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THE EFFECT OF A THERAPEUTIC PLAY PROGRAM ON THE DEVELOPMENT OF PRESCHOOL NEUROLOGICALLY IMPAIRED CHILDREN

By

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ABSTRACT

THE EFFECT OF A THERAPEUTIC PLAY PROGRAM ON THE DEVELOPMENT OF PRESCHOOL NEUROLOGICALLY IMPAIRED CHILDREN

By

Joanne FitzGerald

The purpose of this study is to determine the developmental effect of incorporating therapeutic play into the physical therapy program of neurologically impaired, preschool children. A quasi-experimental design was used for this study.

Eighteen preschool, neurologically impaired children, selected from three physical therapy programs in southern Michigan were matched into pairs based on their child's pretests's overall developmental quotient. Pre- and posttests were administered to each subject with a comprehensive developmental exam. The experimental group was involved in a weekly therapeutic play program for eight weeks. Play activities were selected for each session based on the subjects' physical therapy goals.

The results of this study, as determined by the Wilcoxon Sign Test for Matched Pairs, demonstrated a significant change in both overall and gross motor development. No significant changes were noted for the manipulative, reflexive, expressive language and cognitive-social developmental areas.

ACKNOWLEDGEMENTS

The writer wishes to extend her appreciation to the many people who contributed to this thesis.

This thesis was part of a joint study done in conjunction with another physical therapist, Dawn Welch. It was designed to determine the developmental effects of a therapeutic play program and a parent education program on play for preschool, neurologically impaired children. Working with Ms. Welch was both enjoyable, educational and facilitated the ease of doing the total study.

Thanks are extended to the committee members Dr. Marcia Carter, Dr. William Heusner and Sr. Barbara Cline. Without Dr. Heusner's enthusiasm and assistance with the statistical analysis, Dr. Carter's encouragement, and Sr. Barbara Cline's interest and knowledge in this area of play this thesis would have been much more difficult to complete.

To the volunteers who assisted in the conduction of the therapeutic play program, the writer wishes to express her appreciation for their continued cooperation and assistance throughout the duration of the study.

To the children, their parents and the staff of the Wayne-Westland and Durant-Tuuri-Mott school systems and Ingham Medical Center, special thanks are extended for their willingness to participate in the therapeutic play program.

Many thanks are also extended to the Michigan Easter Seal Society, who donated funds for the implementation of this study. Without this aid the thesis could not have been completed.

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CHAPTER I

THE PROBLEM

Play assumes an important role in the physical, social, intellectual and emotional development of children (Piaget 1969, Caplan and Caplan 1973, Herron and Sutton-Smith 1971, and Freeman 1967). Through play, the child learns to control his movements and his environment, to deal with life's stresses and strains, to adapt his feelings and emotions to society's demands and to develop satisfactory interpersonal relationships (Noble 1967). Fretz (1969) and Van Dalen (1947) have shown that play and physical activities do affect strength and motor performance. Social roles are first learned through play by playing at socialization. References have been made to play's major role as a medium for learning and acquiring other cognitive skills (Ellis 1971, Moffitt 1972, Piaget 1969, Herron and Sutton-Smith 1971).

The neurologically impaired child, whose sensory input and motor output are abnormal, is not able to have the same experiences as a child with normal sensation and movement. Due to both sensory and motor impairments this child is unable to integrate these input-output processes. Free play with others or with items of his own choosing is not possible. His outlook on reality and his awareness of his own capabilities are limited (Lemkau 1967). As a result of this deprivation, as well as the need for decreasing abnormal tone and movement (all of which are major goals of a physical therapy program for the neurologically impaired child), he

needs an enhanced opportunity for playful interaction and stimulation as early as possible. The additional time that is needed for treatment services and basic home care activities (such as feeding and dressing), often decreases the time during which the neurologically impaired child is exposed to a play environment. Due to the longstanding idea that the younger the child the greater his ability to learn, professionals in medical and educational fields advocate early intervention and treatment for a child with this type of impairment (Bobath 1967, Hartley and Frank 1952, Martin and Ovans 1972, and Caldwell 1967).

Since these children are often involved in physical therapy programs and since play is an important adjunct in child growth and development, it may be beneficial to implement play into such a treatment program. There is, therefore, a need to study the developmental progress of these children after their participation in a program which combines physical therapy treatment and play.

NEED FOR THE STUDY

Relatively little research has been done in the area of play and its role in the overall development of neurologically impaired children. That which has been done has been of the observational variety. Since it has been documented that play assumes an important role in a child's developmental progress (Caplan and Caplan 1973, Piers 1972, Herron and Sutton-Smith 1971, Whiren 1976) more experimental study should be conducted to establish the importance and benefits of play

for neurologically impaired children. It is also necessary to determine the beneficial types of play for these children and the various ways in which it can be effectively presented to them.

No research data dealing with the effects of incorporating play into a physical therapy treatment program has been found by this writer. Physical therapy is a service which is provided to most of these children, and could be an appropriate service to present to children in a playful manner in order to increase their exposure to play. Involving play in treatment may serve to make therapy a more enjoyable experience. Many physical therapists do not include play in their treatment plans for their preschoolers. Physical therapy curriculums do not suggest play as a modality to be incorporated into the treatment program for these children. Investigating the developmental effects of integrating play into a pediatric physical therapy program would demonstrate to both therapists and educators the effects on the children that play could have when included in their treatment program.

PURPOSE OF THE STUDY

The purpose of this study was to determine the effects of incorporating therapeutic play into the physical therapy treatment program of neurologically impaired preschool children. Specifically, the study was designed to monitor changes in the physical, social and intellectual development of such children.

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RESEARCH HYPOTHESIS

The hypothesis to be tested by this study is that a significant improvement in physical, social and/or intellectual development will be noted after the implementation of a therapeutic play program in the physical therapy treatment of the preschool neurologically impaired child.

ANTECEDENT PROBLEMS

Two antecedent problems were recognized and dealt with before the commencement of this study.

1. A scale was needed to evaluate developmental progress in children from one through four years of age in the areas of physical, social and cognitive development.
2. A determination was needed as to whether or not the group activities incorporated in the therapeutic play program adequately met the program objectives. A pilot study, simulating the experimental play group, was conducted and evaluated by experts in order to resolve this problem.

RESEARCH PLAN

This investigation was conducted in conjunction with a companion study in order to afford an overall approach to the problem. Twenty-seven children were involved in the combined study, and the sample was selected from three pediatric physical therapy programs located in southern Michigan.

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These included the Roosevelt-McGrath School in Wayne, Michigan, the Durant-Tuuri-Mott School in Flint, Michigan and Ingham Medical Center in Lansing, Michigan. Three comparison groups were established at all three centers:

Group A: The control group for this study was composed of 9 subjects - three from each of the 3 locales. The subjects in this group continued to attend their normally scheduled physical therapy treatment twice a week for 1 hour.

Group B: This group was composed of 9 other children, 3 from each of the 3 locales. These subjects also continued with their therapy treatment once a week for an hour and participated in the experimental therapeutic play program once a week for an hour. This group was the experimental group for this study and the control group for the companion study.

Group C: This group, the experimental group for the companion study, was composed of the remaining 9 subjects, three from each of the 3 locales. These subjects received their therapy treatment once a week for an hour and participated in the experimental therapeutic play group once a week for an hour. In addition to this, their parents were involved in a parent education program dealing

with play and its importance for the neurologically impaired child.

The purpose of the companion study was to determine the developmental progress of the subjects after their parents' involvement in a parent education program focusing on play. This program's duration and time schedule followed that of this research study's therapeutic play program schedule.

In this study an available sample of eighteen preschool, neurologically impaired children were selected from the three designated physical therapy programs. All subjects were between one through four years of age. Only two of the three comparison groups were included in this study: the control group A and the play group B. The eight week therapeutic play program was designated as the independent variable. Three children in each of the three locales were involved in the play group. Three other children in each locale were placed in the control group. Subjects involved in the study were matched into pairs according to their overall developmental quotient.

The therapeutic play program included chosen activities intended to enable the achievement of selected program objectives and sub-objectives. These objectives and those of the companion study may be found in Appendix A. The program was developed and implemented using a modified systems approach. This approach is a systematic method of program planning allowing the designer to select a course of action based on the assessment of the problem. Systems analysis

includes defining objectives, analyzing alternatives and possible outcomes, and evaluating the total program plan in its building stages and its finished product (Peterson 1976).

A pre-test was administered one week prior to the start of the eight-week program and a post-test was administered one week following the termination of the program. The dependent variables measured in this study were the reflexive, gross motor, manipulation, expressive language and cognitive-social developmental progressions as described by the developmental scales used in this study. The gain scores in each developmental category were determined for each subject and compared to their matched partner. The Wilcoxon Sign Test for Matched Pairs was used to determine if a significant difference between the comparison groups existed.

Rationale for Research Plan. Although many children with various problems and disabilities are involved in physical therapy programs, defining and limiting the population to preschool children with neurological impairments facilitated the selection of a more representative sample and helped assist in the control of the confounding variables. These children are often involved in physical therapy programs and comprise a large percentage of the physically impaired preschool population.

Preschool children, between the ages of one to four years, were chosen because it has been documented repeatedly that the greatest amount of developmental change can take place during this period of time, and that early intervention

is important. (Bobath 1967, Caldwell 1967, Hartley and Frank 1952). Five and six year olds were not selected because many of them by this time are now in kindergarten settings. Those under one year old were not chosen because many of these children have not been diagnosed and thus are not in programs. Their inclusion would decrease the possibility of obtaining a representative sample. An eight week program was of a realistic duration for this study in order to maintain the parents' and childrens' interest and cooperation. A longer period of time for the study, though, most likely would have shown a more acceptable picture of the differences in development between the two comparison groups.

The research design facilitates evaluation of the developmental progress of each child in five areas. Research on this study's topic is usually done by observational methods, but can be adapted to an experimental-control research design, even though significant limitations do exist. In this design the differences between the pre- and post-test scores were evaluated and a comparison of gain scores within each matched pair was noted. The data was then analyzed to determine if significant differences existed between the control and experimental subjects. Nonparametric statistics were used because of the small sample size.

The El Paso Comprehensive Developmental Evaluation Chart (EPCDEC) was chosen as the primary evaluation tool for this study because it could be used to evaluate those areas of development that are of interest to this investigator.

Normative values are provided at two-week intervals for the first year of life. Many preschool, neurologically impaired children do not progress much further than the normal one year old child in some developmental areas. Therefore, a scale with small gradations in normative values within the first year was needed to determine developmental progress over such a short period of time. The Denver Developmental Screening Test (DDST) was used to extend the developmental scale for those subjects who developmentally tested above three years of age. Developmental items in each area for both tests were correlated. For those children whose development extended beyond that measured by the EPCDEC, administration of both tests was performed. In addition, the Vulpé Play Assessment was used to supplement the data in the cognitive-social developmental area. No statistical analysis was done on this test's results.

Assumptions. The assumptions underlying the conduct of this study are as follows:

*1. A representative group of children with neurological impairments was available to the researcher.

2. The scales used adequately measured developmental changes in the five stated areas.

*It is now mandated (PL 94-142) that all children below the age of twenty-six must be provided a free, comprehensive education and health service program. Therefore, all diagnosed children with neurologic impairments should be involved in some therapy program.

3. Physical therapy treatment has a beneficial effect on the developmental progress of a neurologically impaired child.

**4. There was no pre-test effect on the post-test scores.

5. The play activities chosen for the physical therapy program appropriately and adequately met the purpose, objectives and sub-objectives of this investigation.

6. The program activities in the therapeutic play sessions afforded a "fun" atmosphere, incorporating a playful approach by the volunteers and group leader.

Limitations. The limitations to be concerned with in this study are as follows:

1. The cooperation of the parents, subjects and volunteers may not have been consistent.

2. The philosophy, cooperation and truthfulness of the administration and personnel may have varied in the three facilities.

3. Socio-economic and racial factors could not be controlled.

4. The physical therapy treatment programs for the subjects may have varied due to the differences in the subjects themselves, their therapists' treatment approaches and/or the facilities' treatment rationale.

**The items in the developmental examination are nonspecific and can be evaluated in different ways through observation.

5. The possibility of illness, inclement weather or other unanticipated factors, such as a change in work schedule, may have prevented continuation in the program of one or more subjects.
6. The philosophy and attitudes of the researcher and volunteers may have biased the study's results, though the variables and evaluation measures were selected because of their objective nature.
7. The attitude of the primary investigator may have differed from that of other group leaders' attitudes.
8. The short duration of the program may not have been sufficient to produce measurable changes.
9. Test reliability and validity of the developmental exam to be used has not yet been completely researched, though work in this area has begun.
10. The inability to randomly assign subjects to treatment groups could have affected the study's results.
11. The amount of play and playfulness in the home environment and during therapy could not be regulated.
12. The small sample size was utilized because it enabled the researcher to perform all pre- and post-tests, and to conduct all therapeutic play groups.

An attempt was made to control these factors as much as possible.

DEFINITIONS

Neurologically Impaired. Any central nervous system defect manifesting a motor disability such as hypertonicity, can be classified as a neurologic impairment. Examples of

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specific conditions which were included in this study under the definition of neurologically impaired are: cerebral palsy, post encephalitis, post meningitis, hydrocephalus, post traumatic head injuries and cerebral tumors. Conditions not dealt with in this study were: Downs Syndrome, peripheral nerve injuries, myelodysplasia and benign congenital hypotonias.

Parent Education Program. An eight week program for parents focused on attitudes about play, knowledge about the value of play for neurologically impaired children, and adaptations and modifications of play activities and equipment for parents of preschool, neurologically impaired children.

Physical Therapy for the Neurologically Impaired Child. An individualized, goal-oriented session was conducted twice a week, emphasizing inhibition of abnormal reflexes and muscle tone, facilitation of normal muscle tone, motor patterns and developmental sequence, maintenance of range of motion, increase of strength and endurance, improvement of balance and coordination, and improvement of ambulation and gait pattern.

Play (for the neurologically impaired child). Behavioral characteristics which are self-initiated, pleasurable and internally motivated experiences and which are both receptive and/or expressive, constituted the entity of play.

Playfulness. Lieberman defined playfulness as a: "personality trait characterized by the quantity and quality of physical, social and cognitive spontaneity, manifest joy and sense of humor" (Lieberman 1966).

Preschool. Children between the ages of one year zero months to four years eleven months were designated as preschool for purposes of this study.

Therapeutic Play. Play activities for neurologically impaired children emphasizing self-initiated, pleasurable experiences (fun), which are oriented towards therapeutic goals i.e. optimal positioning, use of involved extremities, normalization of muscle tone and motor patterns and facilitation of mobility, constituted therapeutic play.

Therapeutic Play Program. An eight week planned program of group play activities, which was designed to meet previously determined therapeutic goals.

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CHAPTER II

REVIEW OF THE LITERATURE

In this chapter the writer will cover several areas involving literature dealing with play. These include the definition of play, the importance of play to the preschool child, the therapeutic values of play in physical, social, cognitive and emotional areas, the application of play to the child's developmental progression, the need the physically impaired child has for play, the effect that a neurological impairment has on one's play ability and the inclusion of play in educational and therapeutic programs for preschool, handicapped children.

ORIGIN AND APPROACHES TO PLAY

Play has been an integral part of life since before mankind (Suomi and Harlow 1970). Although recognition and research of this phenomena did not commence until the end of the eighteenth century, play has been considered important in life and development since the times of Plato and Aristotle (Sapora and Mitchell 1961, Rogers 1932).

Many theories have been presented since the beginning of the century, but none seem to define completely what play is, nor have any of them been thoroughly researched or validated. Gilmore has classified these theories into three categories: 1) classical (traditional) theories - concerned with the purposes of play and the elements in man's nature that lead him to play; 2) recent theories - concerned with

the actual form of play behavior; 3) modern theories - concerned with explaining play behavior in terms of a drive to maintain optimum arousal (Ellis 1972). The relevant points presented in each theory will be included as needed to support the content covered in this review.

DEFINITION OF PLAY

No one definition has been assigned to the entity 'play', but many qualities and characteristics have been attributed to play. Various attempts at defining play have been: 1) "an aimless expenditure of energy" (Schiller); 2) "a natural exercise of mind and body" (Gutmuth); 3) "the unfolding of the germinal leaves of childhood. . . makes use of recently acquired skills or involves changes of touch, sound and sight and is amusing" (Froebal); 4) "a free, aimless, amusing, diverting activity" (Lazarus); 5) "motor habits and spirit of the past persisting in the present" (Hall); 7) "instinctive practice that is preparation for but not important in later life" (Groos); and 8) "A do what we want attitude" (Gulick) (Sapora and Mitchell 1961, Millar 1968).

Traditionally, play has been defined as natural, voluntary, free, novel, self-rewarding, diverse, spontaneous and intrinsically motivating. It allows for mastery over anticipated outcomes and for a free choice of play instruments, play behavior and play time involved (Caplan and Caplan 1973, Herron and Sutton-Smith 1971, Sutton Smith and Sutton Smith 1974).

Play is an activity performed for its own sake with no serious consequences intended (Sapora and Mitchell 1961) that usually occurs in a relaxed atmosphere (Herron and Sutton-Smith 1971). Freud states that

> The child distinguishes play from reality, but uses objects and situations from the real world to create a world of his own in which he can repeat pleasant experiences at will, and can order and alter events in the way that pleases him best. The child wants to be grown-up and to do what adults do. In play this is possible (Millar 1968).

Piaget says that play occurs when the effort in adapting to an object, action or person relaxes. Play involves the maintenance or repetitive exercise of an activity for the mere pleasure derived from mastering it, thereby acquiring a feeling of power (Piaget 1969). Play can make reality more meaningful by distorting reality and associating it to something more familiar to the individual (Herron and Sutton-Smith 1971). Berlyne in his Ludic Theory claims that play is something engaged in for its own sake and for pleasure, in order to seek a particular kind of external stimulation, imagery and thought (Reilly 1974).

A most important element of play is the quality of fun that accompanies this phenomena. "Play is most fun and most playful when it is spontaneous, evolving from an integration of impulses and ideas and providing expression, release, sometimes climax, often mastery, with a degree of exhilaration and refreshment." (Erikson 1972). Huizinga (1949) proposes that fun, resisting all analysis, is the essence of play.

Another entity derived from play is playfulness. In defining this term Erikson states that, "maybe such phenomena as playfulness or youthfulness or aliveness are defined by the very fact that they cannot be wholly defined." (Erikson 1972). Moran states that one's attitude and one's degree of involvement in an activity determine playfulness (Moran 1974). Lieberman proposes a scale for the measurement of playfulness: 1) amount of time engaged in spontaneous physical movement and activity during one's play; 2) amount of joy portrayed during play activities demonstrated by facial expression, singing, repetition of activity; 3) amount of time a sense of humor is portrayed during play, i.e. rhyming and gentle teasing, glint in the eye and seeing situations as funny; 4) amount of flexibility shown in one's interaction with surroundings (Herron and Sutton-Smith 1971).

Play, along with fun and playfulness are three entities for which there is no standard definition or meaning. The careful reader is therefore left with descriptions and attempted interpretations of play and playful behaviors as the results of early efforts to define the concept "play".

THE BENEFITS OF PLAY

Play allows growth in mind and body and provides the impulse to create and achieve (Harvey and Hales-Tooke 1972). It "allows access to a multiplicity of groups which promote a diversity of experiences and interests" (Reilly 1974). Opportunities for voluntary repetition and competition, encouragement and a safe atmosphere to experiment and plan

model situations to cope with risky operations within reality are provided through play (Reilly 1974, Herron and Sutton-Smith 1971).

Play facilitiates the development and expression of neuromuscular, perceptual-motor, sensorimotor, social, language and cognitive skills (Moran 1974, Wheman and Abramson 1976). Much documentation and research has been proposed concerning these specific aspects and benefits of play.

Effects on Physical Development and Condition. Through active play circulation, respiration, excretion, skeletal and muscular growth and cardiac function are all advantageously affected (VanDalen 1947). Play involves fundamental movements of the body that are naturally and progressively performed. Large muscle activities, especially when using the trunk musculature, stimulate growth, improve posture and maintain good function of the body organs. With movement neural activity increases and neuromuscular control improves. This leads to an improvement in skill, accuracy, endurance, agility, strength and coordination (Sapora and Mitchell 1961, Rogers 1932). Changes have also been noted in motor reflexes and reactions through an improvement in neuromuscular skill after involvement in gross motor activities (Sapora and Mitchell 1961). Through play the child is able to test various motor skills such as somersaults, rolling, etc.(Caplan and Caplan, 1973). Sensation and perceptual-motor skills have been shown to be affected through play (Marx 1973). Because

children with neurological impairments are unable to experience normal motor patterns on their own, exposure to gross and fine motor play activities is important.

Language especially through group experiences is also facilitated through play (Leyland 1976). "By playing with his lips and tongue he (the child) prepares for vocalizing and speech" (Pearson 1972). Play is a base for language building. Words evolve from a foundation of play experiences, from encounters with people, objects and wordly events. The young child delights in experimenting with different word shapes and discovering the meaning of words. Repetitive, rhythmic vocalizations signify playful states (Garvey 1977). Since play is an adjunct in facilitating language development, children with speech and hearing problems, which many neurologically impaired children have, often suffer mentally, emotionally and socially due to a diminished exposure to language developmental processes. Thus, they may benefit from play experiences (Caplan and Caplan 1973).

Effects on Social Skills. "Other skills which are necessary for successful development and growth are those which might be called 'social skills', such as cooperation with others, self-discipline and self-relevance." (McClellan 1970). Play provides opportunities for character growth and discovery. Cultivation of tastes through personal integration, social adaptation and cooperation is provided through play (Martin and Ovans 1972). Play is adjunctive in developing interpersonal relationships. Developing the ability to be

willing, to follow directions, to obey rules and regulations and to accept decisions and disciplinary actions are attributes of play. Increasing self-help skills, improving self-direction and establishing one's identity can also be nurtured through play (Moran 1974).

Imitation of peers helps to shape development (Reilly 1974). Children are susceptible to suggestion,and they imitate mores, attitudes and personal experiences (Sapora and Mitchell 1961). Suomi and Harlow (1970) in their animal studies have found that play is important in social development because through play social function can be integrated, initiated and perfected.

Early social development approximates the manner in which children deal with play materials and with each other. Social interaction starts with the parent (Cratty 1970). The toddler is egotistical and asocial in his play, but he is interested enough in other people and objects to explore them (Harvey and Hales-Tooke 1972). Leadership starts to appear between the ages of two and three. It manifests itself either as the "diplomat" who acts through artful and indirect suggestions or the "bully" who with brute force bosses a small group. Between the ages of three and four cooperation starts to manifest itself through imitation and approval seeking (Cratty 1970).

Effects on Cognition. Play has been acknowledged for centuries as an important medium for learning. Plato in 380 B.C. said, ". . . in teaching children, train them by a kind

of game and you will be able to see more clearly the natural bend of each." (Moran 1974). Much has been written concerning the benefits of play on intellectual development. Moffitt has broken down percepto-cognitive skills and suggested some play activities that could be used to improve these skills. She emphasizes that play is a medium for learning (Moffitt 1972). Through play definitions of words and concepts, listening techniques, performance of mental tasks and an understanding of the environment increase (Moran 1974).

Piaget (1969) examined the relationship of play and learning. He said,

> Intellectual adaptation occurs when the two processes balance each other, or are in "equilibrium'. When they are not, accommodation or adjustment to the object may predominate over assimilation. This results in imitation. Alternatively, assimilation in fitting the impression in with previous experience and adapting it to the individual's needs may predominate. This is play. It is the pure assimilation which changes incoming information to suit the individual's requirements. Play and imitation are an integral part of the development of intelligence, and, consequently go through the same stages.

Piaget also says play integrates concepts from social and objective worlds, reproduces what he has encountered and evokes what pleases him (Piaget 1969). Several other authors have written about the importance of incorporating play into learning situations (Caldwell 1964, Ellis 1973, Martinello 1973, Marzello and Lloyd 1972 and Wolfgang 1974).

Emotional Aspects. "It is through play that the young child learns to master his environment, to deal with the strains and stresses of daily living, to adapt himself and his emotions

to the demands which society makes upon him and to make satisfactory relations with the people around him." (Noble 1967). Moran stated that it is through play that one develops a concept of self and that play is the medium for personality development. As success is experienced through play, an increase in confidence, desire, drive and motivation is noted (Moran 1974).

Psychological needs and drives are expressed through play. It redirects and channels aggression and regression, and achieves a state of emotional balance. Clarapedè in the Psychology of the Child states that "The function of play is to allow the child to express his ego, to display his personality, to pursue momentarily the line of his greatest interest in cases when he cannot do so through serious activity." (Piaget 1969).

Play therapy is a technique incorporated into the therapy for children with emotional impairments. Through play, a "natural medium for self-expression, the child is given the opportunity to play out his accumulated feelings of tension, frustration, insecurity, aggression, fear, bewilderment and confusion." By playing out these feelings he brings them to the surface, gets them out in the open, faces them, learns to control or abandon them (Axline 1969). Freud and Klein have found that through play therapy children are encouraged to free themselves of negative feelings through processes identified as purging, transferring or assimilating (Ellis 1973).

Play, normally, assists the child to master fear, anxiety and passivity; the handicapped child may be denied this assistance. Physical handicaps may lead to "emotional immaturity", dependency, poor reality-testing, poor impulse control and stereotyped activities. Lack of play experiences may lead to excess daydreaming, an inability to form strong emotional ties and an inability to individualize and redirect fantasies (Freeman 1967).

DEVELOPMENT OF PLAY

Man, known as the highest functioning member of the animal kingdom due to his adaptability and intellectual facilities, maintains the longest period of protective childhood during which time practice through play and imitation is experienced (Groos)(Reilly 1974).

> Play contributes to the total development of the child, integrating within his natural tendencies to explore the people and artifacts of his culture, his abilities to observe, do, learn and feel. Most play activities use all aspects of development. The children do not recognize the potentials for motor coordination for concept development, for practicing the social skills so necessary for a full and wholesome life. They are just 'playing' (Wolfgang, 1974).

Exploratory, play the first type seen, is initiated by novel stimuli in the environment (Wolfgang 1974). While playing with an object the infant acts upon it to produce interesting visual, auditory or kinesthetic effects which are intrinsically rewarding and lead the child to repeat these actions. The more one is exposed to play, the more patterns of exploration and play he exhibits. An increase

in gross motor coordination and manipulation serves to generate cognizance of the general properties of various objects. This leads to concept formation (Collard 1972). A sociodramatic play stage follows. Imaginative play, Smilansky says, is important in the development of abstract logical thinking and information usage (Collard 1972). This play is a precursor of creativity along with promoting effective interaction. Fantasy play provides a concrete method of expressing hope, fears, needs, wishes and desires (Moran 1974).

Piaget has evolved a developmental schema of play, which he defines as a "distorting continuation of assimilation." Sensorimotor play connotes the first stage; an object is assimilated to an earlier known schema without new accommodation or anticipation of later causal sequences (Piaget 1969). Here the child, when confronted with novel objects, explores them and tries out motor patterns he previously applied to other objects (like pushing a hanging toy). This is tested and repeated over and over, making small adaptations with each trial. At twelve to eighteen months he is an active, systematic experimenter, learning to move towards behavioral actions without objects and initiating symbolization, pretense and make-believe. The next stage, symbolic or make-believe play which lasts from two to seven years is characterized by actions which are appropriate to one object and are substituted for another object. Spontaneous talk and answers to questions begins.

He starts to assimilate and consolidate emotional experiences. With the growing experiences of his physical and social environment, a transition to a more accurate picture of reality begins (Millar 1968). These activities lead to more representational thinking. Ages three through five involve an egocentric stage. Imitation of older children who do follow rules is present (Knox 1974). The pre-operational (eleven and twelve year olds) and operational (teen years) stages then follow (Moran 1974).

Using as her reference developmental progression, Takata has also defined play levels. She begins with solitary play, which is self-initiated with no acknowledgement of others. Next parallel play (one to three years of age) entails playing in a room with others with no manifested physical interaction. Pretend and make-believe play follow next. These finally progress to cooperative play (Takata 1974).

The development of play originates in the child's oral area and is associated with his needs at that time i.e. feeding. He plays at each new motor skill he acquires. By three to four months he kicks vigorously, coordinates eye-hand motion, responds to his mother, reacts to smiles, explores more with moving toward, touching and handling, and takes swipes at things for no apparent reason (Caplan and Caplan 1973). By six months he laughs, uses single syllables, holds objects, shakes rattles to make noise, and likes toys. By nine to twelve months he is reaching out

while sitting, playing 'peek-a-boo', searching for lost toys, imitating simple sounds, throwing toys and wanting them back (Millar 1968, Sutton-Smith and Sutton-Smith 1971 and Caplan and Caplan 1973).

A toddler's world expands as he learns to walk (Harvey and Hales-Tooke 1972). He begins to experiment and seek new ways to solve problems (Caplan and Caplan 1973). He uses large balls and other toys to accompany him by pushing or pulling when he moves (Wolfgang 1974). He scribbles and his vocabulary broadens during this time. He enjoys other children around and plays at building his self-image.

A two year old likes to run, pull toys, build towers, talk to himself, listen to stories, copy adults and maintain constant movement. He clings tightly with affection, defends his possessions, distracts easily, and acts selfishly. At three he turns corners while running, rides a tricycle, cuts with scissors, knows nursery rhymes, demands favorite stories, starts to share, and shows affection to younger siblings (Reilly 1974, Harvey and Hales-Tooke 1972). Brown (1972) has found an increase in dramatic play concentrating mainly on family situations after the age of three. Real and pre-tend are still not completely separate. Activities with collecting and gathering are abundant. Curry and Tittnich (1972) have found that the four year old is more independent. He manages aggressive impulses by incorporating super heroes. Safe hideaways are common, and dress-up is fun for him. Body competence is tested. Dramatic play now includes society

and there is an apparent distinction between real and fantasy. He is more persistent in striving to achieve results and shows preference for different activities. He begins to ask "why" and "how". Cooperative play is starting. He demonstrates this by being more patient when taking turns and also sympathizing for those in distress (Harvey and Hales-Tooke 1972).

This brief review includes documented support for the effects of play on development, the approaches to play development, and the observed actions and movements during play which are seen during the first four years of life. There appears to be a lack of controlled experimentation dealing with developmental aspects of play. Any research that has been undertaken has been implemented via observational methods.

PLAY AND THE PHYSICALLY IMPAIRED CHILD

The major premise of this thesis is that play is important for the neurologically impaired preschool child. Many of these children, who need more sensory input and stimulation via play than "normal" children, actually receive less. This is primarily due to their physical impairment (Gralewicz 1973). Even though certain motor responses are prohibited, the need these children have for arousal and stimulation is not less (Rogers 1932). The United Nation General Assembly in 1959 proposed a bill concerning Children's Rights, which stated that, "The child who is physically, mentally or socially handicapped shall be given the equal

treatment, education and care required by his particular condition." (Michelman 1974). A more recent law (PL 94-142) requires that all handicapped children be provided with appropriate public education emphasizing special education and ancillary services, both designed to meet each child's needs (Education for All Handicapped Children Act of 1975). (Goodman 1976) When speaking of play and the handicapped, it has been stated, "in human capacities for play lie the developmental roots of competence, and therefore a major resource for endeavors to remedy human deficits" (Michelman 1974). A handicap is a "double blow" to development for two reasons. First, it limits the potential of the individual and, secondly, it handicaps the processes whereby the individual can achieve his potential (Rogers 1932). Another statement regarding this problem is, "The retarded infant is at twice a disadvantage. First, although he needs more assistance in progressing through the stages of development than the nonhandicapped infant, he receives less and that less too late. Second, like all babies, his emotional health depends on the emotional health of his parents' but because he is a handicapped child, his parents suffer fear, anguish, bewilderment and far too often shame." (Diamond 1971).

Disturbances in organic or environmental pathology will result not only in quantitative shifts but qualitative distortion of the development of intelligence which Peter Wolff called "actual stage reversals". If the developmental path is blocked, alternative growth patterns are usually

found (Piers 1972). If one's environment does not provide the necessary conditions for integrating physical, emotional, mental and social development, an unruly, antisocial, withdrawn behavior character pattern can develop (Freeman 1967). ". . . the social contacts of the handicapped often tend to be inordinately limited by the handicapping condition." (Moran 1974). These children also have problems with attention span, for it is hard for them to filter the irrelevant stimulation. Play activites seem to draw their interest and attention. Play affords the needed opportunities for increasing self-confidence, independence and satisfaction (Caplan and Caplan 1973).

"Like nothing else, play gives every child a chance to lay plans, to judge what is best in each play situation, to create and control the sequence of events." (Caplan and Caplan 1973). Once he appreciates his actions on different materials, trying out new experiences will quickly evolve. Limitations will arise only within his skills and/or the nature of the material to be used. This will all increase the child's view of reality (Lemkau 1967). Finnie (1975) said of the cerebral palsied child, "If the slightest movement this child makes accidently moves the object or even makes a noise, he will have made something happen himself. This will most likely stimulate him to try again, thus experimenting on his own and not being directed to do so. This is an initial step in learning." When attempting an action, if he does not succeed by the second or third try, he will give

up because the frustration tolerance of the neurologically impaired child is often low. This is why careful evaluation and forethought is important in planning playful, learning situations for this child.

Neurological impairments affect in varying degrees the muscle tone and motor patterns of the extremities and trunk. Sensory (audition and vision included), perceptual-motor and cognitive abilities can also be affected. Extra appropriate stimulation is needed. An important part of early education for these children consists of gross motor activities for motoric and perceptual training (Gralewicz 1973). Uncontrolled, irregular movement characteristic of these children inhibit normal sensori-motor input. These movements impair symbolic function, which will inhibit normal sensory and kinesthetic experience necessary for learning (Reilly 1974). Through play, trial and error sessions can allow for the development of motor patterns (Pearson 1972).

Finnie said that play is equally important for the cerebral palsied child because he too must have a chance to develop his self-image, explore his body, learn about himself in relation to others and understand the world around him. Because of his slow developmental progress and physical impairments, he needs much help. ". . . his handicap prevents him from learning through play in a natural way, so . . . he will not be able to learn as he plays or to reach his potential" (Finnie 1975).

Few researchers have documented the role of play in the growth and development of neurologically impaired children such as those with Cerebral Palsy. These children are delayed in most developmental areas. Since play appears to be valuable in all areas of child growth and development as noted earlier, play may be important in the early care of the neurologically impaired child. However there is need to test this hypothesis.

Play in Physical Therapy Treatment. Gralewicz (1973) in a study on the play deprivation in multiple handicapped children found that the handicapped child has fewer play companions and fewer adult family play fellows, spends more time involved in personal care activities, and participates an average of sixty-seven minutes weekly in special treatment programs. The additional treatment time is approximately equivalent to the additional time the "non-handicapped" child participates in play. Lieberman (1965) in reference to exercising, a primary activity in physical therapy treatments, states that,

> A small child is much more willing to "exercise" his muscles by using a specially adapted climbing frame, slide, see-saw, pedal car, tricycle, etc. or by participation in ball or action games with other children to make it more fun. He is also more likely to gain confidence (watching and imitating the other members of the group) and thus be spurred onto greater efforts. Parents are important. (McLovell 1973).

Lemkau (1967) stated that preschool teachers have found that extensive physical therapy on mats in the gym is not enough. Free play is important for satisfactory development; it

provides the opportunity to show one another around and to feel other bodies reacting to one's own. Pearson (1972) stated that "Play therapy is an important adjunct of Physical Therapy, Occupational Therapy and Speech Therapy, which is an important way of coordinating treatment with the management of the child at home or in a nursery or hospital."

In several play group settings developed around the country, physical therapists are called upon to recommend body positioning suitable to each individual child during play, to select types of play that would be beneficial to the child, and to suggest appropriate assistive devices to aide the child's movement and involvement in group activities (Harvey and Hales-Tooke 1972, Lieberman 1965, and Marx 1973). "The young child uses his body most vigorously in play with other children and in response to toys and activities that he enjoys." This is true for the handicapped as well as for the "normal" child; therefore, therapy takes place naturally in the schoolroom or playground, rather than in a separate therapy room (Marx 1973).

Early Intervention. Many are now realizing the importance of discovering potential neurological problems early and then initiating treatment. Hartley and Frank (1952) encourage early intervention because of "the great plasticity of the young during these years, their instant response to environmental impacts, their readiness to benefit from favorable experience and to assimilate these into their growing concept of self".

Developmental achievement depends on the acquisition of motor skills and the amount of sensory stimulation provided in the critical developmental periods. Deprivation between six to fifteen months leads to basic irreparable deficiencies (Piers 1972 and Martin and Ovans 1972). Varied sensory input in the home environment is important (Caldwell 1964). Because children with neurological impairments do not have the same sensory and motor experiences that "normal" children have, additional stimulation early in life is needed. Studies have shown that with severe deprivation neither speech nor normal thinking processes are acquired, and communication is manifested through basic physical action (Barclay 1972). Wilson, a physician, states that ". . . the younger the child, the greater the change in the lesser amount of time." (Martin and Ovans 1972). Establishment of programs dealing with developmental disabilities should begin shortly after birth and continue until development progresses from sensory exploration to cognitive learning (Martin and Ovans 1972).

PROGRAM DESIGN

Use of a Group Situation. Play groups for the physically impaired child are starting to appear throughout the country. "For all the children, the group stimulation reinforces learning, and the joint teacher-therapist activity planning widens the learning horizon". (Marx 1973). Programmed group instruction aids in the accrual of developmental abilities especially when, through total body movement,

learning is achieved, and when groups are conducted with six children or less (Marx 1973). Through group play activities and in conjunction with such ancillary services as Physical, Occupational and/or Speech Therapy, a child can achieve as full a potential as is possible as well as benefit from the group setting. The group setting allows children to meet other children and play in a happy, care-free manner (Fister, 1974, Leyland 1976, Marx 1973, McLovell 1973 and Pearson 1972). Group activities included in these play groups should emphasize gross motor skills, language development, rhythm activities for auditory skills, physical coordination, manipulative and fine-motor skills (Marx 1973).

Systems Approach. The systems approach applied to program development is a practical way to develop, implement and evaluate new programs with less emphasis on program content (Peterson 1974). Systems analysis "focuses on the utilization of a systematic procedure to enable a decision maker to choose a course of action based on surveillance of a total problem, including a search for objectives, analysis of alternatives and their possible outcomes, and an evaluation process." (Peterson 1976). In designing the program, desired outcomes specified as performance levels are determined. Various procedures and content, selected to attain these criteria, are then analyzed and arranged to achieve the pre-determined objectives. Evaluation is initiated at the onset of the planning process and is ongoing and continuous throughout the course of the planning.

Modifications and adaptations are made when necessary (Peterson 1974).

Systems can be incorporated into many different program levels, including organizations and/or direct practitioner - client interaction. Modifications can easily be made (Musgrove 1971). Many individual programs incorporate the systems approach by modifying it to meet their program needs (Marx 1973).

Testing. Several tests were reviewed in order to select a developmental scale. This scale will be used to evaluate the developmental progress of the subjects in selected areas. These tests included: The El Paso Comprehensive Developmental Evaluation Chart (Cliff, Carr, Gray, Comparetti and Gidoni 1967), the Denver Developmental Screening Test (Frankenburg and Dodds 1969), the Bayley Scales of Infant Development, the Cattell Infant Intelligent Scales, the Preschool Attainment Record (Krajecek and Tearney 1972) and the Wolanski Assessment (Wolanski 1973). Play assessment tools that were considered include the following: "Activities of Daily Living - Play" in the Vulpé Assessment Battery (Vulpé 1977) and the play assessment scales in Caplan and Caplan (1973), Sutton-Smith and Sutton-Smith (1974) and Knox (in Reilly, Ed., 1974).

SUMMARY

There is a large amount of documentation dealing with the topic - play. Over the years many theories of play have

been advanced by people working in a variety of fields. Many works concentrate on the benefits and values of childhood play, and on the role of play in the child's development.

Little documentation has been found on play and the physically impaired child, in particular the preschool child with neurological impairments. Much more has been written and researched on play and the child with mental or emotional impairments.

There is also a lack of supportive literature on the use of play in developmental and educational programs for handicapped children. No research has been found by this writer on the effects of implementing play in physical therapy treatment programs.

It is evident from this literature search that either too few studies have been done dealing with play and the physically impaired child and/or too few researchers or practitioners have reported their results. Hopefully more literature will be written on play and its importance for the neurologically impaired child, in addition to material dealing with implementation of play into physical therapy services.

CHAPTER III

RESEARCH PLAN

The purpose of this study was to determine the developmental effects of incorporating play into a physical therapy treatment program for preschool, neurologically impaired children. Progress was determined by the improvement noted in the physical, social and cognitive areas of development after the implementation of an eight-week, experimental therapeutic play program.

This investigation was conducted in conjunction with a companion study which attempted to determine the effects of a parent education program. The parent program focused on parental attitudes towards play, play's importance for the handicapped child and suggestions for adaptations and modifications of toys and play activities for their children.

SUBJECTS AND SAMPLING

Twenty-seven children were selected from three physical therapy programs in southern Michigan. The subjects, both male and female, ranged in ages from one year zero months to four years eleven months at the onset of the study. All children had been diagnosed as having a neurologic impairment. They resided at their own homes or at foster homes. The available sample was selected from treatment programs at hospital-clinic settings and school programs. Physical therapy program directors from several facilities in southern Michigan were contacted by mail and/or by phone. Included in the letter or phone conversation was a description of the

combined study and a request for their cooperation in providing subjects. If the request was accepted, a letter describing both programs was mailed to each of three selected facilities and the therapists were asked to send a copy of the letter home to each child's parent.

Three comparison groups were utilized in this joint study. Nine (9) children from each of the three (3) facilities were each assigned to one of the three comparison groups. Subjects in Group A, the control group for this researcher's study, continued with their prescribed biweekly physical therapy treatment for an hour. Subjects in Group B comprised the experimental group for this study and the control group for the companion study. These subjects were involved in a therapeutic play group held once a week for an hour, and attended their normally scheduled physical therapy treatment once a week for an hour. Subjects in Group C, the experimental group for the companion study, participated in the weekly experimental therapeutic play group and received their hourly physical therapy treatment once a week. In addition to this their parents were involved in a weekly parent education program on play. Figure 3-1 attempts to describe the comparison group set-up.

Location	Group A (Physical Therapy)	Group B (Physical Therapy and Play)	Group C (Physical Therapy Play and Parent Groups)
Flint	3	3	3
Lansing	3	3	3
Wayne	3	3	3

Control — Experimental

Therapeutic Play Study

Control — Experimental

Parent Education Study

FIGURE 3-1. Number of Subjects by Location and Group.

All twenty-seven subjects were matched according to their overall developmental quotient. The developmental levels in each area were measured after the pre-test, administered one week before the initiation of the study's program, and a Developmental Quotient was calculated. The sample for this study was then matched into nine pairs - one subject placed in the control group (A), the other subject placed in the experimental group (B). When matching into pairs the extent to which the subjects and their parents could participate in the study was considered.

The results of this study can be applied only to the southern Michigan, neurologically impaired preschool population. The sample size was kept small in order that the principal investigator could evaluate all subjects and work with all those involved in both research studies, allowing little tester bias and variability in play group leadership. Only those children with neurological impairments who met the age and physical

therapy treatment requirements were included. Those with primary muscle disease, peripheral nerve injuries or mental retardation were not included.

Demographic data was collected from the parents on the first night of the program. A sample of the form given to each parent is included in Appendix B. Questions concerning parents' attitudes towards play and an evaluation of their playfulness was reviewed as a part of the companion study. There was no attempt to analyze or match the subjects on this data.

INDEPENDENT VARIABLE

The independent variable for this study was the eight-week therapeutic play program. This program involved a play group which met for one hour a week in the evening at the subjects' treatment center. Different play activities were presented at each meeting via a therapeutic approach. The purpose of using a therapeutic approach was to ensure optimal positioning of each child and to encourage the use of all extremities, the trunk and the head. The program plan took into consideration each child's developmental level, by considering each subjects developmental and motoric problems and formulating goals for each problem. Activities were then planned in order to meet these goals.

A modified systems approach was incorporated in the design and implementation of the play program. Selected objectives and activities designed to enable the achievement of desired behaviors were organized into this weekly

therapeutic play program. These program objectives and activities were selected from theneed seen by the primary investigators in their work with these children and from related literature sources (Caplan and Caplan 1973, Diamond 1971, Hartley and Frank 1952, Harvey and Hales-Tooke 1972, Leyland 1976, Lieberman 1965, Marx 1973, Marzello and Lloyd 1972, Moffitt 1972, Stein 1971 and Griswold 1972). Objectives and activities for both programs may be found in Appendix A.

The emphasis during each weekly program was placed on 1) fun and play, 2) use of involved extremities, and 3) good balance in various positions i.e. four-point. The principle investigator with four trained volunteer aides led all play groups.

Volunteers selected to help out in this study were undergraduate or graduate students in Therapeutic Recreation or interested people having experience with play and children. They were chosen on the basis of their experience and their demonstration of flexibility, versatility and playfulness (Lieberman 1965). All participated in a four hour volunteer training session focusing on the importance of play for these children, positioning and handling techniques for the children, organizational information and the program schedules for both programs. A copy of this program format may be found in Appendix C.

Pilot Study. A pilot study was conducted to determine the appropriateness of the activities in meeting the objectives and sub-objectives of the therapeutic play program. Two therapeutic play sessions were simulated using neurologically

impaired children found in an already existing physical therapy program. Two observers, experts in Therapeutic Recreation and Physical Therapy were present to evaluate the effectiveness and appropriateness of the play activities. These observers along with two other specialists were asked to study the program plan and to evaluate its validity. All activities and objectives for all sessions in the program were included. The ease and feasibility of the implementation of these activities were evaluated in addition to their therapeutic value. Changes in the program plan were made, based on the evaluators' observations and written assessments.

Control of Extraneous Factors. Provisions were made to control several possible confounding factors:

1. An attempt was made to control the developmental variability among the subjects by matching each subject in the control group with a subject in the experimental group. Matching was based on the subject's overall developmental quotient. This allowed for comparison between the two groups.
2. The two primary investigators in the companion studies evaluated each subject's developmental status during both the pre- and post-tests, to ensure an objective, reliable appraisal. Each subject's physical therapist was then asked to review the test results to determine if the effect of two "strangers" performing the exam biased the data. If there was disagreement, a

concensus among all three therapists was made. Many children are apprehensive when confronted with someone they do not know, and may not perform well for them during an evaluation.

3. Attendance of the subjects for each play session could not be controlled due to possible illness, lack of transportation or a change in work schedule. To help minimize this effect an additional volunteer was provided to take care of the subjects' siblings during the program hour. Also if transportation to the experimental site was a problem for the parents and their child the primary investigators attempted to provide them transportation whenever possible.

TEST PROCEDURES

Eighteen subjects from a common population were involved in a quasi-experimental study. A pre-test - post-test design was implemented. Developmental levels for five different areas were determined during both tests. The EPCDEC, the DDST and the Vulpe' play assessment were administered to each subject the week prior to and the week following the eight week therapeutic play program under similar conditions. Developmental scores were recorded for each area and differences between the pre- and post-tests were compared. Data from all instruments involved except the Vulpe' play assessment was then analyzed.

CONDUCT OF TREATMENTS

An hourly therapeutic play session was held once a week for eight weeks. Group sessions were conducted at each of the three selected, experimental sites in order that the subjects be in familiar surroundings during the program. Three (3) subjects from the experimental group from this study and three (3) from the experimental group of the comparison study were included in each play group. Therapeutic play activities were planned for this hour every week. Parents of the three children in the companion study's experimental group were included in sessions seven and eight. A program schedule for the play program may be found in Appendix D.

Large equipment used in the play groups such as the Bobath ball, the wedge and bolsters were found at each treatment center. The necessary equipment not available at each center was provided by the investigator.

A proposal for funding was approved by the Michigan Easter Seal Society for the conduct of the two experimental programs involved in this overall study. These funds, six hundred and eighty-five dollars, were used to cover the costs of the equipment and supplies needed for both programs, and transportation between the three experimental sites.

DEPENDENT VARIABLES

The dependent variables in this study were all related to the developmental progress of the subject. The areas of development that were measured were those goals emphasized in

a physical therapy treatment program for neurologically impaired children. They included 1) gross motor, 2) reflexes, 3) manipulation, 4) expressive language and 5) cognitive-social. These areas were evaluated by the chosen developmental scales for the appropriate age group.

Instrumentation. The El Paso Comprehensive Developmental Evaluation Chart (EPCDEC) was chosen as the primary tool to evaluate the subjects' developmental progression. The EPCDEC measures development in each of the following areas 1) reflexes, 2) gross motor, 3) manipulation, 4) expressive language and 5) cognitive-social. The first year of development is broken down into two-week intervals for each area. During the second year the breakdown broadens to three-month intervals. After the age of two, development is measured in six-month intervals. Two additional advantages of the EPCDEC included: 1) the test could be administered by a physical therapist or teacher and not a clinical psychologist, and 2) the test required observation rather than depended upon parental response. This instrument also evaluates the locomotor prognosis for the child with Cerebral Palsy (a syndrome manifesting sensory and motor neurological deficits), the presence of seizure activity, head circumference measurement and body growth (Cliff, Carr, Gray, Nymann and Redding 1975). Research is now being conducted on the reliability, objectivity and validity of this exam.

Because the EPCDEC is designed for ages ranging from zero weeks to thirty-six months, which does not include the

complete age range evaluated in this study, another developmental exam, the Denver Developmental Screening Test (DDST), was employed. This test was used to continue the evaluation of developmental progressions from the three to six years of age. Both these tests may be found in Appendix E.

The DDST is broken down into four developmental areas -- gross motor, language, fine motor-adaptive and personal-social. Its measurement intervals span a one-month period during the first two years and a six-month interval between the ages of two and six years (Frankenberg and Dodds 1969). This test has been shown to be both reliable and valid (Krajeck and Tearney 1972).

Figure 3-2. CORRELATION BETWEEN TEST ITEMS: EPCDEC AND DDST

AGE	DDST	EPCDEC	DDST	EPCDEC	DDST	EPCDEC	DDST	EPCDEC
In Years	Gross Motor	Gross Motor	Fine Motor Adaptive	Manipulative	Language	Expressive Language	Personal-Social	Cognitive-Social
2	Kicks ball, forward*	Standing, kicks ball*	Tower of 5-6 cubes	Unscrews lids	Combines 2 words*	Uses a few 2 word phrases*	Puts on clothing	Unwraps candy
	Walks backward*	Walks backward*	Dumps raisin from bottle	Turns knobs	Points to 1 body part named*	Uses I, me, you	Uses spoon, spilling little	Identifies dolls body parts*
2½	Balances on 1 foot 1 sec.	Walks on tiptoes	Tower of 8 cubes*	Tower of 8 cubes*	Follows 2/3 directions	Uses many 2 word phrases	Washes & dries hands	Is toilet trained
	Throws ball overhand*	Throws ball 4 ft.*	Imitates vertical line	Imitates vertical, cir. & horiz. line	Names 1 picture*	Names pictures in book*	Helps in household tasks	Knows "mine" unable to share
	Jumps in place							
3	Broad Jump*	Jumps up a few inches*	Copies O*	Copies O*	Uses plurals	Uses long phrases, omits words	Plays interactive games*	Plays guessing games*
	Pedals tricycle	Can stand, feet tog.	Imitates 3 block bridge*	Imitates 3 block bridge*	Comp. cold, tired, hungry Gives full name*	Asks freq. questions	Puts on clothing	Knows full name*
3½	Balances on 1 foot 5 sec.		Copies +		Recognizes 3/4 colors		Dresses with supervision	

See Appendix C for complete developmental evaluation forms.

If a subject passed the highest item in an area on the EPCDEC then the DDST was used to continue the assessment in all areas except for reflexes. (In testing the reflexes only the EPCDEC needs to be used, because by the age of three all reflexes that are to be present throughout life should be manifested.)

When a child scored in the twenty-four to thirty month range, developmental level was recorded on both exams to insure reliability. Figure 3-2 demonstrates the resemblance between the major developmental areas and the test items of both exams. An example of developmental area similarity would be the "fine motor-adaptive" area in the DDST which was found to be like the "manipulative" section in the EPCDEC. Many test items were also found to be alike such as the "kicks ball forward" item in the EPCDEC and the "standing, kickball" item in the DDST. In this figure items from both developmental charts were recorded from each developmental age group and matched with their corrolary in the other test. An asterick was placed next to each item at each age level that was parallel to an item in the other exam within a six month period.

Play behaviors were also assessed according to a developmental continuum. The play assessment taken from the Activities of Daily Living section of the Vulpé Assessment Battery was administered along with the other charts during the pre- and post-tests of each subject (Vulpé 1977).

Data Collection Procedures. The El Paso Comprehensive Developmental Evaluation Chart and the Denver Developmental

Screening Test were used to measure the developmental progress of each subject before and after the experimental play program. Post-test scores were collected the week after the program ended and calculations were performed to determine the existence of a possible significant difference between the gain scores of the two comparison groups. All developmental pre- and post-tests were administered during the subjects' therapy treatment. A short period of time was allotted before the pre-test so the testers could become acquainted with each subject. Each subject's physical therapist was consulted in regard to the interpretation of the test results.

During the eight week program observations were recorded (by the volunteers) following each program session. A list of descriptive items was given to the volunteers after each session. They were requested to respond objectively to each item keeping the subjects to whom they were assigned in mind. A copy of this form may be found in Appendix G. At the end of the eight-week period a compilation of the observations was performed and categorization of the findings was made for possible further study. The play assessment taken from the ADL section of the Vulpe' Assessment was also administered during the pre- and post-tests. This was used to assist in determining the child's ability to play.

DATA ANALYSIS

Nonparametric statistics was used to analyze the study's results. This was incorporated because of the small

sample size and because of the assymetry of the sample curve as determined by the Chi Squared (X^2) test results. The Wilcoxan Sign Test for Matched Pairs was used to determine if the experimental play group had a significant effect on the subjects' development in the 5 developmental areas evaluated. Alpha was set at .10. Setting alpha at this value takes into consideration some of the limitations found in this study. By setting alpha at this value it might be possible to determine the feasibility of continued research in this area.

Statistical analysis of the anecdotal and demographic data was not attempted, nor was that data taken from the Vulpe Play Assessment. The material was compiled and a subjective evaluation was performed to detect if any differences in observed behaviors were noted among the subjects during the course of the study which were not reflected in the instrumentation.

CHAPTER IV

THE RESULTS

This chapter will relate the data collected for this study and the analysis of this study's results. Organization of this chapter is as follows: 1) Statistical Analysis, 2) Vulpé Play Assessment, 3) Discussion of Anecdotal Data, 4) Discussion of Demographic Data, 5) Discussion of Results and 6) Summary.

STATISTICAL ANALYSIS

The major research hypothesis tested in this study is that a significant improvement in the physical, social and/or intellectual development of preschool, neurologically impaired children is noted after their participation in therapeutic play program within their physical therapy treatment setting. Five areas of development were examined in addition to the subjects' overall development. They included the gross motor, manipulative, reflexive, expressive language and cognitive-social areas of development. Sub-hypotheses were developed under the major hypothesis for each of these areas. They are as follows:

H1.1 A significant improvement will be noted in the overall development of preschool, neurologically impaired children after participating in an eight week therapeutic play program as part of their physical therapy treatment program.

H1.2 A significant improvement will be noted in the

gross motor development of preschool, neurologically impaired children after participating in an eight week therapeutic play program as part of their physical therapy treatment program.

H1.3 A significant improvement will be noted in the manipulative development of preschool, neurologically impaired children after participating in an eight week therapeutic play program as part of their physical therapy treatment program.

H1.4 A significant improvement will be noted in the reflexive development of preschool, neurologically impaired children after participating in an eight week therapeutic play program as part of their physical therapy treatment program.

H1.5 A significant improvement will be noted in the expressive language development of preschool, neurologically impaired children after participating in an eight week therapeutic play program as part of their physical therapy treatment program.

H1.6 A significant improvement will be noted in the cognitive-social development of preschool, neurologically impaired children after participating in an eight week therapeutic play program as part of their physical therapy treatment program.

Eighteen (18) subjects (nine pairs) were originally involved in this study. Over the eight week period, during

which time the program took place, three of the subjects in the experimental group dropped out of the study. Upon follow-up two of the subjects' parents stated that a time limitation was the reason for not participating. The third subject's parents stated that too much driving was involved. The lack of these three subjects led to the dropping of three pairs. This decreased the sample size (n) from nine pairs to six pairs.

Data Collection. A quasi-experimental, pretest - posttest design was implemented for this study. Gain scores (difference between the pre- and the posttest) for each subject in each of the six pairs were calculated. The Wilcoxon Sign Test for Matched Pairs was then used to analyze the data. The raw data from the pre- and posttests is presented for each of the areas of development measured for each pair in Tables 4.1 through 4.6. Subjects marked with an asterisk (*) are those children who participated in the experimental play group.

Data Analysis. The one-tailed Wilcoxon Sign Test for Matched Pairs was used to determine the significance between the gain scores of each matched pair. For each developmental area the gain score of each subject in the experimental group was subtracted from the gain score of his partner in the control group. These scores were then ranked according to their magnitude, regardless of their sign, the smallest value assigned the number "1". The signs were then replaced to their original position after ranking. The sum of all the positive ranks (T_+) and then the negative ranks (T_-) were calculated. The

TABLE 4.1

GROSS MOTOR DEVELOPMENT (RAW DATA)

Pair No	Subject No	Pretest (in weeks)	Posttest (in weeks)	Gain Score
1	11	18	18	0
	*22	6	12	6
2	21	28	28	0
	*13	18	20	2
3	12	44	46	2
	*15	46	48	2
4	1	40	44	4
	*14	40	50	10
5	20	48	52	4
	* 6	48	52	4
6	10	36	40	4
	*24	44	52	8

TABLE 4.2

MANIPULATIVE DEVELOPMENT (RAW DATA)

Pair No	Subject No	Pretest (in weeks)	Posttest (in weeks)	Gain Score
1	11	16	18	2
	*22	10	14	4
2	21	30	48	18
	*13	18	20	2
3	12	34	34	0
	*15	72	72	0
4	1	192	192	0
	*14	60	96	36
5	20	96	104	8
	* 6	144	172	28
6	10	26	30	4
	*24	42	52	10

TABLE 4.3

REFLEXES (RAW DATA)

Pair No	Subject No	Pretest (in weeks)	Posttest (in weeks)	Gain Score
1	11	8	8	0
	*22	10	10	0
2	21	20	24	4
	*13	16	16	0
3	12	8	8	0
	*15	48	48	0
4	1	96	96	0
	*14	28	32	4
5	20	12	12	0
	* 6	100	100	0
6	10	24	24	0
	*24	48	48	0

TABLE 4.4

EXPRESSIVE LANGUAGE (RAW DATA)

Pair No	Subject No	Pretest (in weeks)	Posttest (in weeks)	Gain Scores
1	11	10	10	0
	*22	4	10	6
2	21	28	28	0
	*13	18	20	2
3	12	40	42	2
	*15	72	84	12
4	1	192	216	24
	*14	132	144	12
5	20	28	30	2
	* 6	192	240	48
6	10	32	36	4
	*24	30	36	6

TABLE 4.5

COGNITIVE-SOCIAL DEVELOPMENT (RAW DATA)

Pair No	Subject No	Pretest (in weeks)	Posttest (in weeks)	Gain Scores
1	11	6	6	0
	*22	16	16	0
2	21	48	52	4
	*13	22	24	2
3	12	40	44	4
	*15	84	96	12
4	1	192	192	0
	*14	92	108	16
5	20	96	104	8
	* 6	192	192	0
6	10	40	48	8
	*24	48	70	32

TABLE 4.6

OVERALL DEVELOPMENT (RAW DATA)

Pair No	Subject No	Pretest (in weeks)	Posttest (in weeks)	Gain Scores
1	11	11.6	12.0	0.4
	*22	9.2	12.4	3.2
2	21	30.8	36.0	5.2
	*13	18.4	20.0	1.6
3	12	33.2	34.8	1.6
	*15	64.4	69.6	5.2
4	1	142.4	148.0	5.6
	*14	70.4	86.0	15.6
5	20	56.0	60.4	4.4
	* 6	135.2	151.2	16.0
6	10	31.6	35.0	3.4
	*24	42.4	51.6	9.2

table for the Distribution of the Sign-Ranked Statistic T was used to determine if the (T_+) or (T_-) results were significant. Values for the test results for each area measured and its critical region of rejection may be found in Tables 4.7 through 4.12. The asterisk (*) noted in these tables depicts the determination of significance.

The following relates the results of the analysis of the data for each sub-hypothesis:

1.1 The research sub-hypothesis concerning overall development was accepted at the .1 alpha level. The sample size (n) for this area equaled six. The values ($T_- = 18.5$, $T_+ = 2.5$) demonstrated significance. The critical region of rejection was ($T_- \geq 17$, $T_+ \leq 4$).

1.2 The research sub-hypothesis concerning gross motor development was accepted at the .1 alpha level. The sample size (n) for this area equaled three. Three pairs showed a difference (D) of zero, therefore were not counted. The values ($T_- = 10$, $T_+ = 0$) demonstrated significance. The critical region of rejection was ($T_- \geq 10$, $T_+ = 0$).

1.3 The research sub-hypothesis concerning manipulation could not be accepted at the .1 alpha level. The sample size for this area equaled five. One pair showed a difference (D) of zero, therefore was not counted. The values ($T_- = 12$, $T_+ = 3$)

TABLE 4.7

GROSS MOTOR DEVELOPMENT - WILCOXON SIGN TEST

Pair No	D	/D/	Rank	Sign
1	-6	6	3.5	-3.5
2	-2	2	1	-1
3	0	0	--	--
4	-6	6	3.5	-3.5
5	0	0	--	--
6	-4	4	2	-2

For n = 4, C.R.R. = ($T_- \geq 10$, $T_+ = 0$); Results: ($T_- = 10$, $T_+ = 0$)

* Significance was demonstrated.

TABLE 4.8

MANIPULATIVE DEVELOPMENT - WILCOXON SIGN TEST

Pair No	D	/D/	Rank	Sign
1	-2	2	1	-1
2	+16	16	3	+3
3	0	0	--	--
4	-36	36	5	-5
5	-20	20	4	-4
6	- 6	6	2	-2

For n = 5, C.R.R. = ($T_- \geq 13$, $T_+ \leq 2$); Results: ($T_- = 12$, $T_+ = 3$)

* Significance was not demonstrated

TABLE 4.9

REFLEXIVE DEVELOPMENT - WILCOXON SIGN TEST

Pair No	D	/D/	Rank	Sign
1	0	0	--	--
2	+4	4	1.5	+1.5
3	0	0	--	--
4	-4	4	1.5	-1.5
5	0	0	--	--
6	0	0	--	--

For n = 2, C.R.R. = ($T_- \geq 3$, $T_+ = 0$); Results: ($T_- = 1.5$, $T_+ = 1.5$)

* Significance was not demonstrated.

TABLE 4.10

EXPRESSIVE LANGUAGE DEVELOPMENT - WILCOXON SIGN TEST

Pair No	D	/D/	Rank	Sign
1	-6	6	3	-3
2	-2	2	1.5	-1.5
3	-10	10	4	-4
4	+12	12	5	+5
5	-46	46	6	-6
6	-2	2	1.5	-1.5

For n = 6, C.R.R. = ($T_- \geq 17$, $T_+ \leq 3$); Results: ($T_- = 16$, $T_+ = 5$)

* Significance was not demonstrated.

TABLE 4.11

COGNITIVE-SOCIAL DEVELOPMENT - WILCOXON SIGN TEST

Pair No	D	/D/	Rank	Sign
1	0	6	--	--
2	+2	2	1	+1
3	-8	8	2.5	-2.5
4	-16	16	4	-4
5	+8	8	2.5	+2.5
6	-24	24	5	-5

For n = 5, C.R.R. = ($T_- \geq 13$, $T_+ \leq 2$); Results: ($T_- = 11.5$, $T_+ = 3.5$)

* Significance was not demonstrated.

TABLE 4.12

OVERALL DEVELOPMENT - WILCOXON SIGN TEST

Pair No	D	/D/	Rank	Sign
1	-2.8	2.8	1	-1
2	+3.6	3.6	2.5	+2.5
3	-3.6	2.6	2.5	-2.5
4	-10	10	5	-5
5	-11.6	11.6	6	-6
6	-9.2	9.2	4	-4

For n = 6, C.R.R. = ($T_- \geq 17$, $T_+ \leq 4$); Results: ($T_- = 18.5$, $T_+ = 2.5$)

* Significance was demonstrated.

failed to show significance. The critical region of rejection was ($T_- \geq 13$, $T_+ \leq 2$).

1.4 The research sub-hypothesis concerning reflexes could not be accepted at the .1 alpha level. The sample size (n) for this area equaled two. Four pairs showed a difference (D) of zero, therefore were not counted. This (n) is so small because very minimal change was noted in any subject during the course of the study. The value ($T_- = 1.5$, $T_+ = 1.5$) failed to show significance. The critical region of rejection was ($T_- \geq 3$, $T_+ = 0$).

1.5 The research sub-hypothesis concerning expressive language could not be accepted at the .1 alpha level. The sample size (n) for this area equaled six. The values ($T_- = 16$, $T_+ = 5$) failed to show significance. The critical region of rejection was ($T_- \geq 17$, $T_+ \leq 3$).

1.6 The research sub-hypothesis concerning cognitive-social development could not be accepted at the .1 alpha level. The sample size (n) for this area equaled five. One pair showed a difference (D) of zero, therefore was not counted. The values ($T_- = 11.5$, $T_+ = 3.5$) failed to show significance. The critical region of rejection was ($T_- \geq 13$, $T_+ \leq 2$.)

PLAY ASSESSMENT

The play scale found in the Activities of Daily Living section of the Vulpé Assessment Battery for the Atypical Child (Vulpe 1977) was not statistically analyzed. Several play assessments were reviewed, and were found to be impractical to use. The Vulpé Assessment Battery, a new developmental evaluation covering many areas of development, was published in 1977. The play assessment in this battery was used in this study to determine if the Vulpé collected similar information to the "cognitive-social" section of the EPCDEC and the "Personal-Social" section of the DDST. If found to be similar the information would be used to support the data collected from the two above areas in the EPCDEC and DDST. After administration of the Vulpé, it was found that most of the items asked were difficult to observe. Greater amounts of reporting from parents and the subjects' therapists were relied upon during testing. It was noted that if during the pretest a subject required assistance or was unable to do an activity, often it was noted one or two weeks later that he could perform the item independently. Such an improvement would be invalid. This was most likely due to the inadequate testing time allotted for this test.

Nine out of twelve subjects noted no change in play development with this test after the ten week period. Of these fifteen subjects only two showed no change on the EPCDEC or the DDST. Three subjects (two in the experimental and one in the control group) did show some improvement on the Vulpé.

The control subject, only, in pair number two showed an improvement on the Vulpe', while on the EPCDEC an increase was noted for both subjects, in this pair, though this increase was greater for the control subject by two weeks. In pair number five the control subject exhibited an increase in cognitive-social development on the EPCDEC. This subject demonstrated no improvement on the Vulpe'. The experimental subject in this pair demonstrated no change on the EPCDEC, but improved greatly on the Vulpe'. In pair number six a larger improvement was noted on both assessments for the experimental subject.

DISCUSSION OF ANECDOTAL DATA

After each therapeutic play group session anecdotal data was collected from the volunteers on each of the subjects participating in the experimental play group. A copy of the form for this data may be found in Appendix G. The following statements appear to be justified after reviewing this data.

1. The majority of the subjects demonstrated an increase in the amount of their interest and attention to group activities throughout the duration of the study. One subject initially displayed interest in doing the activities but as the sessions progressed he was more interested in helping others do the activities. The subjects' involvement in the program activities depended to some extent upon the subjects' like of the activities and his

ability to do it. Some activities involved tactile experiences, i.e. pudding painting, which one subject did not appear to enjoy.

2. A change in the amount of energy expended during the play group was noted in the majority of subjects. This change, from passive to active expenditure, was noted most within the first three weeks.
3. The majority of subjects improved in the amount of time it took to adjust to the play group setting as the eight week program progressed. Towards the end of the program little adjustment time was needed for the majority of participants. At the end of each program session more irritability was demonstrated by some of the younger subjects. The experimental programs took place from seven to eight p.m. each week, which was after the bedtime of some of the subjects. It was noted by the volunteers that as the sessions progressed these children tolerated the activities for longer periods of time.
4. A greater amount of interaction among subjects was observed as the study progressed. The majority of observations noted a change from that of "watching others" to "sharing (objects) with others". In the Detroit group one subject who was usually noted as the "friendly one", who enjoyed interacting with others, appeared to become shy when another subject

took over his role. Upon seeing this first subject's change of personality the second subject became upset. The first subject then demonstrated sympathy and concern over the other subject by patting his head.

5. Verbalization of all the higher level (greater than sixty weeks in expressive language) subjects increased as noted by an observed increase in participation in verbal interaction, especially noted with the group songs and hula hoop activities.
6. No overall change was noted in the subjects' ability to perform the activities during the eight week program. Performance ability of the subjects varied from activity to activity.
7. The majority of subjects (greater twenty weeks overall developmental level) demonstrated a decrease in the amount of direction needed to perform the group activities. Those subjects less than twenty weeks of developmental age needed constant direction and assistance throughout the duration of the program.
8. The subjects' reactions when the parent re-entered after the program was generally noted to be happy and eager. An increase over the eight week sessions was noted in the amount of time the children played with their parents after each group had finished. This is especially true for one parent who appeared upset during the first session with her child. At

the last session it was observed that the mother displayed enjoyment in playing with her child and expressed interest in the continuation of the program.

9. The majority of subjects demonstrated an increase in their playfulness during the play programs. Observations ranged from "fairly playful" initially to "very playful" at the end of the program.

DEMOGRAPHIC DATA

Data was collected from the parents of the subjects in the experimental group but was not analyzed. A summary of the data collected will be presented here. Information could not be collected from one of the subject's parents.

All subjects received both physical and occupational therapy at least twice a week either in a school or clinic setting. Two subjects (not attending a school program) were visited by a home trainer once a week. Two of the subjects were involved in swim programs and one of these subjects was involved in an art class once a week. None of the parents stated they were involved in additional activities related to their child.

Upon describing their child the common word used among all parents was "happy". Two spoke of their children as being bright but having physical handicaps. One mentioned the determination her daughter demonstrated when she wanted something. Another parent described her child as happy, though his attitude changed from minute to minute, and that they (the parents) thought their child knew a lot more than he was given credit.

All subjects' parents completed high school. Fifty percent of these parents pursued further education.

DISCUSSION OF ANALYSIS

Observation of the raw data for all subjects included in this investigation indicated advancement in the desired direction. In all the areas studied except for reflexes, the mean gain scores for each developmental area for the experimental group was larger, (though not always significantly) than the control group (within one unit of the critical region of rejection for expressive language and manipulation). The number of difference scores in favor of the experimental group for each developmental area was greater than those for the control group.

In the area of manipulation only one of the control subjects (#21) improved more than his matched partner (#13) in the experimental group. This control subject demonstrated an eighteen week difference in developmental maturation in this area. Such an improvement is not valid. This might possibly be due to the stranger effect as noted in the study's limitations. Further research is necessary to determine significant results in this area. If this pair had not been included in the study significance might have been demonstrated. This also occurred with subjects (#1) and (#14) in pair number four in the area of expressive language, where the control subject demonstrated a twenty-four week maturational improvement.

As stated in the limitations the stranger effect posed some restrictions on the test results. An increase in cooperation of the subjects during the posttests was noted for both comparison groups.

Alpha was chosen to be .1 for this study. This value was selected because it is accepted in this type of educational research. At this level, if significance is detected, further research in this area can be pursued. If the .2 alpha level had been selected, significance might have been found in more areas, but the use of this larger alpha level would have diminished the validity of the results. Conduct of further investigations would have been questionable.

Due to the dropping of three pairs the smaller (n) most likely posed more limitations on the significance of the results. If a larger (n) had been available, parametric statistics could have been used and more valid, significant differences obtained.

The play assessment in the Vulpé Assessment Battery (for the Atypical Child) was not used to support the "cognitive-social" area of development that was evaluated in this study. Very few subjects (3) showed any developmental change on this test. Those subjects who demonstrated no change on the Vulpé were not consistent with those who showed change on the instruments used in the analysis of this study. Under different testing conditions more definitive findings may result.

Progress was noted via observation for the subjects who participated in the experimental group. A great percentage of the items observed, such as interest, energy expenditure, interaction, verbalization and playfulness, improved during the course of the study. This might be partly due to the subjects becoming progressively familiar with the group leaders, the volunteers and each other. The groups were conducted with greater ease as the study progressed. The subjects were much more willing to participate in activities once they watched others in the group performing. If an activity was found amusing by one subject another child observing him attempted to try the activity. Thus, both the presence of others and the amusement of the activities proved to provide incentive for another child.

An improvement in the ability to perform the various play activities over the eight week period was not demonstrated. This might be due to the fact that the difficulty of the activities varied each night for different goals were emphasized each week. Thus depending upon the activity and the limitations of each subject, the amount of help and direction needed varied throughout the study. Interest and participation were also affected by the subjects' like and dislike of the activity.

Fatigue and irritability, usually noted during the end of each session by some subjects, could have been due to the late hour during which the session took place. This fact might have posed limitations on the study's results.

Observations, though, did note that the onset of this temperment did become later as the sessions progressed.

As the eight week program progressed the volunteers became more relaxed and less attentive to detail. This was demonstrated in the quality of the anecdotal reports after each session and influenced the trends to be evaluated. Multiple volunteer raters and/or reliability checks between raters might have made observations more complete and valid.

SUMMARY

When attempting to determine the effect of the therapeutic play program on development the only significant differences demonstrated were in the areas of overall development and gross motor development. Hypotheses for the developmental areas of manipulation, expressive language, cognitive-social and reflexes had to be rejected. Except for reflexive development the raw data demonstrated a greater improvement for the experimental subjects in the other areas. No attempt to statistically analyze the anecdotal, demographic or Vulpe play assessment data was made. They were all analyzed subjectively in an attempt to stimulate further research.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine the physical, social and cognitive developmental effects on preschool, neurologically impaired children after their participation in an eight week therapeutic play program within their physical therapy setting. The intent was to ascertain that if by incorporating play as a therapeutic modality, physical therapy treatment for these children might be more beneficial.

Eighteen (18) preschool, neurologically impaired children, chosen from three experimental sites, were placed in matched pairs according to their overall developmental quotient. One of each pair was assigned to the control group who continued with their regular physical therapy treatment program. The remaining subject in each pair also continued with his therapy treatment one time per week and was included in the experimental play group for one hour a week. This group was conducted at each of the three experimental sites with three subjects from this study and three from the companion study in each group.

The therapeutic play program consisted of play activities selected and adapted for the subjects in each group. Physical therapy goals such as positioning to inhibit abnormal tone and reflexes and to facilitate developmental progression were determined and emphasized as appropriate for each subject.

All subjects in this quasi-experimental design were pretested and posttested with the EPCDEC. If the child tested

above the age limit on this exam then the DDST was administered. Gain scores were then calculated for each subject and the difference scored (D) between the gain scores of the partners in each pair were determined. The one-tailed Wilcoxon Sign Test for Matched Pairs was used to detect if a significant difference between the subjects in comparison groups A and B was present.

The analysis performed detected a statistical significant difference in the overall and gross motor development of each child. No significant differences were found in the areas of manipulation, expressive language, cognitive-social and reflexive development.

CONCLUSIONS

The following conclusions are presented within the confines of the limitations imposed by this investigation after the statistical analysis and subjective evaluation of the data.

1. Statistical significance was detected in the overall development of the subjects participating in the experimental eight week therapeutic play group program.
2. Statistical significance was detected in the gross motor developmental area for subjects participating in the experimental eight week therapeutic play group program.
3. Manipulation, expressive language and cognitive-social developmental areas failed to show

significant change, though developmental change in these areas was greater for the experimental subjects as observed in the raw data.

4. Reflexive development failed to show significant difference for the subjects participating in the experimental eight week therapeutic play group program.
5. The play assessment in the Activities of Daily Living section of the Vulpé Assessment Battery for the Atypical Child did not coincide with the "cognitive-social" section of the EPCDEC nor the "personal-social" area of the DDST.
6. From the results of the anecdotal data the following conclusions appear justified.
   a. Interest in and attention to group activities did improve.
   b. The level of activity of most subjects did improve over the eight week period, most changing from passive involvement to active involvement.
   c. By the termination of the study the majority of subjects adjusted well to the group. Because the study was carried on in the evening an improvement was also noted in the tolerance of the subjects in the amount of time the younger subjects cooperatively participated in the program.

d. Interaction among the subjects increased as demonstrated both verbally and physically by the subjects.

e. Verbalization of the higher functioning subjects improved over the course of the study as demonstrated by their verbal participation in the activities and among each other.

f. No general improvement in ability to perform the activities was noted. The ability to perform depended on the activity and the subjects' performance limitations.

g. The amount of direction needed by the higher functioning child to perform the activities decreased over the eight week program.

h. The amount of playfulness exhibited by the majority of subjects increased as witnessed by the volunteers over the eight week program.

RECOMMENDATIONS

After the design and implementation of this study the results and conclusions have led this investigator to the following recommendations. These include both those of a clinical and a research-oriented nature.

Clinical Recommendations. Publication of this and other studies might lead to the following recommendations.

1. After concluding that significant changes were seen in overall development and in the development of

gross motor skills, and after reviewing the literature of various authors such as Pearson (1972), Finnie (1975) and Marx (1973), the primary investigator recommends including play activities and a playful approach into the neurologically impaired preschool child's physical therapy treatment program.

2. It is also recommended that play activities should be included in home exercise programs for these children. Educating the parent as to the importance and function of play as a modality is necessary in order to facilitate carry-over of activities in the home. Program information such as this might be compiled into an instructional manual for parents as well as for therapists.
3. Incorporating play into a pediatric physical therapy program should be emphasized to students in physical therapy curriculums as a modality for treating neurologically impaired, preschool children. As demonstrated by the results of the anecdotal data along with related literature, an increase of the attention span and interest of the child was found when involved in a playful activity. This might, therefore, stimulate new therapists to select this approach when treating a child.
4. The group approach to treatment was incorporated in this study. By watching other children a child was encouraged to try something new and to participate

actively (or as best he could) in the activities. This was pointed out from the anecdotal data where improvements in participation, adjustment and interaction were seen. More research into this group approach versus an individualized approach might be pursued.

Research Recommendations. Further investigations concerning the developmental effects of involving play in physical therapy treatment programs may study any of the following points.

1. A larger sample size might be employed.
2. A longer duration period for such a study may be incorporated (minimum of three months).
3. Other developmental areas may be studied.
4. One developmental area may be studied in depth.
5. Other developmental charts may be used.
6. A play scale for neurologically impaired preschool children could be developed.
7. Variation in the relationship of the evaluator to the subject during testing may be tried.
8. Having the same volunteer follow a subject throughout the course of the study may be tried.
9. Various approaches to other play activities and program plans may be evaluated for their therapeutic value.
10. Developmental measurement for the preschool, neurologically impaired child needs to be

investigated. Data needs to be gathered for standardization of the EPCDEC.

11. The use of play as a modality for use in other professions such as Speech and Occupational Therapy and in the classroom should be evaluated. Literature concerning some of this has been previously documented (Florey 1971, Moffitt 1972, Michelman 1971 and Takata 1971).

13. The use of play as a modality for use in the treatment of children with other physical disabilities may be investigated.

14. The use of play as a modality for use in the treatment of children of other ages may be investigated.

15. Further research into incorporating play into a physical therapy treatment program may be pursued, both as to its benefits and other methods of implementation. Only one article was found in the physical therapy journals dealing with play (Witengier 1970).

A P P E N D I C E S

A P P E N D I X A

THERAPEUTIC PLAY PROGRAM

for

PRESCHOOL NEUROLOGICALLY IMPAIRED CHILDREN

GOAL STATEMENT: The intent of this program is to provide recreational, play activities in a Physical Therapy setting once weekly to children with neurological impairments, between the ages of one to five years in order to encourage their progress in physical, social, sensory, perceptual-motor, cognitive and reflexive development.

Objective 1.0 To provide a relaxed, playful atmosphere within a pre-school play group setting.

Sub-objective 1.1 To expose the participants to fun experiences, through playful leadership techniques and presentation of play activities.

Sub-objective 1.2 To decrease excessive sensory input and facilitate normalization of muscle tone in order to enable participation in play activities.

Sub-objective 1.3 To select playful volunteers, based on their interest and previous experience in play or recreational settings.

Objective 2.0 To improve physical development and physical function.

Sub-objective 2.1 To improve gross motor skills.

Activities

2.1.1 Obstacle course: Rolling and crawling up and down a large wedge, somersaults, creeping through the tunnel, sliding down slide, jumping on the trampoline, walking or crawling on various materials-textures, climbing in and out of a large box, climbing on a chair and jumping off, crawling under a bar, climbing over a bar, stepping on flagstones, throwing balls into a barrel, etc.

2.1.2 Ball Games: Nerf ball suspended from above on a string, kick ball, catching and throwing, rolling (balls of various shapes, sizes, textures), bat and ball activities, pushing balls, barrels, etc.

2.1.3 Mobility Games: Belly boards, swinging in sheet or hammock, tyke bikes, wheelbarrow races and other relay races, sit-n-spin, see-saw games, tilt board games, etc.

2.1.4 Beanbag and ring toss games

2.1.5 Angels-in-the-snow, rolling, and somersaults

2.1.6 Marching rhythm band

2.1.7 "Simon Says", and "Follow the Leader"

Sub-objective 2.2 To improve fine motor skills.
Activities
2.2.1 Marching rhythm band, making of instruments such as box guitars, pie pan tambourines, coffee can drums, tin can marracas, bells, xylophone, etc.

2.2.2 "Whats-in-the-box activity; filling and emptying containers with objects of various sizes, shapes, and textures while positioned on large balls, wedges, and barrels, etc.

2.2.3 Bottle sandwiches; fill clear glass or plastic containers with layers of macaroni, peas, beans, rice, cloves, popcorn, peppercorns, etc.

2.2.4 Tactile collages; cutting and pasting onto construction paper, various objects such as macaroni, yarn, cotton, popsicle sticks, fabrics, ribbon, construction paper, etc.

2.2.5 Fun dough activities; using materials such as silly putty, play dough, and flour and cornstarch dough.

2.2.6 Toy boats; making soap sailboats, wooden "motor" boats with rubber band propulsion, for water play.

2.2.7 Body tracings; adult traces child's body, child adds clothing and body parts.

2.2.8 Making cardboard box trains; painting outside, adding windows (to fit various body parts), wheels, smoke stack, etc.

Sub-objective 2.3 To improve range of motion.
Activities
2.3.1 Action songs and rhythm games; examples (to be selected based on the children's abilities), "Head, Shoulders, Knees and Toes", "I'm a Little Teapot", The Itsy Bitsy Spider", "Do Your Ears Hang Low?", "If You're Happy and You Know It, Clap Your Hands", "The Hokey Pokey", "Ring Around The Rosie", "London Bridges", "Row, Row, Row Your Boat".

2.3.2 Hula Hoop Activities; sitting while holding onto the hula hoop, raise it overhead, changing position of hands, moving it around from hand to hand, etc.

2.3.3 Angels-in-the-Snow

2.3.4 Finger Painting; with large sheets of paper on the wall.

2.3.5 Bicycling of extremities; reciprocal movements of legs and arms done to rhymes and songs by adults.

2.3.6 Water play; buoyancy, warmth of water incorporated to increase joint mobility, bilateral hand activities, etc.

2.3.7 "Whats-in-the-Box"; positioning of child and placement of box to facilitate joint mobility.

2.3.8 Ball play; throwing, catching, and kicking various balls.

Sub-objective 2.4 To improve muscle strength.

Activities

2.4.1 Obstacle Course

2.4.2 Ball and Bolster Games; Throwing and pushing balls and bolsters of increasing weight.

2.4.3 Fishing Game; pull weighted ropes to get prizes.

2.4.4 Pretend Animals; Be a duck, bunny, snake, cat, frog, rocking horse, etc.

2.4.5 "What's-in-the-Box?"; To be done prone over balls, bolsters, etc.

2.4.6 Mobility games; such as belly boards, wheelbarrows, tyke bikes, crazy car, etc.

2.4.7 Water play; utilizing resistance of the water.

2.4.8 Bean Bag Toss; utilizing various weights.

2.4.9 Hula Hoop Activities; utilizing resistance to hoop when raising up and down.

2.4.10 Cardboard Box Train; pushing and pulling each other in train

Sub-objective 2.5 To improve balance and reinforce equilibrium reactions

Activities

2.5.1 Obstacle Course; rolling up and down wedge, creeping over tilt board, jumping on trampoline, walking through tires and hoops, teeter-totter, sit-n-spin, etc.

2.5.2 Equilibrium Board Boat; maintaining balance while in various positions on the equilibrium board

2.5.3 Musical Beanbag Pass; children pass the beanbag to music, sitting just far enough apart to have to use balancing reactions.

2.5.4 Large ball and barrel activities

2.5.5 Ball Games; stressing reaching out and maintaining balance

Sub-objective 2.6 To inhibit abnormal reflex activity and muscle tone

Activities

2.6.1 Prone over large balls and bolsters; gentle movement to inhibit spasticity

2.6.2 Swing; child positioned in sheet or hammock to inhibit tone

2.6.3 Mirror play; head in midline to discourage tonic reflexes

2.6.4 Bilateral hand and foot activities; finger and foot painting, throwing and catching, stringing beads, stacking cones or rings, etc.

Sub-objective 2.7 To facilitate oral-motor development

Activities

2.7.1 Tongue games; follow the leader with tongue movements - in/out, to the sides, up/down, etc.; licking off whipped cream, peanut butter, etc.

2.7.2 Mirror play; tongue and facial movements

2.7.3 Pretend Indians; learning war whoops, sounds, etc.

2.7.4 Snacktime; exposure to various textures of foods, jello, whipped cream, pudding, cookies, cheese, etc.

2.7.5 Pudding Painting; encouraging hand to mouth pattern, tongue movements, etc.

2.7.6 Action songs

2.7.7 Water play; using straws, blowing bubbles, etc.

2.7.8 Straw Painting

Objective 3.0 To facilitate sensory awareness.

Sub-objective 3.1 To differentiate between different textures

Activities

3.1.1 Rubbing body with various tactile materials, such as terry cloth, sheepskin, carpet, vinyl, burlap, sandpaper, silk, suede, plastic packaging material, corduroy, mud, hand cream, etc.

3.1.2 Feely ball; made from various textures. Push, pass, and catch games.

3.1.3 Sand play; use of various textured objects in the sand, i.e. sponges, soft plastic animals, hard plastic pails and shovels, add water to change texture of the sand.

3.1.4 Water play; varying temperatures, addition of crazy foam and/or soap bubbles to change the consistency.

3.1.5 Finger and Body Painting; addition of sand, coconut, cornmeal, rice, to change texture. Use of pudding (plain or with rice or tapioca), gel, frosting, or whipped cream.

3.1.6 Tactile collage

3.1.7 "What's-in-the-Box?"; using various textured objects.

3.1.8 Fun dough

3.1.9 Bead Play; wooden beads, pop beads, hair rollers, etc.

3.1.10 "Pass the Jar"; filled with rice, beans, yarn, macaroni, styrofoam pieces, cotton balls, etc.

Sub-objective 3.2 To distinguish between various sounds.

Activities

3.2.1 Identify the sounds; use bell, spoons, tambourine, drums, tin containers with various objects inside, xylophone, blocks of wood, etc.

3.2.2 Rhythm band

3.2.3 Animal Sounds Game

3.2.4 Tearing, wrinkling, crumpling various materials, paper, plastic, cellophane, tinfoils, etc.

3.2.5 Action songs and music

3.2.6 Pass the beanbag to music

3.2.7 Water play, emphasizing sounds such as drip, splash, plop, etc.

Sub-objective 3.3 To distinguish between smells.
Activities
3.3.1 Hand Cream Activities; rubbing on different parts of body, discussing the process of smelling, hand to nose, etc.

3.3.2 Snacktime, emphasizing various smells of foods.

3.3.3 Blowing bubbles; odor and sensation involved

3.3.4 Frosting cookies; use various flavors in frostings, i.e. lemon, mint, chocolate, orange, cinnamon, etc.

Sub-objective 3.4 To distinguish between tastes.
Activities
3.4.1 Foodstuffs; tasting various foods, such as peanut butter, jelly, sugar, salt, lemon, spaghetti (cooked and uncooked), carrots, cheese, apples, nuts, granola, raisins, pudding, etc.

3.4.2 Pudding Painting

Sub-objective 3.5 To facilitate visual discrimination.
Activities
3.5.1 Mirror play

3.5.2 Ball play; emphasis on focus

3.5.3 Obstacle Course; emphasis on focus

3.5.4 Flashflight Games; focusing on moving light, in a darkened room

Objective 4.0 To improve perceptual motor skills.

Sub-objective 4.1 To increase awareness of body parts.
Activities
4.1.1 Angels-in-the-Snow

4.1.2 "Simon Says", and "Follow the Leader"

4.1.3 Body Tracings

4.1.4 Mirror play

4.1.5 Hula Hoop Games

4.1.6 Finger and Body Painting

4.1.7 Hand Cream Activities

4.1.8 Action songs and rhythm games

4.1.9 Cardboard Box Train

Sub-objective 4.2 To improve awareness of spatial concepts.
Activities
4.2.1 Hula Hoop games

4.2.2 Obstacle Course

4.2.3 "Simon Says", and "Follow the Leader"

4.2.4 Mobility Games

Sub-objective 4.3 To improve motor planning
Activities
4.3.1 Obstacle Course

4.3.2 Mobility games

4.3.3 Marching rhythm band

4.3.4 Angels-in-the-Snow

4.3.5 Action songs and rhythm games

4.3.6 Cardboard Box Train

4.3.7 Hula Hoop Games; children get in and out, over and under hoop, etc.

Sub-objective 4.4 To improve figure-ground awareness.
Activities
4.4.1 Obstacle Course

4.4.2 Pegboard Games; copy pre-determined patterns

4.4.3 Suspended ball activities

Sub-objective 4.5 To improve directionality and laterality.
Activities
4.5.1 Angels-in-the-Snow

4.5.2 Ball games

4.5.3 Chalk and felt board activities; acting out stories with figures on the feltboard, making large circles, scribbling on chalkboard.

4.5.4 Obstacle Course

Objective 5.0 To improve cognitive-social (play) skills.

Sub-objective 5.1 To improve the ability to maintain attentiveness during a group activity.

the

Sub-objective 5.2 To improve the ability to follow basic directions and commands.

Sub-objective 5.3 To improve an awareness of self.

Sub-objective 5.4 To increase awareness of others.

Sub-objective 5.5 To increase recognition of common playthings and their function.

Sub-objective 5.6 To improve the ability to imitate others.

Sub-objective 5.7 To improve the ability to explore their immediate environment.

Sub-objective 5.8 To increase ability to show likes and dislikes.

Sub-objective 5.9 To improve ability to take turns.

The activities for this objective are incorporated into the total program.

PARENT EDUCATION PROGRAM

GOAL STATEMENT: The intent is to establish an educational program for parents of preschool neurologically impaired children with an informal, playful atmosphere. The program will focus on the significance of play in development, parental attitudes toward play, information concerning neurological impairment, and adaptations and modifications of activities and play equipment.

Objective 1. To improve parent's awareness and understanding of their attitudes toward play and playfulness and of how their attitudes influence the play attitudes and abilities of their children.

Sub-objective 1.1. To increase parent's knowledge about the significance of play.

Sub-objective 1.2. To increase parent's awareness of their own playfulness and their attitudes toward play.

Sub-objective 1.3. To enable parent's to participate in play activities in a playful manner.

Sub-objective 1.4. To increase parent's knowledge of the effect of a playful attitude on their children.

Objective 2. To increase parent's understanding of neurological impairment.

Sub-objective 2.1 To increase parent's basic knowledge of neurological impairment.

Sub-objective 2.2. To increase parent's knowledge of the varied sensory and motor deficits associated with neurological impairment.

Sub-objective 2.3. To increase parent's knowledge concerning handling and positioning.

Objective 3. To increase parent's understanding of the significance of play in the development of their children.

Sub-objective 3.1. To increase parent's knowledge of child development.

Sub-objective 3.2. To increase parent's knowledge of the way children learn and develop through play.

Sub-objective 3.3. To increase parent's awareness of the incorporation of play into physical therapy treatment of children.

Sub-objective 3.4. To increase parent's awareness of the importance of play for the growth and development of neurologically impaired children.

Objective 4. To assist parents in adaptations and modifications of play activities and play equipment.

Sub-objective 4.1. To increase parent's understanding of the necessity of adapting and modifying toys and play activities for their neurologically impaired child.

Sub-objective 4.2. To increase parent's resources concerning play adaptation and modifications.

Sub-objective 4.3. To increase parent's ability to adapt and modify play activities for their neurologically impaired child.

Sub-objective 4.4. To increase the parent's ability to adapt and modify play equipment for their neurologically impaired child.

Sub-objective 4.5. To encourage parent's to pose problems they encounter with play activities and equipment, to the group for discussion and possible alternatives.

EVALUATION

1. Please identify any objective(s) which are not stated clearly. _____ Comments _____
   _____

2. Please identify any objective(s) you feel does not relate to the goal statement. _____ Comments _____
   _____
   _____

3. Please identify any additional objective(s) which you feel would be necessary to achieve the purpose of the study.
   _____
   _____

4. Please identify any sub-objective(s) which are not stated clearly. _____ Comments _____
   _____

5. Please identify any sub-objective(s) you feel does not relate to its respective objective. _____
   Comments _____
   _____

6. Please identify any additional sub-objective(s) which you feel would be necessary to meets its objective. _____
   _____ Comments _____
   _____

7. Please identify any activity(ies) you feel does not relate to its respective objective(s). _____
   _____ Comments _____
   _____

8. Please identify any additional activity(ies) which you feel would be necessary to meets its respective objective(s).
   _____
   Comments _____
   _____

9. Are the sub-objectives and activities appropriate for preschool Cerebral Palsy children? _____
   _____
   _____

A P P E N D I X B

Child's Name _____ Mother's Name _____

Birthdate _____ Father's Name _____

Siblings' Name _____ Mother's Birthdate _____

_____ Father's Birthdate _____

Siblings' Ages _____

Address _____

Educational Level:

	Mother		Father	
K - 8th grade	K 1 2 3 4 5 6 7 8		K - 8th grade	K 1 2 3 4 5 6 7 8
High School	1 2 3 4		High School	1 2 3 4
College	1 2 3 4		College	1 2 3 4
Post-grad	_____		Post-grad	_____

Diagnosis of Child _____ Phone _____

Treatment services for child (where and number of times per week) _____

_____

Additional programs your child participates in?_____

_____

Additional programs you are involved in related to your child

_____

Describe your child _____

_____

A P P E N D I X C

VOLUNTEER TRAINING PROGRAM

First Session

I. Fingerpainting with Pudding

Half of the volunteers will each be given the description of a child of preschool age, who has been diagnosed with a neurological impairment. The description will include the child's age, disability, personality characteristics, mental status, etc. They will then be requested to role play their assigned child. After a brief description of the Therapeutic Play session the rest of the volunteers will act as volunteers in a modified therapeutic play session. Roles will be reversed after fifteen minutes. Following the play session there will be a group discussion dealing with the participants' feelings during the session, the activity itself (pudding painting), and ways in which the activities can be therapeutic yet fun. Time: One hour

II. Videotape on the therapeutic play program. Time: Thirty minutes

III. Policies and Procedures

A. Time, place and transportation discussion

B. Expectations of the volunteers

1. Versatility between parent and play group.
2. Assist group leaders in the preparation of the area and equipment.
3. Assist with the dressing of the child.
4. Each volunteer will be assigned to specific children.
5. Participate in free play with the children as they arrive.
6. Observe children and parents' reactions for recording after each session.
7. Encourage children to participate in the group.
8. Encourage children to interact, but do not allow them to hurt each other.
9. Assist in cleaning program area.

Time: Thirty minutes

Second Session

I. Roleplay Parents of Handicapped Children

After a brief description of the parent education program on play, half of the volunteers will be given the description of a preschool neurologically impaired child, including the same characteristics as those given for the play program. They will then be requested to role play the parents of these children in a modified parent education session on play. The rest of the volunteers will be asked to

act as volunteers in the session. Roles will be reversed after fifteen minutes. A group discussion will follow dealing with theparticipants' feelings and reactions, handicaps such as neurological impairments and parental attitudes towards these and play. Time: One Hour

II. Observation and Recording

A segment of the Therapeutic Play videotape will be shown and the volunteers will be asked to record their observations. Discussion will follow concerning observation and recording with emphasis on the problem of interpretation. Another segment of the video will then be shown and they will be asked to record their observations again. Comparisons will then be made.
Time: Forty-five minutes

III. Handouts and Further Discussion and Questions

A. An opportunity for the volunteers to ask any further questions or stimulate further discussion will be provided.

B. Handouts

1. Schedule of both programs
2. Chapter on "Play" by Finnie
3. Development of Play
4. "How to Play With Your Baby" (Asconi)

Time: Fifteen minutes

A P P E N D I X D

PLAY SCHEDULE

First Session

7:00-7:08	Free play, dress and organize the first activity
7:09-7:30	Obstacle course - an obstacle course including wedges, bolsters, barrels, boxes, mats, chairs, a tunnel and a bean bag chiar
7:31-7:44	"What's in the Box" - filling and emptying various containers with objects of different sizes, shapes and textures such as rice, beans, yarn and pine needles
7:45-7:52	Snacktime
7:53-8:00	Hula Hoop Games - featuring directional concepts such as up, down, in and out -"I'm a Little Teapot".

Second Session

7:00-7:08	Free play, dress and organize for the first activity
7:09-7:15	Balance activities on balance "boat" and see-saw
7:17-7:44	Rhythm Marching Band - Constructing different instruments with various materials, then participate in a marching band. Incorporated in this section will be "Follow the Leader" and Pretend Indians with the instruments.
7:45-7:52	Snacktime
7:53-8:00	Hula Hoop Games "Head, Shoulders, Knees and Toes" and "I'm A Little Teapot"

Third Session

7:00-7:08	Free play, dress and organize for the first activity
7:09-7:15	"Angels in the Snow" and "Simon Says"
7;16-7:36	Body Tracing - one of the leaders will trace the child's body and the child will add the clothing and accessories. Body parts will be stressed.

7:37-7:44 Relay race - using bellyboards

7:45-7:52 Snacktime

7:53-8:00 Hula Hoop Games
"Do Your Ears Hang Low" and "Itsy, Bitsy Spider"

Fourth Session

7:00-7:08 Free play, dress and organize for the first activity

7:09-7:15 Pretend Animals - Imitate a duck, bunny, snake, cat, frog, rocking horse, chicken, etc. through body movement and verbalization.

7:16-7:36 Straw Painting - Painting pictures by blowing through straws.

7:38-7:44 Relay race with belly boards

7:45-7:53 Snacktime

7:54-8:00 Hula Hoop Games
"Do Your Ears Hang Low" and "Head, Shoulders, Knees and Toes"

Fifth Session

7:00-7:08 Free play, dress and organize for the first activity

7:09-7:30 Pudding Painting - with hands and feet

7:31-7:44 Water Play - Immersion in the water, movement in the water, blowing bubbles, and drying with a soft towel.

7:45-7:53 Snacktime

7:54-8:00 Hula Hoop Games
"London Bridges" and "Itsy, Bitsy Spider"

Sixth Session

7:00-7:08 Free play, dress and organize for the first activity

7:09-7:15 Relay race with tyke bikes

7:16-7:35 Make toy boats - construct, then push or sail them.

7:36-7:44 Bean Bag and Ring Toss

7:45-7:53 Snacktime - "Follow the Leader" with tongue movements

7:54-8:00 Hula Hoop Games
"Ring Around the Rosy" and "Head, Shoulders, Knees and Toes"

Seventh Session

7:00-7:08 Free play, dress and organize for the first activity

7:09-7:15 Swing in sheets

7:16-7:36 Tactile Collage - Select various textured items to paste on a background

7:37-7:44 Roll and do somersaults down wedge.
Nerf ball hanging from string

7:45-7:53 Snacktime

7:54-8:00 Hula Hoop Games
"If You're Happy and You Know It Clap Your Hands" and "Itsy, Bitsy,Spider"

Eighth Session

7:00-7:08 Free play, dress and organize for the first activity

7:09-7:20 Ball Games - kick, catch and throw balls of various sizes and shapes

7:21-7:44 Cardboard Box Train - construct train and follow with relay races

7:45-7:53 Snacktime

7:54-8:00 Hula Hoop Games
"Hokey Pokey" and "If You're Happy and You Know It Clap Your Hands"

A P P E N D I X E

COMPREHENSIVE DEVELOPMENTAL EVALUATION CHART

Child's Name

Birthdate

Initial Evaluation Date

Diagnosis

Physician(s)

Referral Source

Mother's Name

Father's Name

Address

Phone

Other family members with related disorders

Health Clinic

Assisting Agencies (#)

Summary of History:

Precautions:

Clinic Appointments:

Equipment:

SOURCE	TYPE	DATE ORDERED	RECEIVED	RETURNED

Developed by the Early Childhood Development Team of the El Paso Rehabilitation Center

S. Cliff, D. Carr, J. Gray, C. Nymann, S. Redding.

REFLEXES	GROSS MOTOR	MANIPULATION	VISION	WEEKS	FEEDING	RECEPTIVE LANGUAGE	EXPRESSIVE LANGUAGE	COGNITIVE—SOCIAL
	Supine—symmetrical active movements of all extremities	Puts hand to mouth after stimulation of cheek or palm Flexes elbow approximately 100° when arm is extended and then released*	Pupils respond to hand-shadow test* Doll's eye movements*	0	Sucks well: suck reflex*, rooting reflex*, lip reflex*, swallow reflex*, normal oral tone			
	Prone—turns head side to side	Puts hand to mouth	Gazes around; occasionally fixates momentarily	2	No interference from: severe ATNR, severe TNR, palmar-mental reflex*, tactile hypersensitivity		Lusty cry when uncomfortable Cries no tears	Displays awareness of examiner
	In ventral suspension-often raises head slightly, knees & elbows flexed, some hip extension		Briefly follows object moved horizontally in front of face	4	Coordinates sucking & breathing		Makes throaty noises	Changes body activity when spoken to Quiets when picked up
	In ventral suspension-briefly holds head in plane of body Prone—sometimes kicks legs out	Arms thrust in play	Fixates for a few seconds Watches mother intently during feeding	6	Sucks 60-100 times per minute Swallows every 2-3 sucks	Shows vague indirect regard of environment	Cries with changes in pitch	Responds to a speaking voice Smiles when stimulated
	Prone—lifts face to 45° Supine—symmetrical active movements of all extremities. Elbows, hips, & knees are partly flexed		Briefly follows objects from side to midline	8		Shows alert expression	Coos & gurgles in vocal play	Shows awareness of brightly colored rattle
	In ventral suspension—often holds head above plane of body Prone—usually holds head in midline	Briefly retains rattle when placed in hand	Briefly follows a moving person Eyes accommodate to an object held at 7½ inches	10	Begins sucking when held in the feeding position	Shows direct definite regard of environment	Says single vowel sounds, "uh", "ah" Begins blowing bubbles	Reacts when paper is placed on face
	Prone—lifts face to 45°-90° pelvis flat In ventral suspension—maintains head above plane of body	Holds hands open or loosely closed Actively holds rattle & glances at it	Follows a brightly colored dangling toy 180° Catches sight of presented object immediately	12	Automatically opens mouth for feeding	Frequently stops vocalizing when adult joins in	Shows pleasure in making sounds Squeals and chuckles	Simple play with rattle Smiles upon recognition of mother's face
	Sitting—usually holds head up, upper back fairly straight	Primitive clutch; pulls at dress or blanket Reaches for a brightly colored dangling toy; may contact it	Shows binocular coordination Looks at hand when reaching Follows an object moved vertically	14	Can be fed soft pureed foods from spoon	Is aware of noises and objects in environment	Tries to "talk" when spoken to	Excites when a toy is presented Glances from object to object
	Prone—lifts chest up, lifts face to 90° Has only slight head lag when pulled to sitting	Puts hands together Puts toy to mouth Attempts to contact cube with hands	Blinks to threat Intently watches moving & still objects	16	Exhibits hand to mouth pattern	Reduces amount of crying	Laughs aloud Coos and goos when talked to	Spontaneous social smile Enjoys noise-making toys

REFLEXES (bars across the weeks):
- ...OPTICAL RIGHTING—PRONE
- NECK RIGHTING
- POSITIVE SUPPORTING REACTION
- HAND GRASP
- TONIC LABYRINTHINE—SUPINE & PRONE
- SYMMETRICAL TONIC NECK
- ASYMMETRICAL TONIC NECK
- EXTENSOR THRUST
- FLEXOR WITHDRAWAL
- MORO REFLEX

COMMENTS:

ROM LIMITATIONS: | HEAD CIRCUMFERENCE: | WEIGHT: | HEIGHT: | HIPS:* Asymmetry of skin folds; Limitation of hip abduction; Obvious shortening of affected leg; Snapping sign; Telescoping sign

MUSCLE TONE: ____ Hypertonic ____ Hypotonic ____ Athetoid | DTR'S: BABINSKI: CLONUS: | SUSPECTED SEIZURE ACTIVITY: | PHYSICAL ABNORMALITIES: | HEARING: Quiets to a bell; Listens to mother's voice | PARENTAL ATTITUDES:

*ITEM EXPLAINED IN TEST MANUAL

WEEKS	GROSS MOTOR	MANIPULATION	FEEDING	RECEPTIVE LANGUAGE	EXPRESSIVE LANGUAGE	COGNITIVE—SOCIAL	WEEKS
18	Bears some weight when held standing Prone—bears weight on forearms	Puts hands together Puts toy to mouth Attempts to contact cube with hands	Exhibits hand to mouth pattern	Reduces amount of crying	Frequently vocalizes when alone	Recognizes bottle; anticipates feeding	18
20	Has no head lag when pulled to sitting Sitting—has no head wobble when swayed	Approaches rattle with two hands & prehends it using whole hands	Puts hand to bottle	Vocalizes displeasure (cries) at losing toy	Puts lips together and says "mmm" Begins babbling more vowels	Laughs aloud when stimulated Initiates play-interacts with objects	20
22	Lifts head spontaneously when pulled up to sitting	Grasps cube on contact		Cries to angry voice; smiles to pleasant voice	Puts together two sounds; e.g. "ahgoo" Occasionally imitates babbling	Distinguishes mother from another person Crumples paper Exhibits playful curiosity	22
24	Rolls prone to supine Prone—bears weight on hands with extended arms	Palmar grasp of cube*	Can be placed routinely in a sitting position for feeding		Grunts and growls Begins true babbling; vocalizes well-defined syllables	Is aware of toes Looks when people enter room	24
26	Enjoys bouncing when held standing	Approaches & grasps cube or ring (usually two-handed)	Holds bottle Central lower incisors erupt	Enjoys listening to own voice Coos to music	Begins lalling; tries to repeat his own sounds	Turns head to find fallen toy Reaches for/pats a mirror	26
28	Sits alone using hands forward for support	Radial-palmar grasp (partial thumb opposition)* Transfers cube or ring	Drinks from cup when held to lips	Appears to listen to family conversation	Babbles sounds "da" & "ba" Crows and squeals	Holds out hands to be lifted Playful response to reflection in mirror	28
30	Prone—bears weight on one hand and reaches with the other	Unilateral approach and grasp of rattle		Responds to simple commands when accompanied by gestures; e.g. "Look."	Vocalizes differently when happy or angry	Attends to scribbling Shows interest in self-image in mirror	30
32	Sits alone without hands for support; unsteady	Attempts inferior scissors grasp of pellet; usually unsuccessful*	Begins to chew finely chopped food: Bite reflex disappears then lateral chewing motions appear Tongue tone normal* Good lip closure*	Looks at a family member when that person is named	Says "da", "ba", "ka" Imitates sounds	Smiles at reflection in mirror Playfully puts feet to mouth	32
34	Sits alone without hands for support for 10 minutes	Inferior scissors grasp of ring (thumb adducted, not opposed)*	Central and lateral upper, lateral lower incisors erupt Finger feeds	Responds to disapproving voice	Begins to couple consonant sounds; e.g. "dada" not "dadadada"	Enjoys playing peek-a-boo Exhibits shyness with strangers	34

REFLEXES (weeks 18–34):
- ASYMMETRICAL TONIC NECK
- SYMMETRICAL TONIC NECK
- EQUILIBRIUM REACTION ALL FOURS
- FOOT GRASP
- INTEGRATION
- POSITIVE SUPPORTIVE REACTION
- BODY RIGHTING
- NECK RIGHTING
- OPTICAL & LABYRINTHINE RIGHTING—PRONE
- OPTICAL & LABYRINTHINE RIGHTING—SUPINE
- OPTICAL & LABYRINTHINE RIGHTING—RIGHT & LEFT
- LANDAU REFLEX
- PARACHUTE REACTION
- EQUILIBRIUM REACTION SUPINE & PRONE

COMMENTS:

ROM LIMITATIONS: | HEAD CIRCUMFERENCE: | WEIGHT: | HEIGHT: | HIPS:* Asymmetry of skin folds; Limitation of hip abduction; Obvious shortening of affected leg; Snapping sign; Telescoping sign

MUSCLE TONE: ____ Hypertonic ____ Hypotonic ____ Athetoid | DTR'S: BABINSKI: CLONUS: | SUSPECTED SEIZURE ACTIVITY: | PHYSICAL ABNORMALITIES: | HEARING: Localizes sound side to side | VISION: No irregularities in the eye position or movements; Can track 180° in all planes; Can accommodate to close objects. | PARENTAL ATTITUDES:

*ITEM EXPLAINED IN TEST MANUAL

WEEKS	REFLEXES	GROSS MOTOR	MANIPULATION	FEEDING	RECEPTIVE LANGUAGE	EXPRESSIVE LANGUAGE	COGNITIVE—SOCIAL	WEEKS
36	Equilibrium reactions—prone, supine & all fours Equilibrium reaction—sitting Foot grasp Integration of supporting reactions to allow for reciprocation Body righting Optical & labyrinthine righting—prone, supine, right & left Landau reflex [illegible]	Pulls to standing Attempts to crawl	Radial-digital grasp of cube (thumb begins to move towards opposition)*	Begins to chew finely chopped food: Bite reflex disappears then lateral chewing motions appear Tongue tone normal* Good lip closure* Central and lateral upper, lateral lower incisors erupt Finger feeds	Meaningfully waves "bye-bye" Cries when scolded	Enjoys making coupled sounds; e.g. "lala," "baba" Begins to string sounds together with inflectional patterns	Inspects a toy Exhibits curiosity; uncovers toy	36
38		Sitting—recovers balance after leaning forward	Scissors grasp of pellet*	Does not gag on anterior half of tongue Gag occurs on back half of tongue	Comprehends "no-no"	Repeats most sounds said to him (not words)	Responds appropriately to "no-no"	38
40		Crawls forward on stomach Goes over into prone from sitting	Inferior pincer grasp of pellet*		Responds to own name	Begins echolalia: imitates facial expressions and sounds	Is a cooperative participant in peek-a-boo Dislikes being supine except to sleep	40
42		Gets to a sitting position independently	Crude release of cube		Understands some phrases of body action; e.g. "Open your mouth."	Jabbering begins to resemble short sentences	Extends toy to examiner; may not release Will look in box for contents	42
44		Creeps on hands and knees Pulls to standing using furniture	Removes cube from cup	Begins to eat solid table foods	Understands meaning of "hot"	Enjoys making bilabial sounds Uses both speech and nonspeech sounds	Shows interest in pictures in book Deliberately drops toy to be picked up	44
46		Can lift one foot when standing with support	Puts cube into cup; may not release		Looks at shoe when asked, "Where's (child's name) shoe?"	Tries to say names of familiar objects; e.g. "babo" for "bottle"	Attempts to scribble after demonstration	46
48		Cruises along furniture Pivots while sitting	Neat pincer grasp of pellet*		Shakes head "yes" or "no" in answer to a few questions	Talks to himself in mirror	Repeats performance when laughed at Attempts to "play" ball	48
50		Lowers from standing to sitting without help	Removes round block from formboard	Attempts to drink from cup by self	Looks for ball when asked, "Where's the ball?"	Imitates some new sounds not previously heard	Plays ball with examiner Obeys "no"	50
52		Walks with one hand held Stands alone momentarily	After demonstration, releases a cube into cup	Begins to acquire mature swallow pattern No more drooling Should no longer drink from bottle Eats most table foods—meat may be chopped	Usually follows command, "Give it to me."	Uses one word with meaning	Turns pages of a book	52

COMMENTS:

ROM LIMITATIONS: HEAD CIRCUMFERENCE: WEIGHT: HEIGHT: HIPS:* Asymmetry of skin folds / Limitation of hip abduction / Obvious shortening of affected leg / Snapping sign / Telescoping sign

MUSCLE TONE: ____ Hypertonic ____ Hypotonic ____ Athetoid

DTR'S: BABINSKI: CLONUS:

SUSPECTED SEIZURE ACTIVITY:

PHYSICAL ABNORMALITIES:

HEARING: Localizes sound side to side and up and down

VISION: No irregularities in the eye position or movements. Can track 180° in all planes. Can accommodate to close objects.

PARENTAL ATTITUDES:

*ITEM EXPLAINED IN TEST MANUAL

REFLEXES:
- EQUILIBRIUM REACTIONS WHILE STANDING—FORWARD, BACKWARDS, SIDEWAYS
- EQUILIBRIUM REACTIONS KNEEL-STANDING
- EQUILIBRIUM REACTIONS—PRONE, SUPINE, ALL FOURS, SITTING
- INTEGRATION OF SUPPORTING REACTIONS TO ALLOW FOR [illegible]
- [illegible]

AGE	GROSS MOTOR	MANIPULATION	FEEDING	RECEPTIVE LANGUAGE	EXPRESSIVE LANGUAGE	COGNITIVE—SOCIAL	AGE
1 YEAR 3 MOS.	Walks alone Squats, then regains standing position	Builds a tower with 2 blocks Places round block in formboard without demonstration	Picks up cup with palmar grasp* Begins independent spoon-feeding	Looks at correct picture in book when named	Says at least two words with meaning Uses expressive jargon	Cooperates in dressing	1 YEAR 3 MOS.
1 YEAR 6 MOS.	Walks hurriedly Seats himself in small chair	Builds a tower of 3-4 cubes	Partially feeds self; frequently spills Eats bite-sized pieces of meat Has approximately 12 teeth	Identifies a few body parts when named	Points to make wants known Says 4-7 words with meaning; e.g. "All gone," "Thank you."	Plays meaningfully with toys; e.g. doll, cup, car Scribbles spontaneously when given crayon	1 YEAR 6 MOS.
1 YEAR 9 MOS.	Walks up stairs using railing	Builds a tower of 5-6 cubes Places 2-3 shapes in formboard	Handles a cup well	Points or looks to 4 common items when named	Vocalizes wants Asks for familiar objects by name	Shows favoritism for selected toys Copies mother in household tasks	1 YEAR 9 MOS.
2 YEARS	Standing—kicks ball Walks backward	Unscrews lids; turns knobs Strings 1" beads	Holds spoon in the supinated position Has approximately 16 teeth	Carries out simple commands; e.g. "Put the book on the chair." Identifies 5 pictures in a book	Uses a few two word phrases; e.g. "More milk," "Daddy gone." Uses I, me, you	Unwraps candy Identifies doll's body parts	2 YEARS
2 YEARS 6 MOS.	Can walk on tiptoes Throws a ball 4 feet	Builds a tower of 8 cubes Imitates a circular, vertical & horizontal stroke with a crayon	Has all 20 deciduous teeth	Understands the prepositions on and under	Uses many two word phrases; usually intelligible Can name 5 pictures in a book	Is toilet trained Knows meaning of "mine"; unable to share easily	2 YEARS 6 MOS.
3 YEARS	Jumps up a few inches Can stand with feet together	Imitates a bridge with three blocks Copies a circle	Feeds self independently; seldom spills	Identifies action pictures in books	Uses longer phrases with some words omitted; e.g. "That boy bad." Asks frequent questions	Plays guessing game, "Which hand?" Knows full name	3 YEARS

COMMENTS:

ROM LIMITATIONS:

HEAD CIRCUMFERENCE:

WEIGHT:

HEIGHT:

HIPS:* Asymmetry of skin folds
Limitation of hip abduction
Obvious shortening of affected leg
Snapping sign
Telescoping sign

MUSCLE TONE: Hypertonic / Hypotonic / Athetoid

DTR'S:

BABINSKI:

CLONUS:

SUSPECTED SEIZURE ACTIVITY:

PHYSICAL ABNORMALITIES:

HEARING: Localizes sound in all planes

VISION: No irregularities in the eye position or movements
Can track 180° in all planes
Can accommodate to close objects.

PARENTAL ATTITUDES:

*ITEM EXPLAINED IN TEST MANUAL

REFLEXES:
- EQUILIBRIUM REACTIONS WHILE STANDING—FORWARD, BACKWARDS, SIDEWAYS
- EQUILIBRIUM REACTIONS KNEEL STANDING
- EQUILIBRIUM REACTIONS—PRONE, SUPINE, ALL FOURS, SITTING
- INTEGRATION OF SUPPORTING REACTIONS TO ALLOW FOR [illegible]
- [illegible]
- [illegible]

AGE	GROSS MOTOR	MANIPULATION	FEEDING	RECEPTIVE LANGUAGE	EXPRESSIVE LANGUAGE	COGNITIVE—SOCIAL	AGE
1 YEAR 3 MOS.	Walks alone Squats, then regains standing position	Builds a tower with 2 blocks Places round block in formboard without demonstration	Picks up cup with palmar grasp* Begins independent spoon-feeding	Looks at correct picture in book when named	Says at least two words with meaning Uses expressive jargon	Cooperates in dressing	1 YEAR 3 MOS.
1 YEAR 6 MOS.	Walks hurriedly Seats himself in small chair	Builds a tower of 3-4 cubes	Partially feeds self; frequently spills Eats bite-sized pieces of meat Has approximately 12 teeth	Identifies a few body parts when named	Points to make wants known Says 4-7 words with meaning; e.g. "All gone," "Thank you."	Plays meaningfully with toys; e.g. doll, cup, car Scribbles spontaneously when given crayon	1 YEAR 6 MOS.
1 YEAR 9 MOS.	Walks up stairs using railing	Builds a tower of 5-6 cubes Places 2-3 shapes in formboard	Handles a cup well	Points or looks to 4 common items when named	Vocalizes wants Asks for familiar objects by name	Shows favoritism for selected toys Copies mother in household tasks	1 YEAR 9 MOS.
2 YEARS	Standing—kicks ball Walks backward	Unscrews lids; turns knobs Strings 1" beads	Holds spoon in the supinated position Has approximately 16 teeth	Carries out simple commands; e.g. "Put the book on the chair." Identifies 5 pictures in a book	Uses a few two word phrases; e.g. "More milk," "Daddy gone." Uses I, me, you	Unwraps candy Identifies doll's body parts	2 YEARS
2 YEARS 6 MOS.	Can walk on tiptoes Throws a ball 4 feet	Builds a tower of 8 cubes Imitates a circular, vertical & horizontal stroke with a crayon	Has all 20 deciduous teeth	Understands the prepositions on and under	Uses many two word phrases; usually intelligible Can name 5 pictures in a book	Is toilet trained Knows meaning of "mine"; unable to share easily	2 YEARS 6 MOS.
3 YEARS	Jumps up a few inches Can stand with feet together	Imitates a bridge with three blocks Copies a circle	Feeds self independently; seldom spills	Identifies action pictures in books	Uses longer phrases with some words omitted; e.g. "That boy bad." Asks frequent questions	Plays guessing game, "Which hand?" Knows full name	3 YEARS

COMMENTS:

ROM LIMITATIONS:

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WEIGHT:

HEIGHT:

HIPS:* Asymmetry of skin folds / Limitation of hip abduction / Obvious shortening of affected leg / Snapping sign / Telescoping sign

MUSCLE TONE: Hypertonic / Hypotonic / Athetoid

DTR'S:

BABINSKI:

CLONUS:

SUSPECTED SEIZURE ACTIVITY:

PHYSICAL ABNORMALITIES:

HEARING: Localizes sound in all planes

VISION: No irregularities in the eye position or movements / Can track 180° in all planes / Can accommodate to close objects.

PARENTAL ATTITUDES:

*ITEM EXPLAINED IN TEST MANUAL

100

DENVER DEVELOPMENTAL SCREENING TEST

STO.=STOMACH
SIT=SITTING

PERCENT OF CHILDREN PASSING 25 50 75 90

May pass by report

Footnote No. - see back of form

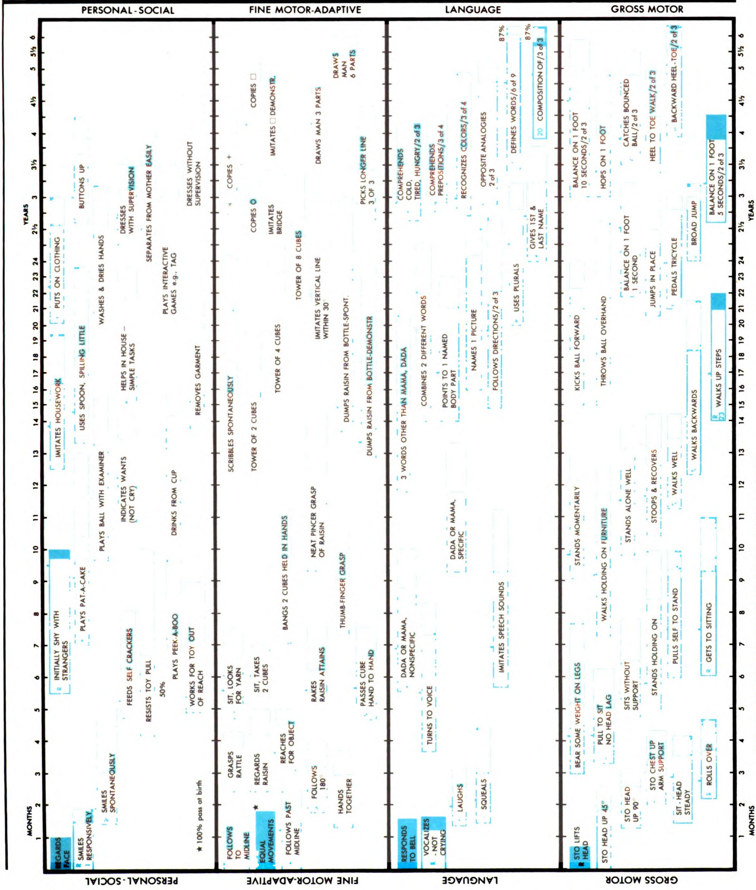
Test Item

Date

Name

Birthdate

Hosp. No.



PERSONAL-SOCIAL
FINE MOTOR-ADAPTIVE
LANGUAGE
GROSS MOTOR
MONTHS
YEARS
REGARDS FACE
SMILES RESPONSIVELY
SMILES SPONTANEOUSLY
FEEDS SELF CRACKERS
RESISTS TOY PULL
50%
WORKS FOR TOY OUT OF REACH
PLAYS PEEK-A-BOO
INITIALLY SHY WITH STRANGERS
PLAYS PAT-A-CAKE
PLAYS BALL WITH EXAMINER
INDICATES WANTS (NOT CRY)
DRINKS FROM CUP
IMITATES HOUSEWORK
USES SPOON, SPILLING LITTLE
HELPS IN HOUSE – SIMPLE TASKS
REMOVES GARMENT
PUTS ON CLOTHING
WASHES & DRIES HANDS
PLAYS INTERACTIVE GAMES e.g., TAG
DRESSES WITH SUPERVISION
SEPARATES FROM MOTHER EASILY
BUTTONS UP
DRESSES WITHOUT SUPERVISION
★ 100% pass at birth
FOLLOWS TO MIDLINE
EQUAL MOVEMENTS
FOLLOWS PAST MIDLINE
GRASPS RATTLE
REGARDS RAISIN
REACHES FOR OBJECT
FOLLOWS 180°
HANDS TOGETHER
SIT, LOOKS FOR YARN
SIT, TAKES 2 CUBES
RAKES RAISIN ATTAINS
PASSES CUBE HAND TO HAND
BANGS 2 CUBES HELD IN HANDS
NEAT PINCER GRASP OF RAISIN
THUMB-FINGER GRASP
SCRIBBLES SPONTANEOUSLY
TOWER OF 2 CUBES
TOWER OF 4 CUBES
DUMPS RAISIN FROM BOTTLE-SPONT.
DUMPS RAISIN FROM BOTTLE-DEMONSTR.
TOWER OF 8 CUBES
IMITATES VERTICAL LINE WITHIN 30°
COPIES O
IMITATES BRIDGE
PICKS LONGER LINE 3 OF 3
COPIES +
DRAWS MAN 3 PARTS
IMITATES □ DEMONSTR.
COPIES □
DRAWS MAN 6 PARTS
RESPONDS TO BELL
VOCALIZES NOT CRYING
LAUGHS
SQUEALS
TURNS TO VOICE
DADA OR MAMA, NONSPECIFIC
IMITATES SPEECH SOUNDS
DADA OR MAMA, SPECIFIC
3 WORDS OTHER THAN MAMA, DADA
COMBINES 2 DIFFERENT WORDS
POINTS TO 1 NAMED BODY PART
NAMES 1 PICTURE
FOLLOWS DIRECTIONS/2 of 3
USES PLURALS
GIVES 1ST & LAST NAME
COMPREHENDS COLD, TIRED, HUNGRY/2 of 3
COMPREHENDS PREPOSITIONS/3 of 4
RECOGNIZES COLORS/3 of 4
OPPOSITE ANALOGIES 2 of 3
DEFINES WORDS/6 of 9
COMPOSITION OF/3 of 3
87%
STO LIFTS HEAD
STO HEAD UP 45°
STO HEAD UP 90°
SIT-HEAD STEADY
STO CHEST UP ARM SUPPORT
ROLLS OVER
BEAR SOME WEIGHT ON LEGS
PULL TO SIT NO HEAD LAG
SITS WITHOUT SUPPORT
STANDS HOLDING ON
PULLS SELF TO STAND
GETS TO SITTING
WALKS HOLDING ON FURNITURE
STANDS MOMENTARILY
STANDS ALONE WELL
STOOPS & RECOVERS
WALKS WELL
WALKS BACKWARDS
WALKS UP STEPS
KICKS BALL FORWARD
THROWS BALL OVERHAND
BALANCE ON 1 FOOT 1 SECOND
JUMPS IN PLACE
PEDALS TRICYCLE
BROAD JUMP
BALANCE ON 1 FOOT 5 SECONDS/2 of 3
BALANCE ON 1 FOOT 10 SECONDS/2 of 3
HOPS ON 1 FOOT
CATCHES BOUNCED BALL/2 of 3
HEEL TO TOE WALK/2 of 3
BACKWARD HEEL-TOE/2 of 3

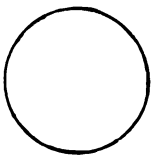
DATE

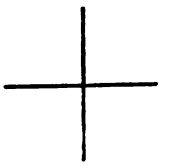
NAME

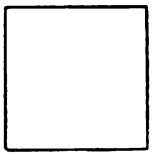
DIRECTIONS BIRTHDATE

HOSP. NO.

1. Try to get child to smile by smiling, talking or waving to him. Do not touch him.
2. When child is playing with toy, pull it away from him. Pass if he resists.
3. Child does not have to be able to tie shoes or button in the back.
4. Move yarn slowly in an arc from one side to the other, about 6" above child's face. Pass if eyes follow 90° to midline. (Past midline; 180°)
5. Pass if child grasps rattle when it is touched to the backs or tips of fingers.
6. Pass if child continues to look where yarn disappeared or tries to see where it went. Yarn should be dropped quickly from sight from tester's hand without arm movement.
7. Pass if child picks up raisin with any part of thumb and a finger.
8. Pass if child picks up raisin with the ends of thumb and index finger using an over hand approach.



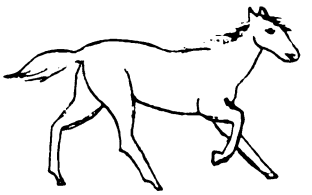


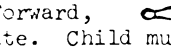


9. Pass any enclosed form. Fail continuous round motions.
10. Which line is longer? (Not bigger.) Turn paper upside down and repeat. (3/3 or 5/6)
11. Pass any crossing lines.
12. Have child copy first. If failed, demonstrate

When giving items 9, 11 and 12, do not name the forms. Do not demonstrate 9 and 11.

13. When scoring, each pair (2 arms, 2 legs, etc.) counts as one part.
14. Point to picture and have child name it. (No credit is given for sounds only.)



15. Tell child to: Give block to Mommie; put block on table; put block on floor. Pass 2 of 3. (Do not help child by pointing, moving head or eyes.)
16. Ask child: What do you do when you are cold? ..hungry? ..tired? Pass 2 of 3.
17. Tell child to: Put block on table; under table; in front of chair, behind chair. Pass 3 of 4. (Do not help child by pointing, moving head or eyes.)
18. Ask child: If fire is hot, ice is ?; Mother is a woman, Dad is a ?; a horse is big, a mouse is ?. Pass 2 of 3.
19. Ask child: What is a ball? ..lake? ..desk? ..house? ..banana? ..curtain? ..ceiling? ..hedge? ..pavement? Pass if defined in terms of use, shape, what it is made of or general category (such as banana is fruit, not just yellow). Pass 6 of 9.
20. Ask child: What is a spoon made of? ..a shoe made of? ..a door made of? (No other objects may be substituted.) Pass 3 of 3.
21. When placed on stomach, child lifts chest off table with support of forearms and/or hands.
22. When child is on back, grasp his hands and pull him to sitting. Pass if head does not hang back.
23. Child may use wall or rail only, not person. May not crawl.
24. Child must throw ball overhand 3 feet to within arm's reach of tester.
25. Child must perform standing broad jump over width of test sheet. (8-1/2 inches)
26. Tell child to walk forward,  heel within 1 inch of toe. Tester may demonstrate. Child must walk 4 consecutive steps, 2 out of 3 trials.
27. Bounce ball to child who should stand 3 feet away from tester. Child must catch ball with hands, not arms, 2 out of 3 trials.
28. Tell child to walk backward,  toe within 1 inch of heel. Tester may demonstrate. Child must walk 4 consecutive steps, 2 out of 3 trials.

DATE AND BEHAVIORAL OBSERVATIONS (how child feels at time of test, relation to tester, attention span, verbal behavior, self-confidence, etc,):

A P P E N D I X F

PILOT PROJECT EVALUATION

THERAPEUTIC PLAY PROGRAM AND PARENT EDUCATION PROGRAM ON PLAY

As you observe the play/parent education pilot session, please comment on the following areas:

1. Organization (time structure, order of presentation, etc.)

2. Preparation

3. General Atmosphere

4. Leadership and Direction

5. Participant Interaction

6. Activities (therapeutic, fun, motivating, etc.)

7. Additional Comments

A P P E N D I X G

ANECDOTAL DATA FORM

THERAPEUTIC PLAY PROGRAM

NAME:_____ DATE:_____

SESSION:_____ EVALUATOR:_____

Answer the following questions with brief descriptions of interactions observed. Use direct quotations whenever appropriate.

Describe the subjects' approach to the activities. (fearful, withdrawn, agressive, etc.) _____

_____

Describe the subjects' degree of involvement during the session.

_____

Describe the energy expended by the subjects (passive, active, hyperactive) _____

Describe adjustment to group activities during the session.

_____

Did the subject(s) exhibit appropriate behavior?_____

_____

Describe the interaction among the subjects._____

_____

Comment on the verbalization of the subjects. _____

_____

Describe the subjects' ability to perform the activities._____

_____

Describe the amount of direction the subject(s) needed to perform the activities _____

_____

Describe the playfulness of the subject(s). _____

_____

Describe the subjects' and their parents responses when they reunite at the end of the session. _____

_____

General Comments: _____

_____

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