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THE EFFECTIVENESS OF A HOME-BASED APPROACH FOR MOTOR SKILL DEVELOPMENT IN MILDLY AND MODERATELY RETARDED CHILDREN

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THE EFFECTIVENESS OF A HOME-BASED APPROACH FOR MOTOR SKILL DEVELOPMENT IN MILDLY AND MODERATELY RETARDED CHILDREN

By

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ABSTRACT

THE EFFECTIVENESS OF A HOME-BASED APPROACH FOR MOTOR SKILL DEVELOPMENT IN MILDLY AND MODERATELY RETARDED CHILDREN

By

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The purpose of this study was to investigate the effect of a supplementary 10 week program of home-based physical education on the motor skill acquisition of mildly and moderately mentally retarded children. Twenty-eight mentally retarded children were randomly assigned to one of three treatment groups. The experimental group was provided with motor skill instruction by parents in their home. Instruction was limited to three selected fundamental motor skills from a list which included the catch, throw, kick, strike, run, jump down, log roll and/or task analyzed derivatives of these skills. Control group I subjects were provided with additional parent contact during each week of the study. Additional parent contact was devoted to non fundamental motor skill activities. Control group II received no treatment. All subjects received sixty minutes of school-based motor skill instruction during each week of the ten week treatment period.

The pre-treatment and post-treatment motor skill performance of each subject was determined by two independent assessors using I CAN criterion referenced motor skill assessment items. Assessor accuracy

was determined to be greater than 90% immediately prior to the study's commencement. A one-way fixed analysis of variance of subject age determined that a significant difference existed among the treatment groups. Consequently, the test statistic selected for analysis of percentage difference scores of motor skill performance was an analysis of covariance with age as the covariate. The hypothesis tested was that no significant difference in motor skill performance existed between the treatment groups for cumulative pre/post difference scores. The hypothesis was accepted ($p < .05$) indicating that there was no instructional effect on children who received home-based motor skill instruction.

DEDICATION

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I would like to acknowledge my sincere gratitude to Dr. Luke Kelly for his guidance in the completion of this thesis. I am grateful for his insights, continued encouragement and assistance in handling many of the logistical details associated with a study of this nature.

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A special note of gratitude goes to the parents and children who participated in the study, for they made it all worthwhile. Finally, I am most indebted to my wife, without whose support, encouragement and sacrifice this work would not have been possible.

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CHAPTER I

INTRODUCTION

Federal legislation has highlighted the importance that educators have placed on the role of parents in the education of their handicapped children. Public Law 94-142, the Education for all Handicapped Children Act, has mandated that parents be involved in the planning of their children's education. Support for this law among parents of handicapped children has proven to be strong. Past attempts to deregulate PL 94-142 brought an outcry of public disapproval, necessitating the immediate withdrawal of the deregulation proceedings from Congress (Macmillan & Turnbull, 1983).

Professionals within the field of special education have extended parent involvement to include the teaching of motor skills and concepts (Sandler, Coren & Thurman, 1983). In the past, parent intervention programs have focussed on language and speech development, behavior adjustment, self-help skills and cognitive development (Strom, 1974; Johnson & Katz, 1973).

Initial skepticism concerning the ability of parents to learn and apply effective instructional techniques in the teaching of educational objectives has been silenced. Lombardino and Mangan (1983) found that through systematic instruction parents were able to increase their use of systematic language teaching strategies. In

addition to conducting research centered on the ability of parents to learn educational instructional techniques, investigators within special education have studied the effect that home-based instruction and family environment have on the learning of children. Willems, Lombardino, MacDonald and Owens (1982) reported that five language delayed children involved in a parent-tutored home-based language training program dramatically increased the usage of communication signs in conversation and spontaneous speech settings. The importance of the family environment has been highlighted by Sandler, Coren and Thurman (1983). The primary purpose of their study was to investigate the effect of a maternal parent training program upon child skill acquisition and parent attitude. The investigators found that as children improved their skill performance, mothers tended to express a positive attitude toward their children, whereas fathers tended to express a more negative attitude toward their children and spouse. As a result of this finding, the authors recommended that home-based education programs incorporate total family involvement as opposed to single parent participation.

The positive relationship between a program of supplemental physical education and improved motor skill performance has been underscored by Olson (1966). The investigator confirmed that non-handicapped elementary school age children benefited from a program of supplemental physical education. The study, using children who exhibited poor motor skills, showed that involvement in a program of physical education which supplemented that offered in the school led to improved motor performance.

Ample evidence exists to suggest that a program of systematically designed home-based physical education, which supplemented the experiences offered to a child by the school, would lead to improved motor learning. Physical education specialists working with handicapped children have failed to capitalize on parent intervention strategies to supplement their efforts. Consequently, there was a need to determine the effect of a home-based supplemental physical education program on the motor skill acquisition of handicapped children.

Need for the Study

The use of an experimental design to study the effect of a home-based physical education program on the motor skill development of mentally retarded children was urgently needed. Broadhead (1983) has stressed that motor development and skill acquisition can be enhanced by greater home support which supplemented the work of the school or agency. French and Jansma (1982) have emphasized the importance of soliciting parental cooperation and the employment of physical education homework in an attempt to help mildly and moderately retarded children "catch up" to their non-handicapped peers in motor skill development.

The amount of instructional time devoted to physical education for the teaching of motor skills traditionally has been limited. Research conducted by Wessel (1977) has indicated that, on average, handicapped children receive only fifty hours of physical education instruction each year. The disparity in motor skill performance between nonhandicapped, mildly and moderately retarded children has served to further highlight the necessity for motor skill

intervention. Francis and Rarick (1959) have reported that the motor skill proficiency of mentally retarded children was two to four years behind the published age norms of non-handicapped children. Ulrich (1983) has indicated that non-handicapped children are three to five years ahead of mildly mentally retarded children on the qualitative performance of fundamental motor skills and are at least six years ahead of moderately mentally retarded children. Further research evidence confirming the motor skill deficiency of mildly and moderately mentally retarded children when compared to their non-handicapped peers has been documented by Rarick, Widdop and Broadhead (1970) and Howe (1959). Ulrich (1983) attributed much of the difference in qualitative motor skill performance between mildly and moderately mentally retarded children and non-handicapped children to the lack of adequate opportunities for movement experiences that handicapped children have at an early age. It is apparent therefore, that those children most in need of physical education are those who are being consistently deprived of it. In order to facilitate motor skill acquisition of handicapped children, new ways must be found to increase the amount of physical education instruction time available to them.

Children differ in their rate of learning, amount of learning, method of learning and response to external motivation (Sherrill, 1981; Corder, 1966). Handicapped children have demonstrated more variability in these factors than normal children, and as a result, individualization of the teaching-learning process has been more important for handicapped children than for most of their non-handicapped peers (Knowles, 1983). Furthermore, the rate of learning

and quality of retention of motor skills by the handicapped has been enhanced when general principles of motor learning were followed (Sherrill, 1981). Maximum involvement, specificity of learning and continuous reinforcement were real possibilities obtained within the home setting. If proven effective, home-based physical education programs could be used to individualize instruction for handicapped children increasing the likelihood of motor skill acquisition in both a qualitative and quantitative sense.

Purpose

The purpose of this study was to measure the effect that a supplementary program of home-based physical education had on the motor skill acquisition of mildly and moderately mentally retarded children. In addition, the effect that increased child-parent contact had on motor skill development was investigated to establish that it was the teaching of motor skills that effected motor skill development, not increased parent-child contact.

Research Hypothesis

It was hypothesized that elementary school aged mentally retarded children who participate in a supplemental home-based physical education program would make significantly greater performance gains in selected fundamental motor skills than like children who receive school-based physical education only.

Limitations

The results of this study were subject to the following limitations:

1. The subjects who participated in the study were volunteered by their parents or guardians. They constituted an available sample population of elementary school aged mentally retarded children who attended the Marvin E. Beekman or Ingham Developmental Centers and received school-based physical education instruction. Therefore, the results of this study can only be generalized to similar mentally retarded children and their families who attend the Marvin E. Beekman Center and Ingham Developmental Center and who receive school-based physical education.
2. The results of the study may be biased since participation of parents in the study was voluntary and involved considerable time expenditure. Volunteers for the study may not be characteristic of the population of parents of mentally retarded children who received school-based physical education.
3. The results are limited to the motor skills of throwing, catching, kicking, running, walking, striking, jumping down, log rolling or task analyzed derivatives thereof. In addition, subjects received motor skill instruction which focussed on three individually selected skills. Therefore, skill instruction across subjects was not homogeneous.
4. Due to the subjective and ordinal nature of criterion referenced test items, measurement of subject achievement may have been skewed. The assumption was made that change from one skill level to another skill level or from one focal point to another focal point were of equal importance

and equal value.

5. Stratification by gender was not attempted during the random assignment of subjects to treatment groups and may have been a limiting factor in the results obtained.

6. The motor skills selected for inclusion in the study did not exhibit an equal number of focal points. Therefore, the potential for change in motor skill performance based on focal point gain was not equal for each subject and may have influenced individual performance differentially.

7. Each subject who participated in the study was scheduled to receive 60 minutes of school-based motor skill instruction each week. However, the investigator had no control over how much allotted physical education time was spent on instruction of the specific skills selected for each subject.

8. The parents of subjects who participated in the study were not screened as to their suitability to provide motor skill instruction. Although specific instruction and training were provided to each parent instructor, individual differences and ability may have been a limiting factor in the results obtained.

CHAPTER II

REVIEW OF THE LITERATURE

There has been a growing body of research literature which has addressed the topic of parent intervention and skill development. Substantial evidence has accumulated which testifies that the utilization of parents as teachers in the skill development of their children is beneficial. Traditionally, home-based parent intervention programs have been utilized to address academic skill areas, yet in recent years, the development of motor skills as a result of parent intervention has generated considerable interest. The review of the literature has focused on the following topics: (1) early parent intervention, (2) the effectiveness of parent intervention, and (3) skill development resulting from parent intervention.

Early Parent Intervention

Research on early intervention programs has shown that effective parent involvement is a key factor in facilitating and maintaining child learning. Parents have played a critical role in the development of their children and their inclusion in intervention programs has been necessary for success in the home. (Bronfenbrenner, 1974; MacDonald, 1980; Mahoney and Geller, 1980).

Early intervention programs which have used parents as a

treatment source for teaching their language delayed children have proven effective in preventing more serious language deficiencies. When systematically trained by a language specialist to work with their children in a range of communication related skills, parents have been shown to be effective behavior change agents (Lombardino and Mangan, 1983).

Parent facilitation of early child development has proven successful in behavior modification studies (Berkowitz and Graziano 1972). In addition, published reports by Allen and Harris (1966), Walher (1969) and O'Leary and Becker (1967) have verified the effectiveness of parents as modifiers of various learning disorders in children.

Skill retention also has been shown to be facilitated by parent intervention during early child development. Gordon (1979) reported that evidence was widespread, based on educational research conducted within the United States and abroad, that as long as ten years after program completion, children from families who had participated in a pre-school intervention program were still doing better in school than control group children. Citing a specific study from Florida, Gordon reported that at age ten, scores on the Wechester Intelligence Scale were, on the average, ten points higher for those children who were involved in an early intervention program from age three months to three years than for control group children participating in the same study. Goodson and Hess (1976), reviewed several major pre-school parent intervention programs and reported that the acquisition and retention of skills by children were assisted by parent involvement in pre-school programs. Hence skills were learned and retained more

readily when parent intervention accompanied attempts at early remediation.

Accelerating the rate at which children learn has been a major aim of much research in education. A systematic program of instruction conducted by a parent in conjunction with a school program almost doubled the rate of acquisition of a reading skill (Fredricks, Baldwin, Grove, 1974). Furthermore, significant gains have been reported in the development of young Down Syndrome children in cases where parents were involved actively as learning therapists (Hayden and Haring, 1977; Connolly, 1978).

Early intervention has been useful in remediating or preventing learning problems in young children. In addition, prevention and remediation strategies that incorporated parental assistance were more likely to achieve success than those programs that worked in isolation of parent involvement.

Parent Intervention Effectiveness

In this section studies related to the effectiveness of parent intervention will be discussed. Emphasis will be placed upon the parents' role as the principal interventionist or as an aide to the teacher. The effect of the home environment upon learning and the relationship between parent intervention and family interaction also will be examined. Finally, components of successful parent-child teaching programs as supported by the literature will be presented.

Parents as principal interventionists.

Conflicting views and opinions exist throughout the literature concerning the role parents should play in the education of their

children. Parents who have attempted to teach their children prior to their initial attendance at school have been criticized in the past (Peters and Stephenson, 1979). Arnheim and Sinclair (1979) maintain that parents who do not receive careful supervision are not able to be effective home motor therapists. Parents who normally were reasonable and understanding found it difficult to be non-judgemental of their children's response. Furthermore, the emotional climate in the home may be the very reason a child is experiencing motor problems. In conclusion, Arnheim and Sinclair reported that home motor therapy programs designed to remediate motor deficiencies only serve to increase further the seriousness of the deficit and that motor therapy should be left to a teacher or therapist while the parents provide the most positive home atmosphere possible.

To the contrary, Rich, Van Dien and Mattox (1979) found that developing the mode of participation which directly involves parents in the education of their own children is most beneficial. Based on research conducted at Stanford University, the authors concluded that the best method of parent involvement in compensatory education is the one in which parents fulfill the role of the principal interventionist. Further, the authors reported that the parent as teacher approach appealed to the most basic parental motivation for involvement, the desire to help one's children succeed.

Few parent taught home-based programs have been implemented specificially for the purpose of remediating motor skill deficiencies. In response to a need to investigate the efficiency of alternative instructional strategies, Horvat (1980) instigated a twelve week parent taught home motor program and found that parents significantly

increased the balance proficiency of their learning disabled children. Additionally, Bishop and Horvat (1984) investigated the effect of parent taught home instruction on the physical and motor performance of a clumsy child. This study reiterated the findings of Horvat (1980) substantiating that parent delivered home instruction favorably influenced performance in a variety of physical and motor tasks. In a similar study, Paciorek (1981) investigated the effect of a home-based parent intervention motor development program on developmentally delayed children. Data analysis revealed that significant improvement was made by children who had received home-based instruction on gross motor skills that centered around eye-hand coordination tasks such as throwing objects at targets, fundamental movement patterns, balance and general coordination skills.

The literature concerning the role of parents as teachers of their children has been contradictory. However, a substantial portion of the literature seems to justify the use of parents as teachers of their children in a home-based setting.

Home learning environment.

Much of the literature concerning parent-taught programs has addressed the effect of the home as a learning enviroment. Lombardino and Mangan (1983) indicated that it was important to train parent-child dyads in the same context as their naturally occurring activities in the home. Similar conclusions have been drawn by McLoughlin, Edge and Strenecky (1978) who have stated that the role of parents has been enhanced by the increased recognition of the significance of the home and community as settings in the total program for the learning disabled.

The limited availability of educational resources has restricted the dissemination of many programs of early intervention. Hoyt (1978) has stated that a major advantage of the home as a learning environment lies in its ability to be replicated. The home has been a naturally occurring educational resource of special importance in rural areas isolated from educational settings. With few modifications, the home environments have been structured to provide learning activities similar to those usually found only in school-based settings (Shearer and Shearer, 1972).

Family convenience has been identified as an important variable that must be addressed before initiating parent taught programs in the home. A major advantage of the home environment was that it was convenient and provided a continuous treatment resource which augmented existing therapeutic manpower capabilities (Johnson and Katz; 1973). An advantage of the home as a learning environment reported to Sandow and Clarke (1978) by parents was that it was neither intimidating nor threatening, as a university setting was to many. Furthermore, by centering remediation efforts in the home, the primary caretaker was able to become involved in therapy and even more importantly, parents were more willing to participate (Gray, 1980). Shearer and Shearer (1972), reported that the home offered many advantages as a learning environment in the education of children. Home-based education allowed learning to occur in the parent and child's natural environment which alleviated the problem of transferring to the home skills learned in a classroom or clinic. Moreover, the development and maintenance of desired behavior has been facilitated as a result of the direct access to a child's environment

that the home allowed. Furthermore, the opportunity to achieve full family participation in the educational program of a child has been possible when instruction was centered in the child's home, allowing father, sibling and extended family involvement to become a realistic and obtainable goal.

Practical advantages of the home as a learning environment have been reported by Gray (1980). Additional family transportation costs have been alleviated as a result of basing the teaching-learning process in the home. Furthermore, the need to find supervisory care for other family members was eliminated since parents were not drawn away from their homes.

The literature concerning the home as a learning environment has indicated that the home has offered special advantages to the education process which have not as yet been available in most school based settings. Home learning environments have been found to be non-threatening, replicable and convenient. In addition, skill transfer, full family participation in the learning process and continuous access to child learning as it occurred naturally have all been achieved when the learning environment was centered in the home.

Parent-child interaction.

Parental expectation of possible child achievement must be monitored carefully so as to avoid deterioration of the parent-child relationship. Over zealous or carefree parental attitudes have had adverse effects. Parents who expected too much of their children initiated a process in which they were precluded from reaching their achievable potential. Likewise, parents who have attached little value to their children and their learning, shape their children for

failure in life (Hildebrand, 1977).

The use of parents as teachers has in some cases increased the risk of parent burnout, especially when a child had a severe handicap (MacMillan and Turnbull, 1983). Great care must be taken by well meaning educators not to overburden a parent who may already be experiencing emotional stress. Detrimental effects of imposing on a parent a home-based learning program as identified by MacMillan and Turnbull included increased parental frustration, absenteeism from work, decreased leisure time availability and usage by the parent, physical exhaustion and a feeling that they have done things which were essentially not their responsibility. Detrimental effects on the children have included a deterioration in the relationship with the parent (due possibly to parent resenting the time and effort expended in a parent taught learning program), increased pressure to achieve resulting in failure, and even a decrement in the instructional and social climate of the home as a result of parent interference or over protectiveness. Parent taught home-based programs therefore must not be imposed on families already experiencing emotional stress. Administrators of parent taught home-based programs must take great care when selecting potential sites to avoid those homes in which the potential exists for a deterioration of the parent-child relationship.

A variety of positive outcomes associated with parent taught programs have been identified in the literature. An important outcome of many parent taught education programs as identified by Swick and Duff (1978) was that parents began to realize they could learn new skills for parenting as well as for their personal careers. They became better parents and their children had a positive model to

follow. The provision of a positive role model was one of the major benefits associated with parent taught programs (Bronfenbrenner, 1974). A young child placed more credence on examples set by a parent than in words spoken by a parent (Charnley and Myre, 1977).

Carson (1982) has reported that when parents and their children were both involved in a program designed to improve gross motor skill proficiency of the children, both gained from the interaction process. Parents in the study reported that their children became more skilled and were able to plan motor movements with more certainty and precision. Gratification at being able to assist constructively their children to improve in motor skill proficiency and in the achievement of better observational skills were additional benefits identified by parents as being associated with the parent taught motor skill program. Furthermore, Carson reported that besides seeing their children improve in skill efficiency and self concept, many parents reported the pleasure of spending more productive time at home practicing motor skills with their child.

Motivating children to learn has been a recurring dilemma for educators. Rich, Van Dien and Mattox (1979) reported that the instigation of a parent taught instructional process was a successful technique which led to increased child motivation to learn, greater skill acquisition by the child and an enhanced development of self image for the parent (Rich, Van Dien, and Mattox, 1979). These authors have reported that by learning how to teach their own children, parents acquired the necessary resources to provide their children with individual instruction. In turn, the children realized that their parents perceived education as an important variable and

operationalized this perception by becoming more motivated to learn. The chain of events will culminate with the children learning skills better and feeling confident that they had learned new skills. The positive effects of the cycle of events have not been limited to the child. Upon realization of the positive role that they have played in the increased skill acquisition of their children, the parents grew in self image. As identified by Rich, Van Dien and Mattox, the end product of the cycle of events was that the parent acquired new skills and a more positive self image, while the child learned better, became motivated to learn and perceived learning as important.

Shearer and Shearer (1972) and Miller (1978) have reported that the feeling of helplessness often experienced by parents of handicapped children has in part been alleviated by their inclusion in their children's education. MacMillan and Turnbull (1983) reported that the many positive affects associated with the parent taught education programs necessitate the inclusion of parents in the overall educational process of their children. In addition to parents' reporting their enjoyment at being involved in the education of their children, MacMillan and Turnbull indicated that parents gained an increased understanding of the education program their children received, learned strategies that enabled them to work more effectively with their children and acquired a positive feeling of belonging and self worth due to the meaningful contribution they made to their children's education. Children who received parent taught instruction made more rapid developmental gains and were able to establish a better relationship with their parents. Facilitation of an improved instructional and social climate in the school was a

further outcome of active parent participation in the education of their child.

Parent-child relationships have been shown to be affected by involvement in parent taught instructional programs. Recent information has indicated that carefully planned programs of parent taught instruction have enhanced the self concept and skill development of both children and parents. However, programs imposed on over zealous parents or those already experiencing emotional stress were likely to affect adverseley child achievement and parent self image.

Family interaction.

Any change in family behavior or behavior of members of a family has affected family interaction. Sandler, Coren and Thurman (1983) conducted a study in which their purpose was to investigate the effect of a maternal parent training program upon child skill acquisition and parental attitude. They hypothesized that intervention which enhanced maternal competence and fostered increased involvement of a mother with her handicapped child would affect not only the mother and child, but the father as well. The investigators found that as children improved their skill performance, mothers tended to express a positive attitude toward their children, whereas fathers tended to express a negative attitude toward their children and spouses. As a result of their research, the authors reported that any home-based education program which strengthens the proximity of the mother and child, while ignoring the father, may act to weaken the spouse relationship and thereby adversely affect the total family intrastructure. Incorporation of the total family as opposed to single parent participation was recommended. The reluctance of fathers to join home-based

intervention programs may not be a simple matter to resolve. Nonetheless, when intervention strategies were utilized that focused on both parents as interventionists, marital disharmony was less frequent than in those families in which single parent intervention had occurred (Grath,1978).

Change in sibling relationships as a consequence of parent taught home-based instruction may also occur. To accommodate the requirements of a home-based program, parents may reduce that portion of their time usually spent interacting with other family members, particularly other children. MacMillan and Turnbull (1983) indicate that if such circumstances develop, a worsening of sibling relationships will likely result due to the over emphasis on a single child. In turn, sibling rivalry will adversely affect the outcome of any program of parent intervention. Thus, prior consideration must be given toward meeting the expectation of other children within the family unit.

In an effort to maximize the effect of a parent taught home-based program, full support of all family members would be necessary. This would be best achieved by actively involving all family members in any intervention program and highlighting the positive effect that additional family involvement had. Indeed, Shearer and Shearer (1978), Blacker and Turnbull (1983), and Grath (1978) reported that when an entire family unit was associated with the process of intervention, and were able to observe developmental gains made by the program recipient as a result of their intervention, a closer family relationship resulted.

Parent teaching programs.

Characteristics have been identified which are associated with successful parent child teaching dyads. Professionals who implement programs of home-based instruction must do so with a clear understanding of those factors likely to assist and impede the successful implementation of home-based instruction.

Of paramount importance to the success of a parent taught home-based program has been the utilization of professional help to advise, guide and instruct parents on matters concerning teaching. Parents need to learn principles of teaching from a specialist in order to become effective teachers (Serra, 1978; Rich, Van Dien and Mattox, 1979). Emphasizing such a criterion, Johnson and Katz (1973) have reported that the success of therapeutic intervention by a parent was dependent upon the ability of a backup therapist to produce reliable changes in the behavior of the parent toward the child. As reported by Shearer and Shearer (1972), this concept was the corner stone of the Portage Project, a home-based parent teaching system conducted in Portage, Wisconsin. In this project, the home visiting teacher travelled throughout the rural community visiting isolated homes instructing parents on the principles of home-based teaching. The parent then utilized these skills in conjunction with activity charts and skill activities left by the visiting teacher to teach prescribed skills. Following the initial parent training program, the visiting teacher visited the parent and child each week checking on child progress and parent retention of teaching skills. According to Shearer and Shearer, the training of parents to use basic teaching skills and the provision of supervisory support from a visiting teacher were major

components leading to the successful home-based program. In order to provide parents with a clear and concise understanding of what a skill to be taught entails, Shearer and Shearer (1972) and Charnley and Myer (1977) have recommended that parent trainers instruct parents to practice and become proficient at performing skills which are to be included in the home program.

The importance of achieving early success for both the parent and the child involved in home-based programs has been stressed throughout the literature. Shearer and Shearer (1972) indicated that curriculum goals should be set which are readily achievable by the child within a week. This in turn necessitated the assessment of a child's current level of performance so that appropriate prescription of learning activities could occur which would result in early success by the child (Bijou, 1980; Swick and Duff, 1970; Hoyt, 1976; Carson, 1982 and Spadafore, 1979).

Parent training systems designed to teach parents how to instruct their child have been classified into two major categories by Bijou (1980), the "How-To-Do-It books / multi-media packages" and "Face-to-Face" training programs. How-To-Do-It systems were typically designed for use by middle and upper socio-economic parents with at least a high school educational background. These programs have been shown to be non-effective without professional or para-professional help. Face to face parent training programs were teaching programs involving professional or para-professional teachers and an organized set of teaching materials. Bijou, Schoeing (1978) and Spadafore (1979) suggested that programs which included an inventory-type assessment procedure, a method for setting definite and easily

obtainable goals, a clearly stated set of teaching techniques, and a simple recording system were more likely to be successful than programs that exclude these criteria.

In addition to these criteria, Spadafore (1979) has reported that to achieve a productive learning environment, several conditions must be met. Included in these conditions were the provision of a quiet and comfortable work location with extraneous stimuli eliminated or muffled and equipment readily available. Learning activities should be prescribed which have measurable criteria and thus provide a mechanism for measuring teaching effectiveness which in turn serve as reinforcement to child and parent. Finally, it was recommended that parents should be refrained from working their children to the point of exhaustion. Preference should be given to several short training sessions rather than one long arduous session.

The length of a parent taught teaching session also has received considerable attention in the literature. Home-based parent taught programs have commonly been conducted over a short time period, usually fifteen weeks or less. Generally, such programs have focussed on providing several parent-child instructional sessions per week. In a program designed to improve the academic skills of isolated rural children, Hoyt (1976) indicated that parents worked with their child for thirty minutes a day. In contrast, Shearer and Shearer (1978) did not delineate a time limit to be applied to parent taught academic instruction, their criterion was that the parent spend time each day with the child working toward a weekly goal.

Conjecture exists within the current literature concerning the optimal duration of parent taught motor skill instruction sessions.

According to Carson (1982) the time a parent spends with a child in a parent taught motor skill training session should be forty-five minutes. In Horvat's (1980) study, parents administered instructional sessions of thirty minutes three days a week over a twelve week period. A follow up study conducted by Bishop and Horvat (1984) involving the motor performance of an eight year old clumsy male was conducted over seven weeks with three thirty minute sessions per week. In addition to these research studies, Paciorek (1981) investigated the effect that a home-based, parent intervention motor development program had on developmentally delayed children. In this study, children received between twenty to forty minutes of motor skill instruction each week during an eight week program. Thus duration of each instructional session in which increased motor skill proficiency was the primary objective has tended to be about thirty minutes, while weekly instructional time has amounted to approximately 90 minutes across all studies reviewed.

The need for home-based activity programs to have readily available equipment was indicated by Shearer and Shearer (1972). In addition to this requirement, Gordon (1979) stressed that criteria which must be met for a successful home-based parent taught program were that the program have an educational focus, be structured, and be carefully planned. To provide structure and direction for parents conducting home-based instruction in conjunction with her "Kinder-skills" program, Carson (1982) used work booklets which included instructional directions and information regarding the construction of home made equipment. Horvat (1980) and Bishop and Horvat (1984) followed a procedure similar to that of Carson in their studies. The

home learning packet used by Bishop and Horvat in their study involving the gross motor development of an eight year old clumsy male was bound in a loose leaf notebook. It contained, in addition to instructional activities, information concerning goals of the home-based instruction program, general statements about how to deliver instruction and an explanation of the procedure for recording the day-to-day performance of the child. Prior to the commencement of the home-based program, the investigators contacted the child's parents in their home and the home learning packet was explained to the parents and each instructional activity was discussed to ensure complete understanding of how instruction was to be delivered. Although no comparison studies have been conducted, the use of instructional booklets to assist parents to implement home-based programs of motor skill instruction appears beneficial and has been supported by recent literature.

Training parent instructors.

Disagreement exists within the literature as to which location or environment has been most conducive for the training of parent instructors. Rich, Van Dien and Mattox (1979) reported that programs which required attendance at meetings or involvement in school activities during the day have had limited participation. Furthermore, attendance at program training conducted on a University campus has been found to be intimidating to some (Sandow and Clarke, 1978). Home-based training of parent instructors was reported to be most productive in programs conducted by Shearer and Shearer (1972), Horvat (1980), and Bishop and Horvat (1984). To the contrary, Carson (1982), Miller (1978), Serra (1978) and Schoeing (1978) have reported studies

in which no adverse effects were observed as a result of parents gaining skills or actually teaching in a facility away from the home. Recent literature has offered conflicting opinions concerning the most advantageous location in which to conduct parent training.

Researchers and educators recognize the need for professional support and for visits to the homes of parent-child teaching dyads. Visiting teachers involved in the Portage Project made weekly visits to homes in which parent taught instructional activities occurred (Shearer and Shearer, 1972; Hoyt, 1976). Monitoring of program and parent effectiveness by Paciorek (1981) included biweekly visits to each child's home. Professional support also has been provided in the form of telephone calls in some instances. Biweekly telephone calls were used to monitor parent training programs in a study by Horvat (1980). Bishop and Horvat (1984) used a weekly telephone monitoring procedure to provide consultation and support in order to circumvent any problems that had been encountered. Unabridged support for parrents may prove detrimental however. Evidence exists that too much support and too frequent visiting by a professional may prove counter productive by increasing parent dependency, with the risk of initial gains being followed by some degree of fall off (Grath, 1979). Evidently then, professional support of parents must be monitored with care to avoid over dependency on the professional.

Educators who design home-based parent taught instructional programs should consider the parent professional ratio. In order to meet the needs of parents conducting a home-based program and to avoid over extending professional support, a ratio of six to ten parents per visiting professional has been recommended (Kroth,1978).

Furthermore, to facilitate parent-professional communication, Kroth recommends that a clearly defined specific number of meetings be planned into a home-based program from the outset.

Literature concerned with the characteristics of a successful parent teaching program has been supportive of the concept of combining professional guidance with a clearly defined structured program of activities. Structure may be infused into a parent taught home-based program by the use of booklets prescribed for a particular home-based setting, or as a result of regular monitoring by a professional. Parents must be trained to use general teaching principles and immediate success must be experienced by both parent and child involved in a home-based program.

Academic And Motor Skill Development

Traditionally, studies involving parent intervention programs have focused on language and speech development, behavior modification, self help skills, or cognitive development. Until recently, physical educators have been slow to realize the potential of parental involvement in the development of a child's gross motor proficiency.

Research literature has indicated that such skills as reading, speech, and behavior modification can be enhanced by parent intervention. In a parent taught program based upon the principles of reinforcement and reward, children were able to make significant gains in word recognition, understanding, and elaboration (Strom, 1974). Peters and Stephenson (1979) reported that parents were vitally important to the resolution of a child's language learning disability. Evidence of the success of parent intervention programs on anti-social and immature behavior, speech dysfunction and self injurious behavior

have been reported by Johnson and Katz (1973). Furthermore, successful parent intervention programs have been used in the behavior modification of behavior disordered children (Sandler, Coren, Thurman, 1983).

The literature on motor skill development has been supportive of recent evidence which testified that parents are capable of learning to implement a teaching-learning process for the benefit of their children. The children of parents who utilized general teaching principles have made significant gains in motor skill proficiency specific to the area of instruction.

Subjective evidence supportive of the benefits associated with parent taught motor skill development programs has been documented by Carson (1982). Conducted at West Virginia University, a program entitled "Kinderskills" was designed to serve three to five year old children making normal progression in motor development. During ten weekly forty-five minute instructional sessions, parents were actively involved in structuring, supervising and evaluating their child's gross motor skill development. Although lacking statistical authenticity, Carson has reported that initial data collection from the study suggested that children respond successfully to gross motor skill instruction provided by their parents.

Children involved in an instructional program of fundamental motor skill development demonstrated greater gains in motor skill proficiency than did children exposed to free play settings. In a study undertaken by Miller (1978), results indicated that instruction in fundamental motor skills was equally effective whether it was

provided by physical education teachers alone or by parents working under the direction of physical education teachers. Although neither instructional program conducted by Carson or Miller occurred in a home-based setting, results indicated that when provided with information concerning general principles of gross motor skill instruction, parents were effective motor skill teachers.

Home-based programs of parent taught gross motor instruction have recently gained popularity. Taggart (1980) has provided empirical evidence to substantiate that a home-based activity program enhanced the physical fitness of elementary school children. In addition Cox (1960), French (1979), Thompson (1972) and Vaughan (1965) recommended home instruction as a means of improving the physical fitness and/or gross motor ability of children.

A study designed to investigate the effect of a home learning program on the balance proficiency of learning disabled children has been reported by Horvat (1980, 1982). Thirty children were assigned to three groups. An experimental group participated in a home-based program involving parent instructed developmental static and dynamic balance tasks while an alternative experimental group participated in a home-based program which focused on pre-academic and fine motor tasks. The control group subjects received no home-based instruction. Additionally, each group involved in the study participated in a twelve week school-based physical education program administered by the same instructor. Parents of subjects in both experimental groups received instruction in specific teaching strategies and were given the necessary equipment to conduct the home learning program. Pre- and post-test assessment results were obtained and subjected to

statistical analysis. It was found that parents who had implemented a structured gross motor training program at home significantly ($p < .05$) enhanced the static and dynamic balance of their learning disabled children. The author concluded that home learning was a valuable supplement to a school's physical education program and should be utilized in an effort to individualize programs of gross motor learning.

A follow-up study to that conducted by Horvat was reported by Bishop and Horvat (1984). The purpose of this investigation was to determine the effect of a home instruction program provided by parents on the motor skill performance of a clumsy child. The parents implemented prescribed activities during twenty instructional sessions of thirty minutes duration over seven weeks. A multiple baseline design was used to determine the effect of the home-based program. Following initiation of instruction, the child demonstrated a higher level of performance in all motor skill tasks in comparison to his baseline period performances. The authors' concluded that the differences between baseline and training period results were attributable to the influence of home instruction. This study extends the findings of Horvat (1980) substantiating that a parent delivered home instruction can favorably influence child performance in a variety of physical and motor tasks.

An additional study investigating motor skill development and parent invervention has been reported by Paciorek (1981). The primary purpose of Paciorek's study was to research the effect of a home-based, parent intervention motor development program on developmentally delayed children. Twenty children were randomly assigned into an

experimental group and a comparison group. Children in experimental group received between three to five sessions of sequential motor development instruction taught by their parents or guardians each week for between twenty and forty minutes over an eight week training period. The comparison group did not receive any home-based instruction. At the conclusion of the study, analysis of data revealed that the gross motor scores of the experimental group had improved significantly over the gross motor scores of the comparison group. The results of this study further subsantiate that gross motor functioning of handicapped children can be improved by developmental intervention programs. The author emphasized that parent intervention programs should not be considered a substitute for physical education or motor development programs staffed by professionals. Rather, parent intervention programs should be used in conjunction and cooperation with physical education programs and staff.

All empirical evidence however does not uphold the success of parent intervention and motor skill development of children. The effectiveness of parents as tutors of children with basic motor skill deficiencies was not resolved by Serra (1978). The purpose of Serra's study was to determine the effectiveness of parental involvement in the remediation of basic motor skill deficiencies in children through programs implemented in the home. Ten of forty-seven children were assigned to a parent tutored experimental group, while the remaining children were randomly assigned to an experimental group taught by a physical education specialist or to a control group. Children in the parent tutored group received one hour of basic motor skill instruction from their parents each week. Parents met with a specialist in

physical education to learn principles and techniques of the teaching-learning process for motor skill acquisition. Children in the specialist taught group received instruction in small groups for half an hour twice a week. The control group received no additional motor skill instruction other than that provided as a result of normal school-based activities. Judgement of the effectiveness of motor skill instruction provided by parents compared to no motor skill instruction was reserved due to a lack of sufficient power of the statistical test used to detect significant differences. However, statistical analysis did reveal that instruction in motor skills by a specialist in physical education resulted in significantly greater ($p < .001$) development of basic motor skills than motor skill instruction provided by parents. The nonsignificant effect of parent intervention may have occurred due to a lack of professional support for parent tutors. Although the parent tutors received instruction in the principles of teaching motor skills, such instruction did not occur in the home, nor was it supported by any form of home monitoring. The research literature has indicated that when such criteria are not met negative results are likely to eventuate.

In a study designed to evaluate the effects of a parent training program upon child skill acquisition across six areas, including gross motor skills, Sandler, Coren and Thurman (1983) found no significant difference after achievement scores of the parent taught experimental group and the control group were analyzed. Paternal attitude was not controlled for in this study and may have adversely affected the achievement of children receiving maternal instruction. In conclusion, the author's hypothesized that a negative attitudinal

shift of fathers had interfered with the mother-child teaching dyad, resulting in child underachievement. The authors recommended that future programs of home-based instruction incorporate the total family unit as a cooperate in the remediation of skill deficiency.

A growing body of research evidence has provided support to the efficacy of parent taught home-based motor skill instruction for the handicapped. When provided with instructional assistance in specific teaching strategies and with professional support and advisement, parents of handicapped children have been able to teach successfully selected motor skills.

Summary

In order to facilitate the development of motor skill proficiency in mildly and moderately mentally handicapped children, motor skill intervention must occur. Limited cognitive capacity, short term memory deficits and an ability to formulate learning strategies have prevented the mildly and moderately mentally retarded from acquiring age appropriate motor skills.

The literature on motor skill development of the mildly and moderately mentally retarded children has shown regular instruction to be necessary for improvement. Such instruction must reflect known principles of teaching and include repetition, individualized instruction and regular exposure to successful experiences. To achieve this goal, researchers have begun to investigate the effectiveness of parents as instructors of their handicapped children. Home-based parent instruction has been effective when structured techniques for the intervention process have been established.

CHAPTER III

RESEARCH METHODS

The purpose of this study was to measure the effect that a supplementary program of home-based physical education had on the motor skill acquisition of mildly and moderately mentally retarded children. Three groups of children were compared; one group was given motor skill instruction at home by their parents, a second group was provided with additional parent contact, and a third group received no additional parent contact. Throughout the study, all children received school-based physical education.

Subjects

The subjects for the study were mildly and moderately mentally retarded children (15 females, 15 males) of elementary school age (mean = 131 months). Classification of subject mental retardation was determined from school-based criteria and placement decisions. One or more members of each subject's family were involved in the study in either a motor skill instruction or non motor skill activity role. The subjects attended a special education school during the day and lived at home with their parents. The children involved in the study received 150 minutes of physical education each week in a school-based setting which comprised 90 minutes of aquatics activity and 60 minutes

of motor skill instruction. Aquatics instruction focussed on introducing children to a water environment and the development of modified swimming and water survivial strokes. With few exceptions, aquatics instruction was conducted using a one teacher/aide to one child ratio. Instruction in motor skill development emphasized the acquisition of fundamental motor skills such as the overhand throw, run, catch or continuous ball bounce. Employing the assistance of instructional aides, a one teacher/aide to four children ratio was generally achieved during motor skill instruction sessions.

Parents involved in the study spent 60 minutes each week teaching their children selected fundamental motor skills in their homes which supplemented the motor skill instruction received at school. Instruction was directed toward the achievements of selected focal points identified during each child's pre-assessment. Skill drills and modified game activities were employed by parents to compliment their home-based instruction.

Subjects for the study were obtained from the Marvin E. Beekman Center and the Ingham Developmental Center. Both centers were special schools serving mildly and moderately retarded children of Ingham County, Michigan. All families of elementary school aged children enrolled in these centers were contacted by letter (see Appendix F) outlining the nature of the study. Each family was invited to participate in the study. Families who wished to participate in the study were invited to an orientation meeting (see Appendix A) which was designed to acquaint potential participants with their role in the proposed study. Individual commitment to participate in the study was given to the investigator following the orientation meeting or during

a series of confirmatory telephone conversations. In compliance with Michigan State University regulations, permission was sought and granted by the University Committee on Research Involving Human Subjects to conduct the study.

Sampling Procedure

Using a table of random numbers, the subjects were assigned to one of three groups. The participating families were listed alphabetically on one of two master participant lists according to the school their children attended. The investigator, after randomly selecting a starting number, systematically assigned each subsequent number from the table of random numbers to the family that occurred next in alphabetical order on each list. One experimental group and two control groups were then randomly established from each list. Subjects whose families were assigned a random number one, two or three were combined to form the experimental group; subjects in families assigned a number four, five or six were combined to form control group I, and the subjects from families assigned a number seven, eight or nine were combined to form control group II. As a result of this random assignment procedure, each sample group was assigned ten subjects.

Parents assigned to the experimental group spent 60 minutes each week in their homes instructing their children on selected fundamental motor skills. Control group I parents spent 60 minutes each week interacting with their children in non-fundamental motor skill activities, whereas control group II parents were not required to participate in any additional activity with their children.

Conduct of Treatment

The treatment that the experimental group received was a home-based physical education program (see Appendix B). The program was developed by a trained adapted physical educator and focussed on the development of three selected fundamental motor skills. Included in the program were skill drills and activities designed to facilitate each subject's motor skill development. Motor skills were individually selected for each subject so as to reflect the instruction which they received during their regular school-based physical education program. By employing this technique, it was possible to structure each home-based physical education program so that it supplemented and paralleled the fundamental motor skill instruction provided to the subjects in their school-based physical education class.

Over a 10 week treatment period, subjects in the experimental group received 60 minutes of home-based physical education instruction each week. Individual instruction sessions were restricted to 20 minutes or less. Consequently, each subject received instruction in motor skill development on at least three occasions each week. Such instruction was parent directed and occurred in the subject's home. Parents of subjects in the experimental group were trained during a home-based training session (see Appendix C) to identify component parts of their child's selected motor skills as well as activities that could be used to develop the individual motor skill components. Basic principles of teaching also were discussed (see Appendix B) during the home-based training session. Parent training was conducted in each subject's home during the week immediately before

the treatment period.

To maintain a check on parental effectiveness, a home visit was made to families conducting home-based activities during the third to eighth week of the treatment period. The investigator visited the homes of families who were included in the experimental group and viewed a parent-child teaching session (see Appendix D). In addition to visiting families of subjects in the experimental group, the investigator visited families of subjects in control group I. This procedure was adopted to avoid the possibility of investigator-subject familiarity biasing the final results. Throughout the treatment period, bi-weekly telephone calls were made to parents conducting home-based activity to provide consultation and support in order to circumvent any problem that parents had encountered. Telephone calls were structured so as to provide an introduction from the investigator, a summary by the parent of the instructional activities that were employed during the previous two week period and a question-answer session to discuss areas of concern. Each telephone conversation always concluded with a supportive statement by the investigator as to the parent's effectiveness. This technique was employed so that continuous supervision of participating families could occur and regular reinforcement and encouragement were available to parents.

A confounding variable associated with the study was that of increased child-parent contact. In order to establish that it was extra instruction provided in the home that had affected a subject's motor skill level and not extra parent-child contact per se, two control groups were used. Control group I subjects participated

weekly in 60 minutes of non-motor skill activity in addition to their regular school-based physical education experiences for 10 weeks. The parents of these subjects received the same training in teaching principles, were visited during the third to eighth week of the treatment period, and received similar support through bi-weekly telepone calls from the investigator as the experimental group. Control group I parents were trained during the week immediately before the commencement of the treatment period. Control group II subjects only received 60 minutes of school-based physical education for 10 weeks.

Dependent Variables

Level of motor skill development across three selected fundamental motor skills for each of the subjects constituted the dependent variables in this study. The fundamental motor skills assigned to each subject were determined following consultation with each subject's physical education teacher immediately prior to the commencement of the study. The final selection of fundamental motor skills for each subject was based on the assessed needs of the subjects as determined by their school-based physical education teacher. Skills included in the study were the catch, throw, run, walk, log roll, strike, jump down, kick and/or task analyzed derivatives of these skills.

Research assistants were used to pre- and post-test all subjects using I CAN criterion referenced assessment procedures (Wessel, 1976). Subjects were assessed during a regularly scheduled physical education class. Subjects were brought to the school gymnasium by their teacher or the investigator. Before entering the gymnasium subjects were introduced by the investigator or physical education teacher to the

research assistants who would assess and record their motor skill performance. The assessment of each participant was conducted individually in a confined section of the school gymnasium while class mates participated in a physical education lesson. Visual distraction of subjects being assessed was avoided by the use of a gymnasium divider or gymnasium mats positioned vertically to create a secluded alcove. Subjects were randomly assigned to research assistants for the purpose of testing and subject testing order was randomly determined within each class. The investigator elicited the motor skill assessment for each subject. Immediately prior to the assessment of a motor skill of each subject, a demonstration of the mature pattern of the desired motor skill was provided by the investigator. Subjects were instructed to perform a given skill until the research assistant indicated that an assessment level had been determined.

Data Collection

Pre-test and post-test data were obtained using I CAN criterion referenced skill assessment items (see Appendix E) and procedures. Two research assistants administered and recorded the results of the pre- and post-tests. The research assistants were trained to assess reliably motor skill performance using I CAN techniques. Training was based on the fundamental motor skills of catching, overhand throwing, running and vertical jumping. The assistants were trained two weeks prior to subject pre-testing and achieved a minimum of 90% accuracy rate of skill assessment. Pre-test information on each subject was collected at school during the week prior to commencement of the study. Post-test data were collected during the 11th week under

conditions matching those of the pre-test as closely as possible.

Data Treatment

In order to measure each subject's change in motor skill performance over the treatment period, comparison of each subject's pre- and post-test scores was made to establish a percentage difference score on each variable. Percentage difference scores were derived so that scores of several objectives could be combined into one score for each subject. In addition, percentage difference scores enabled each fundamental motor skill tested to be transformed into a standard score of similar value overcome the problem associated with the unequal number of ordinal levels of measurement characteristic of the fundamental motor skills used in this study.

It has been difficult to determine whether an increase from one focal point to a second focal point was equivalent to a gain from the second focal point to the third focal point on any given fundamental motor skill. Therefore, while recognizing that motor skill behavior change between independent ordinal levels of measurement is not necessarily equal, the assumption was made for the purpose of the study that change from one focal point to a subsequent focal point was of equal importance and therefore of equal value.

Percentage difference scores were derived for each subject and each sample group across each variable by calculating the change in motor behavior that occurred over the treatment period. Individual subject change scores were calculated by deriving the fractional change in motor skill performance relative to the possible total for each subject's selected motor skill objectives, and then summing these scores and changing the fraction score to a percentage score. For

example according to I CAN criterion referenced test items, the strike, overhand throw, and catch comprise 13, 11 and 9 focal points respectively for a total of 33 focal points. A subject who scored a total of 11 focal points combined across the three skills on a pre-test would be judged to have performed at 33.34% skill mastery level. If the same subject was assessed as achieving a total of 22 focal points combined across the three skills on a post-test, he/she would then be judged to possess a 66.67% skill mastery level. The difference which exists between a subject's pre- and post-test skill level has been termed their percentage difference score. In the example given above, the percentage difference score would be 33.3%. After each subject's percentage difference score had been calculated, they were summed and a group mean score of percentage difference was calculated. For each group, this was achieved by summing the percentage difference scores for each subject and dividing that score by the total number of subjects from which data were collected for the group.

A series of descriptive statistical analyses were applied to the data collected on subject age, pre-treatment and post-treatment motor skill performance scores. A one-way analysis of variance ($p \leq .05$) was subsequently applied to each independent variable to detect if any significant difference existed among the treatment groups. A one-way analysis of covariance ($p \leq .05$) across groups' mean cumulative difference scores was conducted in order to obtain an indication of the difference on the dependent variables for the experimental and control groups. Analysis of covariance was the statistical technique chosen for data analysis since subject age was not controlled for

during random assignment of subjects to groups. A Scheffé post hoc test was to be used to locate the source of significant difference if a significant F value was obtained from any analysis.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this study was to investigate the effect that a supplementary program of home-based physical education could have on the motor skill acquisition of mildly and moderately mentally retarded children. A sample of thirty elementary school aged mentally retarded children were selected from two special education day schools serving the Ingham County, Michigan area. Subjects were randomly assigned to three comparison groups, and the comparison groups were randomly assigned into one experimental and two control groups. The experimental group received sixty minutes per week of parent directed physical education in addition to sixty minutes per week of school based physical education for ten weeks. Control group I received sixty minutes per week of additional parent contact for ten weeks on non-physical activities in addition to their regular sixty minutes per week of school-based physical education. The purpose of this group was to control for the Hawthorne effect of additional parent contact. Control group II subjects received no treatment in addition to their regular 60 minutes per week of school-based physical education. Each subject's motor skill development level was assessed using I CAN assessment items on a pre- and post-test basis by independent assessors.

In this chapter, the results will be presented and discussed in three sections. A description of the characteristics of the subject

population has been presented first. This discussion is followed by an analysis of the results obtained from pre- and post-test motor skill assessment. The chapter concludes with a discussion of the research findings.

Sample Characteristics

Thirty mildly and moderately mentally retarded children comprised the initial subject population for this study. During the course of the study, two subjects were lost from the subject pool. The parents of subject sixteen withdrew from the study during week four due to personal family reasons. Subject thirty was omitted from the subject pool after attempts to locate the family and conduct a motor skill post-assessment failed. Consequently, data analyses across the three treatment groups were conducted with 28 subjects (13 male, 15 female).

The age distribution of children in the study was not equal across groups. It can be observed in Table 4.1 that subjects of control group I were on average 44 months older than subjects of control group II and 69 months older than subjects of the experimental group.

Table 4.1 Means, standard deviations (SD) and ranges of age in months of the three treatment groups.

GROUP	MEAN	SD	RANGE
Experimental	101.30	37.84	54-160
Control group I	170.00	63.62	76-264
Control group II	126.11	44.57	80-223
Total	131.38	55.74	54-264

A one-way fixed effects analysis of variance (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975) was applied to the age data. The critical region of rejection for the null hypothesis that no significant difference in age existed between treatment groups at the .05 level with 2 and 25 degrees of freedom was any F value $\geq$ 3.39. Analysis of the computed scores for age resulted in the rejection of the null hypothesis (F = 4.649) (see Table 4.2). There was a significant difference ($p < .05$) in the age of subjects among the three treatment groups. Using a Scheffé post hoc test it was determined that a source of the significant difference existed between the experimental group and control group I. In order to control for the effect of age on motor skill performance, age has been used in later analyses as a covariate for the dependent variable, motor skill performance.

Table 4.2 Analysis of variance comparing age in months of the three treatment groups.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Methods	22,721.44	2	11,360.72	4.644
Residual	61,154.99	25	2,446.20	
Total	83,876.43	27		

The severity of mental retardation of the individual subjects across the groups displayed much less variability. Of the final twenty-eight subjects accepted for use in statistical analysis, twenty-seven were moderately mentally retarded and one subject was mildly mentally retarded as determined by school classification criteria. Random assignment of subjects to groups and random assignment of groups to treatments resulted in nine moderately and one

mildly retarded child combining to form the experimental group, nine moderately retarded children combining to form control group I, and nine moderately retarded children combining to form control group II.

The distribution of boys and girls was not equal across groups. The experimental group was comprised of four males and six females. Control group I was comprised of four males and five females, whereas control group II was comprised of five males and four females. The total group distribution based on sex was thirteen males and fifteen females.

The dependent variable of this study was a summed motor skill performance change score. Motor skills selected for use in this study included the catch, throw, kick, strike, run, log roll, roll a ball, jump down and/or task analyzed derivatives of these skills.

Analysis

The data obtained from the pre-test assessment of motor skill performance were analyzed to determine if a significant difference existed among the groups based on initial motor skill performance. Inspection of the means, standard deviations and ranges of the motor skill performance of the three treatment groups on the pre-test assessment of motor skill performance indicated that the greatest difference for these values occurred between the experimental group and control group one (see Table 4.3).

Table 4.3 Means, standard deviations (SD) and ranges of the motor skill performance of the three treatment groups on the pre-treatment assessment.

GROUP	MEAN	SD	RANGE
Experimental	39.995	17.295	11.43-60.00
Control group I	46.460	27.915	8.33-81.82
Control group II	43.201	17.887	8.33-60.61
Total	43.228	20.802	8.33-81.82

A one-way fixed effects analysis of variance (Nie et al, 1975) was applied to the pre-treatment motor skill performance data. The hypothesis tested was that no significant difference in motor skill performance existed among the treatment groups. The critical region for rejection of the null hypothesis at the .05 level was calculated to be any F value $\geq$ 3.39 (df = 2,25). The analysis of variance resulted in an F = 0.215 and an acceptance of the null hypothesis (see Table 4.4) that there was no significant difference in motor skill performance among the three treatment groups based on pre-assessment data.

Table 4.4 Analysis of variance comparing the motor skill performance of the three treatment groups on the pre-treatment assessment.

Source of Variation	Sum of Squares	Degrees of Freedom	Means Square	F
Methods	198.108	2	99.054	0.215
Residual	11485.686	25	459.427	
Total	11683.794	27		

The means, standard deviations and ranges of the motor skill performance of the three treatment groups based on post-treatment assessment were inspected (see Table 4.5). It was observed that the greatest difference was between control group I and control group II.

Table 4.5 Means, standard deviations (SD) and ranges of the motor skill performance of the three treatment groups on the post-treatment assessment.

GROUP	MEAN	SD	RANGE
Experimental	40.319	22.525	11.43-75.75
Control group I	53.290	28.010	2.77-87.87
Control group II	39.666	20.718	16.67-66.67
Total	44.278	23.848	2.77-87.87

In order to determine the existence of any significant difference among the groups, the hypothesis was tested that no significant difference in motor skill performance existed between the treatment groups based on post-test data. A one-way fixed effects analysis of variance (Nie et al, 1975) was applied to the post-test motor skill performance data. The critical region of rejection for the null hypothesis at the .05 level was calculated to be any F value $\geq$ 3.39 (df = 2,25). The analysis of variance resulted in an F = 0.944 and an acceptance of the null hypothesis (see Table 4.6). Thus, there was no significant difference in motor skill performance among the three treatment groups based on post-assessment data.

Table 4.6 Analysis of variance comparing the motor skill performance of the three treatment groups on the post-treatment assessment.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Methods	1079.061	2	539.530	0.944
Residual	14277.493	25	571.099	
Total	15356.554	27		

In an attempt to provide a precise measure of motor skill improvement, percentage difference scores were derived from the subtracted difference between each subject's pre- and post-test assessment data (see Table 4.7). These raw data measures were subjected to descriptive statistical analysis and the resulting means, standard deviations and ranges of percentage change in motor skill performance have been included in Table 4.7.

Table 4.7 Means, standard deviations (SD) and ranges of the difference in pre-test/post-test motor skill performance scores for the treatment and control groups.

GROUP		RAW SCORES Pre-test	RAW SCORES Post-test	DIFFERENCE (%)
Experimental				
Ss 1		60.00	43.33	-16.67
Ss 2		53.34	66.66	18.18
Ss 3		56.64	75.75	24.24
Ss 4		43.33	15.15	-24.24
Ss 5		11.43	11.43	0.00
Ss 6		36.36	54.54	18.18
Ss 7		30.77	38.46	7.69
Ss 8		23.08	26.92	3.84
Ss 9		25.00	16.66	-8.33
Ss 10		60.00	54.29	-5.71
	Mean	39.995	40.319	1.712
	SD	17.295	22.525	15.851
	Range	11.43 - 60.00	11.43 - 75.75	-24.24 - 24.24
Control group I				
Ss 11		72.72	78.78	6.06
Ss 12		11.11	2.77	-8.33
Ss 13		38.71	54.54	19.35
Ss 14		80.65	83.87	3.22
Ss 15		81.82	87.87	6.06
Ss 16		8.33	25.00	16.66
Ss 18		31.25	50.00	18.75
Ss 19		54.84	54.84	0.00
Ss 20		38.71	41.94	3.22
	Mean	46.460	53.290	7.221
	SD	27.915	28.010	9.339
	Range	8.33 - 81.82	2.77 - 87.87	-8.33 - 19.35
Control group II				
Ss 21		48.15	44.44	-3.70
Ss 22		48.15	22.22	-25.92
Ss 23		44.48	45.45	-3.03
Ss 24		69.70	75.75	6.06
Ss 25		39.39	36.36	-3.22
Ss 26		60.61	66.67	6.06
Ss 27		26.67	30.00	3.33
Ss 28		43.33	16.67	-26.67
Ss 29		8.33	19.44	11.11
	Mean	43.201	39.666	-3.997
	SD	17.887	20.718	13.603
	Range	8.33 - 60.61	16.67 - 66.67	-26.67 - 11.11
Total	Mean	43.228	44.278	1.649
	SD	20.802	23.848	13.615
	Range	8.33 - 81.82	2.77 - 87.87	-26.67 - 24.24

A one-way fixed effects analysis of covariance (Nie et al, 1975) using age as the covariate and percentage difference scores as the dependent variable was the technique chosen for the analysis. The hypothesis tested was that no significant difference in motor skill performance existed between the three treatment groups for percentage difference scores. The critical region of rejection for the null hypothesis was calculated at the .05 level to be any F value $\geq$ 3.40 (df = 2,24). The analysis of covariance resulted in an F = 1.094 and an acceptance of the null hypothesis (see Table 4.8).

Table 4.8 Analysis of covariance comparing the percentage change in motor skill performance of the three treatment groups.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Methods	356.746	2	178.373	1.094
Residual	3911.029	24	162.959	
Total	4267.775	26		

There was no difference in the degree of change in motor skill performance of the three treatment groups. It was concluded that parent directed instruction in motor skill development had no significant effect ($p < .05$) on the performance of selected motor skills during a 10 week experimental period.

Discussion

Based on these results of the statistical analysis of the motor skill performance assessment data, it is concluded that the parents of the subjects in this study were not effective instructors of motor skills when compared to either control group. Indeed, inspection of

the means, standard deviations and ranges of the change in motor skill performance based on pre- and post-test assessment data reveal that of all three groups, the group which received additional parent contact in non motor skill activity (control group I) displayed the greatest gain in motor skill performance (see Table 4.7). However, this gain was not significant at the .05 level.

Level of proficiency, gender and age of subjects were considered in an attempt to explain the lack of significance between the parent taught (experimental) group and the control groups. Distribution of males and females across treatment groups was determined as a result of random assignment of subjects to groups and groups to treatments. Level of motor skill proficiency of subjects based on pre-test assessment data was determined to be statistically equal (see Table 4.6). The age of the subjects randomly assigned to treatment groups was analyzed and found to be significantly different ($p < .05$). Consequently, to control for the difference in age of the subjects across the treatment groups, age was used as a covariate when the percentage difference scores of motor skill performance were subjected to analysis.

Three factors which may have had an influence on the results of the experimental group were the extent of parental participation, length of the study and characteristics of the motor skills selected for use in this study. The ten parents who administered the home-based physical education program each indicated a willingness and commitment to the study at the outset. Bi-weekly telephone conferences and a home visit by the investigator provided assurance from parents that they were working each week with their children.

The length of the study may have been a handicap for parents and subjects of the experimental group. Ten weeks may have been an insufficient time allotment for parents to both learn and teach basic motor skills to this population.

It was considered that the characteristics implicit within certain motor skills selected for use in the study may have hindered the overall gain of individual subjects. A frequency table of motor skills was constructed which compared the frequency of change in motor skill performance on a positive, zero and negative change basis (see Table 4.9).

Table 4.9 Frequency of positive, zero and negative change in motor skill performance.

Motor Skill	Positive Change	Zero Change	Negative Change
Run	11	11	1111
Log Roll	11	11	
Jump Down	111		1
Catch	~~1111~~ ~~1111~~	~~1111~~ 1	1111
U.H. Throw		1	1
O.H. Throw	~~1111~~ 111	111	~~1111~~ 1
Roll a Ball		1	1
Kick	1111	111	11
Strike	~~1111~~ 1	1	111
Catch a Ball	1	11	11
Throw a Ball			11
Total	36	22	26

Inspection of this data indicates that change in motor skill performance across motor skill was evenly distributed and is unlikely to have adversely affected the performance of individual subjects of the three groups.

These results do not support the recent findings in the literature (Paciorek, 1981; Horvat, 1982) which suggest that parents can be effective in assisting their handicapped children to acquire selected fundamental motor skills. Further investigation must occur which provides for a larger sample size, a mechanism for monitoring actual parental participation in the teaching process and various techniques for determining effective methods of facilitating parent learning of teaching principles. In addition, future research must attempt to control the variability of subject motor skill performance. Multiple baseline assessment of motor skill performance may provide a more reliable measure of subject performance, especially in research involving handicapped populations.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to investigate the effect of a supplementary 10 week program of home-based physical education on the motor skill acquisition of mildly and moderately mentally retarded children. Twenty-eight mentally retarded children were randomly assigned to one of three treatment groups. The experimental group was provided with motor skill instruction by parents in their home. Instruction was limited to three selected fundamental skills from a list which included the catch, throw, kick, strike, run, jump down, log roll and/or task analyzed derivatives of these skills. Control group I subjects were provided with additional parent contact during each week of the study. Additional parent contact was devoted to non fundamental motor skill activities. Control group II received no treatment. All subjects received sixty minutes of school-based motor skill instruction during each week of the ten week treatment period from one of two adapted physical education teachers. Teacher influence was controlled by equally allocating teacher/subject contact across each of the treatment groups.

The pre-treatment and post-treatment motor skill performance of each subject was determined by two independent assessors using I CAN criterion referenced motor skill assessment items. Assessor accuracy was determined to be greater than 90% immediately prior to

the study's commencement.

A one-way fixed analysis of variance of subject age determined that a significant difference existed among the treatment groups. Consequently, it was decided that age difference should be accounted for in the analysis of percentage difference scores of motor skill performance. The test statistic selected for use was an analysis of covariance with age as the covariate. The hypothesis tested was that there were no significant differences in percentage difference scores of motor skill performance among the experimental groups. Analysis showed that there was no significant difference ($p < .05$).

Conclusions

The following conclusions have been made for mildly and moderately mentally retarded elementary school children and their parents. These conclusions are based upon the results of this study and are generalizable to the motor skill performance of like children who attended the special education day schools from which the subject sample was obtained.

1. There was no significant ($p < .05$) difference in the percentage difference scores of motor skill performance among the three treatment groups.
2. Instruction in motor skills by parents did not result in a significant ($p < .05$) development of fundamental motor skill performance when contrasted with additional parent contact in non motor skill activity.
3. Instruction in motor skills by parents did not result in a significant ($p < .05$) development of fundamental motor skill

performance when contrasted with no motor skill instruction and no additional parent contact.

Based on the results of this study, it can be concluded that the subjects in this study did not significantly improve in motor skill performance following 10 weeks of parent taught motor skill instruction. This conclusion should not serve to deter future research investigating the effectiveness of parents as instructors of motor skills, rather, it should serve to stimulate such investigation.

Recommendations

Level of motor skill proficiency and age are variables which should be controlled. Since ordinal levels of motor skill assessment are normally used to provide evidence of subject motor skill performance, it is important that subjects are equated as nearly as possible prior to the commencement of any research project. This may add more authenticity to results obtained using ordinal levels of measurement and may alleviate the problems associated with assuming that performance change between ordinal levels are equal. Although it is possible to control subject age statistically using analysis of covariance, it would be preferrable to equate groups based on all variables, including age, prior to the commencement of a study.

To allow parents to become more proficient and familiar with motor skill instruction, a treatment period of longer than ten weeks duration should be planned. In addition, prior to the initiation of a home-based program, a comprehensive parent training program of several sessions may be necessary to augment parent effectiveness. Based on the results of this study, it appears unrealistic to expect parents to acquire proficiency in motor skill instruction from a single training session.

A tool should be developed that will provide investigators interested in implementing programs of home-based instruction with a measure of parental attitude and potential effectiveness. This may aid in the selection of parents to implement home-based instruction. Parent instructors of this study were volunteers and were not subjected to an analysis as to their suitability for inclusion in the study. It may have occurred that those parents who volunteered were not suited in character nor experience to provide instruction to their children.

To control for the inconsistent motor performance patterns of mentally retarded children, baseline assessment data should be collected to provide a more reliable measure of motor skill proficiency. Subjects of this study displayed considerable variability of motor skill performance. Inspection of table 4.7 reveals the inconsistant performance of the mentally retarded. A more reliable assessment of motor skill performance of mentally retarded children may be obtained as a result of multiple baseline assessment procedures.

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APPENDIX A

ORIENTATION MEETING

APPENDIX A

PARENT TRAINING STUDY: HOME-BASED PHYSICAL EDUCATION ORIENTATION MEETING

1. JEFF WALKLEY

   a. Graduate student at Michigan State University.
   b. Spent 1983 Winter Term at Beekman (2 days per week).
   c. Involved in Special Olympics at Beekman.
   d. Australian Citizen.

2. IMPORTANCE OF THIS STUDY

   a. Improve quality and quantity of what children learn.

3. STUDY DESIGN

Study Groups	Assessment	School Based P.E.	Home Based P.E.	Assessment
Group One	X	X	X	X
Group Two	X	X		X
Group Three	X	X		X

Group One - receives Home Based P.E. (60 mins) which supplements School Based P.E.
Group Two - receives 60 minutes parent interaction in non-motor skill activity at home as well as School Based P.E.
Group Three - receive School Based P.E. only.

4. ROLE OF PARTICIPATING PARENTS

   Sixty minutes per week minimum involvement with child on motor skill activities child is working on at school.

   Document time spent on activity.

5. SUPERVISION

   One home visit, one phone call per two weeks.

6. CHILD BENEFITS

   Increased motor skill performance can lead to improved physical fitness, efficient use of leisure time and improved self concept.

APPENDIX B

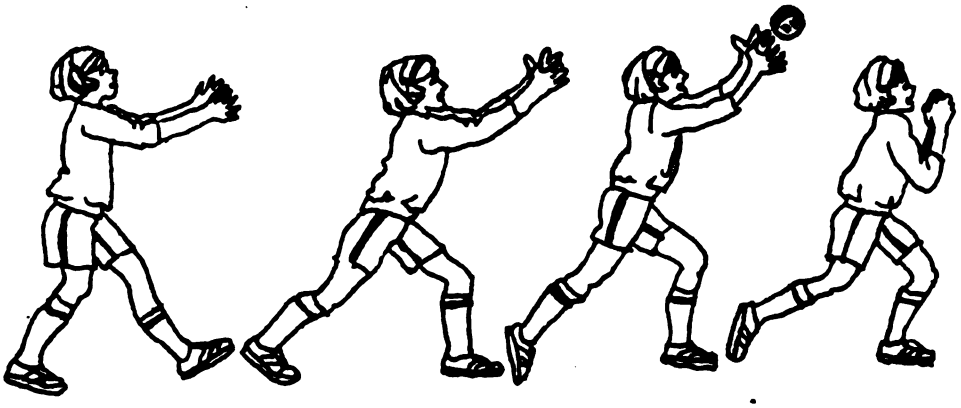
HOME-BASED PHYSICAL EDUCATION PROGRAM

APPENDIX B

H O M E B A S E D

P H Y S I C A L E D U C A T I O N

P R O G R A M *



*Materials in part adapted from Project I CAN (Wessel, 1976).

PARENT TEACHING MODEL

STEP 1 GET READY

Read the student skill checklist, making note of your child's present level of skill performance. You will need to direct your instruction towards achieving the next focal point of the skill being taught.

Assemble all materials which may be needed. Plan the spatial arrangements in the instructional area and set up all necessary equipment before you begin teaching your child. Children learn best when they are free from distractions. Try and find a comfortable, quiet work area in which to instruct your child.

Select a time to teach. Try to pick a time that is best for yourself and your child. The best time for the child would be when they are not tired and can maintain a high interest and energy level. A good time may be just after a favorite T.V. program when your child is happy and alert. This would help to establish a routine, which is important when teaching children.

STEP 2 REVIEW TEACHING STRATEGIES

Read the student skill checklist and determine what level of assistance your child requires to successfully perform the skill.

Always begin each teaching session with an activity you know the child will succeed at. Children learn new skills best when they have experienced success in the past.

Select a spot in your teaching area and always bring your child to that spot before beginning the activity. It is preferable to begin every lesson in the same location.

STEP 3 **TEACH**

Use a variety of practice activities for the same skill. This will help maintain your child's interest and provide motivation. If you find that your child has a favorite activity, use it to help them learn.

Keep the duration of activities short to begin with (5 minutes). As your child becomes more familiar with the home program, gradually increase the duration of instruction (20 minutes maximum), but never work your child when they are tired.

When possible, involve other family members in the teaching session. This is a powerful motivating force which can greatly aid your child's learning.

Give your child several trials at each activity and always pair your verbal cue with a physical prompt (if they are needed). For example, tap your child's leg when you say "step".

Keep directions simple and short and always demonstrate the skill you wish your child to learn. Demonstrate the skill exactly

how you want your child to learn it.

STEP 4 **MOTIVATE AND REINFORCE**

The correct use of motivational and reinforcement procedures will aid your child's learning. Each child reacts differently, but the following methods have proven successful with children in the past.

1) Be enthusiastic and show interest in the acitivities your child and you are sharing together.

2) Show interest in game activities and sports when talking to your child, make them aware that you value this a lot.

3) Each time your child is successful at an activity, reinforce (reward) this behavior. Many children appreciate a smile, pat on the back, or even a hug. Have family members provide reinforcement on occasions of particularly good work. If the child does poorly, encourage them, but never make them feel bad. Reinforcement works best when it is provided immediately after the skill performance.

4) When using targets, make them attractive. Colorful and noisy targets are wonderful motivators.

5) If using home made equipment, have your child help you make it. This will make the child's experience more personal.

6) If possible, have fellow family members demonstrate the skill being worked on by the child.

STEP 5 **RECORD**

Children learn at different rates. It is important that you recognize improvement in your child's skill performance. When your child masters the focal point you are instructing towards, record this on their skill checklist. Instruction in the future should be directed towards achieving the next focal point.

HELPING YOUR CHILD TO LEARN

When instructing your child, you will need to provide assistance of some kind. Try to fade (withdraw) your assistance until the child can perform the skill without your assistance. But remember, don't rush your child, it could cause failure.

Assistance Levels:

Total Physical Assistance; manipulation or physically guiding the student through the entire skill.

Partial Physical Assistance; tapping, applying pressure to the student or some other type of physical prompting at some point during the skill performance.

Demonstration; showing the child what to do by doing it yourself using gestures or other people performing the skill.

Verbal Assistance; providing verbal instruction as the child performs the skill or prior to skill performance.

No Assistance; student skill performance is self initiated (started) by the child without teacher prompts.

STUDENT SKILL CHECKLIST

Catch

There are three skill levels to demonstrate a mature catch. Skill levels 2 and 3 are divided into specific focal points for the catch.

Skill Level 1

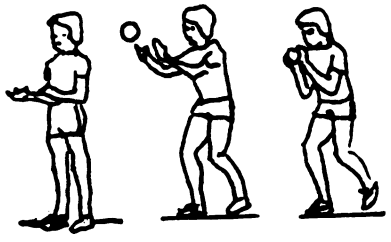
The child can catch or trap, with hands or arms and chest, an 8-12 inch ball lofted directly into his arms from a distance of 3-5 feet without resistance, two out of three times.

Skill Level 2

The child can catch (grasp or trap with hands or arms and chest) an 8-12 inch ball lofted softly to the middle of the chest from a 6 foot distance. The student can do this in two out of three times in this manner:

a. Eyes focused on ball, adjusting the arm position to receive the ball on cue from watching the ball's path.
b. Trap or catch ball with hands or arms and chest.

Skill Level 3



The child can catch a 6 inch playground ball tossed to chest height from a 15 foot distance two out of three times in this manner:

a. Hands in front of the body with elbows bent and near sides in preparatory position.
b. Extension of the arms in preparation for ball contact.
c. Contact the ball with hands only.
d. Elbows bend as arms absorb the force of the ball.
e. Smooth (not mechanical or jerky) integration of four previous points.

Skill Levels

Date	Level 1	Level 2		Level 3				
	a	a	b	a	b	c	d	e
1.								
2.								
3.								

X = Focal points mastered

STUDENT SKILL CHECKLIST

Roll a Ball

Skill Level 1

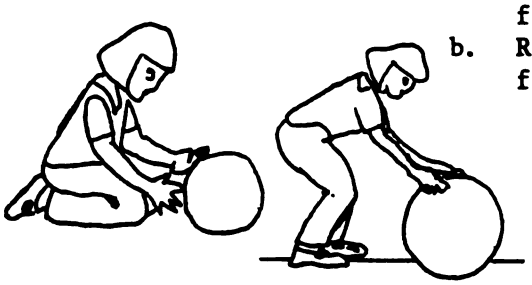
While seated in a stable position, the child will roll a 6- to 14-inch ball with one or both hands 3 consecutive trials in this manner:

a. Grasp the ball with hands and release.
b. Roll or push a ball so it travels at least an arms length.

Skill Level 2

The child will sit or stand and roll or push a 6- to 14-inch ball with one or both hands 3 consecutive trails in this manner:

a. Roll or push a ball so it travels at least 2 feet.
b. Roll or push a ball so it travels at least 5 feet.



Skill Level 3

The child will sit or stand and roll or push a 6- to 14-inch ball with one or both hands to a target 20 feet wide 3 consecutive trials in this manner:

a. Focus eyes on target.
b. Roll or push ball so it travels 8 feet to a target.

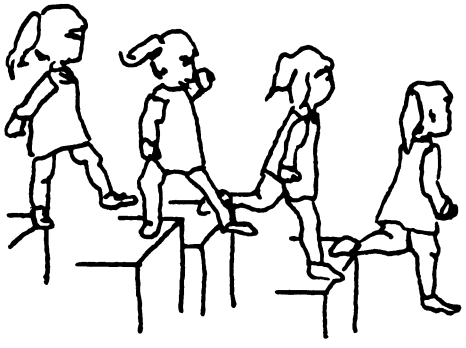
	Skill Levels					
	Level 1		Level 2		Level 3	
Date	a	b	a	b	a	b
1.						
2.						
3.						

X = Focal points mastered

STUDENT SKILL CHECKLIST

Jump Down

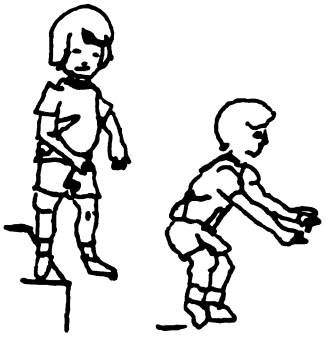
Skill Level 1



The child will step down using a 1-foot take-off 3 consecutive trials in this manner:

a. Step down from a 2- to 4-inch height and land on the opposite foot without falling.
b. Step down from a 5- to 9-inch height and land on the opposite foot without falling.

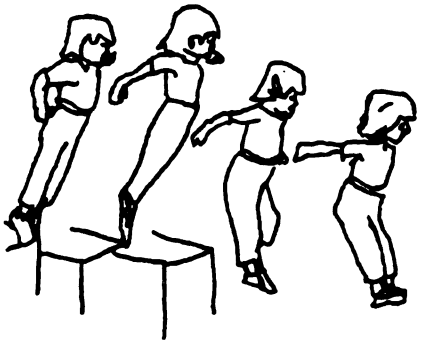
Skill Level 2



The child will jump down from 1 foot to 2 feet 3 consecutive trials in this manner:

a. Jump down from a 2- to 4-inch height and land without falling.
b. Jump down from a 5- to 9-inch height and land without falling.

Skill Level 3



The child will jump down using a 2-foot take-off and land on 2 feet 3 consecutive trials in this manner:

a. Jump down from a 2- to 4-inch height and land without falling.
b. Jump down from a 5- to 9-inch height and land without falling.

Skill Levels

Date	Level 1		Level 2		Level 3	
	a	b	a	b	a	b
1.						
2.						
3.						

X = Focal points mastered

STUDENT SKILL CHECKLIST
Overhand Throw

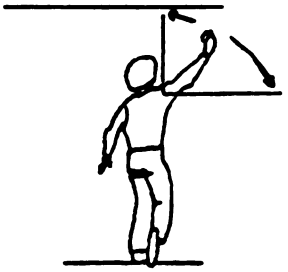
There are three skill levels to demonstrate a mature overhand throw. Skill levels 2 and 3 are divided into specific focal points for the overhand throw.

Skill Level 1

The child with the ability to grasp a ball can throw a 3-4 inch ball a distance of at least 10 feet without resistance, two out of three times in this manner:

a. Overhand motion in the direction of the throw (hand passes above shoulder)
b. Release the ball in the anticipated direction of the throw.

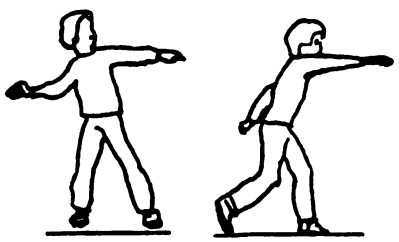
Skill Level 2



The child can throw a 3-4 inch ball toward a 20 inch wide target placed 15 feet away, two out of three times in this manner:

a. Eyes focused on the target
b. Throwing arm motion includes the hand passing above the shoulder.

Skill Level 3



The child can throw a 3-4 inch ball, two out of three times in this manner:

a. Almost complete extension of the throwing arm to initiate windup for the throwing action (assuming a side orientation prior to the throw)
b. Weight transfer to the foot opposite the throwing arm
c. Hip and spine rotation (1/4 rotation) in preparation for and during the throwing action
d. Follow through well beyond ball release and toward the desired direction of travel
e. Smooth (not mechanical or jerky) integration of four previous points.

Skill Levels

Date	Level 1 a	Level 1 b	Level 2 a	Level 2 b	Level 3 a	Level 3 b
1.						
2.						
3.						

X = Focal Points Mastered

STUDENT SKILL CHECKLIST

Underhand Throw

There are three skill levels to demonstrate a mature underhand throw.

Skill Level 1

The child with the ability to grasp a ball can throw underhand a 3-4 inch ball a distance of at least 10 feet without resistance, two out of three times in this manner:

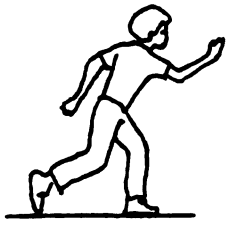
a. Pendular arm swing below the shoulder
b. Release the ball in the anticipated direction of throw (+/- 30°).

Skill Level 2

The child can throw underhand unassisted a 3-4 inch ball toward a 20 inch wide target placed 15 feet away, two out of 3 times in this manner:

a. Eyes focused on the target
b. Throwing arm motion includes arm swing directly below the shoulder; arm is straight but not rigid and the hand passes from behind the thigh to in front of the thigh
c. Release of the ball in the anticipated direction of the throw (+/- 30°).

Skill Level 3



The child can throw underhand a 3-4 inch ball, two out of three times in this manner:

a. Body faces the direction of the throw; shoulders perpendicular to the line of flight
b. Forward stride with and weight shift to the foot opposite the throwing arm
c. Follow through well beyond ball release and toward the direction of throw
d. Smooth (not mechanical or jerky) integration of previous focal points.

Skill Levels

Date	Level 1		Level 2		Level 3	
	a	b	a	b	a	b
1.						
2.						
3.						

X = Focal Points Mastered

STUDENT SKILL CHECKLIST

Throw a Ball

Skill Level 1

The child will release a 2- to 3-inch ball, letting it fall forward into a box or basket placed one foot in front of the student 3 consecutive trials in this manner:

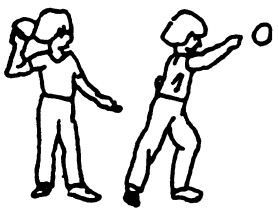
a. Focus eyes on ball
b. Grasp ball with one hand
c. Release the ball so it falls forward into box/basket.

Skill Level 2

The child will toss a 2- to 3-inch ball in a forward direction 3 consecutive trials in this manner:

a. Extend forearm as ball is released
b. Ball travels 5 feet in the air in a forward direction.

Skill Level 3



The child will throw a 2- to 3-inch ball toward a target (e.g. a wall, a parent) 3 consecutive trials in this manner:

a. Focus eyes on the target
b. Draw back arm in preparation for throw
c. Extend forearm as ball is released
d. Ball travels 10 feet in air toward target
e. a, b, c and d.

Skill Levels

Date	Level 1				Level 2		Level 3				
	a	b	c	d	a	b	a	b	c	d	e
1.											
2.											
3.											

X = Focal points mastered

STUDENT SKILL CHECKLIST

Catch a Ball

Skill Level 1

The child will sit and trap a 6- to 14-inch ball rolled slowly 2-4 feet per second and directly to the child from a distance of 3 feet 3 consecutive trials in this manner:

a. Focus eyes on ball
b. Stop ball with hands and/or arms.

Skill Level 2

The child will sit and trap a 6- to 4-inch ball rolled slowly from a distance of 10 feet to within one foot of the right or left side of the student 3 consecutive trials in this manner:

a. Focus eyes on ball
b. Stop ball with hands and/or arms.

Skill Level 3

The child will trap or catch a 6- to 14-inch ball bounced or dropped on the floor to a height between the student's waist and shoulders and no more than 18 inches in front of the student's body 3 consecutive trials in this manner:

a. Focus eyes on ball
b. Extend arms in preparation to receive the ball
c. Contact and control the ball with hands and/or arms after a bounce
d. a, b and c.

Skill Levels

Date	Level 1 a	Level 1 b	Level 2 a	Level 2 b	Level 3 a	Level 3 b	Level 3 c	Level 3 d
1.								
2.								
3.								

X= Focal Points Mastered

STUDENT SKILL CHECKLIST
Two-hand Sidearm Strike

There are three skill levels to demonstrate a mature strike. Skill levels 2 and 3 are divided into specific focal points for the strike.

Skill Level 1

The child can strike a lightweight 6-inch ball suspended at waist height with a plastic bat without resistance, two out of three times, in this manner:

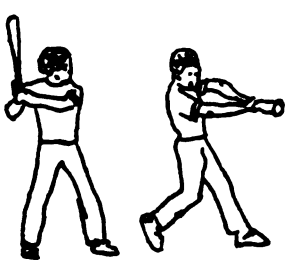
a. Bat swings at approximately waist height
b. Bat swings forward in a horizontal plane during strike and follow through.

Skill Level 2

The child can strike a lightweight 6-inch ball suspended at waist height without a plastic bat without assistance, two out of three times, in this manner:

a. Bat swings at approximately waist height
b. Bat swings forward in a horizontal plane during strike and follow through
c. Eyes focused on ball throughout strike.

Skill Level 3



The child can strike a lightweight 6-inch ball suspended at waist height using a plastic bat with a mature two-handed strike, two out of three times, in this manner:

a. Dominant hand gripping bat (palm up) above non-dominant hand (palm down)
b. Side orientation (nondominant side toward direction of travel)
c. Bat is held behind dominant shoulder prior to strike
d. Hip and spine rotation during swing and follow through
e. Weight transfer from back foot to front foot during swing
f. Follow through well beyond point of contact
g. Smooth (not mechanical or jerky) integration of focal points above.

Skill Levels

Date	Level 1		Level 2			Level 3						
	a	b	a	b	c	a	b	c	d	e	f	g
1.												
2.												
3.												

X = Focal Points Mastered

STUDENT SKILL CHECKLIST

Kick

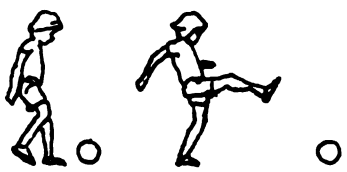
There are three skill levels to demonstrate a mature kick. Skill levels 2 and 3 are divided into specific focal points for the kick.

Skill Level 1

The child can kick a stationary 8-12 inch playground ball at least 10 feet without resistance, two out of three times, in this manner:

a. Pendular leg motion (either foot) propels the ball.

Skill Level 2

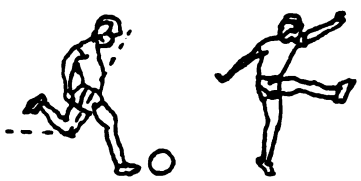


The child can kick a stationary 8-12 inch playground ball at least 15 feet without assistance, two out of three times, in this manner:

a. Pendular leg motion (either foot) propels the ball.
b. Eyes focused on the ball.

Skill Level 3

The child can kick an 8-12 inch playground ball at least 30 feet, two out of three times, in this manner:



a. Step forward on the nonkicking leg with foot landing next to the ball
b. Hip extension and knee flexion (at least 120°) during preliminary kicking motion
c. Contact center of ball with toes or instep
d. Forward swing of arm opposite the kicking leg
e. Follow through of kicking foot in an upward motion
f. Smooth (not mechanical or jerky) integration of focal points above.

Skill Levels

Date	Level 1	Level 2		Level 3					
	a	a	b	a	b	c	d	e	f
1.									
2.									
3.									

X = Focal points mastered

STUDENT SKILL CHECKLIST

Kick a Ball

Skill Level 1

The child will push a stationary 8- to 12-inch playground ball with their lower leg 3 consecutive trials in this manner:

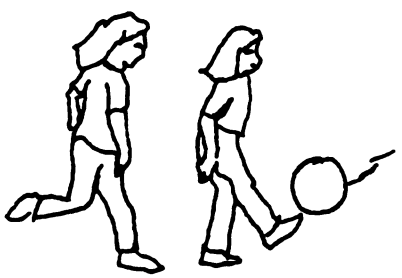
a. Focus eyes on ball
b. Contact ball at some point below the knee
c. Ball travels at least 4 feet in a forward direction
d. a, b and c.

Skill Level 2

The student will kick a stationary 8- 12-inch playground ball 3 consecutive trials in this manner:

a. Focus eyes on ball
b. Swing leg forward to contact ball at some point on foot
c. Ball travels at leaast 6 feet in a forward direction
d. a, b and c.

Skill Level 3



The child will move into position to kick a stationary 8- 12-inch playground ball 3 consecutive trials in this manner:

a. Step forward with nonkicking foot
b. Swing lower leg backward in preparation for the kick
c. Kick ball so it travels at least 8 feet in a forward direction
d. a, b and c.

Skill Levels

Date	Level 1				Level 2				Level 3			
	a	b	c	d	a	b	c	d	a	b	c	d
1.												
2.												
3.												

X = Focal points mastered

STUDENT SKILL CHECKLIST

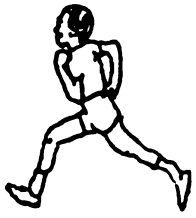
Run

There are three skill levels to demonstrate a mature run. Skill level three is divided into specific focal points for the run.

Skill Level 1

The child with the ability to walk can exhibit consistent periods of nonsupport (both feet temporarily off the ground) for at least half the strides taken over a distance of 50 feet, without resistance.

Skill Level 2



The child can exhibit consistent periods of nonsupport for at least half of the strides taken over a distance of 50 feet, unassisted.

Skill Level 3

The child can run 100 feet at moderate to fast speeds (with a stride at least one and one half times as long as the normal walking stride), in this manner:

a. Knee of nonsupporting leg bent more than 90° from side view
b. Foot placement near or on line (inside edge of foot touching within 2 inches on either side of a 1-inch line)
c. Heel-toe (moderate speed) and/or toe-heel-toe (fast speed) foot placement (not a flat-footed placement)
d. Arms in opposition to legs, elbows bent
e. Smooth (not mechanical or jerky) integration of four points listed.

Skill Levels

Date	Level 1		Level 2		Level 3				
	a	b	a	b	a	b	c	d	e
1.									
2.									
3									

X = Focal point mastered

STUDENT SKILL CHECKLIST

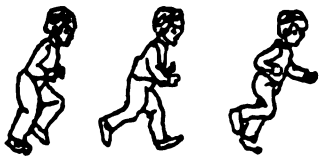
Run

Skill Level 1

The child will perform a walk-run 3 consecutive trials in this manner:

a. 1 or more periods of nonsupport (instances where both feet are off the ground) within 15 steps.
b. 3 or more periods of nonsupport within 30 steps.

Skill Level 2



The child will run a distance of 30 feet 3 consecutive trials in this manner:

a. 5 or more periods of nonsupport
b. Run within a 24-inch wide path
c. Run around a circle (diameter = 10 feet)

Skill Level 3

The child will maintain skill level 2 for:

a. 2 weeks after attainment
b. 6 weeks after attainment.

Skill Levels

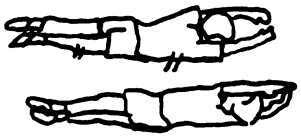
Date	Level 1 a	Level 1 b	Level 2 a	Level 2 b	Level 2 c	Level 3 a	Level 3 b
1.							
2.							
3.							

X = Focal points mastered

STUDENT SKILL CHECKLIST

Log Roll

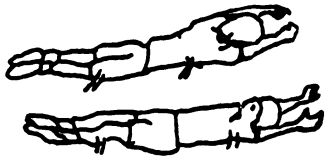
Skill Level 1



The child can perform a quarter roll 3 consecutive trials in this manner:

a. Roll fromm front to side, arms extended overhead
b. Roll from back to side, arms extended overhead

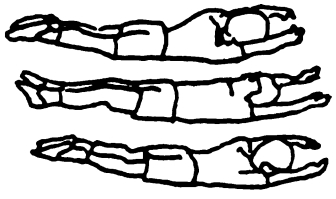
Skill Level 2



The child can perform a half roll 3 consecutive trials in this manner:

a. Roll from front to back, arms extended overhead
b. Roll from back to front, arms extended overhead

Skill Level 3



The child can perform a log roll 3 consecutive trials in this manner:

a. Roll from back to front, arms extended overhead
b. Roll from back to front to back, arms extended overhead.

Skill Levels

Date	Level 1 a	Level 1 b	Level 2 a	Level 2 b	Level 3 a	Level 3 b
1.						
2.						
3.						

X = Focal points mastered

APPENDIX C

PARENT TRAINING AGENDA

APPENDIX C

HOME-BASED PHYSICAL EDUCATION

PARENT TRAINING AGENDA

1. Reiterate purpose of study.

2. Overview home-based physical education handbook

   (a) Format
   (b) Content (subject specific)

3. Outline systematic approach to instruction as presented in handbook.

4. Outline selected fundamental motor skills that subject will work toward mustering

   (a) Identify skills
   (b) Identify focal point toward which instruction is to be focussed.
   (c) Identify pre-assessment results.

5. Structure a teaching session. Allow each parent an opportunity to practice instruction techniques during home visit.

6. Outline activity log and parental responsibilities.

7. Question/Answer session.

APPENDIX D

HOME VISITATION AGENDA

APPENDIX D

HOME-BASED PHYSICAL EDUCATION

HOME VISITATION AGENDA

1. General introduction.

2. Discuss instructional progress

   (a) Content/activities employed
   (b) Areas of concern (supplement with additional suggestions from investigator).

3. View parent/subject instructional activity session and provide feedback.

4. Reassess subject to ascertain correct instructional focus.

5. Summary

   (a) Overview other parent/child instruction dyads and their progress
   (b) Conclude with supportive statements.

APPENDIX E

ASSESSMENT INSTRUMENT

I CAN

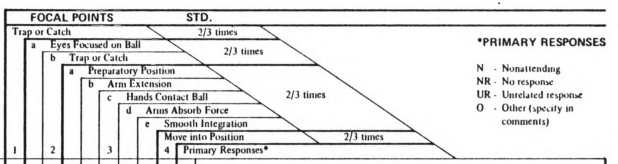
CLASS PERFORMANCE SCORE SHEET

PERFORMANCE OBJECTIVE: Catch

SCORING

Assessment:
X = Achieved
O = Not achieved

Reassessment:
⊠ = Achieved
Ø = Not achieved



***PRIMARY RESPONSES**

N - Nonattending
NR - No response
UR - Unrelated response
O - Other (specify in comments)

NAME	1	a	b	2	a	b	c	3	d	e	4	COMMENTS
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												
10.												
11.												
12.												
13.												
14.												
15.												

APPENDIX F

REGISTRATION INFORMATION

APPENDIX F

Dear Parent,

I am writing to you to inform you of a study being undertaken this Spring which you may wish to participate in. The study will examine the effect that home-based physical education has on the development of motor skills in exceptional children.

The study has the support of (School Principal) and the physical education staff at (School Name), (physical education staff names). In addition, the research will be supervised by Dr. Luke Kelly, Dr. John Haubenstricker and Dr. Crystal Branta at Michigan State University.

Participating parents will be requested to spend 60 minutes each week in play activities at home with their children, helping them to learn motor skills such as the hop, catch, or bounce. The study will be conducted for ten weeks during the Spring entirely free of cost to parents. Parents may discontinue their involvement in the study at any time. I CAN assessment procedures will be used to pre- and post-test children and to assess their change in motor skill performance. All results of the study will be treated with strict confidence and the participants will remain anonymous. On request, results of the study will be made available to participants concerning their involvement.

Since openings are limited, you are encouraged to return the form below to (Name of School) as early as possible if you wish to participate.

Yours sincerely,

Jeff Walkley

Mr. Walkley:

I am interested in the motor skill development study. I can be contacted at:

Contact phone number:_____

Mr.
Mrs._____
Ms.

Please phone me during the:

_____ morning, 8:00am to 12:00pm

_____ afternoon, midday to 5:00pm

_____ evening 7:00pm to 9:30pm