settings: the initial training setting (the home), a variety of generalization settings in the community, and the family breakfast. A multiple baseline across subjects design was used. Results indicated that the Instructions Plus Feedback phase was sufficient to produce reduced levels of problem behavior at home, and high levels of accurate implementation, but generalization gains out of home were equivocal. The Self-Management group maintained reduced levels of problem behavior at home but, in addition, resulted in generalization

effect in community settings for both children and parents. Maintenance probes three months following the program revealed that the effects of the program had been maintained.

O'Dell, Drug, Patterson, and Faustman (1980) examined the relative effectiveness of three methods for teaching parents to use time-out. Twenty-four parents were randomly assigned to one of three types of training: a written take-home manual, a film plus written take-home manual, or individual modeling and rehearsal plus written take-home manual. Five parents were assigned to a non-treatment control group. The parents were assessed through a multiple-choice exam and a home assessment of parents' implementation of time-out one week after training. All of the training methods were superior to non-treatment on both outcome measures. The authors identified that, in contrast to all the previous research in this area which had not included a take-home manual, there were no significant differences among the three types of training. Additionally, the authors emphasized the importance of take-home materials for immediate reference by the parent.

An article by McWhirter (1976) described a parent education group which focused on the learning disabled child and provided parents with a survey of specific learning disabilities. Factual information and emotional support were provided in a series of six to eight group sessions. The content areas included ten definitions, laterality and directionality, visual perception difficulties, auditory perception problems, and perceptual-motor issues. In addition to the cognitive

input, parents were involved in experiential activities designed to simulate the world of the learning disabled youngster. Time was provided for open-ended discussion of specific problems. Informal feedback from parents indicated a very positive response.

Nay (1975) studied a systematic comparison of instructional techniques for parents of preschool children. Instruction in time-out procedures was given to 77 mothers. The mothers were trained in accordance with one of four instructional techniques: written presentation, lecture presentation, videotape modeling presentation, modeling coupled with role-playing at each aspect of time-out. A no-treatment control group was also employed. Following treatment, no significant difference was found among the four instructional techniques when a questionnaire assessment of knowledge of time-out was evaluated; however, all instructional techniques were superior to no treatment. An assessment of the subject's ability to apply time-out with a child in simulated situations showed modeling coupled with role-playing to be superior to either written presentation or lecture, but not to modeling alone. The data in his study suggest that an instructor should choose a written presentation with a question-and-answer period as being the most efficient and least costly means of providing a group of parents with procedural information. However, an analysis of the audiotape analogue results suggest that, when generalization of procedural information to situations calling for knowledge of how to handle diverse and novel contingencies is required, a written presentation may not be satisfactory. The author suggests that such generalization of

knowledge may best be promoted by using training procedures which incorporate modeling or modeling/role-playing.

Summary

The research reported on parent training in special education clearly supports the involvement of parents as an effective intervention strategy. Studies reported in the area of speech and hearing identify the effectiveness of home-school intervention (Andersland, 1961; Jackson et al., 1971), as well as the impact of parent as teacher for the child learner (England et al., 1972; Sommers et al., 1964; Tuffs & Holiday, 1959).

In the area of mental retardation, Filler (1976) identified the effectiveness of mothers as teachers, citing specific teaching methodology to be employed and the importance of nonverbal cues (model/demonstration) in the learning process. Cheseldine and McConkey (1979) addressed the methodological issue in training parents of children with Down's Syndrome. The parents were found to be successful teachers of their children, especially when the verbal cue in the instructional process was delivered in shorter statement utterances.

Of the studies reviewed, the Portage Project with orthopedically handicapped and neurologically impaired students represents the most comprehensive parent training project (Shearer & Shearer, 1972). The investigators describe an indepth preservice training program with assessment techniques and instructional strategies that continue

beyond the inception of the program. Professional home trainers visited the mothers weekly to assist in the instructional process. This model showed significant educational gains with child performance illustrating the impact of appropriate parent preparation for assessment and instruction and the importance of weekly monitoring of the implementation of instruction by the parent.

Parent training in behavior disorders has focused primarily on the parents' correction of aversive behaviors. Whitman et al. (1978), Fowler et al. (1978), and Wahler (1980) highlighted the use of positive reinforcement for appropriate behavior as a key element in the success of the parent implemented program. Specifically parents have successfully influenced conduct problems (Bernal et al., 1980) prolonged tantrums (Strain et al., 1982), and socially undesirable behaviors (Lobitz & Johnson, 1975).

The number of parent training studies in physical education is very small. Paciorek (1981) addressed his parent training efforts to the developmentally delayed population. Parents in this study presented a variety of movement experiences from a developmental perspective; however, the implementation of a specific instructional process was not addressed. Horvat's (1980) study addressed the motor fitness area of balance with learning disabled children. Similarly, Horvat assigned a variety of tasks to parents for home instruction. The tasks were not presented in a developmental fashion, but employed randomly without specific instructional methodology.

Research in parent training methodology is restricted to a few studies. Sanders and Glynn (1981) suggest the importance of goal setting and feedback for appropriate implementation of the home program by the parent. O'Dell et al. (1980) stress the importance of take-home material for immediate reference by the parent in parent training. Nay (1975) suggests that when concepts taught are to be generalized, modeling and role-playing are effective strategies.

The effectiveness of parent intervention with the employment of various systematic instructional strategies is apparent in the literature reviewed. The number of parent training studies conducted in physical education is lacking. Specifically, no studies were found which address the effects of the utilization of parents as instructors of their own children as a supplement to the school physical education program. Since there was no information available on the effect of parent intervention as a supplement to the school physical education program, the null hypothesis was chosen for use in this study.

CHAPTER 3

METHODS AND PROCEDURES

The problem of the present study was to determine if parents of selected children who are moderately and severely mentally retarded could improve the motor performance of their children by supplementing school instruction with home instruction utilizing the Data Based Gymnasium Instructional Model. The study was conducted with 45 moderately and severely mentally retarded students who received instruction in Oregon and Washington public schools. In this chapter, the methods and procedures used in this study are presented in the following sections: preliminary procedures, selection of instrument, selection of subjects, hypothesis, selection of tasks, treatment period, treatment process, statistical analysis, and statistical model.

Preliminary Procedures

The investigator surveyed, studied, and assimilated the available literature related to all aspects of the study. From this information, a thesis proposal was developed and presented to the thesis committee. Permission was secured from the committee to conduct the study in the Spring of 1985. Correct procedures were followed in accordance with guidelines prescribed by the Human Subjects Committee, Oregon State University.

Selection of Instrument

The Data Based Gymnasium Instructional Model is essentially a prescriptive curriculum with individual programming for children and youth with moderate to severe handicapping conditions. The physical education curriculum is divided into four sections: Movement Concepts, Game Skills-Basic, Physical Fitness, and Leisure Movement. The curriculum was developed through a cooperative effort by the Physical Education Department at Oregon State University (OSU) in Corvallis, Oregon and the staff at Teaching Research (a division of the Oregon State System of Higher Education) in Monmouth, Oregon. The curriculum provides a bridge between therapeutically oriented motor programs and the more advanced physical education experiences which include highly organized game, sport, and physical fitness skills (Dunn et al., 1980). The primary objective of the curriculum is to equip moderately and severely handicapped students with essential prerequisite skills to enable them to use these skills in more normal settings. The OSU/Teaching Research curriculum is systematic, data based, and consistent with the definition of physical education in PL 94-142 (Dunn et al., 1980). Unfortunately, in the area of physical education, there are very few curricula which are specifically designed for the moderately and severely handicapped (Geddes, 1974), and those which have been reported are either targeted to the higher functioning populations or are entirely therapeutic in nature.

Curriculum Structure

The Data Based Gymnasium curriculum is criterion referenced with

a series of behavior analyses (task analyses) of basic physical education tasks (Dunn et al., 1980). Task analysis involves breaking down a task into sub-tasks which are taught independently. The curriculum is designed to be employed with individualized instruction.

Student progress with the curriculum is tracked through a continuous data system (see Appendix A, Fig. 1). The curriculum is organized into major sections, tasks, and sub-tasks. For example, under the major curriculum section Game Skills-Basic the underhand roll is identified as a task (see Appendix A, Table 1). The underhand roll is task analyzed into eight sub-tasks leading to a mature pattern (terminal objective). Progress through each task is determined by measuring the difference between baseline and the final sub-task mastered.

Curriculum Placement Procedure

Placement into a particular curricular area and more specifically into a task is determined through the placement testing procedure. Placement testing is the initial testing procedure used with the Data Based Gymnasium Instructional Model. It is defined as the assessment given to a student to determine specific tasks that a student has or does not have (Dunn et al., 1980). Prior to initiating the placement test, the physical educator requests input from school personnel and parents regarding recommended tasks to test (e.g., underhand roll). The placement process involves requesting the student to perform the terminal objective of a particular task (Appendix A, Table 1). If the student performs the terminal objective correctly for two trials

(requests), then the task is assumed to be one that the student has acquired and a "yes" is recorded (Appendix C). If the terminal objective is not performed correctly, then it is assumed that this is a task the student has not acquired and should be included in the student's physical education program.

Curriculum Baseline Procedure

The completion of the placement process allows for the identification of tasks that have been acquired and tasks that have not been acquired. Consultation with the classroom teacher and the parent(s) regarding the tasks which have not been acquired determine the tasks to be taught. At this point, a baseline measurement is conducted on the tasks to be taught to pinpoint the specific sub-task within each task that the student does or does not possess. Thus, an accurate place to begin teaching a particular skill is determined (Dunn et al., 1980). The baseline process involves the teacher asking the student to perform the most difficult sub-task of the task and then proceeding to easier sub-tasks until two correct responses are obtained for any one sub-task. Once the baseline process is conducted, instruction begins at the next most difficult sub-task (Fig. 3.1).

DBG Curriculum Learning Approach

The learning approach used in the Data Based Gymnasium Instructional Model is commonly known as behavior modification. The three essential elements practiced with this learning approach include (1) the stimulus or cue; (2) the behavior, or the task, which the student is to learn to perform; and (3) the consequence, or the

RAW DATA SHEET

Student: Steve M. Task: Catch

X = Correct performance at initial cue
M = Performance at model level
P = Performance at physical assistance level

Reinforcer	Sub-Task	Trials 1	2	3	4	5	6	7	8	9	10	Comments	Date
	9	O	O										
	8	O	O										
	7	O	O										
	6	O	O										
	5	O	X									→ Instruction begins here	
	4	X	X										
	3												
	2												
	1												

Fig. 3.1. Example of baseline procedure.

feedback, that the student receives after responding. These elements are further defined in the Parent Notebook (Appendix A).

Selection of Subjects

The Teaching Research Infant and Child Center in Monmouth, Oregon trains classroom teachers in the Data-Based Classroom (DBC) Model and has developed a network of classrooms that are currently employing the model. The Center provided the investigator with a list of twelve Data-Based classrooms from six school districts in the states of Oregon and Washington. Administrative personnel in the six districts were contacted to secure permission to conduct the study. Upon receiving approval from the six districts, the twelve classroom teachers were contacted to request permission for the participation of their students in the the study. Six teachers agreed to participate in the study and provided the investigator with a list of students with moderate and severe mental retardation in their classrooms. The total number of students obtained through this process was 45. Parents of these students were contacted to invite their participation in the parent training portion of the study and to seek permission to involved their children (Appendix F). Forty-three of the 45 parents contacted agreed to participate and to involve their children in the study. Children of the parents who agreed to participate were administered placement and baseline testing in the following tasks: underhand roll, catch, overhand thrown, kick with preferred toe, and strike. Thirty-eight students displayed placement and baseline data

that were similar for three tasks: underhand roll, catch, and overhand throw (see Appendix A, Tables 1, 2, 3). Thirty of the 38 students were randomly selected and assigned to experimental group one (E_1) or experimental group two (E_2). The parents of E_1 students were trained to employ the DBG model for the duration of the treatment period. The parents of E_2 students were involved in an initial parent education session delivered at the beginning of the treatment period but were not formally involved in the study during the treatment period (see Appendix B). The control group (C) consisted of 15 students with moderate and severe mental retardation who were randomly selected from four classrooms in the states of Oregon and Washington and who had similar deficiencies in the same three tasks. The control group students were taught physical education skills of a recreational nature by the classroom teacher.

Hypothesis

The null hypothesis selected for use in this study was: There was no significant difference between E_1, E_2, and the Control group mean scores for skill acquisition.

$$H_0: \quad \mu_1 = \mu_2 = \mu_3$$

Selection of Tasks

The tasks selected for use in this study (overhand throw, kick, catch, strike, and underhand roll) are appropriate for all developmental levels (ages) (Dauer & Pangrazi, 1984), are manageable

in classroom and home environments (time and space), and require a minimal amount of equipment (administrative feasibility). The tasks in which all subjects displayed similar placement and baseline levels were the underhand roll, catch, and overhand throw.

Treatment Process

Participating E_1, E_2, and C classrooms (see Selection of Subjects) were contacted for an orientation to the study. Students in these classrooms were administered placement and baseline tests. Students and parents were randomly assigned to the appropriate experimental group (E_1 or E_2) and the control group (see Selection of Subjects). Classroom aides in experimental groups E_1 and E_2 were trained in the DBG Instructional Model. Parents in experimental group one participated in a DBG orientation session followed by individual training in their respective homes. Parents and classroom aides were evaluated previous to the treatment period by the investigator using the Volunteer Observation Form (see Appendix H) to verify competency with the DBG Instructional Model. Competency with the implementation of the model by parents and classroom aides was ensured through weekly evaluations by the investigator.

Studies in speech and hearing (Harris et al., 1981), counseling (Bernal et al., 1980), and physical education (Paciorek, 1981) utilized an eight-week treatment period. Considering the success of these previous studies and the investigator's resources, an eight-week treatment period was implemented. During the eight-week treatment

period, students in experimental group one (E_1) received DBG instruction by school personnel and parents in the underhand roll, catch, and overhand throw. Students participating in experimental group two (E_2) received school DBG instruction but no home instruction in the same tasks. Parents in experimental group one (E_1) received a weekly visit from the investigator to update the clipboard system used in the DBG model. Classroom aides for both E_1 and E_2 were visited twice weekly to update the clipboard management system and to monitor their skills with the implementation of the DBG model.

The students in the control group received physical education instruction of a recreational nature. The instruction was not individualized and was directed by the classroom special educator. This instruction was informal, focusing on basic group games. The requested frequency of instruction in the DBG Instructional Model for E_1 students was three times per week in their respective homes and three times per week at school. Students in experimental group two received DBG instruction three times per week in school for the duration of the treatment period.

A post-test consistent with the process used for the baseline procedure was administered to subjects in groups E_1 and E_2 upon mastery of the terminal objective for each task or at the termination of the eight-week treatment period. The control group was administered a post-test at the termination of the eight-week treatment. Comparisons were made between adjusted post-test scores, with statistical analyses applied to differences between groups. The

data were summarized and a conclusion drawn based upon the findings of the study.

Statistical Analysis

The statistical design chosen for this study was analysis of covariance. In some experimental situations it is not possible to design the experiment so as to control for differences in the experimental units. However, in such experimental situations it may still be possible to control certain sources of variation by taking additional observations. Analysis of covariance is a technique for adjusting the observations according to the value of the covariate and then analyzing the adjusted experimental data.

In this study the analysis of covariance was used to test the null hypothesis. The pretest scores were used as the covariate in all analyses.

Model and Assumption

The analysis of covariance is recommended for studies where there is any reason to think that initial variation exists among the subjects used in the research (Courtney, 1983). It is a statistical technique that combines the concepts of analysis of variance and regression to handle situations where the researcher cannot completely control all of the variables in a study. It is a procedure for testing the significance of differences among adjusted post-measure mean scores, accounting for the influence of uncontrolled factors in the experiment (Courtney, 1983). This analysis adjusts for initial differences in the data, using pre-measurement information as a base.

By making these adjustments, sampling error is reduced and precision is increased. The criterion of random sampling is required with the use of this tool.

The F statistic is employed when using the analysis of covariance technique. It is most applicable when very little control has been exercised over the independent variable used in the research. Considering the minimal amount of control exercised over the independent variable in this study, analysis of covariance was selected as the appropriate statistical procedure.

The underlying assumptions peculiar to the use of analysis of covariance are not greatly different from those suggested for the student t and analysis of variance tests, except that analysis of covariance utilizes regression in its computational procedure. The regression influence of the technique removes those effects which have not been controlled through matching (Courtney, 1983). Thus, the components of the model allow for the testing of a single hypothesis ($\mu_1 = \mu_2 = \mu_3$) for the treatment (or condition) effects.

The F ratio was computed to ascertain individual mean differences. The Student-Newman-Keul's test was selected for use as a multiple comparisons procedure should the null hypothesis be rejected. This test allows for separate stepwise comparisons and is a sequential variant of the Q method. That is, the comparison value decreases as the number of pairwise steps decrease. This increases the significance levels in effect as the number of steps increase. With this test it is possible that the difference between the largest and the smallest mean may not reach significance but the differences

between the second largest and the smallest mean may reach significance.

CHAPTER 4

PRESENTATION AND DISCUSSION OF FINDINGS

The purpose of this study was to determine if parents of children with moderate and severe mental retardation could improve the motor performance of their children through the implementation of the Data-Based Gymnasium (DBG) Instructional Model as a supplement to the school program. This chapter presents a description of the subjects, an analysis of the results of the study, and an interpretation of the findings.

Description of the Subjects

A total of 45 individuals with moderate and severe mental retardation from the states of Oregon and Washington took part in this study. Each individual was randomly selected to participate in one of three groups (see Selection of Subjects) based upon baseline data gathered for the same three tasks (underhand roll, catch, overhand throw). During the eight-week treatment period, subjects in experimental group one received Data-Based Gymnasium (DBG) instruction in school and at home, subjects in experimental group two received DBG instruction in school only, and subjects in the control group participated in the physical education program offered in their respective special education settings.

Experimental group one contained five females and nine males ranging in age from 3 to 8, with a mean age of 5.1 years. One subject

dropped out of the study due to time constraints experienced by the parent. Experimental group two contained five females and ten males ranging in age from 3 to 9, with a mean age of 5.2 years. The control group contained ten females and five males ranging in age from 3 to 9, with a mean age of 4.3 years. The functioning level of the subjects was consistent among the three groups.

Table 4.1

Age and Male-Female Composition of Each Group

Group	N	Sex		Age Range (years)	Mean Age (years)
		Male	Female		
E_1	14	9	5	3-8	5.1
E_2	15	10	5	3-9	5.2
C	15	5	10	3-9	4.3

Analysis of the Results of the Study

The acquisition of sub-tasks (gain scores) by subjects involved in this study was determined by comparing scores obtained at the initial baseline (pre-test) with scores obtained using the same procedure at the termination of the eight-week treatment period (post-test) or upon mastery of the terminal objective.

The grand mean gain for all three groups within the three tasks was 4.55. Experimental group one had a raw mean gain of 6.24 with a standard deviation of 1.69, and an adjusted mean gain of 6.17 with a standard deviation of 1.62. Experimental group two had a raw mean gain of 5.29 with a standard deviation of .74, and adjusted mean gain

of 5.43 with a standard deviation of .88. The control group had a raw mean gain of 2.23 with a standard deviation of 2.32, and an adjusted mean gain of 2.15 with a standard deviation of 2.40. These data are presented in Table 4.2.

Table 4.2

Raw and Adjusted Mean Gains and Standard Deviations by Group

Groups	Raw Mean Gain	SD	Adjusted Mean Gain	SD
E_1	6.24	1.69	6.17	1.62
E_2	5.29	.74	5.43	.88
C	2.23	2.32	2.15	2.40

The null hypothesis, ($\mu_1 = \mu_2 = \mu_3$), was chosen for use in this study. Analysis of covariance was the statistical model used to test the null hypothesis. The Student-Newman-Keul's test was used as a test for analyzing multiple comparisons. Analysis of covariance tests were applied to group and to task-by-task data. The .05 level of significance was chosen for use in this study.

To determine if there were any statistically significant differences among the three groups in learning of the selected motor tasks, the ANCOV design was applied. Average post-test scores for all three tasks combined was the dependent variable with the groups (E_1, E_2, and control) being the independent variable. Average pre-test scores for all three tasks combined was the covariate. The F value of 3.23 was needed for significance at the .05 level. As reported in Table 4.3, the F value was 33.847. Thus, the hypothesis that there

was no significant difference between E_1 (home and school DBG), E_2 (school DBG, no home program), and the control group (physical education program offered in respective special education setting) was rejected.

Table 4.3

Analysis of Covariance Group-by-Group Comparison

Source of Variation	df	Adjusted SS	Adjusted MS	F	P
Tasks	1	53.922	53.922	27.123	.001
Groups	2	134.577	67.289	33.847	.001
Error	40	79.521	1.988		
Total	43	268.020			

The Student-Newman-Keul's multiple comparisons procedure was applied to determine if there were significant differences in the learning of tasks between groups. A computed mean difference value of 1.2745 was necessary for statistical significance between E_1 and the control group. The reported mean difference was 4.02 (see Table 4.4). Thus, experimental group one was significantly different from the control group ($E_1 \neq C$). A computed mean difference value of 1.0596 was necessary to identify E_1 and E_2 as statistically different. The reported difference between adjusted means was .74. Thus, experimental group one was not significantly different from experimental group two ($E_1 = E_2$). A computed mean difference value of 1.3412 was necessary for statistical significance between E_2 and the control group. The reported mean difference was 3.28 (see Table 4.4).

Thus, experimental group two was significantly different from the control group.

Table 4.4

Group-by-Group Comparison of Pre-Post Mean Gain Scores

Group	Raw Mean		Adjusted Mean	
E_1	6.24	a	6.17	a
E_2	5.29	b	5.43	b
C	2.23		2.15	

a = not statistically different
b = statistically significant

An additional analysis was applied to determine if there were any significant group differences in learning for each motor task (underhand roll, catch, and overhand throw). The analysis of covariance procedure was applied to Task 1 (underhand roll) with the post-test scores for the task being the dependent variable, the groups (E_1, E_2, and control) being the independent variable, and the covariate being the pre-test. The F value of 3.23 was needed for significance at the .05 level. As reported in Table 4.5, the computed F value was 10.625. Thus, the hypothesis that there was no significant difference with the learning of the underhand roll by individuals in E_1, E_2, and C groups was rejected.

Table 4.5

ANCOV Model for Task 1 (Underhand Roll)

Source of Variation	df	Adjusted SS	Adjusted MS	F	P
Task	1	66.321	66.321	22.770	.001
Groups	2	120.148	60.074	10.625	.001
Error	40	116.508	2.913		
Total	43	302.977			

The Student-Newman-Keul's multiple comparisons procedure was applied to Task 1 (underhand roll) to determine if there was a statistically significant difference with the learning of this task between groups. A computed mean difference value of 1.5428 was necessary to determine that E_1 and the control group were statistically different. The reported difference between adjusted means was 3.92 (see Table 4.6). Thus, experimental group one was significantly different from the control group ($E_1 \neq C$). A computed mean difference value of 1.2827 was necessary to identify E_1 and E_2 as significantly different. The reported difference between adjusted means was 1.07. Thus, experimental group one was not statistically different from experimental group two ($E_1 = E_2$). A computed mean difference value of 1.6284 was necessary to determine that E_2 and the control group were statistically different. The reported mean difference was 2.85 (see Table 4.6). Thus, experimental group two was significantly different from the control group.

Table 4.6

Group-by-Group Comparison of Pre-Post Mean Gain
Task 1 (Underhand Roll)

Group	Raw Mean		Adjusted Mean	
E_1	6.22	a	6.18	a
E_2	4.94	b	5.11	b
C	2.40		2.26	

a = not statistically different
b = statistically significant

The analysis of covariance procedure was applied to Task 2 (catch) with the post-test scores for the task being the dependent variable, the groups (E_1, E_2, and control) being the independent variable, and the covariate being the pre-test. The F value of 3.23 was needed for significance at the .05 level. As reported in Table 4.7, the computed F value was 14.169. Thus, the hypothesis that there was no significant difference with the learning of the catch by individuals in E_1, E_2, and C groups was rejected.

Table 4.7

ANCOV Model for Task 2 (Catch)

Source of Variation	Adjusted df	SS	MS	F	P
Task	1	67.692	67.692	19.613	.001
Groups	2	97.802	48.901	14.169	.001
Error	40	138.051	3.451		
Total	43	303.545			

The Student-Newman-Keul's multiple comparisons procedure was applied to Task 2 (catch) to determine if there was a statistically significant difference with the learning of this task between groups. A computed mean difference value of 1.4231 was necessary to determine that E_1 and the control group were statistically different. The reported difference between adjusted means was 3.28 (see Table 4.8). Thus, experimental group one was significantly different from the control group ($E_1 \neq C$). A computed mean difference value of 1.123 was necessary to identify E_1 and E_2 as significantly different. The reported difference between adjusted means was .27. Thus, experimental group one was not statistically different from experimental group two ($E_1 = E_2$). A computed mean difference value of 1.528 was necessary to determine that E_2 and the control group were statistically different. The report mean difference was 3.01 (see Table 4.8). Thus, experimental group two was significantly different from the control group.

Table 4.8

Group-by-Group Comparison of Pre-Post Mean Gain
Task 2 (Catch)

Group	Raw Mean	Adjusted Mean
E_1	5.64 a	5.53 a
E_2	b 5.14	b 5.26
C	2.27	2.25

a = not statistically different
b = statistically significant

The analysis of covariance procedure was applied to Task 3 (overhand throw) with the post-test scores for the task being the dependent variable, the groups (E_1, E_2, and control) being the independent variable, and the covariate being the pre-test. The F value of 3.23 was needed for significance at the .05 level. As reported in Table 4.9, the computed F value was 48.899. Thus, the hypothesis that there was no significant difference with the learning of the underhand roll by individuals in E_1, E_2, and C groups was rejected.

Table 4.9

ANCOV Model for Task 3 (Overhand Throw)

Source of Variation	Adjusted df	SS	MS	F	P
Task	1	14.690	14.690	7.464	.009
Groups	2	192.474	96.237	48.899	.001
Error	40	78.722	1.968		
Total	43	285.886			

The Student-Newman-Keul's multiple comparisons procedure was applied to Task 3 (overhand throw) to determine if there was a statistically significant difference with the learning of this task between groups. A computed mean difference value of 1.328 was necessary to determine that E_1 and the control group were statistically different. The reported difference between adjusted means was 4.85 (see Table 4.10). Thus, experimental group one was significantly different from the control group ($E_1 \neq C$). A computed mean difference value of 1.284 was necessary to identify E_1 and E_2 as significantly different. The reported difference between adjusted

means was 1.02. Thus, experimental group one was not statistically different from experimental group two ($E_1 = E_2$). A computed mean difference value of 1.429 was necessary to determine that E_2 and the control group were statistically different. The reported mean difference was 3.83 (see Table 4.10). Thus, experimental group two was significantly different from the control group.

Table 4.10

Group-by-Group Comparison of Pre-Post Mean Gain
Task 3 (Overhand Throw)

Group	Raw Mean		Adjusted Mean	
E_1	6.86	a	6.84	a
E_2	b 5.80		b 5.82	
C	2.00		1.99	

a = not statistically different
b = statistically significant

Summary of Findings and Discussion

The null hypothesis that there was no significant difference between subjects who received Data-Based Gymnasium (DBG) instruction in the home and school (E_1) and those who received school DBG instruction only or those who received no DBG instruction (C) was rejected on the basis of an obtained F value of 27.223. Application of the Student-Neuman-Keul's multiple comparisons Test across groups (E_1, E_2, and C) revealed that E_1 and E_2 were not statistically different ($E_1 = E_2$) and that E_1 and E_2 were statistically different

from the control group ($E_1 \neq C$, $E_2 \neq C$). The findings of this study suggest that the DBG Instructional Model when applied in school or when applied in school supplemented by home instruction is superior to traditional physical education instruction.

A review of the control group's data suggests that not only were minimal gains evident, but that there was regression in motor task performance by some subjects. The minimal gains may be attributed to the lack of a systematic instructional model with this group. The minimal gains achieved by the control group and for some individuals within the group regression in scores suggest the necessity of a systematic instructional model to maintain and improve motor task performance for students who have moderate and severe mental retardation. These findings suggest that the difference between E_1 and E_2 and the control group ($E_1 = E_2 > C$) may be attributed to the employment of the Data-Based Gymnasium Instructional Model. The effective utilization of various components of the DBG model has been reported in previous studies. Filler (1971) reported the effectiveness of non-verbal cues (model/demonstration) in the learning process, further reinforcing the importance of the "model" instruction level used in the DBG system. Cheseldine and McConkey (1979) reported the effectiveness of delivering the verbal cue in shorter statement utterances with mentally retarded children, another critical component of the DBG instructional process. Fowler (1978) and Wahler (1980) reported the importance of positive reinforcement for appropriate behavior--a critical element of the feedback system in the DBG Instructional Model.

The educational significance of school instruction supplemented by home instruction by parents is supported by previous studies in speech and hearing (Andersland, 1961; Webster, 1968), with orthopedically handicapped and impaired students (Shearer & Shearer, 1972), and with behavior disordered children (Jackson et al., 1971; Fowler et al., 1978; Whitman et al., 1978; Wahler, 1980). The findings of this study appear to contradict the findings of the above studies as well as those conducted by Horvat (1980) and Paciorek (1981) which reported that there were significant differences in the learning of motor tasks when instruction at school was supplemented by home instruction. In view of this contradiction the investigator reviewed the description of the subject, the reported raw and adjusted mean gain scores and the standard deviations to further analyze the data and to report observations and trends that may have influenced the results.

A trend that surfaced in the analysis of the data was the consistent difference in raw means and adjusted mean scores for E_1, E_2, and control groups within group (Table 4.4) and between tasks (Tables 4.6, 4.8, and 4.10). Although the mean scores for E_1 and E_2 within groups were not statistically different, the E_1 means were greater than the E_2 means. The within-group raw and adjusted mean gain scores are illustrated for each task in figures 4.1 and 4.2. This trend suggested that students receiving parent intervention (E_1) were able to acquire more sub-tasks than were students without parent intervention (E_2).

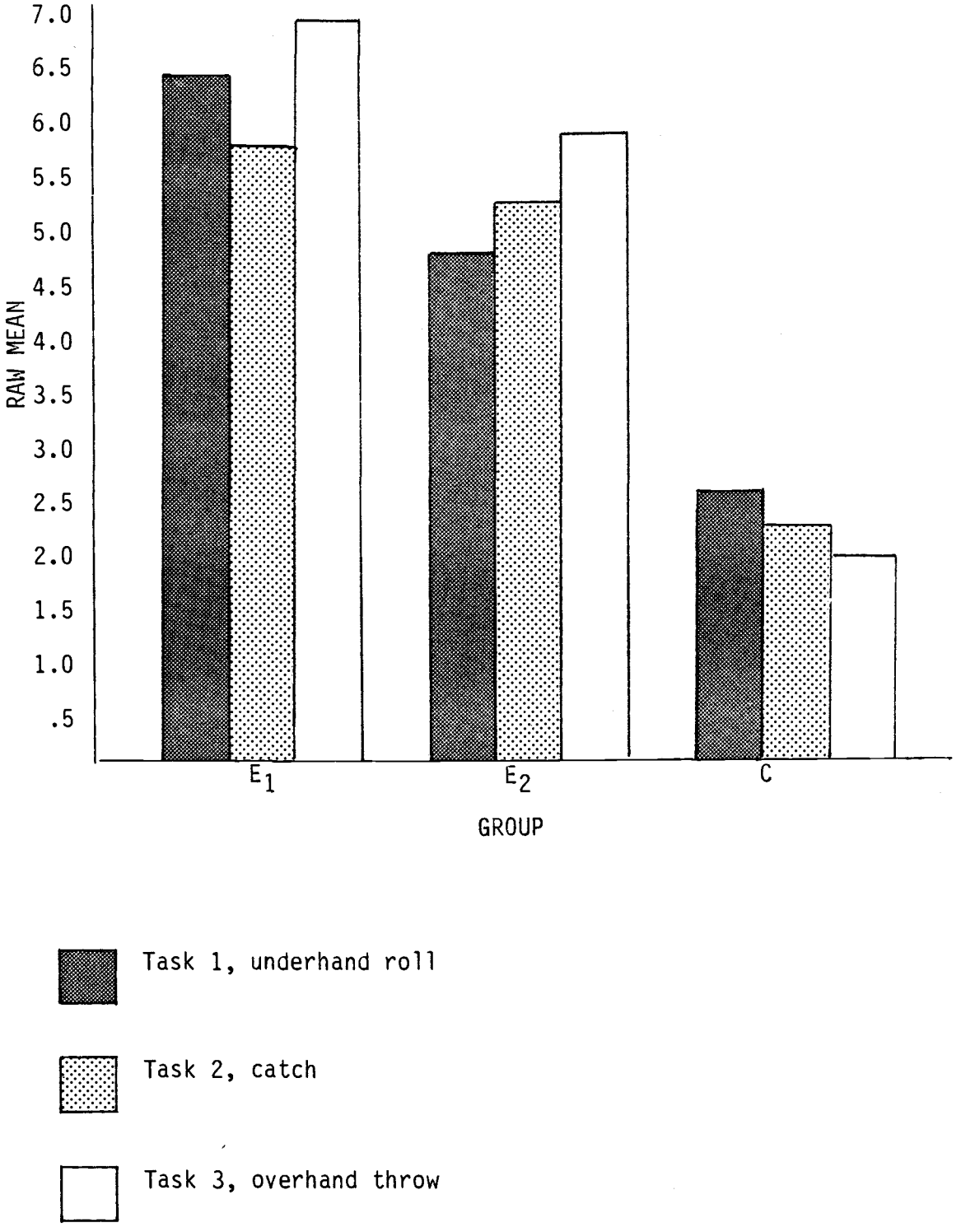


Fig. 4.1. Raw mean gain scores (Tasks 1, 2, and 3).

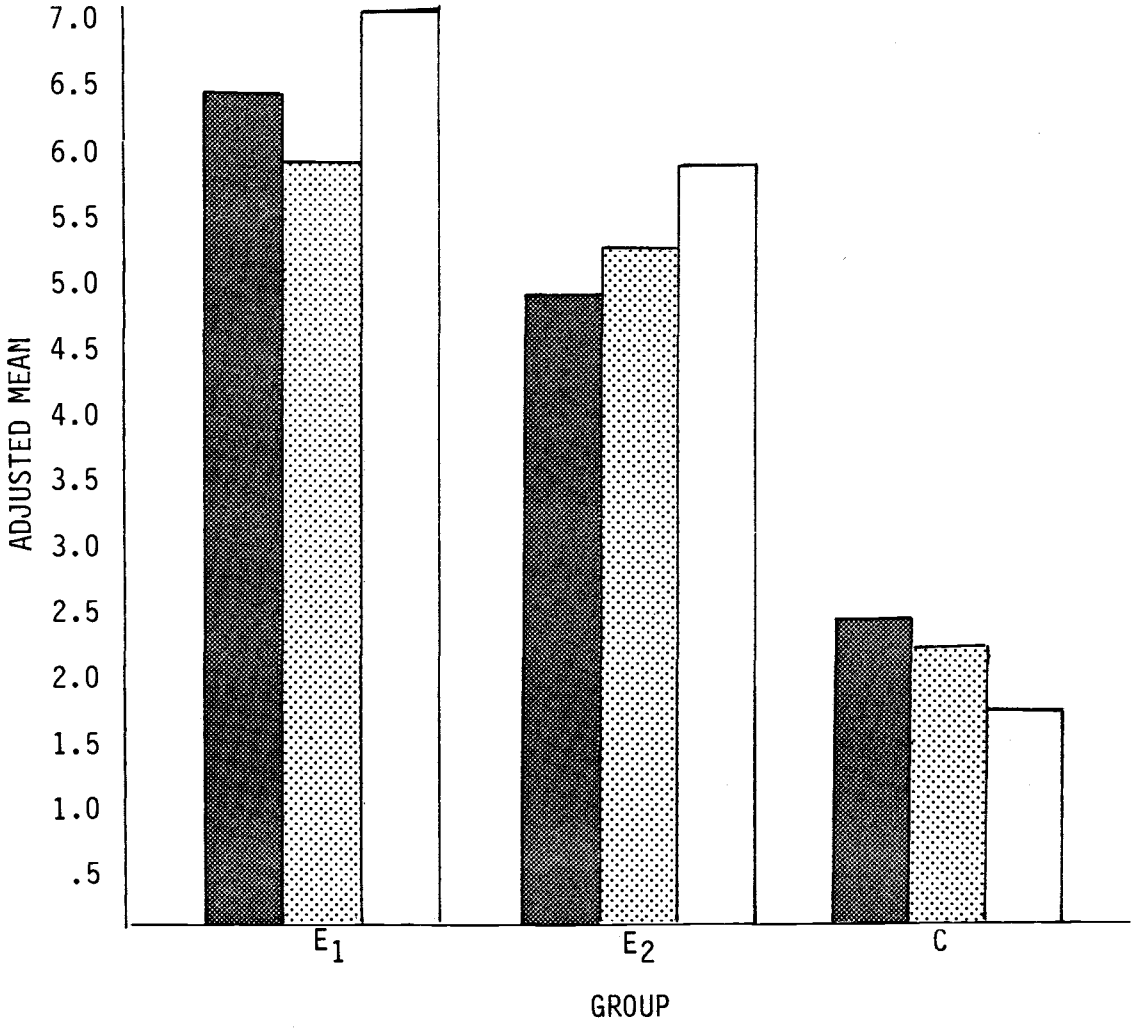


Fig. 4.2. Adjusted mean gain scores (Tasks 1, 2, and 3).

Additional evidence supporting the educational significance of parent instruction as a supplement to the school program is the number of subjects achieving the terminal objective for Tasks 1, 2 and 3 within the eight-week treatment period. Six subjects in E_1 achieved the terminal objective for Task 1 (underhand roll) versus four subjects in E_2 and none in the control group. For Task 2 (catch), three subjects in E_1 achieved the terminal objective versus two in E_2 and none in the control group. For Task 3 (overhand throw), seven subjects in E_1, four in E_2, and none in the control group achieved the terminal objective within the treatment period. Table 4.11 illustrates these findings.

Table 4.11

Number of Subjects Achieving Terminal Objective Within the Eight-Week Treatment Period, by Group and Gender

	Group E_1			Group E_2			Group C			Overall		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Task 1	2	4	6	3	1	4	0	0	0	5	5	10
Task 2	2	1	3	2	0	2	0	0	0	4	1	5
Task 3	4	3	7	1	3	4	0	0	0	5	6	11

The trends identifying E_1 students as having acquired more sub-tasks within groups and between tasks and having achieved more terminal objectives than E_2 or C students suggest that supplemental home instruction is beneficial. Additional studies utilizing longer treatment periods or larger sample sizes may support this observation in a more conclusive manner.

Further analysis was applied to the gender and age of the subjects in this study to determine whether or not these variables may have influenced the findings.

A review of the description of the subjects of this study revealed that the control group contained a disproportionate number of males (5) and females (10) when compared to experimental group one (9 males, 5 females) and experimental grup two (10 males, 5 females). Although this distribution was the result of random assignment, the investigator tabulated mean gains for each gender and analyzed data to discern possible differences due to gender distribution. The grand mean gain for all three groups within the three tasks was 4.55. The 24 males in this study had a raw mean gain of 4.88 with a standard deviation of .33, and an adjusted mean gain of 4.54 with a standard deviation of .01. The 20 females in this study had a raw mean gain of 4.15 with a standard deviation of .40, and an adjusted mean gain of 4.56 with a standard deviation of .01. Table 4.12 presents these data.

Table 4.12

Raw and Adjusted Mean Gains and Standard Deviations by Gender

Gender	Raw Mean Gain	SD	Adjusted Mean Gain	SD
Male (n = 24)	4.88	.33	4.54	.01
Female (n = 20)	4.15	.40	4.56	.01

To determine if there were any statistically significant differences between males and females and within groups, the ANCOV

design was applied by gender and by group. The average post-test score for all three tasks combined was the dependent variable and the groups (E_1, E_2, and C) and gender (male, female) were the independent variables. The average pre-test score for all three tasks combined was the covariate. The F value of 4.08 was needed for significance at the .05 level for male and female interaction and 3.23 for significance for group-by-gender interaction. As reported in Table 4.13, the computed F was .002 for male-female interactions and .659 for group-by-gender interactions. It was concluded that there was no significant difference in motor task gain between male (n = 24) and female (n = 20) participants in this study within and between groups.

Table 4.13

Analysis of Covariance Male by Female and Group by Gender

Source of Variation	df	Adjusted SS	MS	F	P
Tasks	1	53.922	53.922	25.985	.001
Groups	2	123.136	61.568	29.669	.001
Gender	1	.004	.004	.002	.964
Two-Way Interaction (Group x Gender)	2	2.737	1.369	.659	.523
Error	37	76.780	2.075		
Total	43	268.020			

To further examine the effects of this finding on the comparison of experimental groups one and two and the control group, the investigator reviewed the distribution of subject ages (see Table 4.14) and their raw and adjusted mean gains (see Table 4.15).

Table 4.14

Distribution of Subject Ages (Years) by Group

	3 yrs	4 yrs	5 yrs	6 yrs	7 yrs	8 yrs	9 yrs
E_1	2	6	1	1	3	2	0
E_2	3	5	0	1	3	0	1
C	6	5	1	1	2	0	1

Table 4.15

Raw and Adjusted Mean Gains and Standard Deviations by Age

Age	N	Raw Mean Gain	SD	Adjusted Mean Gain	SD
3	11	3.46	1.09	3.75	.80
4	16	4.40	.15	4.29	.26
5	2	4.17	.38	3.73	.82
6	3	4.54	.01	4.45	.10
7	8	3.35	1.20	3.24	1.31
8	2	.76	3.79	1.54	3.01
9	2	3.50	1.05	3.73	.82

An ANCOV was applied to determine if there were differences in sub-task gain among ages. The average post-test score for all three tasks combined was the dependent variable and age was the independent variable. The average pre-test score for all three tasks combined was the covariate. The F value of 2.34 was needed for significance at the .05 level. As reported in Table 4.16, the computed F was 1.46. It

was concluded that there was no significant difference with sub-task gain among ages.

Table 4.16

ANCOV Model for Age

Source of Variation	df	Adjusted SS	Adjusted MS	F	P
Tasks	1	53.922	53.922	11.274	.002
Age	6	6.985	6.785	1.460	.219
Error	36	172.186	4.783		
Total	43	268.020			

In an effort to further interpret the findings of this study, the investigator reviewed the parent profile data (Appendix D). A review of the parent profile for E_1 parents indicated that the results were obtained with the parent for the majority of subjects being a married female homemaker 34 years of age, with a high school education and one or more children at home. The parent profile data showed that parents of subjects 6, 8 and 11 were less consistent in recording data than were the remaining E_1 parents (see Appendix D). The inconsistent recording of data by these parents (n = 3), contrasted to the consistent recording of data by the other E_1 parents (n = 11), may have contributed to the large standard deviation for E_1 subjects. By identifying more specific criteria and stringent standards for parent involvement, future studies may demonstrate the effectiveness of parent intervention for parents who implement home programs in a consistent manner.

Further examination of the raw and adjusted data task by task revealed other trends. Experimental group one experienced the greatest raw (6.86) and adjusted (6.84) mean gain with Task 3 (overhand throw). These gains exceeded the highest raw and adjusted mean gains for experimental group two and the control group across all three tasks (see Fig. 4.1 and 4.2). This trend may be the result of two variables. First, in the opinion of the investigator, the overhand throw is a frequently practiced task by parents and their children. Second, the familiarity of parents with this task and the child's possible comfort level in the performance of this task with the parent may have influenced the results.

Examination of each task also revealed that for Task 1 (underhand roll) and Task 3 (overhand throw), experimental groups E_1 and E_2 displayed similar adjusted mean gain differences for both tasks (Task 1, 1.07; Task 2, 1.02) (see Table 4.17).

Table 4.17

Adjusted Mean Gain Scores by Task and Group

	Task 1		Task 2		Task 3	
E_1	6.18	1.07	5.53	.27	6.84	1.02
E_2	5.11		5.26		5.82	
C	2.26		2.25		1.99	

This finding may reflect the result of the performance of a common motor pattern found in both the overhand throw task and underhand roll task, resulting in accelerated learning of sub-tasks in both tasks.

The underhand roll (Task 1) contains four sub-tasks that focus on the oppositional step while the overhand throw task contains five sub-tasks focusing on this motor pattern. The adjusted higher mean gain scores may have been partially influenced by the sharing of the oppositional step motor pattern in both the underhand roll and the overhand throw. The adjusted mean gain scores for the catch (Task 2) were lower for both experimental groups one and two (E_1, 5.53; E_2, 5.26). Additionally, a smaller mean gain difference was evident between E_1 and E_2 for Task 2 (.27) than for Task 1 (1.07) or Task 3 (1.02). This finding suggests that the catch (Task 2) was dissimilar to the underhand roll (Task 1) and the overhand throw (Task 3). The differences may be the result of the sequence of task analysis for the catch or the difference in the motor pattern with the catch when compared to the underhand roll and overhand throw.

Further review of the adjusted mean gain scores by task and group (Table 4.17) revealed that the control group's adjusted mean gain scores across all three tasks were similar (Task 1, 2.26; Task 2, 2.25; Task 3, 1.99). This finding contradicts the trend evident in the mean gain difference scores between tasks for experimental groups one and two, with Task 1 and Task 3 being similar and Task 2 dissimilar. The ability of students to associate similar motor patterns and experience optimum learning appears to be enhanced with the implementation of a systematic approach to instruction in school or when applied in school supplemented by home instruction.

On the basis of the findings of this study, and within the limits of the investigation, it was concluded that the Data-Based Gymnasium

Instructional Model when applied in school or when applied in school supplemented by home instruction appears to be more effective than instruction provided by a classroom teacher which is primarily recreational in nature. Although a statistical significance was not found between E_1 and E_2, a trend was evident that suggested that parents can positively influence the motor skill acquistion of their children.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter is divided into three sections. The first section summarizes the purpose, procedures and results of this study. The second presents the study's conclusion, and the third identifies areas in which future study is needed.

Summary

The purpose of this study was to determine if parents could improve the motor performance of their moderately and severely mentally retarded children through the implementation of the Data-Based Gymnasium (DBG) Instructional Model as a supplement to the school program. Twelve classroom teachers from Oregon and Washington who use the Data-Based Classroom model were contacted to request permission for the participation of their students in the study (E_1 and E_2). Six teachers agreed to participate in the study; they provided the investigator with a list of the moderately and severely handicapped students in their classrooms (see Appendix E for list of participating schools). The total number of students obtained through this process was 45. Parents of these students were contacted to invite their participation in the parent training portion of the study and to seek permission to involve their child. Forty-three of the 45 parents contacted agreed to participate and to involve their child in the study. Children of the parents who agreed to participate were administered placement and baseline testing in the underhand roll,

catch, overhead throw, kick with preferred toe, and strike. Thirty-eight students displayed placement and baseline data that were similar for three tasks: underhand roll, catch, and overhand throw (see Appendix A, Tables 1, 2, 3). Thirty of the 38 students were randomly selected and assigned to experimental group one (E_1) or experimental group two (E_2). The parents of the E_1 students were trained to employ the DBG Instructional Model for the duration of the treatment period. The parents of the E_2 students were involved in an initial parent education session delivered at the beginning of the treatment period, but were not formally involved in the study during the treatment period (see Appendix B). The control group (C) consisted of 15 students with moderate and severe mental retardation who were randomly selected from four classrooms in Oregon and Washington and who had similar deficiencies in the same three tasks (see Appendix E). These students received the physical education program developed by their classroom teacher. The requested frequency of instruction in the DBG Instructional Model for E_1 students was three times per week in their respective homes and three times per week at school. Students in experimental group two received DBG instruction three times per week in their respective schools (no home instruction) for the duration of the treatment period. A post-test consistent with the process used for the baseline procedure was administered to subjects in groups E_1 and E_2 upon mastery of the terminal objective for each task or at the termination of the eight-week treatment period. Comparisons were made between the raw

and adjusted post-test scores with statistical analyses applied to differences between groups.

The null hypothesis ($\mu_1 = \mu_2 = \mu_3$) was tested through the use of the analysis of covariance. The Student-Newman-Keul's Test was used as the multiple comparisons procedure. The .05 level of significance was selected for use in this study.

The null hypothesis that there was no significant difference between children who received DBG instruction in the home and school (E_1) and those who received school DBG instruction only (E_2) or no DBG instruction (C) was rejected on the basis of an obtained F value of 33.847. Application of the Student-Newman-Keul's Multiple Comparison's test across groups (E_1, E_2, and C) revealed that E_1 and E_2 were not statistically different ($E_1 = E_2$) and that E_1 and E_2 were statistically different from the control group ($E_1 \neq C$, $E_2 \neq C$). An examination of the raw and adjusted mean gain data for E_1, E_2, and C groups revealed a trend favoring the utilization of parents as an effective supplement to the school program.

Conclusion

Based on the findings of this study and within the limits of the investigation, it was concluded that the DBG Instructional Model when applied in school or when applied in school supplemented by home instruction appears to be more effective than traditional physical education instruction for children with moderate and severe mental retardation. A statistically significant difference was not evident between children receiving home-based and school DBG instruction and

children receiving only school DBG instruction. However, a review of the raw and adjusted data suggested that experimental group one maintained consistently larger raw and adjusted means within groups and between skills. This finding supports the intervention of parents as an effective supplement to the school program.

Recommendations for Future Studies

After analyzing the results of the present study, the investigator recommends the following additional studies:

1. A study similar to the present one should be conducted to examine the effects of a longer treatment period and larger sample size on the learning of motor skills by students receiving parent intervention.

2. A study similar to the present one should be conducted using other motor tasks. A comparison of tasks containing varied motor patterns would be valuable.

3. A study similar to the present one should be conducted that investigates the effects of parent intervention in the learning of a novel skill by the child. Developing and utilizing a novel skill may ensure the learning of a skill without the influence of previous experience.

4. A study similar to the present one should be conducted using more specific age ranges than the age range of 3 to 9 years used in this study. Studies exploring the effects of parent intervention on preschool (3-5 years) or elementary (6-9 years) aged children would be valuable.

5. A study similar to the present one should be conducted using specific criteria for the involvement of parents as program providers, including family income, specific parameters for age groups and number of dependent children, comparisons with the gender of the parent, and the educational background of the parent.

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APPENDICES

APPENDIX A

EXPERIMENTAL GROUP 1
PARENT TRAINING INFORMATION

EXPERIMENTAL GROUP 1
PARENT TRAINING NOTEBOOK

Introduction

Your child has been tested to determine specific physical education tasks which need attention (instruction). This testing was conducted in the school setting under the supervision of the classroom teacher and Paul Maguire. The five tasks tested included kicking, catching, overhand throw, underhand roll, and strike. These tasks were selected for a variety of reasons, including classroom and home manageability, appropriateness for all age groups and developmental levels, and administrative feasibility (minimal amount of equipment needed). They are in the DBG Curriculum, which has been successfully implemented in Oregon and nationally. The three tasks chosen for home and classroom instruction were identified as similarly deficient among all participants in the study.

This notebook is designed to orient you to the process involved in instructing your child using the Data Based Gymnasium (DBG) Instructional Model. The notebook is divided into sections: DBG Learning Approach, DBG Instructional Model, DBG Instructional Sequence, Data Recording, Tasks and Criterion for Success, Materials, Instruction Schedule. Your careful review of these sections will assist the parent training process.

Your consistent effort to implement home instruction during the 8-week period April 1 to June 1 will contribute to our (educators and parents) understanding of the impact of parent intervention on the acquisition of the motor tasks by moderately and severely mentally retarded children and youth.

If you have questions or concerns, please call Paul Maguire at home (753-0858) or at work (754-2631). Thank you.

DBG Learning Approach

The OSU/Teaching Research physical education curriculum is based upon three essential elements. These elements have been employed successfuly by Teaching Research in Monmouth, Oregon for several years and are described in A Data Based Classroom (H. D. Fredericks et al., 1979). They are further stated and focused toward physical education concepts in A Data Based Gymnasium (J. Dunn et al., 1980).

The basic approach which underlies many effective instructional programs for individuals with moderate to severe handicaps is know as behavior modification. The essence of this approach is that the instructor (parent) makes maximum and efficient use of the environment to assist a student in learning a behavior (physical education task).

The foundation for the DBG Instructional Approach has three essential elements:

1. The stimulus, or as we shall refer to it, the cue.
2. The task (behavior) that your child is to learn.
3. The feedback that your child receives after responding.

The Cue

The cue is the sign, signal, request, or information that calls for occurrence of a task (behavior). It is synonymous to the instructions or materials presented to the learner. Cues are the things in the environment that "set the occasion" for the student to behave. For example, "Johnny, throw the ball" is a cue for the learner to respond to verbal instructions by throwing a ball.

The Task

The second major element of this approach is the task or behavior. Behavior is anything which a person does (Dunn et al., 1980). It includes lifting a little finger, blinking an eye, driving a car, or climbing a rope. In the teaching of students, a behavior is a particular task which the student is to learn. The task can be something as simple as having the student extend his arms or as complex as having the student bat a pitched ball.

The Feedback

Feedback is the third element of this approach. When a learner performs a particular task, feedback is delivered that tells the student whether the sub-task was performed correctly or incorrectly.

DBG Instructional Model

The DBG Instructional Model is systematic and data-based. The implementation of any system requires the recognition of certain guidelines. The guidelines for the DBG System include:

1. Cueing which precedes each performance of a sub-task;
2. Feedback given to the learner after each sub-task performance; and
3. Data recorded at the completion of each sub-task performance.

Prior to initiating instruction, a cue will be be determined for the sub-task to be taught. The cue that is defined for use in instruction should not be changed or altered throughout instruction. The cue should be stated in command form and should not be repeated until a response is made by the student. Consecutive repeating of cues to your child may teach him/her to respond to consecutive repeated cues.

Definitions

Model: To demonstrate the desired task or sub-task.

Physically assist: To initiate contact with the body parts involved in the task and to guide them in the appropriate movement pattern.

Reinforcer: Any condition or event following a response that increases the probability that the response will be repeated.

Trial: A successful completion of the verbal cue, model and physical assistance process. For example, if your child acquires the sub-task at any one of the levels, data are recorded and that is considered a trial.

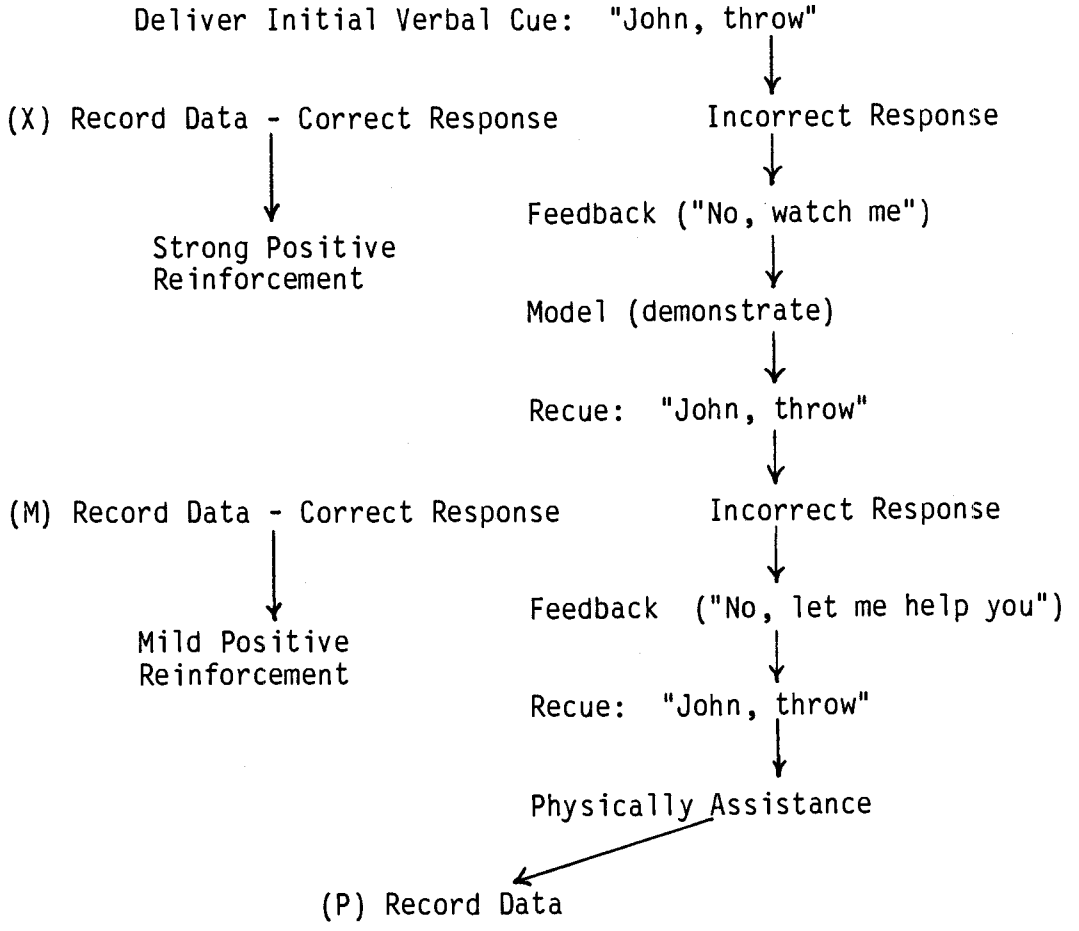
Clipboard management system: A system designed to facilitate individualized instruction in the DBG Instructional Model. The components include a half-page cover sheet, task analysis of sub-task to be taught, and the raw data sheet.

Criterion: A designated level of success for movement to the next most difficult sub-task.

DBG Instructional Sequence

The sequence for instruction in the DBG Instructional Model involves delivering an initial verbal cue; if incorrect, modeling or demonstrating the skill for the learner, recue; if incorrect, recueing and physically assisting the learner through the correct performance of the skill and recording data.

INSTRUCTIONAL SCHEMA



Data Recording

You will record your data on a Raw Data Sheet (Fig. 1). It is necessary that you identify the reinforcer, sub-task number, and date prior to instruction. You will be recording data after each single trial or trial-by-trial.

If the learner performs the sub-task at the initial cue level, an "X" is recorded for correct performance. If the sub-task is successfully performed at the model level, an "M" is recorded. Successful sub-task performance at the physical assistance level is recorded as a "P." Note: only one letter (X, M, P) will be entered for each trial, the letter indicating the level at which sub-task performance was successful.

		Trials										
Reinforcer	Sub-Task	1	2	3	4	5	6	7	8	9	10	Date
1:1 Social	1	X	P	M	P	M	X	M	P	M	P	4/1

The data recorded indicates that on April 1 the learner correctly performed the sub-task on initial cue in trials 1 and 6. In trials 3, 5, 7, 9, the learner successfully performed at the model level. The learner with physical assistance successfully performed the sub-task in trials 2, 4, 8, and 10.

Tasks and Criterion for Success

The tasks in which you will be instructing your child are broken down (task analyzed) into smaller sub-tasks (for example, see Table 1). You will be instructing your child in these smaller sub-tasks. Criterion for success is that point of skill proficiency that allows you as a parent instructor to begin teaching the next most difficult sub-task to your child. The criterion for success for movement from one sub-task to a more difficult sub-task level is three consecutive correct performances.

		Trials										
Reinforcer	Sub-Task	1	2	3	4	5	6	7	8	9	10	
1:1 Social	1	P	M	X	M	X	X	X				1 day > go to next sub-task
1:1 Social	2											

Materials

Your instruction will be best facilitated utilizing the clipboard management system. For each task being taught, you will be provided with a task description sheet (e.g., Table 1), program cover sheet (Fig. 2), and raw data sheet (Fig. 1). You will need to have the appropriate materials readily available prior to each instruction session.

Instruction Schedule

You are asked to teach the three tasks identified for a minimum of three (3) days per week for eight (8) weeks. This should take you 20 to 30 minutes per instruction period.

RAW DATA SHEET

Student:_____ Task:_____

X = Correct performance at initial cue
M = Performance at model level
P = Performance at physical assistance level

Reinforcer	Sub-Task	Trials 1	2	3	4	5	6	7	8	9	10	Comments	Date

Fig. 1. Example of data sheet used by parent instructor

HOME PROGRAM COVER SHEET

Date Started: Task:

Date Completed:

Verbal Cue: Materials:

Reinforcement Procedure: Criterion:

Fig. 2. Home program cover sheet (half-page)

RAW DATA SHEET

Student: Steve M. Task: Underhand Roll

X = Correct performance at initial cue
M = Performance at model level
P = Performance at physical assistance level

Reinforcer	Sub-Task	Trials 1	2	3	4	5	6	7	8	9	10	Comments	Date
Home-social	1	X	P	X	P	X	X	X					2/1
School-social	2	P	X	X	M	P	X	M	P	X	M		2/1
Home-social	2	P	X	P	X	X	X						2/2
	3												

Fig. 3. Example of data sheet for Group E_1 student

Table 1

Game Skills-Basic:
Underhand Roll

Terminal Objective: Student, from a standing position, will perform an underhand roll, swinging the arm backwards and then forwards while stepping forward simultaneously with the opposite foot and releasing the ball at the end of the swing in a manner which causes the ball to roll and strike a 3'x3' target 7' away.

Sub-task 1 Student, sitting in a chair 5' from target, is given a tennis ball; teacher assists student in swinging arm back and then forwards, releasing ball toward target.

Sub-task 2 With student sitting in a chair 5' from target, teacher assists in swinging arm back and allows student to swing arm forward, releasing ball at end of swing and in direction of target.

Sub-task 3 With student sitting in a chair 5' from target, student independently swings arm backward and forward, releasing ball at end of swing and in direction of target.

Sub-task 4 With student standing 5' from target and with knees bent, student will swing arm backward and forward, releasing ball at end of swing and in direction of target.

Sub-task 5 With student standing 5' from target, with one foot forward, one foot back and knees bent, student will swing arm backward and forward, releasing ball at end of swing and in direction of target.

Sub-task 6 With student standing 5' from target and with knees bent, student will swing arm backward and forward, releasing ball at end of swing and in direction of target, while teacher is pushing student's opposite side foot forward simultaneously with swing.

Sub-task 7 With student standing 5' from target and with knees bent, student will swing arm backward and forward, releasing ball at end of swing and in direction of target, while teacher is prompting student's opposite side foot forward simultaneously with swing.

Sub-task 8 Student, from standing position, will perform an underhand roll, swinging arm backward and then forwards simultaneously with the opposite foot and releasing the ball at the end the swing in a manner which causes the ball to roll and strike a 3'x3' target 7' away.

Suggested Materials: Tennis ball; 3'x3' target placed on floor

Teaching Notes:

1. For those students in wheelchairs, the underhand roll can be performed with the student sitting in the wheelchair, hence eliminating the prerequisite standing positions (4 thru 8).

2. For non-ambulatory students who are not in a wheelchair, ball rolling could be taught from a supported sitting position.

Table 2

Game Skills-Basic:
Catching a Thrown Ball

Terminal Objective: Student, from standing position, will catch a tennis ball thrown within a one stride distance either to his preferred or non-preferred side by a teacher standing 6' away.

Sub-task 1 Student, from a standing position, will catch a 7" ball delivered midline of the student by the teacher standing 2' away. Teacher physically assists child to move over catch ball.

Sub-task 2 Student, from a standing position, will catch a 7" ball thrown to the midline of the student by the teacher standing 2' away. Teacher prompts the child to move over to catch ball.

Sub-task 3 Student, from a standing position, will catch a 7" ball delivered to the midline by a teacher standing 4' away.

Sub-task 4 Student, from a standing position, will catch a 7" ball delivered to the preferred side of the student by the teacher standing 2' away.

Sub-task 5 Student, from a standing position, will catch a 7" ball delivered to the non-preferred side of the student by the teacher standing 4' away.

Sub-task 6 Student, from a standing position, will catch a tennis ball thrown to midline of student by teacher standing 4' away.

Sub-task 7 Student, from a standing position, will catch a tennis ball thrown to the preferred side of student by teacher standing 4' away.

Sub-task 8 Student, from a standing position, will catch a tennis ball thrown to the non-preferred side of student by teacher standing 4' away.

Sub-task 9 Student, from a standing position, will catch a tennis ball thrown within a one stride distance to either the preferred side or non-preferred side by a teacher standing 6' away.

Suggested Materials: A 7" ball and tennis ball

Teaching Notes:

1. Two skills are involved here: trapping ball and moving in front to trap ball. Branching may be necessary to get student through each phase.

2. "Catching" means capturing the ball in the hands.

Table 3

Game Skills-Basic:
Overhand Throw

Terminal Objective: Student, from a standing position, will perform an overhand throw, swinging the arm backwards and then forwards while stepping forward simultaneously with the opposite foot and releasing the ball at the end of the swing in a manner which causes the ball hit a 3'x3' target 12' away.

Sub-task 1 Student, standing 5' from target, will swing the arm backwards and then forwards, releasing the ball at the end of the swing in the direction of the target. Teacher will physically assist student to bring his arm back and then forward.

Sub-task 2 Student, standing 5' from target, will swing the arm backwards and then forwards, releasing ball at end of swing and in direction of target. Teacher will assist to bring his arm back.

Sub-task 3 Student, standing with feet together 5' from target, will independently swing arm backwards and forwards, releasing ball at end of swing and in direction of target.

Sub-task 4 With student standing 5' from target, with one foot forward, one foot back and knees bent, student will swing arm forward, releasing ball at end of swing and in direction of target.

Sub-task 5 With student standing 5' from target and with knees bent, student will swing arm backward and forward, releasing ball at end of swing and in direction of target while teacher is pushing student's opposite side foot forward simultaneously with swing.

Sub-task 6 With student standing 5' from target and with knees bent, student will swing arm backward and forward, releasing ball at end of swing and in direction of target while teacher is prompting student's opposite side foot forward simultaneously with swing.

Sub-task 7 Student, standing, will perform an overhead throw by swinging arm backward and then forward while stepping forward simultaneously with the opposite foot and releasing the ball at the end of the swing in a manner which causes to hit a 3'x3' target 7' away.

Sub-task 8 Student, standing, will perform an overhand throw by swinging arm backward and then forward while stepping forward simultaneously with the opposite foot and releasing the ball at the end of the swing in a manner which causes to hit a 3'x3' target 12' away.

Suggested Materials: Tennis bnall and 3'x3' target placed on floor

Teaching Note: If the student is in a wheelchair, he should be able to perform this behavior by sitting in the wheelchair. For the physically impaired child who cannot perform all of the behaviors described above, approximation of the behaviors can be accepted as correct.

APPENDIX B

EXPERIMENTAL GROUP 2
PARENT TRAINING INFORMATION

EXPERIMENTAL GROUP 2
PARENT TRAINING INFORMATION

Introduction

Parents have been effective with employing a variety of instructional approaches in a number of educational settings. Studies in Special Education and Physical Education suggest that parent involvement may complement the learning process.

In the past few years, two studies in Physical Education were conducted to examine the involvement of parents with the teaching of motor skills. Paciorek (1981) measured the effects of a home-based, parent-intervention motor development program on developmentally delayed children. The major question considered was: Is there any difference in the motor skill performance scores obtained on the Peabody Development Motor Scales received by (a) those children who participated in the program and (b) those children who did not participate in such a program? The eight-week program was administered by the children's parents or guardians. An analysis of the data revealed that the children whose parents participated showed improvement in the performance of certain motor skills.

Horvat (1980) investigated the effect of a structured gross motor home learning program on the balance proficiency of elementary school-aged learning disabled students. As a result of this investigation, it was concluded that parents could significantly enhance the balance proficiency of their children.

Task Analysis

A technique employed with the teaching of motor skills is task analysis, which involves dividing a task (motor skill) into smaller parts. This process enables the teacher and learner to focus on the learning of the smaller parts sequentially, until the skill is eventually performed in complete form. An example of a skill task analysis is attached for your review. [For example, see Appendix A, Table 1.]

APPENDIX C

EXAMPLE OF PLACEMENT TEST FORM FROM OSU/TR DATA BASED GYMNASIUM INSTRUCTIONAL MODEL

EXAMPLE OF PLACEMENT TEST FORM

This placement form is used with the OSU/TR Data Based Gymnasium Instructional Model.

TASK	CUE	DATE	Placement Yes / No	DATE	Baseline # Total	DATE	Posttest # Total	COMMENTS
Movement Concepts, Personal Space					/		/	
A. Execute Body Actions While Standing	"Do this," demonstrate action, stretch and curl.	2/11/80	Yes		/4		4	
B. Execute Body Actions While in Prone Position	"Do this," demonstrate action, stretch and curl.	2/11/80	Yes		/4		4	
C. Execute Body Actions While in Supine Position	"Do this," demonstrate action, stretch and curl.	2/11/80	no		/4		4	
D. Move Body Forwards and Backwards in Space	"____, move forward and backwards."				/3		3	
E. Move Body Up and Down in Space	"____, move up and move down."				/3		3	
F. Move Body Sideways	"____, move left and move right."	2/11/80	no		/3		3	
					/		/	
					/		/	
					/		/	
G. Move Arms Forwards and Backwards in Space	"Move both arms forwards and backwards."	2/11/80	Yes		/5		/5	
H. Move Arms Up and Down in Space	"Move both arms up and down."	2/11/80	yes		/5		/5	
I. Move Arms Sideways in Space	"Move both arms to the side away from the body."	2/11/80	no		/3		/3	
J. Move Body In Front Of and Behind Object in Space	"Move in front of the chair." Response, repeat.				/12		12	
K. Move Body Over and Under In Space	"Move over the table and under the table."				/3		/3	
L. Move Body Forwards and Backwards Around Objects	"Back around the chair and walk around the chair."	2/11/80	no		/3		/3	
M. Move Body Through Objects in Space	"Move through the hoop forwards, backwards and sideways."				/13		13	
N. Demonstrate 3 part body movement sequence in various directions in space	"Move sideways to the left, right, and left."				/3		3	
					/		/	
					/		/	

Source: Dunn et al., 1980.

APPENDIX D

PARENT PROFILE QUESTIONNAIRE AND DATA SUMMARY

Parent Profile

1. Your sex (circle number of your answer)

   1 Male
   2 Female

2. Your present marital status (circle number)

   1 Never married
   2 Married
   3 Divorced
   4 Separated
   5 Widowed

3. Number of children you have in each age group (if none, write "0")

   _____ under 5 years of age
   _____ 5 to 13
   _____ 14 to 18
   _____ 19 to 24
   _____ 25 and over

4. Your present age: _____ years

5. Do you own (or are you buying) your own home? (circle number)

   1 No
   2 Yes

6. Did you serve in the Armed Services? (circle number)

   1 No
   2 Yes Year entered _____
          Year discharged _____

7. Are you presently: (circle number)

   1 Employed
   2 Unemployed
   3 Retired
   4 Full-time homemaker

8. Please describe the usual occupation of the principal wage earner in your household. (If retired, describe the usual occupation before retirement.)

   Title: _____

   Kind of work you do: _____

   Your work-shift hours (e.g., 8-5): _____

9. What was your approximate net family income from all sources, before taxes, in 1984? (circle number)

   1 Less than $3,000
   2 3,000 to 4,999
   3 5,000 to 6,999
   4 7,000 to 9,999
   5 10,000 to 12,999
   6 13,000 to 15,999
   7 16,000 to 19,999
   8 20,000 to 24,999
   9 25,000 to 29,999
   10 Over $30,000

10. Which is the highest level of education that you have completed? (circle number)

    1 No formal education
    2 Some grade school
    3 Completed grade school
    4 Some high school
    5 Completed high school
    6 Some college
    7 Completed college (Specify major) _____
    8 Some graduate work
    9 A graduate degree
      (Specify degree and major) _____

11. Have you worked as a volunteer or paid classroom aide in a public or private school? (circle number)

    1 No
    2 Yes

12. Have you participated as a data-collector in a classroom previous to this study? (circle number)

    1 No
    2 Yes

Parent Profile Data Summary

Questions 1 thru 6:

Parent	Sex		Marital Status					Number of children in each age group					Age	Own Home	Armed Svc.
	M	F	Never married	Married	Divorced	Separated	Widowed	Under 5 yrs of age	5-13	14-18	19-24	25 and over			
Subj 1		x		x				1	2	0	0	0	35	No	No
Subj 2		x		x				2	2	0	0	0	34	No	No
Subj 3		x		x				0	3	0	0	0	38	Yes	No
Subj 4		x		x				2	2	0	0	0	35	No	No
Subj 5		x		x				3	1	0	0	0	35	No	No
Subj 6	x			x				1	0	0	0	0	35	No	No
Subj 7	x			x				0	1	0	0	0	35	Yes	Yes
Subj 8		x		x				1	0	0	0	0	25	No	Yes
Subj 9		x		x				2	0	0	0	0	32	No	No
Subj 10		x			x			0	3	1	0	0	37	Yes	No
Subj 11		x		x				1	0	0	0	0	35	Yes	No
Subj 12		x		x				0	2	0	0	0	32	Yes	No
Subj 13		x		x		x		0	1	2	0	0	40	Yes	No
Subj 14		x		x				0	1	1	0	0	33	Yes	No

Questions 7 and 8:

Parent	Employed	Unemployed	Retired	Full-time homemaker	Description of usual occupation of the principal wage earner in your household		
					Title of Wage Earner	Kind of work you do	Your Work hours
Subj 1				x	Research	Homemaker	NA
Subj 2				x	Purchasing supervisor	Homemaker	NA
Subj 3				x	Tower operator Wah Chang	NA	NA
Subj 4				x	NA	Homemaker	NA
Subj 5				x	NA	Homemaker	NA
Subj 6	x				Plasterer	Manager-El	6:30-3:30
Subj 7	x				Farmer	Homemaker	All hours
Subj 8				x	Unemployed	Homemaker	NA
Subj 9				x	Pre-loader U.P.S.	Homemaker	NA
Subj 10	x				NA	Day care	24 hrs
Subj 11				x	Owner insurance agency	Homemaker/ Former VP S&L	40 hrs
Subj 12	x				Student GI bill	Homemaker/ 7-11 Store	12-8PM
Subj 13	x				D.D. preschool asst./ Parent trainer	Work with handicapped children & parents	8-4PM
Subj 14				x	Carpenter	Secretarial	8-5PM

Questions 9 thru 12:

	Family Income										Education					
Parent	Less than $3,000	$3,000 to 4,999	$5,000 to 6,999	$7,000 to 9,999	$10,000 to 12,999	$13,000 to 15,999	$16,000 to 19,999	$20,000 to 24,999	$25,000 to 29,999	Over $30,000	Some high school	Complete high school	Some college	Completed college	Volunteer or paid classroom aide	Data collector in classroom previously
Subj 1							x						x		No	No
Subj 2							x							x	Yes	No
Subj 3										x		x			Yes	Yes
Subj 4					x								x		No	No
Subj 5					x							x			Yes	No
Subj 6							x				x				No	Yes
Subj 7								x			x				No	No
Subj 8					x							x			No	No
Subj 9					x							x			Yes	Yes
Subj 10	x												x		Yes	No
Subj 11										x			x		No	Yes
Subj 12					x								x		No	No
Subj 13						x						x			Yes	Yes
Subj 14						x						x			Yes	Yes

APPENDIX E

LIST OF PARTICIPATING SCHOOLS

The following schools participated in this study:

"Data-Based Classroom" Schools (E_1 and E_2):

Brush Prairie Preschool
Brush Prairie, Washington
One preschool DD classroom (classroom #1)

Fairmont School
Albany, Oregon
One preschool/DD classroom

Garfield Elementary School
Corvallis, Oregon
One preschool/DD classroom
Two elementary DD classrooms

Waverly School
Albany, Oregon
One elementary DD classroom (classroom #1)

"Traditional Classroom" Schools (Control):*

Brush Prairie Preschool
Brush Prairie, Washington
One preschool DD classroom (classroom #2)

Campus Elementary School
Western Oregon State College
Monmouth, Oregon

Teaching-Research Preschool
Teaching-Research/Todd Hall
Western Oregon State College
Monmouth, Oregon

Waverly School
Albany, Oregon
One elementary DD classroom (classroom #2)

*NOTE: Individuals in the control group participated in large group activities of a "recreational" nature directed by the classroom special educator. There was no individualized instruction in Task 1, 2 or 3 during the eight-week treatment period.

APPENDIX F

GROUPS E_1 AND E_2 COVER LETTER AND PARENT CONSENT FORM

The Department of Physical Education
Oregon State University
Corvallis, Oregon 97331-3302

Special Physical Education Programs
Room 107-D, W.B.
(503) 754-2631 / (503) 753-0858

March 15, 1985

Dear Parents:

As a graduate student at O.S.U., I have an interest in studying the effects of parent involvement on the learning of physical skills by their children. Knowing the effects of parent involvement may assist our planning of sound, progressive physical education programs for children with special needs.

I would like to ask permission to involve your child in this study. As a participant in the study your child will be involved in testing his/her performance of physical skills in the classroom and you may receive parent training in the instruction of physical skills to your child at home. The school district is supportive of this project and, if you approve, will provide the instruction in select motor skills in the classroom.

If you are interested in involving your child in this study, please review the attached Parent Consent Form, sign, and return the form to your child's classroom teacher as soon as possible. Please note that the name of your child will not be used when working with the data and confidentiality will be strictly enforced. You may, at any time, withdraw your permission to use your child's scores. Should you choose to be involved in the study, you will be contacted soon regarding parent training details.

Thank you for your time.

Sincerely,

Paul Maguire
Graduate Research Assistant

PM/dlr
Attachment

The Department of Physical Education

Oregon State University

Corvallis, Oregon 97331-3302

Consent Form

(Please return to the classroom teacher)

Student's name: _____

Description of the Research

The proposed research project deals with measuring the performance of physical skills by special needs students who receive parent instruction in the home. Students participating in the study will be evaluated and will receive instruction in select physical skills. Participating parents will be involved in parent training and instruction of their children in the home. All data will be group data and strict confidentiality will be enforced.

This is to certify that I agree to allow my child to participate in the above study. I understand that although I may not choose to participate in parent training, the data collected on my child in the classroom will contribute to the purpose and design of the study. I understand the purpose of the research and that if I have any questions they will be answered by the researcher or the classroom teacher.

I hereby give my consent for _____ to participate in the above stuoy. I reserve the right to withdraw my consent and discontinue participation at any time.

☐ I am interested in participating in a parent training program.

Parent's name (printed): _____

Child's name: _____

Address: _____

Phone: _____

☐ I am unable to participate in a parent training program.

Parent's Signature: _____

Date: _____

APPENDIX G

CONTROL GROUP PARENT CONSENT FORM

Consent Form

Student's Name: _____

Description of the Research

The proposed research project deals with measuring the effects of parent involvement on the performance of select physical skills with special needs children and youth. Classrooms participating in the study will be involved to varying extents. The intent of this note is to request permission to involve your child in the study. The classroom that your child attends has been chosen for the purpose of testing the performance of each child in select motor skills. The obtained scores will be used for comparison with other children receiving specific instruction in the same skills. Although your child will not be involved with specific instruction in the skills tested the obtained test scores will be of value. Confidentiality will be strictly enforced and all data will be group data.

I hereby give consent for _____ to participate in the study. I reserve the right to withdraw my consent and to discontinue participation at any time. I understand the purpose of the research and that if I have any questions, they will be answered by the researcher in person or by mail:

Paul Maguire
Room 107-D, W.B.
Oregon State University
Corvallis, Oregon 97331
(503) 754-2631

_____
Parent/Guardian Signature

_____
Parent/Guardian Name Printed

_____
Date

APPENDIX H

VOLUNTEER OBSERVATION FORM FROM OSU/TR DATA BASED GYMNASIUM INSTRUCTIONAL MODEL

INSTRUCTION

OSU/TR Gymnasium Observation Form

Volunteer/Aide:_____ Observer:_____

Program:_____ Date:_____

Cue (verbal):_____ Time:_____

Cue (non-verbal):_____ Materials:_____

Student Response:_____ Criteria:_____

_____

_____

Reinforcer and Schedule:_____

_____

Correction Procedure:_____

_____

KEY

Code 1	Code 2
1 = Correct	1 = Correct
0 = Incorrect	D = Delay
	W = Weak
	R = Repeat
	F = Fail To
	C = Change Word
	L = Level

	PROGRAM CUES			PROGRAM CORRECTION					Behavior Cues and Consequences			Data	
	Initial Cue			Directive			Assistance						
Student	Cue	Consequence		Cue	Consequence		Cue	Consequence	Cues	+	-	Yes	No
		+	-		+	-		+					
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

COMMENTS:

SCORES

Cues: $\frac{\text{Correct Cues}}{\text{Correct + Incorrect Cues}}$ = ___/___ or ___%

Consequences: $\frac{\text{Correct Consequences}}{\text{Correct + Incorrect Conseq.}}$ = ___/___ or ___%

Data: $\frac{\text{Correct Data}}{\text{Correct + Incorrect Data}}$ = ___/___ or ___%

Criterion: Individual 90%, Agreement 85%

APPENDIX I

DATA SUMMARY: PRE AND POST SCORES BY GROUP

PRE AND POST SCORES BY GROUP

Subj.	Age	Sex	Task 1 Pre	Task 1 Post	Task 1 Net Change	Task 2 Pre	Task 2 Post	Task 2 Net Change	Task 3 Pre	Task 3 Post	Task 3 Net Change
					Group E_1						
1	4	M	5	8	+3	5	8	+3	2	8	+6
2	3	M	2	7	+5	1	5	+4	2	8	+6
3	8	M	2	8	+6	3	9	+6	5	8	+3
4	7	F	2	8	+6	2	6	+4	2	8	+6
5	4	F	2	6	+4	2	5	+3	1	6	+5
6	4	M	4	6	+2	3	3	0	3	7	+4
7	5	M	1	6	+5	1	5	+4	1	7	+6
8	4	M	1	2	+1	2	1	+1	1	3	+2
9	4	M	1	7	+6	5	6	+1	1	7	+6
10	4	F	4	8	+4	3	8	+5	2	8	+6
11	3	M	1	2	+1	1	2	+1	1	6	+5
12	8	F	2	8	+6	3	9	+6	3	8	+5
13	7	F	1	3	+2	1	2	+1	1	4	+3
14	7	M	4	8	+4	3	9	+6	5	8	+3
					Group E_2						
1	4	F	3	8	+5	2	5	+3	2	8	+6
2	3	M	4	8	+4	1	6	+5	3	8	+5
3	7	M	1	8	+7	1	8	+7	1	6	+5
4	7	M	1	5	+4	3	9	+6	3	7	+4
5	3	M	2	2	0	1	2	+1	1	3	+2
6	9	M	1	3	+2	1	3	+2	1	3	+2
7	4	M	3	8	+5	3	7	+4	1	7	+6
8	4	M	1	1	0	3	3	0	2	6	+4
9	3	F	1	4	+3	2	6	+4	3	5	+2
10	6	F	2	7	+5	5	8	+3	3	8	+5
11	7	M	5	8	+3	3	9	+6	2	8	+6
12	4	M	3	3	0	1	2	+1	2	6	+4
13	5	F	1	3	+2	3	4	+1	3	4	+1
14	4	F	2	4	+2	3	3	0	2	5	+3
15	4	M	1	2	+1	1	2	+1	2	3	+1

Subj.	Age	Sex	Task 1 Pre	Task 1 Post	Task 1 Net Change	Task 2 Pre	Task 2 Post	Task 2 Net Change	Task 3 Pre	Task 3 Post	Task 3 Net Change
					Group C						
1	9	F	3	4	+1	3	4	+1	3	4	+1
2	7	F	1	1	0	1	1	0	1	1	0
3	3	M	1	1	0	1	1	0	2	2	0
4	3	M	1	1	0	1	1	0	1	1	0
5	3	F	4	4	0	4	3	-1	3	3	0
6	4	M	1	1	0	1	1	0	2	1	-1
7	4	F	4	4	0	3	3	0	3	3	0
8	5	F	4	2	-2	3	3	0	6	2	-4
9	4	F	1	1	0	1	1	0	1	1	0
10	3	F	1	1	0	3	2	-1	2	2	0
11	4	F	4	3	-1	3	2	-1	3	2	-1
12	4	M	4	4	0	3	3	0	2	2	0
13	6	F	1	2	+1	2	2	0	1	2	+1
14	3	F	1	2	+1	3	3	0	1	2	+1
15	3	M	5	5	0	3	4	+1	1	2	+1

APPENDIX J

DATA SUMMARY: NUMBER OF HOME INSTRUCTIONAL PERIODS (E_1)

NUMBER OF HOME INSTRUCTIONAL PERIODS (E_1)

Subject	Task 1	Task 2	Task 3
1	23	24	23
2	25	25	25
3	22	22	22
4	23	24	16
5	27	27	27
6	19	20	19
7	23	23	23
8	16	17	18
9	31	30	30
10	13	12	13
11	20	20	20
12	23	22	24
13	25	25	25
14	23	23	21

NOTE: Parents were requested to provide home-based DBG instruction for three tasks (Task 1, Underhand Roll; Task 2, Catch; Task 3, Overhand Throw) for three periods per week for the duration of the eight-week treatment period (or until terminal objective was achieved).