DEVELOPMENTAL ASSESSMENT OF CHILDREN BELOW SIX YEARS

By

HEMA DEVI .R

Dissertation submitted to the Avinashilingam Institute for Home Science and Higher Education for Women Deemed University Coimbatore – 641 043

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PHILOSOPHY IN HUMAN DEVELOPMENT

AUGUST – 2005

CERTIFICATE

This is to certify that the dissertation entitled **'Developmental Assessment of Children Below Six Years'** submitted to the **Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore** in partial fulfillment of the requirements for the award of the Degree of Master of Philosophy in Human Development is a record of original research work done by **Hema Devi R.**, during the period of study in the Department of Human Development, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore under my supervision and guidance and the dissertation that has not formed the basis for the award of any Degree / Diploma / Association / Fellowship or similar title to any candidate of any other University and it represents entirely an independent work on part of the candidate.

Vasantha D
18.8.05

Signature of the Guide

Forwarded

Signature of the Head of the Department

DECLARATION

I hereby declare that the dissertation entitled **'Developmental Assessment of Children Below Six Years'** submitted to the **Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore** in partial fulfillment of the requirements for the award of the **Degree of Master of Philosophy in Human Development** is a record of original research work done by me under the supervision and guidance of **Mrs.D.Vasantha, Lecturer (S.G.), Department of Human Development** and that it has not formed for the award of any Degree / Diploma / Associateship / Fellowship or similar title to any candidate of any other University.

R. Hema devi

Signature of the candidate

Vasantha D

18.8.05

Signature of the Guide

ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

The investigator expresses her deepest sense of gratitude to the 'God Almighty' for His manifold mercies and blessings showered upon her, which made the conduct of this research study possible.

The investigator extends her heartfelt thanks to ***Dr.K.Kulandaivel, M.A. (Ohio State), Ph.D. (Madras),*** *Chancellor;* ***Dr.(Tmt.) Saroja Prabhakaran, M.A., Dip.Ed. (Madras), Ph.D. (Mother Teresa),*** *Vice Chancellor and Director, Hall of Residence, and* ***Dr.(Tmt.)Gowri Ramakrishnan, M.Sc. (Madras), M.Phil., Ph.D. (Avinashilingam),*** *Registrar, Avinashilingam Institute for Home Science and Higher Education for Women Deemed University, Coimbatore for providing the necessary facilities during the course of study.*

The researcher is deeply indebted to ***Dr.(Tmt.) N.Jaya, M.Sc., Ph.D. (Madras),*** *Dean, Faculty of Home Science, Professor and Head, Department of Human Development, Avinashilingam Institute for Home Science and Higher Education for Women Deemed University, Coimbatore, for her constant encouragement, suggestions, help and constructive criticisms rendered throughout the study.*

The investigator feels extremely happy and grateful for working under the guidance of her esteemed guide ***Mrs.D.Vasantha, M.Sc., Dip.Ed., M.Phil., (Madras),*** *Lecturer (S.G.), Department of Human Development, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore, for her immense patience, help, stimulating suggestions, motivation, innovative ideas, deep insight and consistent inspiration which were instrumental for steady progress and successful completion of the research work.*

The researcher expresses a special note of thanks to Mr.Parankusam for their timely help rendered for the successful completion of the study. The researcher also expresses her humble thanks to the concerned authorities of anganwadies (Project II) and Dr. Kalanidhi (Pediatrician) for their assistance in the successful completion of the study.

The present study could not have been proceeded on an even keel but for the enthusiasm, support, cooperation and blessings by the investigator's family and friends. To them, she owes her sincere thanks and gratitude.

CONTENTS

CONTENTS

CHAPTER NO.	TITLE	PAGE NO.
	List of tables	
	List of figures	
	List of plates	
	List of appendices	
I	**INTRODUCTION**	1
II	**REVIEW OF LITERATURE**	6
	1. Meaning and Definition of terms	6
	2. Developmental milestones of children	9
	3. Developmental assessment of children	20
	4. Research studies	24
III	**METHODOLOGY**	30
	A. Selection of the area	30
	B. Selection of the sample	30
	C. Tools adopted for the study	31
	D. Conduct of the study	38
	E. Analysis and interpretation	39
IV	**RESULTS AND DISCUSSION**	41
	A. General information of selected anganwadi children	41
	B. Anthropometric measurements of anganwadi children	43
	C. Developmental assessment of anganwadi children	47
	D. Developmental abilities of infants	67
V	**SUMMARY AND CONCLUSION**	70
	BIBLIOGRAPHY	
	APPENDICES	

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
I.	GRADES	33
II.	GENERAL PROFILE OF ANGANWADI CHILDREN	42
III.	HEIGHTS OF ANGANWADI CHILDREN	43
IV.	WEIGHTS OF ANGANWADI CHILDREN	45
V.	FINER MOTOR SKILLS	48
VI.	GROSS MOTOR SKILLS	51
VII.	HEALTH AND HYGIENE	53
VIII.	SOCIAL AND EMOTIONAL DEVELOPMENT	55
IX.	COMMUNICATION SKILLS OF ANGANWADI CHILDREN	58
X.	READING SKILLS OF ANGANWADI CHILDREN	60
XI.	CONCEPT DEVELOPMENT OF ANGANWADI CHILDREN	63
XII.	MEAN SCORES OBTAINED BY ANGANWADI CHILDREN	65
XIII.	GRADES OBTAINED BY ANGANWADI CHILDREN	66
XIV.	SCORES OBTAINED BY INFANTS IN MDI AND PDI	67
XV.	MENTAL AND MOTOR ABILITIES OF INFANTS	68

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
1.	DEVELOPMENTAL ASSESSMENT OF CHILDREN	40
2.	FINER MOTOR SKILLS OF ANGANWADI CHILDREN	50
3.	GROSS MOTOR SKILLS OF SELECTED CHILDREN	52
4.	SOCIAL AND EMOTIONAL DEVELOPMENT OF ANGANWADI CHILDREN	57
5.	COMMUNICATION SKILLS OF PRESCHOOL CHILDREN	59
6.	READING SKILLS OF ANGANWADI CHILDREN	62
7.	CONCEPT DEVELOPMENT IN ANGANWADI CHILDREN	64
8.	MENTAL AND MOTOR ABILITIES OF INFANTS	69

LIST OF PLATES

PLATE NO.	TITLE	PAGE NO
1.	KITS USED FOR ASSESSING CHILDREN	36
2.	ANTHROPOMETRIC MEASUREMENTS OF ANGANWADI CHILDREN	37

LIST OF APPENDICES

APPENDIX NO.	TITLE
1.	DEVELOPMENTAL SCREENING FOR CHILDREN BELOW SIX YEARS
2.	BAYLEYS INFANT DEVELOPMENT SCALE

INTRODUCTION

I INTRODUCTION

Nothing fortuitous happens in child's world
There are no accidents
Everything is connected with everything else
and everything can be explained by
everything else.... For a young child
everything that happen's is a necessity.

— John Berger

A child's development is worthy of careful attention and scientific study. There is a worldwide consensus among the psychologists, sociologists and biologists that the early years of life is the critical period in the life span of the child. It is during this period that foundation for all later development is laid. The child is highly respective to all that prevails in his environment and his learning potentials are at their peak whatever is assimilated in this foundation period gradually stabilizes (Kumar, 2002).

Society looks on early childhood as a very special period. A young child is in many ways the ideal embodiment of the positive hopeful aspects of human nature. In early childhood an individual development is characterized by in several ways that is, a time of discovery period of emerging competencies and self-awareness, a time when socialization efforts begin in earnest and it is a time when social roles and interaction patterns are first learnt and shapes children who appear to be very naughty and irrepressible in the first three years (Sharma and Sharma, 2002).

Biological and transactional models describe child development as the result of reciprocal interactions between children and the multiple environments in which they are embedded (Coley and et al, 2004).

Growth is defined in several ways, and broadly speaking it implies physical maturation ie, increase in size and development of the body and its parts. This growth process covers nearly a one third of one's life span. Histopathologically, growth may be considered as a triad of proliferation, differentiation, hyperplasia and hypertrophy of cells, most of which is completed in uterus even in the foetal stage(Eastwood,1997).

The term development means a progressive series of changes that occur as a result of maturation and experience. "Development implies qualitative change"(Rice, 2001).

Growth and development are so closely interrelated that it is virtually not possible to separate one from the other. They denote two different aspects quantity (growth) and quality (development). Though the two generally proceed concurrently, this may not always be so (Gupta, 2001).

Assessment of growth is extremely important for a growing child. An assessment is a structured evaluation of a child's development physical, language, motor, intellectual, social and emotional by a developmental assessment specialist, or a team of professionals that can include a pediatrician, child psychologists, and child psychiatrists among others. The child will undergo a series of tests that may include a physical examination hearing and eye screenings, play observation and standardized

tests that present the child with certain tasks to determine areas of strength and weakness (**www.vh.org**, 2005).

Children of 2-6 years are generally energetic, curious and eager to learn. Since their bones and muscles are still in the process of developing, sitting for longer periods at a desk tires them out. Finer muscular co-ordination particularly of the wrist, fingers need strengthening (Daniel, 2005).

During 2-6 years children develop many concepts. The most common concept development in early childhood are life and death concept, concept about abusc, wcight, numbers, time self, sex roles, social awareness, beauty and comics (**www.amazon.com**, 2005). It is important to understand not all children, develop all of these concepts nor do they develop them to the same degree (**www.niu.ed**, 2005). Children who attend nursery school, usually understand numbers upto 5, but have only vague concepts about numbers higher than that young children have no idea of the duration of time how long an hour is, for example nor can they estimate time in terms of their own activities. Most four or five year olds know the day of the week and by the age of six they know the month, season and year
(Mohanty and Mohanty, 2000).

Various skills help the children to improve the physical, motor, social and emotional developmental levels. Skills such as drawing, colouring and painting helps in co-ordination of hand movements. Constructive play teaches them team work. Imaginative play such as story telling, acting and puppet shows encourages creativity. Independence and confidence can be installed if they are left to play alone. Music such as songs, rhymes and

playing musical instruments improve sense of rhythm. Motor skills like play and exercise and social skills such as making friends, sharing and talking will give the child a head start in social life. Children also learn manner and courtesy (The Hindu, 2005).

In terms of opportunity, structures, several characteristics of child care influence children's development including the type, stability and extent of childcare. Especially important are high quality arrangements that are characterized by a safe and healthy environment, caregivers who are responsive and warm, and materials and experiences that offer the stimulation and support, necessary for mastering the central cognitive and social developmental challenges of Early Childhood (National Institute of Child Health and Human Development (NICHD) Early Care Research Network, 2003).

Bangele et al (2004) suggested that every child needs to be provided with rich and integrated sensory motor experiential learning environment for attaining his or her optimum development. The optimum environment for the child is the one in which the child is cared for in his or her own home by their family members with the warm and continuous relations along with varied inputs of sensory motor experiences. For the healthy and optimum wholesome development of infants the child's primary care given must give young children adequate freedom, opportunities, guidance and incentives to move about and explore things in an environment.

Children's attentive span for activities, in which they are physically and mentally involved should be limited to maximum of seven

to fifteen minutes. Thinking tends to be perception bound and egocentric and limited to concrete objectives and events (The Hindu, 2005).

For healthy mental and emotional development of children preschool years are very important. During the preschool years children have a rapid physical, mental and social growth. They gather information and form them into patterns of knowledge that become integrated with their life. They begin to work and play co-operatively with other children (Bentzen, 2000).

According to 2001 census in India there are 170 million children within the age group of 0-6 years. In Tamil Nadu there are 68 lakhs children in the age group of 0-6 years (**www.censusindia.net**).

As the child population is very vast, it is essential that these children need to progress in their growth and development age wise. Developmental assessment helps to understand any deviation from the normal, any impairment or retardation. This will help to plan appropriate intervention. Hence this study was undertaken with the following objectives to,

- Assess the physical and motor development
- Screen the social and emotional development
- Study the aspects of language development
- Identify aspects that denote various concepts.
- Check the sex difference in development
- Place children in different grades based on scores obtained.
- Screen the developmental abilities of infants

REVIEW OF LITERATURE

II REVIEW OF LITERATURE

The literature pertaining to the study on "Developmental assessment of children below six years" has been classified under the following headings:

1. Meaning and Definition of terms
2. Developmental milestones of children
3. Developmental assessment of children
4. Research studies

1. Meaning and Definition of Terms

- Growth refers to increase in the physical size of the body or a body part. It is usually assessed in units of measurements such as kilograms, and centimeters. Growth occurs by two process, an increase in the number of cells called hyperplasea and an increase in the size of individuals cells termed hypertrophy (Elizabeth, 2000).
- Development refers to systematic continuities and changes in the individual that occur between conception and death. By describing changes as "systematic" that they are orderly, patterned and relatively enduring. So, temporary mood swings and other transmitory changes in our appearances, thoughts and behaviours are excluded. In short "it is a systematic continuities and changes in an individual over the course of life (Desai, 2000).
- Development refers to a gradual change in function not size that results in more complex skills and abilities. These new functions expands the child's capacity for achievement (Viswanathan, 2000).

- Developmental milestones is a specific task, skill or learned behaviour that can be used to assess a child's development at a particular age. Infant's developmental milestones are mainly neuromuscular only gradually the developmental milestones reflect increasing interactions with the environment (Dutta, 2001).
- Child development is a process which every child goes through. This process involves learning and mastering skills like, sitting, walking, talking, skipping and tying shoes. Children learn these skills, called developmental milestones, during predictable time periods (**www.child development.info.com**, 2005).
- Finer motor skill development is the child's ability to use small muscles, specifically their hands and fingers, to pick up small objects, hold a spoon, turn pages in a book, or use a crayon to draw (**www.vh.org**, 2005).
- Gross motor skill development is the child's ability to interact with others, including helping themselves and self-control. This type of development would include; a six week old baby smiling, a ten-month-old baby waving bye-bye or a five year old boy knowing how to take turns in games at school (**www.vh.org**, 2005).
- Speech and language development is the child's ability to understand and use language. This includes a 12 month – old baby saying his first words, a two year old naming parts of her body, or a five year old learning to say "feet" instead of "foot"(**www.edu.com**, 2005).

Cognitive development is the child's ability to learn and solve problems. This includes a two month old baby learning to explore the

environment with hands or eyes or a five year old learning how to do simple mathematical problems (**www.vh.org**, 2005).

Screening is a brief assessment procedure designed to identify children who should receive more intensive diagnosis or assessment. Developmental screening is aimed at identifying children who may require further evaluation and may lead to a definitive diagnosis and individualized intervention path (**www.questia.com**, 2005).

Anthropometric measurements

Nutritional Anthropometry is a measurement of human body at various ages and levels of nutritional status. It is based on the concept than an appropriate measurement should reflect any morphological variation occurring due to a significant functional physiological change (Mahtal et al, 2003).

Height and weight are the most common and useful anthropometric measurements. Length measurements for infants and children up to age three and height measurements for children over three are particularly valuable in assessing growth. Body weight is one of the most expedient and helpful indicator of nutritional status and growth. It is a non specific measure of all body components including fat and protein (Burtis et al, 1998).

Mid arm circumference

Mid arm circumference indicates the level of the body's protein stores, which are found mainly in the muscles. The non dominant arm is flexed at a 90 degree angle, and the circumference is measured with a non-

stretchable measuring tape after the mid point of the upper arm is determined (Bamji, 2001).

Head and chest circumference

Head circumference is measured to assess brain growth and development of infants and children. To measure head circumference, the assessor places a nonstretchable tape so that it encircles the largest part of the infants or child's head just above the eyebrow ridges, just above the point where the ears attach and around the occipital prominence at the back of the head. The chest circumference is measured using a flexible fiber glass tape taken at the nipple level preferably in mid inspiration (Srilakshmi, 2001).

2. Developmental Milestones of Children

A developmental milestone is a skill that a child acquires within a specific time frame. For instance, one developmental milestone is learning to walk. Most children learn this skill or developmental milestone between the ages of 9 and 15 months. Milestones develop in a sequential fashion. This means that a child will need to develop some skills before he or she can develop new skills.

Physical development

Physical development is the development involving the body's physical make up, including the brain, nervous system, muscles and senses and the need for food, water and sleep (Feldman, 1999).

Physical changes occur rapidly in early childhood, but not at the rate seen in infancy. The changes in hand skills, allow a child to explore objects more easily, and new body skills permit greater investigation of the

environment. Early childhood is a time of refinements in physical abilities (Dutt, 1993). The average annual increase in weight is three to five pounds. At age six, children should weigh approximately seven times as much as they did at birth. The average girl weighs 48.5 pounds and the average boy weighs around 49 pounds (**www.cdcgrowthchart.com**,2005).

Body proportions change markedly and the "baby look" disappears. By the end of the second year, somatic and brain growth slows, with corresponding decreases in nutritional requirements and in appetite. The toddlers prominent abdomen flattens, and the body becomes leaner. Physical energy peaks, and the need for sleep declines to 11-13 hours / 24 hours usually including one nap. Visual acuity reaches 20/30 by age three years and 20/20 by age four. All 20 primary teeth have erupted by three years of age (Jenson et al, 2000).

Motor development

Shaffer (2002) defines motor development as the complex changes in the child's body activities and movements.

Gross motor skill

These are the skills those involving the large muscle groups of the body (Sharma and Sharma, 2002). Preschool children between two and five years of age make important advances in motor development. Five year olds can skip smoothly, broad jump up to three feet, jump one foot high, hop on one foot a distance of 6 feet, start, turn and stop effectively in playing games, descend a long stairway unaided, alternating the feet, walk on balance beam throw a ball with one leg, stepping forward on the same side as the throwing arm and catch ball using their hands only (Corbin, 1993). By

four years children run on tip toes. They gallop and jump themselves on a swing. Thcy hop on one foot and throw a ball over hand where as three year olds can ride a tricycle and catch a ball. They jump horizontally and two year old kick a large ball forward (**www.ncbi.nlm.nih.gov**., 2005).

Fine motor skills

These are the skills involving small muscle groups of the body and eye-hand co-ordination. For eating two year olds can hold a glass with a spoon and pour from a pitcher. For dressing two year olds can put on simple clothing, four year-olds can dress themselves, and five year olds may be able to manage a zipper, fasten buttons, or even tie shoe laces (Bentzen, 2000). For other small muscle activities two year olds will scribble, three year olds can copy a circle or draw a straight line, four year olds can draw simple figures, cut on a line with scissors and make crude letters, and five year olds can copy squares, a task that takes considerately more manipulative skill and eye hand co-ordination than drawing a circle (Thompson and Rudolph, 2000).

Handedness is the preference for using one hand rather than another in the performance of a variety of motor functions. Approximately 90 to 93 per cent of the population eventually develop a preference for use of the right hand as the left hemisphere of the brain assumes dominance and control over motor functions (**www.childdevpt.info.com**, 2004).

Bowel and bladder control emerge during this period. Day time bladder control typically proceed bowel controls, and girls precede boys. Bedwetting is normal up to age four in girls and five in boys. Many children

master toileting, particularly once they are able to verbalize their bodily needs (Marlow and Redding, 1998).

Social development

The skills needed to develop interactions in the society and the acquisition of such skills, is known as social development (Berk, 2003).

Socialization is the process by which individuals are taught to conform to social rules, to acquire personal values and to develop attitudes typical of their culture. This process begins in early childhood. Parents and significant others in a child's life take an active role in teaching these lessons (Prasad, 1996). According to Bee (1997) the ages of two and three years children show a decided interest in watching other children and they attempt to make social contacts with them. This is known as parallel play, play in which young children play independently beside other children rather than with them. Following this comes associative play, in which children engage in similar, if not identical, activities with other children. According to Choi (2000) as social contacts increases, young children engage in cooperative play in which they are a part of the group and interact with group members.

Sympathy, empathy and sharing are some of the social patterns existing in preschool years. Sympathy requires an understanding of the feelings and emotions of others, it appears only occasionally before the third year. The more play contacts the child has, the sooner sympathy will develop. Like sympathy, empathy requires an understanding of the feeling and emotions of others but in addition it requires, the ability to imagine

oneself in the place of the other person. Relatively few children are able to do this until early childhood ends (Hurlock, 2001).

Emotional development

Emotions are especially intense during early childhood years. This is a time of disequilibriam when children are "out of focus" in the sense that they are easily around to emotional outbursts and as a result, are difficult to live with and guide (Steinberg, 2000). Anger, fear, jealousy, curiosity, envy, joy, grief and affections are the common emotions of early childhood. Emotions such as anger, fear, curiosity, joy and affection are seen since babyhood. Emotions like jealousy, envy, and grief are newly seen in the preschool years. Young children become jealous when they think parental interest and attention are shifting toward someone else in the family, usually a new sibling (Suriakanthi,1999). Young children often become envious of the abilities or maternal possessions of other children. They express their envy in different ways, the most common of which is complaining about what they themselves have, by verbalizing wishes to have what the other has, or by appropriating the objects they envy (**www.kidsource.com**, 2005).

Young children are saddened by the loss of anything they love or that is important to them, whether it be a person, a pet, or an inanimate object, such as a toy. Typically, they express their grief by crying and by losing interest in their normal activities (**www.vh.org**, 2005).

Language development

Language is a system of communicating in which words and their written symbols combine in various, regulated ways to produce an infinite number of messages (Parke, 1999).

Communication is the process creating or sharing meaning in informal conversation, group interaction or public speaking (Verderber and Verderber, 2002).

Crying, cooing, gurgling, murmuring and assorted types of other noises are produced by infants in early stages. These sounds although not meaningful in themselves, play an important role in linguistic development paving the way for true language (Biron, 1993). Crying is the most noticeable sound uttered by the newborn. Although it serves as the infants primary means of communication, crying cannot be considered as a true language. Young infants also produce a number of other sounds including sighs, coughs, sneezes and belches (Vander Zanden, 1993).

Infants are noisy creatures, crying, cooing and making a variety of other sounds even in the first week of life. These noises gradually become more varied over the first months, so that by five months, squeals, gnaws, grunts, croons and yells, as well as some speech like sounds, are part of most babies verbal repertoire. Then at six or seven month babies utterances begin to include the repetition of certain syllables ("ma-ma ma", "da-da-da", "ba-ba-ba"), a phenomenon referred to as babbling because of the way it sounds (Berger, 1994). During the same months that babbling appears gestures become part of the babies deliberate efforts to communicate (Oller and

Eiters, 1998). At every stage of development including the preverbal stage, children understand much more than they express (Kulzar, 1996).

Language development occurs most rapidly between two and five years of age. Vocabulary increases from 50 – 100 words to more than 2000. An important milestone in the development of language is the formation of complex sentences. These are formed by the joining of two simple sentences together by conjunction by embedding. The appearance of these apparently embedded complex sentences seems to occur between two and three years (Behrman et al, 2000).

Intellectual development

Development involving the ways that growth and change in intellectual capabilities influence a person's behaviour (Feldman, 1999).

As children move from the sensorimotor to pre-operational stage, the most obvious change is an extraordinary increase in representational or symbolic mental activity. Unlike infants and toddlers, preschoolers have the language skills to describe what they remember and they can follow directions on simple memory tasks. As a result, memory development becomes easier to study in early childhood (Stewart and Friedman, 1997). At age two, they can recall more than one or two of the items, at age 4 only about three or four (Schiamberg, 1998).

By the second year, children have formed a variety of global categories, such as kitchen utensils, bathroom objects, animals, vehicles, plants and furniture for example the category of "kitchen utensils" includes objects that differ widely in appearance but that go together because of their common function and place of use (Johnson and Melvin, 1994).

During three to six years, cognitive and compensational skills improve, their descriptions are special. One time events become better organized, detailed and related to the larger context of their lives. As a result, children enter into the history of their family and community (Farrar, 1995).

Once preschoolers acquire the counting strategy, they apply it to conservation of number tasks with only a few items. As counting improves, they extend the strategy to problems with more items. By age six they have formed a mental understanding that a number remains the same after a transformation (Siegler and Robinson, 1992).

Factors affecting growth and development of preschool children heredity and environment

Genes influence growth by controlling the body's production and sensitivity to hormones. When environmental conditions are adequate, height and weight of physical growth are strongly influenced by heredity (Malina and Bouchard, 1991). Body size is sometimes the result of evolutionary adaptations to a particular climate. Long lean physiques are typical in hot, tropical regions and short stocky ones in cold, artic areas. At the same time children who grow tallest usually reside in developed countries, where food is plentiful and infectious diseases are controlled (Tanner, 1990).

- **Birth weight :** Premature infants are at high nutritional risk because of poor nutrient stores, physiological immaturity, illness, which may interfere with nutritional management and needs and the nutrient demands required for growth (Mahan et al, 2000). Illingworth and

colleagues (1995) at the university of Sheffield found that at all ages the weight at birth bare a well marked and constant relationship to the weight at subsequent age.

- **Sex :** Sex is responsible for certain differences in growth patterns. According to Bowditch (1995), boys are on the average taller and heavier than girls, and their growth curves remain consistently above those of girls throughout early and middle childhood. Sex differences are not only slight in physical appearance but also in composition of muscle and fat in these years although boys remain slightly taller, heavier and more muscular than girls until girls overtake them in the puberty growth spurt (Karmal and Karmal, 1984).
- **Nutrition :** Growth and development can occur only when the proper hormonal signals are available, thus nutrient deficiencies at critical times can prevent cells from dividing, and adequate nutrition later on may not be able to compensate (Smolin and Grosvenors, 2000).
- **Eating habits - Likes and dislikes :** During the preschool years children have definite food likes and dislikes. Lowenberg (1998), has pointed out that preschool children prefer mild flavoured foods, those with a soft, jelly like texture and those which are lukewarm in temperature. Colourful foods hold a special appeal. A well balanced eating pattern allows children to meet their nutrient needs for growth and development and to prevent or delay the outset of the chronic diseases.
- **Malnutrition :** Children who do not get enough to eat and are malnourished tend to be smaller and are more likely than well fed children to become ill because of decreased immunity. Such children

may also be less able to learn (Peckenpaugh and Poleman, 1999). Recent evidence indicates that 40 to 60 per cent of the world's children do not get enough to eat (Bellamy, 1998). This may limit the countries future social and economic development children who manage to survive these extreme forms of malnutrition grow to be smaller in body dimensions (Galler et al, 1995).

- **Obesity :** Obesity is rising in developing nations, as greater urbanization is accompanied by a shift towards sedentary lifestyles and diets high in refined foods, meats and eggs (Popkin and Doak, 1998).
- **Infectious diseases :** Disease in turn is a major cause of malnutrition and through it, affects physical growth. Minor illness like coughs, sniffles and stomachaches are part of early childhood (Denny and Clyde, 1983). Illness reduces appetite and it limits the body's ability to abort foods. In developing countries, diarrhoea is widespread and increases in early childhood due to unsafe drinking water and contaminated foods lead to several million childhood deaths each year (Gregory et al, 1995).
- **Hormonal influences :** The vast physical changes of childhood and adolescence are controlled by the endocrine glands of the body. These glands manufacture hormones. Children who lacks it, reach on average mature height of only 4 feet 4 inches, when treated with injections of growth hormone such children grow faster than expected and then grow at a normal rate (Tanner, 1990).
- **Socio economic status :** Children living under favourable conditions are taller, heavier and better developed in other aspects at a given age than those children living under less favourable conditions. Gray and his

colleagues have repeatedly shown, in a series of investigations reported since 1985, that children in private schools who come from higher income homes are larger than the average.

- **Family environment :** For toddlers and preschool children, the family is the primary influence in the development of food habits. Parents and older siblings are significant models for young children as they learn, and imitate the individuals in their immediate environment (Trahms and Pipes, 1997).
- **Social trends :** In recent decades, the nuclear family has changed from the traditional two parent, one income family almost three fourths of women with school aged children are employed outside the home. Children therefore, eat one or more meals at child care homes, day care centres or schools. Due to time constraints, food purchasing and meal preparation routines may be modified to include proportionately more convenient or fast foods (Johnson, 1993).
- **Generation :** It is agreed that children of this generation are taller and heavier on the average, than those of previous generations. Undoubtedly many factors enter into this increased size of children through recent generations. Improved nutrition, advances in sanitation and better methods of fighting diseases are among the most important (Marlin and Robert, 1994).
- **Peer influence :** As children grow, their world expands and their social contacts increase in importance. Peer influences increases with age and extends to food attitudes and choices. This may be manifested by a

sudden refusal of a food or a request for current popular food (Shea, 1993).

- **Emotional state :** We are not used to thinking of love and stimulation as necessary for healthy physical growth but they are just as vital as food. Deprivation dwarfism is growth disorder observed between two and fifteen years of age, characterized by substantially below average stature, weight that is usually inappropriate for height, immature, skeletal age and decreased growth hormone secretion caused by severe emotional deprivation. When such children are removed from their emotionally inadequate environments, their growth hormone levels quickly return to normal and they grow rapidly (Oates et al, 1995).
- **Homelessness :** Most homeless children are under the age of five since they are spending these crucial early years in an unstable, insecure, chaotic environment, it is not surprising that both as preschoolers and as school children, they tend to have high rates of developmental delays, learning difficulties and severe depression and anxiety (Papallia and Olds, 1992).

3. Developmental assessment of children

Assessment is a primary tool for guidance and placement helps to identify the child's strength and weaknesses and helps to set realistic goals for the child (Rodrigues, 2000).

Assessment of developmental level has been a heightened interest in the assessment of preschool children to identify those at risk for academic failure and to provide enrichment or early intervention programme designed to ameliorate.

Assessment is a structured evaluation of child's development physical, language, intellectual, social and emotional by a developmental assessment specialists or a team of professional that can include a pediatrician, language specialists, audiologists, occupational therapists, child psychologists and child psychiatrist among other.

Good signs of assessment

Every assessment is different because every child and family are different. The best share the following characteristic. According to zero to three a non-profit organ devoted to the physical and mental health of young children and a leader in establishing professional standards for child assessment.

(i) Parents and professional should work together

If you are an expert on your child behaviour and should play a key role in the evaluation process. The information and opinion are crucial in determining how your child is really doing.

(ii) The assessment should be conducted by a team

This include a pediatrician, audiologists, child psychologists and child psychiatrists, to get a complete picture of the child's skills, member of the team should all have a solid understanding of child development.

(iii) Your child should be observed in a number of setting with different people

Behaviour is complicated. To get a complete picture of how the child plays, learns, reasons, moves, interacts etc, he needs to be evaluated in different surroundings, how he acts with you. For instance, the child may

differ from how he is at day care or with his siblings. A good team will take all these things into consideration.

(iv) The process should identify your child strengths and weaknesses

Child development is very complicated, and a good assessment should take into consideration how the child is functioning in a number of areas, not just the one or two that he seems to be having trouble with.

(v) Your child should not be forced to separate from you during test

You can't expect a baby or young child to function at his best up he's anxious about being separated from his parents.

(vi) An assessment should feel like help

A formal evaluation of child development is often the first step in determining whether he needs early intervention or treatment. But when the testing is done well, many parents say that it is helpful in itself. During the process you should feel like the knowledge of the child is growing and you are getting new ideas on how to interact with the child and answers to many of the developmental questions (**www.babycenter.com**, 2005).

Studying the child

In every science theories like those we have just received, guide the collection of information its interpretation and its application to everyday life. Infant research usually begins with a hypothesis, or prediction, drawn directly from a theory. But theories and hypothesis are only the beginning of the many activities that result in sound research on child development.

Common methods in the field of child development include systematic observation, self-reports, psycho physiological measures, clinical

or case studies of a single child and ethnographies of the life circumstances of a specific group of children.

Systematic observation

Observation of the behaviour of children and of the adults who have impairment in their lives, can be made in different ways. One approach is to go into the field or natural environment, and observe the behaviour of interest a method called naturalistic observation. The great strength of naturalistic observation is that investigation can see directly the everyday behaviour they hope to explain. Naturalistic observation also has a major limitation. Not all individuals have the same opportunity to display a particular behaviour in everyday life.

Structured observation was done in a laboratory and the investigator sets up a situation that evokes the behaviour of interest so every participant has an equal opportunity to display the response. The procedures used to collect structured observation vary considerably depending on the purpose of the research. Structured observation provides insolvable information on how children and adults actually behave but it tells us about the reasoning that lies behind their responses.

Self reports : interviews and questionnaires

Self-reports are instruments that ask participants to answer question about their perceptions, thoughts, abilities, feelings, attitudes, beliefs, and past experiences. They range from relatively unstructured clinical interviews, the method used by piaget to study children's thinking.

Clinical interview is a method in which the researcher uses a flexible, conversational style to probe for the participants point of view.

Structured interview is a method in which each participant is asked the same questions in the same way.

Psychophysiological methods

Methods that measure the relation between physiological processes and behaviour. Among the most common are the measures of autonomic nervous system activity (such as heart rate and respiration) and brain functioning (such as the EEG and EMRI, Electroencephalogram, Functional magnetic resournance imaging).

The clinical method or case study method

This is a method in which the researcher attempts to understand the unique individual child by combining interview data, observation, test scores and sometimes psycho physiological measures. It is some times called the case study approach.

Ethnography

Ethnography is a method in which the researcher attempts to understand the unique values and social processes of a culture or a distinct social group by living with the members and taking field notes for an extended period of time (Berk, 1999).

4. Research Studies

For the assessment of physical development status of rural children, a longitudinal study was conducted on 192 children of Hisar district. The observations were recorded on five selected parameters viz height, weight and head, chest and arm circumference. The results reported that with advancement in age all the parameters of children of both the sexes increased though at different rate. Sex wise differences were evident in the

rate of growth as male children gained by 4.8 kg in weight whereas female children gained by 4.6 kg during the study. The time series data revealed that health and nutrition wise children were at their worst status at one year of age. Therefore majority of children being malnourished calls for due care and attention for physical development of rural infants during the first year of life (Manocha and Sangwar, 2004).

Bronfenbirenner (2004) quoted that the family is the most effective and economical child care system for fostering and sustaining child's over all development. Without family's involvement, childcare intervention may not yield satisfying results.

Williams (1983) study of children's climbing ability suggested that there are several stages of climbing. It emerges initially from infants crawling. (Corbin, 1993), revealed that by age six, 92 per cent of children are proficient climbers, and there are no significant differences between boys and girls in climbing skills.

Researches revealed that about 81 per cent of children are proficient jumpers by age five. In a comparative study of preschoolers, and second graders who played with a box containing eighteen drawers (each drawer contained a different toy). It was observed that the preschoolers demonstrated curiosity and asked the most questions and handled the toy the most (Henderson and Moore, 1989).

Berk (2003) conducted a study on sex differences in motor skills of preschool children. Through his study it is evident that there are sex differences in motor skills in preschool years. Boys are slightly ahead of girls in skills that emphasis force and power. By age five, they can jump and

run slightly farther and throw a ball much further then the distance covered by girls. At the sametime girls have an edge in fine motor skills and in certain large motor skills that require a combination of good balance and foot movement such as hopping and skipping. Boy's greater muscle mass and their slightly longer forearms may contribute to their skills and advantages.

A cohort of 37 preterm children was assessed for both morphosyntactical and for vocabulary skills at the age of two and again at the age of three years and six months. They were compared with two comparison groups of full term children. The results indicated a clear asynchrony between the two components of language production assessed at both ages and revealed an accurate prediction of language delay at age two pre term children (Benefice,1994).

A study was conducted to ascertain the impact of Early verses Late phonological intervention for reading competence among kindergarten and standard one children. Some reading tests were administered on both groups of children during pre training session and post training session. One month training programme began in which four weekly training sessions were conducted. The results of this study revealed that phonological sensitivity was present in both the groups. Phonological sensitivity increases steadily as the age of the children increases (Patnam et al, 2004).

Saylor and Sabbagh(2004) conducted a study on "Different kinds of information affect word learning in the preschool years". This study revealed that preschool children learn words with remarkable flexibility and efficiency.

Researchers have focused on the kinds of information available to children during word learning, including object familiarity and syntactic and pragmatic information (Akthar et al, 2001).

Denham et al (2003) studied the emotional expressiveness, emotional regulation, and emotional knowledge. Their contributions to social competence as evidenced by sociometric liability and teacher ratings were evaluated via latent variable modeling, both concurrently and across time. Moderation of key results by age and sex was also explored.

The present research evaluated a conceptual model that links temperament, emotional knowledge and family expressiveness to preschoolers emotion regulation ability, the emotional understanding of 82 preschoolers was assessed with two separate tasks. After the second emotional knowledge task the children were presented a "disappointing prize" and their facial displays of positive and negative effect were recorded. Mothers provided information about preschoolers temperament and about the frequency of positive and negative effect (Garner, 1996).

Derryberry et al (2002), noted in their summary section that, developmental research can be enriched by studies of the role of emotions in organizing a child's thinking, learning and action, and likewise by studies of the role of thinking, learning and action in the regulation of emotions.

Bell and Christy (2004) propose that those suggested developmental studies linking cognition and emotion would do more than simply enrich the child development field. Posner and colleagues (2000) suggested that the attention processes associated with the anterior attention system regulates both cognitive and emotional processing.

Among studies that have examined child care quality in community care arrangements for a sufficiently large number of low-income children most have found that child care quality was equally predictive of the cognitive and socio emotional development of poor and rich children (Burchinal et al, 2000).

A study was conducted to assess the cognitive abilities of five year old preschoolers two socioeconomic strata. The sample consisted of 80 preschoolers of both sexes. Pandey's cognitive development test for preschoolers was used to assess cognitive abilities. Result showed significant social class differences among children. The children from higher status were found to have more general information which they have abstracted from their surrounding environment, have great ability to think, recall, associate, and comprehend oral directions and actions and people in the environment and reasoning with attraction (Aeri. P and Singh. V, 2004).

Clark (1983) and Stevenson (1987) studied that two year old grasp the general distinction between 'big' and 'small' but not until age three to five are more refined. Differences between 'tall' and 'short' and 'low' and 'long' and 'short' understood.

Pick et al, (1975) conducted a study on preschooler's memory and found that preschoolers have better "recognition memory" than "recall memory". Deloache's (1999) study found out that granting young children many opportunities to learn about the functions of diverse symbols pictures, books, photographs, models, maps, drawings and make-believe enhances their understanding that one object or event can stand for another.

Recent studies indicated that Piaget over estimated preschooler's animistic beliefs because he asked children about objects with which they have little direct experiences, such as the clouds, sun and moon. Children as young as three rarely think that every families in animate objects, like rocks and crayons are alive (Paulin et al, 1994).

Shannon et al (2004) found that father's positive engagements with their 24 months old led to a four fold decrease in the likelihood that their children would have developmental delays as indexed on the Bayley (1993) mental development Index. The NICHD Early Child Care Research Network (2002) found that the effects of child care quality were significantly higher for children with low cognitive scores. Further more, the academic and cognitive achievement of boys may be more sensitive to early experiences in childcare than those of girls (Brooks and Gunn, 2002).

In a recent study it was found that more than nine preschool children, out of 10 are able to button their own clothes and hold a pencil properly,and more than eight out of ten were able to identify the primary colours by name. Fewer about six in ten, could court to twenty or recognize most letters of the alphabet (www.drpaul.com, 2005).

A typical preschool child grows about 3 inches each year. Height gians exceed weight gains. At age three, the average child is about 38 inches tall and by age five, has reached a height of about 43 inches (Tanner, 1990). Stuarts (1996), studies of subcutaneous tissue showed that girls tend to have more of body tissue than boys throughout childhood.

METHODOLOGY

III METHODOLOGY

The research design pertaining to the study entitled, "Developmental assessment of children below six years" consists of two phases as represented and discussed in the following headings

A. Selection of the area

B. Selection of the sample

C. Tools adopted for the study

D. Conduct of the study

E. Analysis and interpretation

A. SELECTION OF THE AREA

ICDS Anganwadi (project II) children were selected for the first stage of study and children from Dr.Kalanidhi's pediatric clinic for the second stage.

The areas were selected due to the co-operation and help rendered by the concerned authorities.

B. SELECTION OF THE SAMPLE

A sample is the one which is taken from any group of measurements, selected from a population for analysis (Gupta, 2001).

Sampling technique adopted was the random sampling method, it is one where each item in the universe has an equal or known opportunity of being selected. Harper cites, "random sample as a sample selected in such a way that every item in the population has an equal chance of being included". It is more suitable in more homogeneous and comparatively larger groups (Gupta, 2003).

A sample of 400 children from ICDS Anganwadi were taken which comprised of 50 boys and 50 girls of different age groups such as 2.6, 3.6, 4.6 and 5.6 years were selected for Phase I. Phase II consisted of 120 children who are below 2 years, from this 15 children were selected in different ages such as 2–3.5, 4–5.5, 6–9, 10–15, 16–18, 20–22, 22–25, 26–30 months.

C. TOOLS ADOPTED FOR THE STUDY

The tools used for conducting the study was checklist, as it was easy to collect the information from the selected children. The tools adopted for conducting the study was as follows :

- → A developmental screening schedule – devised by Dr.N.Jaya, Head of the Department, Human Development (Appendix – 1).
- → Bayley's scale of infant development (Appendix – 2).

❋ The screening schedule enclosed in (Appendix – 1) comprised of 100 questions with 25 questions in each developmental aspect such as physical, motor, social and emotional, language and concept development. It also includes the anthropometric measurement such as assessing height, weight, chest, head and mid upper arm circumference. The measurement taken was compared with the standard measurements as per the ICMR (1998) value.

The screening of developments include physical, motor, social and emotional, language and intellectual aspects. The questions in physical development includes aspects on gross-motor, finer-motor and sensori-motor development of children below six years social and emotional development

includes the aspects of interaction with peers, adults and their emotional behaviour towards peers and adults language development includes the aspects such as reading, speaking and communicating abilities and intellectual development includes items which is used to measure the child's concepts in numbers, colours, science, sizes and shapes.

Test materials

Informal screening was done to gather information from parents and those questions which required observations was done using a screening kit to observe child's performance. The screening kit comprised of the weighing machine, growth chart (inch tape and scale) puzzles, blocks, alphabets, story books, crayons, pencils, papers, scissors, aids for number, colour and science concept (Plate 1).

Scoring

Scores were given to the children depending on the activities performed by them. For each performance of an activity, a score was allotted. Each child was observed and they were assessed according to their ability to perform and they were graded as good average as seen in Table I.

TABLE I

GRADES

S.no.	Age group in years	Scores	Grade
1.	2.6	30 – 40	G – Good
		20 – 30	A – Average
2.	3.6	40 – 60	G – Good
		30 – 40	A – Average
3.	4.6	60 – 80	G – Good
		50 – 60	A – Average
4.	5.6	80 – 100	G – Good
		70 – 80	A – Average

* The Bayley's scale of infant development (Appendix – 2) was designed to provide a tripartite basis for the evaluation of a child's developmental states in the first two months and one and a half years of life. The three parts are considered complementary, each making a distinctive contribution to clinical evaluation.

(a) The mental scale is designed to assess sensory perceptual acuities ; discriminations and the ability to respond to these; the early acquisition of "object – constancy" and memory, learning, and problem solving ability; vocalizations and the beginnings of verbal communication and early evidence of the ability to form generalizations and classification which is the basis of abstract thinking. Results of the administration of the mental scale are expressed as a standard score, the MDI or Mental development Index.

(b) The motor scale items is designed to provide a measure of the degree of control of the body co-ordination of the large muscles and finer manipulatory skills of the hands and fingers. As the motor scale is specifically directly towards behaviours it reflects motor coordination and skills. It is not concerned with functions that are commonly thought of as "mental" or "intelligent" in nature. Results of the administration of the Motor scale are expressed as a standard score, the PDI, or psychomotor development Index.

- MDI – Mental Development Index.
- PDI – Psychomotor Development Index.

Test materials

The materials used for testing were red ring with string, sugar pellet, hand bell, 2 teaspoons, mirror, yellow pencil, rattle, play pen, red flashlight, light switch, stopwatch, yellow peg board with 6 pegs, Blue box with 2 lids, toys car, round plastic box, whistle doll, picture book, 12 square yellow beads, clear plastic bottle, blue form board with 9 blocks, pink form board with 3 blocks, Toy watch, scissors, red ball etc. (Plate 1).

Scoring

The mental development index (MDI) and psychomotor, development index (PDI) were derived from the administration of the mental and motor scales, respectively. MDI represents the mental development index derived from the mental scale, the PDI represents the psychomotor development index derived from the motor scale. The distribution of raw

scores at each age level was converted to a set of normalized standard score having a mean value of 100 and a standard deviation of 16.

A cumulative frequency distribution of raw scores was prepared and the appropriate standard score value was assigned to each raw scores and the appropriate standard score value was assigned to each raw score on the basis of its position on a theoretical normal curve.

The standard score range of 50 through 150 covers more than three standard deviations of either side of the average MDI or PDI for each age. These standard scores permit ready comparison of the performance of an infant with the performance of his age peers. While for most children the MDI and PDI will fall within this range, exceptional children with total scores below or above these limits on either or both scales may be encountered. In such cases, the MDI or PDI should be reported as "below 50" or "above 150".

D. CONDUCT OF THE STUDY

Phase – I

In the first phase of the study, the overall development of preschool children were assessed. Before carrying out the study preliminary study was done by using the screening schedule, with a sample of 60 children from Avinashilingam Nursery School, A screening kit was used to assess the child's development.

Phase - II

In the second phase the developmental abilities and skills of the infants were assessed using the Bayleys infant development scale. Bayleys kit was used to assess the infant development.

Observation, becomes a scientific tool and method of data collection for the research, when it serves a formulated research purpose it is systematically planned and recorded and is subjected to check and controls on validity and reliability (Kothari, 2001). The observation was sought by way of investigators own observation without asking the respondent.

Informal screening is an other method which aims at correctly identifying. Children with subtle developmental delays through informal screening methods such as observation and obtaining from parents about their concerns concerning child developmental milestones at various ages (Gupta, 2001).

The investigator gained the information by adopting checklist. The data was collected due to the co-operation and help extended by the concerned authorities, parents and selected children.

E. ANALYSIS AND INTERPRETATION

After the data has been collected, it is essential to organize the information in a systematic manner in order to obtain the desired results and make interpretation scientifically (Singh, 2000).

Scores were given to the children depending on the activities performed by them. For each performance of an activity, a score was allotted for both the tools.

After consolidating, analysis was done and percentage analysis was used to tabulate them. 't' test and percentile analysis was used to associate age and grade assessment for each age group.

RESULTS AND DISCUSSION

IV RESULTS AND DISCUSSION

Development is a process every child goes through. This process involves learning and mastering skills like sitting, walking, talking, skipping and tying shoes. Developmental milestone is a skill that a child acquires within a specific time. Each milestone that a child acquires, builds on the last milestone developed. Each child is an individual and may meet developmental milestones, a little earlier or later than his peers.

The results of the study on "Developmental assessment of children below six years" are discussed and interpreted under the following headings:

A. General information of selected anganwadi children.

B. Anthropometric measurements of anganwadi children.

C. Developmental assessment of anganwadi children.

D. Developmental abilities of infants.

A. GENERAL INFORMATION OF SELECTED ANGANWADI CHILDREN

The general profile of the selected children such as type of family, parent's educational status and their occupation were discussed under the following headings.

1. General profile of anganwadi children

Table II projects the family background of the selected anganwadi children.

TABLE II

GENERAL PROFILE OF ANGANWADI CHILDREN

General profile	Number (400)	Percentage (%)
1. Type of Family		
• Nuclear	248	62
• Joint	152	38
2. Educational status		
• Primary education	196	49
• S.S.L.C.	104	26
• Higher secondary	44	11
• Illitrate	56	14
3. Occupation		
• Coolie	240	60
• Labourer	96	24
• Government Employee	64	16

As for the family profile of the anganwadi children, out of 400 families 62 per cent were from nuclear family and the rest belonged to joint family system. It was noted that 49 per cent of the parents had studied up to primary education, where as 26 per cent and 11 per cent of them had studied up to S.S.L.C. and Higher Secondary, while the others 14 per cent of them seemed to be illiterate. As regards the occupation, 60 per cent of them were coolies, 24 per cent of them were labourers and only 16 per cent of them employed in government jobs.

B. ANTHROPOMETRIC MEASUREMENTS OF ANGANWADI CHILDREN

Anthropometry is the science that deals with body measurements such as size, weight and proportions (Peckenpaugh and Poleman, 1999). Anthropometric measurements such as height, weight, mid arm circumference, head and chest circumference of the anganwadi children were measured and compared with the ICMR standards and discussed under the following headings.

1. Heights of anganwadi children

The comparison of the heights of anganwadi children with the ICMR value are exhibited in Table III.

TABLE III

HEIGHTS OF ANGANWADI CHILDREN

Age in years	Sex	Number of children	ICMR value	Height in Centimeters		
				Children above the value (%)	Children below the value (%)	Children on par with the value (%)
2.6	Boys	50	89.8	54	32	14
3.6		50	98.5	62	14	24
4.6		50	105.8	32	44	24
5.6		50	112.3	40	56	4
2.6	Girls	50	89.5	24	32	24
3.6		50	97.9	32	46	22
4.6		50	105.1	34	56	10
5.6		50	111.6	26	38	36

The table reveals that boys who 24 per cent of both 3.6 and 4.6 years were on par with the value when compared to the expected value which was 98.5 and 105.8, whereas the other age group seemed to be very

less when compared to the expected value. Majority of boys 54 per cent of 2.6 and 64 per cent of 3.6 years were found to be above the expected value. Girls 24 per cent in the age of 2.6 years seemed to be on par with the value were the expected value in 89.5 and in the age of 5.6 years 36 per cent of girls were on par with the value.

Growth in height is not evenly distributed over the first twenty years of life. The growth rate is rapid during the first two years. At two years the maximum height gain is 32 to 34 inches. Boys are slightly taller than girls until the age of eleven after which there is a reversal of the trend up to fifteen and again boys regain their superiority. Height is normally distributed and mostly genetic change in height is a significant indicator of physical growth (Panda, 1998).

2. Weights of anganwadi children

Body weight is one of the most expedient and helpful indicator of nutritional status and growth. It is a nonspecific measure of all body components including fat and protein (Burtis et al, 1998). Table IV represents the weights of anganwadi boys and girls.

TABLE IV

WEIGHTS OF ANGANWADI CHILDREN

Age in years	Sex	Number of children	ICMR value	Weight in Kilograms		
				Children above the value (%)	Children below the value (%)	Children on par with the value (%)
2.6	Boys	50	13.3	-	76	24
3.6		50	15.4	8	58	34
4.6		50	17.2	4	76	20
5.6		50	19.1	-	18	82
2.6	Girls	50	13	14	62	24
3.6		50	15.1	22	46	32
4.6		50	16.8	28	56	16
5.6		50	18.6	8	52	40

In preschool years boys tend to have more muscle per pound of body weight than girls while girls have more fatty tissues (Loda,1990). Boys and girls 24 per cent seemed to be on par with the ICMR values. For the next age group 3.6 years, boys 34 per cent and girls 32 per cent were on par with ICMR values. The result reveals that less than 35 per cent have reached the ICMR standards. This may be due to lack of proper nutritious diet and exercise and protection from infections. The values obtained by 5.6 years seem to be encouraging as boys 82 per cent and girls 80 per cent have reached the ICMR values. Again this reveals that early years need more attention in their intake of food and health and hygiene. As the early years are the trainable years, parents have to be more alert. When children reach five years they are able to learn to eat enough for the health needs. So a developing child needs attention and observation from their parents. As the

Anganwadi mothers are not aware of these facts they need parenting on this aspect if the health status of children has to improve.

Hence because of the vulnerable period and poor diet in the 2.6 years the boys and girls showed a less gain in their weight. After entering to the preschool and because of the noon meal programme children showed an increase in their weight and they developed good food habits. At age six, the child should weigh approximately seven times as much as he did at birth (Hurlock, 2001).

3. Mid upper arm circumference

The mid upper arm circumferences of anganwadi children were measured and compared with the standard values of ICMR. Children in the ages of 2.6 years, 28 per cent were above the value, 40 per cent below and 32 per cent on par with the expected value. Children in the age of 3.6 years, 31 per cent were above the value, 42 per cent below and 27 per cent of them were on par with the value. In the age of 4.6 and 5.6 years 37 per cent and 48 per cent of children scored above the value, 27 per cent and 30 per cent were below the value, and 36 per cent and 22 per cent were on par with the value.

Head and chest circumference

The values of head and chest circumference of Anganwadi children were measured and it was observed that the head circumference was above the expected value, 20 per cent of 2.6 years old, 32 per cent of 3.6 year old. 27 per cent of 4.6 years old and 12 per cent of 5.6 years respectively. Sixty three per cent of 2.6 years, 58 per cent of 3.6 years, 63 per cent of 4.6 years and 55 per cent of 5.6 years old children were on par

with the value. Comparatively 17 per cent of 2.6 years, 10 per cent of both 3.6 and 4.6 years and 40 per cent of 5.6 years scored on par with the value respectively. It was observed that the chest circumference of 2.6 year old children were 63 per cent above the value, 14 per cent below the value and 23 per cent on par with the value and in the age of 3.6 years 70 per cent above, 13 per cent below and 17 per cent on par with the value children in the age of 4.6 years seemed to be 65 per cent above, 20 per cent below and 15 per cent on par with the value and in 5.6 years it was observed that 52 per cent were above, 38 per cent below and 10 percent on par with the value.

C. DEVELOPMENTAL ASSESSMENT OF ANGANWADI CHILDREN

Development is defined as functional maturation (i.e.), acquisition of skills, normally growth and development are closely related, working in such a manner that the infant and child progressively, mature in all aspects of their well being, namely physical, mental, emotional and social. Thus the developmental milestones of the children were assessed and discussed under the following headings.

1. Finer motor skills

Table V and Figure (2) elucidates the finer motor skills of the anganwadi children.

TABLE V

FINER MOTOR SKILLS

Skills	Age in years							
	2.6		3.6		4.6		5.6	
	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)
✸ Puts puzzles together	8	12	24	22	46	48	72	56
✸ Cuts with scissors	6	14	28	16	34	32	56	46
✸ Ties shoe laces	14	24	56	48	54	64	70	74
✸ Holds crayon / pencil	18	32	34	76	64	74	94	90
✸ Draws on a paper	38	46	72	66	62	96	86	96
✸ Eats by themselves	42	54	64	14	94	56	96	96

*** Multiple response, B – Boys, G - Girls**

The finer motor skills of the children includes the use of small muscles, specifically their hands and fingers, to pick up small objects, hold a spoon, turn pages in a book or use a crayon to draw (Berk, 1999).

Among children of 2.6 years, boys eight per cent and girls 12 per cent had the ability to put the puzzles together, where as in the age of 5.6 years boys 72 per cent and girls 56 per cent gained this skill. Putting puzzles needs more concentration. Due to this reason children of 2.6 and 3.6 years had yet to develop these skills. As they grow and as the age increases they had the ability to concentrate in their work. Only negligible number of children used scissors. Even in the age of 3.6 and 4.6 years 34 per cent and 56 per cent of boys, 32 per cent and 46 per cent of girls had achieved this ability.

In the age of 5.6 years boys 70 per cent and girls 74 per cent were able to tie shoe laces by themselves, whereas in the other age group such as 2.6, 3.6, 4.6 boys and girls had very less eye-hand co-ordination for

tying shoes laces. Holding crayon and pencil seemed to be more in the age of 4.6 and 5.6 years, boys 64 per cent and 94 per cent, girls 74 per cent and 90 per cent accomplished this skill. Skill of eating neatly by themselves was refined by 5 years. Both boys and girls 96 per cent achieved this skill by 5.6 years. Majority of the other age group children had food by themselves but they used to spill the food. Devadas and Jaya (1999) states that preschools give necessary training to children for eating by themselves.

2. Gross motor skills

Gross motor skills of the preschool boys and girls were enounced in Table VI and Figure 3.

TABLE VI

GROSS MOTOR SKILLS

Skills	Age in years							
	2.6		3.6		4.6		5.6	
	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)
✷ Enjoys outdoor play	42	36	86	76	86	78	94	84
✷ Climbs on stairs	36	22	34	54	82	74	86	76
✷ Throws and bounces ball	54	32	56	48	94	78	96	80
✷ Lifts chair	26	30	36	74	72	94	80	88
✷ Rides tricycle	64	42	20	56	92	66	92	92
✷ Moves body actively	82	66	80	76	98	86	88	82

*** Multiple response, B – Boys, G – Girls**

The most evident and most delightful development to watch is the child's gross motor skills. Their gradual mastery over the limbs and growth is in muscular control (Sharma, 2002). Boys 86 per cent of both 3.6 and 4.6 years and 94 per cent in 5.6 years enjoyed outdoor play, girls 76 per cent, 78 per cent and 84 per cent in the same age respectively enjoyed outdoor play. Using alternate steps to climb the stairs was achieved by the age of four years, boys 82 per cent and 86 per cent girls 74 per cent and 76 per cent achieved this skill by the age of 4.6 and 5.6 year. Only 50 per cent of children gained the skill of throwing and bouncing the ball during 2.6 and 3.6 years. Majority of the boys 94 per cent and 96 per cent, girls 78 and 80 per cent had mastered this skill. Ability to use both hands to throw ball, catch and bouncing needs practice and motivation.

By the age of 2.6, children develop the habit of lifting their chairs by themselves, but the skill is refined at the age of 4.6 years. Boys 72 per cent and 80 per cent, girls 94 and 88 per cent in the age of 4.6 and 5.6 years achieved this skill. It is found that more than boys, girls improved in this skill by age four.

By the age of three to four tri cycling and swimming can be learnt (Bee, 1991). All children move their body actively, majority of children 82 per cent, 80 per cent, 98 per cent and 88 per cent of boys, 66 per cent, 76 per cent, 86 per cent and 82 per cent of girls were seemed to be active in the age of 2.6, 3.6, 4.6, and 5.6 years respectively.

Girls and boys differ in several aspects of gross motor coordination. This difference is produced by variation in muscle strength which is somewhat greater in boys than in girls (Tarachand, 1997).

3. Health and Hygiene

Table VII denotes several hygienic habits of anganwadi children.

TABLE VII

HEALTH AND HYGIENE

Habits	Age in years							
	2.6		3.6		4.6		5.6	
	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)
✸ Has routine habits	26	36	32	52	56	46	54	64
✸ Maintains hygienic habits	4	10	8	18	14	24	26	34
✸ Expresses toilet needs	34	42	36	56	74	84	88	92
✸ Manages toilet needs	62	76	48	66	82	86	94	92
✸ Eats healthy foods	46	52	24	42	68	58	74	66

*** Multiple response, B – Boys, G – Girls**

The table represents the hygienic habits of preschool children in anganwadies. As the children were from rural area and the mothers being from poor socio economic status they do not bother to train health and hygienic habits in their children. Hence these aspects needs attention and training.

Therefore the results shows that very few children have attained hygienic habits in them. Even by the age of 5.6 years only less number of boys 26 per cent and girls 34 per cent attained hygienic habits, which is a poor picture.

By the age of 4.6 and 5.6 years, boys 74 per cent and 88 per cent, girls 84 per cent and 92 per cent were able to express their toilet needs and also 82 per cent and 94 per cent of boys and 86 per cent and 92 per cent of girls achieved the ability to manage in their toilet needs. Since language is established in this stage, children make use of language to express and manage in toilet needs. Bowel control is generally well established when babyhood ends. By the time the child is 3 to 4 years old bladder control is achieved, by the time they enter the school bladder control is completely achieved that even fatigue and emotional tension will not interfere with it (Hurlock, 2001).

In the age of 2.6 years boys 46 per cent and girls 52 per cent had the ability to eat correct amount of food, besides boys 24 per cent, 68 per cent and 74 per cent, girls 42 per cent, 58 per cent and 66 per cent of 3.6, 4.6 years had the capacity of eating proper food.

4. Social and Emotional Development

The social and emotional development of the preschool children were illustrated in Table VIII and Figure 4.

TABLE VIII

SOCIAL AND EMOTIONAL DEVELOPMENT

Aspects	Age in years							
	2.6		3.6		4.6		5.6	
	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)
✷ Has friends	64	72	86	76	84	84	94	92
✷ Respects others	38	44	48	54	78	66	76	82
✷ Likes to play in group	84	76	76	72	94	82	100	100
✷ Imitate adult behaviour	66	56	78	48	58	72	94	84
✷ Interact with adults	42	54	76	64	82	94	92	98
✷ Relax and have fun	64	74	72	54	74	68	66	74
✷ Helps others	42	64	68	74	54	70	74	78
✷ Solves problem using words	34	42	66	58	92	84	90	96
✷ Manifest spontaneous reactions	64	74	72	58	74	86	94	82
✷ Expresses positive feelings	58	62	54	46	52	78	70	74

*** Multiple response, B – Boys, G – Girls**

The process of socialization begins early on at home, but for the three year old child the nursery increases its scope. The nursery provides the opportunity to mix with other children and develop social competence and it also puts the child in a position (Davis, 1999).

From the table it is evident that majority of the boys 64 per cent, 86 per cent, 84 per cent, 94 per cent and girls 72 per cent, 76 per cent, 84 per cent and 92 per cent of 2.6, 3.6, 4.6 and 5.6 years had friends. All the children of 5.6 years both boys and girls liked to play in-group, where as boys 84 per cent, 76 per cent and 94 per cent and girls 76 per cent,

72 per cent and 82 per cent of 2.6, 3.6 and 4.6 years liked to play in group. Boys 76 per cent and girls 82 per cent of 5.6 year had the habit of respecting elders, in spite only very few children of 2.6, 3.6 and 4.6 years respected others. By the age of 5.6 years 94 per cent boys and 84 percent girls used to imitate adult behaviour. Davis (2002) found that children identify themselves with the group, imitates the attitudes and behaviour of the person whom they especially admire and to be like.

With reference to emotional development helping tendency was seen more in girls rather than in boys. Children of 5.6 year, boys 90 per cent and girls 96 per cent had the ability to solve problems by using words, comparatively other age group children ages 5.6 year, boys 70 per cent and girls 74 per cent mastered to express positive feelings for others, instead children of other age group achieved only very less. Empathy requires an understanding of the feeling and emotion of others but in addition it requires the ability to imagine oneself in the place of the other person. Relatively few children are able to do this until early childhood ends (Hurlock, 2001).

5. Language Development

a) Communication skills of anganwadi children

Table IX and Figure 5 exhibits the various communication skills of the Anganwadi children.

TABLE IX

COMMUNICATION SKILLS OF ANGANWADI CHILDREN

Communication skills	Age in years							
	2.6		3.6		4.6		5.6	
	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)
Ability to :								
✷ Talk	34	52	48	74	84	88	94	98
✷ Use descriptive language	24	34	34	36	46	54	64	74
✷ Recite nursery rhymes	12	24	32	42	44	54	62	76
✷ Expresses spontaneously	36	42	34	38	52	58	64	74
✷ Have clarity in speech	56	54	64	66	92	82	100	100

*** Multiple response, B – Boys, G – Girls**

Table VIII propounds the communication skills of the children. Children achieve language development by age of 3 and 4 it is noted that in early years children use simple language more in these years. In the age of 4.6 and 5.6 year, boys 84 per cent and 94 per cent, girls 88 per cent and 98 percent achieved the ability to talk to others. Using descriptive language were seen to be very less in all age groups as they are in early years of age. Only less number of children used to recite rhymes in the age of 5.6 years boys 62 per cent and girls 76 per cent gained this ability.

Spontaneous expression was seen in 36 pre cent, 34 per cent, 52 per cent and 64 per cent of boys and 42 per cent, 38 per cent, 58 per cent and 74 per cent of girls at 2.6, 3.6, 4.6 and 5.6 years respectively. All boys and girls of 5.6 years had clarity in speech as development of speech gets completed at these age, whereas 92 per cent of boys and 82 per cent of girls had clear speech in 4.6 years.

Language is the systematic, meaningful arrangement of symbols, which provides the basis for communication. In considering the development of language, one needs to distinguish between linguistic comprehension, the understanding of speech and linguistic production, is the use of language to communicate (Berger, 1994).

b) Reading skills of Anganwadi children

The various reading abilities of the preschool boys and girls were indicated in Table X and Figure 6.

TABLE X

READING SKILLS OF ANGANWADI CHILDREN

Skills Developed	Age in years							
	2.6		3.6		4.6		5.6	
	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)
✷ Identifies alphabets	16	18	26	34	42	58	66	74
✷ Recognizes name in print	-	-	-	-	16	18	24	32
✷ Try to read along with others	14	10	18	26	24	32	42	48
✷ Reads stories	-	-	26	34	56	62	66	72
✷ Learns new words	-	-	-	-	22	26	36	32
✷ Talks about people and things in the story	8	14	40	52	62	64	80	76

*** Multiple response, B – Boys, G – Girls**

Regarding reading skills, identifying the alphabets was found to be comparatively less in 2.6 and 3.6 years of boys 16 per cent and 26 per cent and girls 18 per cent and 34 per cent, after attaining the age of 5.6 years they adapted the ability. Boys 16 per cent and 24 per cent and girls 18 per cent and 32 per cent were able to recognize their names in the age of 4.6 and 5.6 years. Since parents were less educated and they did not have

any interest in helping the children. Thus achievement of reading needs improvement. Vocabulary learning starts in infancy and continues throughout life. Each new word that the baby learns to understand and use, represents a piece of knowledge about the world. If the child is learning words more than he or she will be learning about their world and the things and people in it, more slowly than the child who picks up words at a faster rate (www.edu.com.2004). Thus even in the age of 5.6 year, boys 66 per cent and girls 72 per cent had the ability to read stories, this credit goes to the story sessions held in anganwadies. Children of 5.6 year old boys 80 per cent and girls 76 per cent had the ability of communicating with others, whereas children achieved this ability very less such as boys 8 per cent and 14 per cent of girls in the age of 2.6 years. Anganwadi teachers alone cannot assure the development of reading skill, it has to be continued at home also.

6. Concept development of anganwadi children

Table XI and Figure 7 reveals the concepts of the anganwadi children.

TABLE XI

CONCEPT DEVELOPMENT OF ANGANWADI CHILDREN

Concepts	Age in years							
	2.6		3.6		4.6		5.6	
	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)	B(%)	G(%)
✷ Nature	-	-	4	14	42	46	64	72
✷ Colours	6	4	28	26	36	34	34	64
✷ Numbers	8	14	32	38	66	72	74	84
✷ Body parts	4	8	12	22	38	32	54	62
✷ More or less	4	6	14	18	62	58	58	64
✷ Size and shape	12	16	26	36	52	40	62	52
✷ Comparison of items	-	-	10	14	22	26	62	76

*** Multiple response, B – Boys, G – Girls**

Children in the age of 5.6 years boys 54 per cent and girls 62 per cent had the knowledge about body parts whereas the others had very little knowledge, this is because of the informal talks conducted by the teacher. Concept of nature also found to be very less 42 per cent and 64 per cent in boys and 46 per cent and 72 per cent in girls, in the age of 4.6 and 5.6 years. In early years children though they enjoy nature they are not able to verbally express about nature. Very few children boys 12 per cent and girls 16 per cent in the age of 2.6 years, and even in 5.6 year, boys 62 per cent and girls 52 per cent only had the knowledge of size and shape concept. The number concepts found to be 66 per cent and 74 per cent in boys and 72 per cent and 84 per cent in girls, whereas the other concepts such as colour and comparison of items found to be very less in all age group of children, as comparison is still an abstract for young children.

The children need some intensive training and time for the development of concepts, may be the children will be better if it was done with using more teaching aids in the anganwadi.

Children develop concepts because of some learning experiences. Concept development depends upon the learning opportunities of the particular child (Hurlock, 2001).

7. Mean scores obtained by anganwadi children

The mean scores of the anganwadi children were vividly presented in Table XII.

TABLE XII

MEAN SCORES OBTAINED BY ANGANWADI CHILDREN

Age in years	Sex	Mean scores	Standard deviation	't' value	Level of significance
2.6	Boys	30.78	4.73	1.53	N.S.
	Girls	28.76	8.05		
3.6	Boys	43.08	5.50	-.70	N.S.
	Girls	43.88	5.91		
4.6	Boys	60.80	5.55	.71	N.S.
	Girls	59.96	6.29		
5.6	Boys	78.20	8.24	-.61	N.S.
	Girls	79.10	6.29		

*** N.S. – Not significant**

Mean scores of the boys and girls of 2.6 years were 30.78 and 28.76, children of 3.6 years of boys and girls scored 43.08 and 43.88, in the age of 4.6 and 5.6 year boys and girls scored 60.80, 78.20, 59.96 and 79.10.

't' test was applied to find whether there was any significant difference between boys and girls in their average scores. The calculated 't' value, of 2.6, 3.6, 4.6 and 5.6 age children was found to be 1.53, -.70, .71, and -.61 which was not significant. This indicates that there is no significant difference between boys and girls in their average scores.

8. Grades obtained by anganwadi children

Table XIII exhibits the grade placement of the anganwadi children.

TABLE XIII

GRADES OBTAINED BY ANGANWADI CHILDREN

Age in years	Sex	Grades	
		Good (G) %	Average (A) %
2.6	Boys	66	34
	Girls	54	46
3.6	Boys	64	36
	Girls	76	24
4.6	Boys	56	44
	Girls	74	26
5.6	Boys	49	51
	Girls	62	38

Based on the scores obtained by the children, they were placed in "good" or "average" grades according to the expected scores. Among children of 2.6 years more than girls 54 per cent, boys 66 per cent fell under the grade "good". Comparatively children of 3.6 years more than boys 64 per cent, girls 76 per cent had "good" grade. In the age of 4.6 and 5.6 years girls 74 per cent and 62 per cent, boys 56 per cent and 49 per cent

accomodated the grade "good". This indicates that more than boys, girls are achieving their developmental skills faster in their younger age.

D. DEVELOPMENTAL ABILITIES OF INFANTS

1. Scores obtained by infants in MDI and PDI

The developmental abilities MDI and PDI scores of infants were represented in Table XIV.

TABLE XIV

SCORES OBTAINED BY INFANTS IN MDI AND PDI

Age in Months	Scores											
	50 – 83 (Average)				84-116 (Good)				117 – 150 (Very good)			
	MDI*		PDI**		MDI*		PDI**		MDI*		PDI**	
	N.:15	%	N.:15	%	N.:15	%	N.:15	%	N.:15	%	N.:15	%
2 – 3 ½	6	40	6	40	3	20	5	33	6	40	4	26
4 – 5 ½	7	46	7	46	5	33	5	33	3	20	3	20
6 – 9	6	40	6	40	5	33	6	40	4	26	3	20
10 – 13	5	33	5	33	6	40	6	40	4	26	4	26
14 – 17	8	53	6	40	3	20	6	40	4	26	3	20
18 – 21	6	40	7	46	5	33	3	20	4	26	5	33
22 – 25	5	33	4	26	7	46	7	46	3	20	4	26
26 – 30	7	46	6	40	3	20	6	40	5	33	3	20

* **MDI – Mental Development Index**

** **PDI – Psychomotor Development Index**

According to the scores the (MDI) Mental Development Index and Psychomotor Development Index (PDI), children were given grades according to their scores "Average", "Good" and "Very good". Based on this, children were placed and the table reveals that below 50 per cent of the children were under the "Average" category for both, "MDI" and "PDI" only few children scored "Good" and "Very good".

2. Mental and Motor abilities of infants

The developmental abilities and skills of infants were entailed in Table XV and Figure 8.

TABLE XV

MENTAL AND MOTOR ABILITIES OF INFANTS

Age in Months	MDI*			PDI**		
	Percentile values			Percentile values		
	25th	50th	75th	25th	50th	75th
2 – 3 ½	68	105	126	75	101	126
4 – 5 ½	72	96	116	75	96	114
6 – 9	63	86	123	67	86	111
10 – 13	65	99	117	72	98	120
14 – 17	65	82	118	61	99	124
18 – 21	68	93	117	66	92	133
22 – 25	62	94	111	66	97	122
26 – 30	72	92	117	64	91	116

* **MDI – Mental Development Index**

** **PDI – Psychomotor Development Index**

It is evident from the table that the mental and motor abilities of the children seemed to be good. As per the 25th percentile the MDI and PDI has not much difference in their values. Comparatively in 50th percentile the values of MDI and PDI of 4–5½ and 6–9 month old children seemed to be the same as 96 and 86. In 75th percentile value the MDI and PDI of 2–3½ month old had same 126, where as the MDI values seemed to be less when compared to PDI.

SUMMARY AND CONCLUSION

V SUMMARY AND CONCLUSION

India has the second largest child population in the world. One out of every five children in the age group 0 to 12 years live in India, one out of every three low birth weight children live in India besides the staggering number of malnourished children. These statistics prove that whatever happens to a young child in India, shapes the global picture of children world wide (The Hindu, 2000).

During infancy and childhood there are many important physical and developmental changes that take place, especially in the first year of life. Studies have shown that in healthy full-term children, "developmental milestones" are generally always achieved within certain age ranges. An important part of the general paediatric check up is to make sure that the child is reaching these milestones within the appropriate age range.

Developmental assessment is an integral part of pediatric examination and it is of more importance during the preschool period 0-5 years. Developmental assessment helps to understand any deviation from the normal, any impairment or retardation. This will help to plan appropriate intervention.

Hence the study was taken with the following objectives, to assess the physical and motor development, social and emotional development, aspects of language development, identify aspects that denote various concepts sex wise and to assess the developmental abilities of infants.

Four hundred children from ICDS Anganwadies, consisting of boys (50) and girls (50) in the ages of 2.6, 3.6, 4.6 and 5.6 years and 120 children from pediatric clinic, from each group 15 children such as 2–3½, 4–5½, 6–9, 10–15, 16–18, 20–22, 22–25, 26–30 months old were selected. Assessment of preschool children was carried out by using a screening checklist devised by Dr.N.Jaya, Professor and Head, Department of Human Development and for assessing infants Bayley's infant development scale was used.

The findings emerged from the study were summarized as :

A. General information of Anganwadi children

- Out of 400 children (62%) were from nuclear families and (38%) belonged to joint families.
- Parents educational status showed that (49%) had studied upto primary education, (26%) up to S.S.L.C., (11%) Higher Secondary and (14%) were seemed to be illiterate.
- Occupational status showed (60%) of the parents as coolies, labourers (24%) and government employees (16%).

B. Anthropometric measurements of Anganwadi children

- Measurement of height in the age of 3.6 and 4.6 years boys (24%) seemed to be on par with the expected value and girls (24%) of 2.6 years were on par with the expected value boys (14%) and (4%) of 2.6 and 3.6 years were on par with the expected value. Girls (22%), (10%) and (36%) of 3.6, 4.6 and 5.6 were on par with the expected value respectively.

- Regarding weight measurements, boys and girls (24%) of 2.6 years were on par with the expected value. Among children of 3.6 years boys (34%) and girls (32%) were on par with the expected value. Majority of the children 5.6 years, boys (82%) and girls (40%) were on par with the expected value. Very few children gained weights above the expected value.
- Incase of mid arm circumference among children of 2.6 years (32%) were on par with the expected value. In the age of 3.6, 4.6 and 5.6 years, (27%), (36%) and (22%) of them were on par with the expected value respectively.
- Head circumference of children in the age of 2.6 years seemed to be (17%) on par with the value. Ten per cent of them were on par with the value in the age of 3.6 and 4.6 years. Children in 5.6 years (40%) seemed to be on par with the expected value. Majority of the children seemed to be below the expected value and others seemed to be above.
- The chest circumference of the children seemed to be on par with the value (23%) for 2.6 years, in case of 3.6, 4.6 and 5.6 years it was (17%), (15%) and (10%) on par with the expected value, as most of the children found to be above the expected value very less found to be below.

Finer motor skills

- In 5.6 years boys (72%) and girls (56%) achieved the skill of putting puzzles together. Boys (8%) and girls (12%) in the age of 2.6 years gained this skills.

- Handling scissors seemed to be very less. Boys (56%), girls (46%) of 5.6 years mastered this skill and only (6%) and (14%) of boys and girls achieved this ability in 2.6 years.
- Boys (70%) and girls (74%) were able to tie their shoes laces in the age of 5.6 years.
- Majority of boys (94%) and girls (90%) of 5.6 years had the ability to hold crayon or pencil and draw neatly. About (64%) and (74%) of boys and girls of 4.6 years accomplished the skill of holding a crayon or pencil.
- About (86%) of boys and (96%) of girls of 5.6 years had the ability to draw on a paper. In 4.6 years boys (62%) and girls (96%) accommodated with this skill.
- Both boys and girls (96%) mastered in the skill of eating by themselves and in the age of 2.6 years boys (42%) and girls (54%) gained this habit.

Gross motor skills

- Regarding outdoor play boys (94%) and girls (54%) enjoyed playing outside in 5.6 years. Boys (86%) and girls (76%) and (78%) enjoyed outdoor play in case of 3.6 and 4.6 years respectively. Among children of 2.6 year boys (42%) and girls (36%) enjoyed this activity.
- Climbing on the stairs seemed to be more by the age of 4.6, boys (82%), girls (74%), and in 5.6 years boys (86%), girls (76%) achieved this ability.
- Boys (94%) and (96%), girls (78%) and (80%) seemed to be very interested in throwing and bouncing ball in 4.6 and 5.6 years respectively.

- Incase of lifting chair boys (72%) and (80%), girls (94%) and (88%) of 4.6 and 5.6 years were able to do it.
- Riding tricycle seemed to be more in boys (92%) in both 4.6 and 5.6 years, whereas girls (66%) and (92%) were able to ride tricycle in the same age respectively.
- Majority of the boys (82%), (80%), (68%) and (88%), girls (66%), (76%), (66%) and (82%) in the age of 2.6, 3.6, 4.6 and 5.6 years seemed to be active in their work.

Health and Hygiene

- Boys (54%), girls (64%) of 5.6 years, and in 4.6 years boys (56%) and girls (46%) had some routine habits.
- Hygienic habits seemed to be very less even in 5.6 years boys (26%) and girls (34%) attained this skill.
- Boys (74%) and girls (84%) in 4.6 years and boys (88%), girls (92%) of 5.6 years had the ability to express toilet needs.
- In case of managing toilet needs majority of 4.6 and 5.6 year, boys (82%) and (94%) and girls (86%) and (92%) were able to manage by themselves respectively.
- Boys (46%), girls (24%) in the age of 2.6 years were able to eat properly where as in the age of 5.6 years boys (74%) and girls (66%) mastered this habit.

Social and Emotional Development

- Majority of the children boys (64%), (86%), (84%) and (94%) and girls (72%), (76%), (84%), (92%) of 2.6, 3.6, 4.6 and 5.6 years had friends.

- Boys (78%), (76%), girls (66%) and (82%) in the age of 4.6 and 5.6 years respectively had the ethics of respecting elders.
- All the children of 5.6 years liked to play in a group, boys (84%), (76%) and (94%) and girls (76%), (72%) and (82%) of 2.6, 3.6 and 4.6, were interested in playing in group respectively.
- Majority of children in the age of 5.6 years boys (94%) and girls (84%) had the habit of imitiating adults.
- In the age of 4.6 and 5.6 years boys (82%) and (92%), girls (94%) and (98%) were able to interact with adults appropriately.
- Regarding helping tendency boys (42%), (68%), (54%), and (74%), girls (64%), (74%), (70%) and (78%) of 2.6, 3.6, 4.6 and 5.6 years had the tendency of helping others.
- In the age of 4.6 and 5.6 years boys (92%), (90%) and girls (84%) and (96%) were able to solve problems using words respectively.
- In case of expressing positive emotions it was found more in the age of 5.6 years boys (70%) and girls (74%).

Language development

A. Communication skills

- Majority of boys in the age of 4.6 and 5.6 years (84%), (88%) girls (94%) and (98%) were able to talk clearly with others.
- Using descriptive language found to be more in the age of 5.6 years boys (64%) and girls (74%).
- Boys (62%) and girls (76%) of them recited nursery rhymes clearly in the age of 5.6 years.

- All children in the age of 5.6 years had clear speech, boys (92%) and girls (82%) of 4.6 years attained this skill.

B. Reading skills

- Boys (66%) and girls (74%) in the age of 5.6 years were able to identify alphabets.
- Boys (66%), girls (62%) and (72%) in the age of 4.6 and 5.6 years were able to read stories.
- Majority of the boys (80%), girls (76%) of 5.6 years had the ability to talk about the people and things in the story.

Concept development

- Boys (54%), girls (62%) of 5.6 years identified the body parts whereas only very few boys (38%) and girls (32%) of 4.6 years achieved this ability.
- Regarding the concept of nature boys (64%) and girls (72%) in the age of 5.6 years were able to understand.
- In case of size and shape concept boys (62%) and girls (52%) were clear in their concept.
- Boys (66%) and (74%), girls (72%) and (84%) in the age of 4.6 and 5.6 years had number concept.
- Only few children boys (34%), and girls (64%) had colour concept in the age of 5.6 years where as it seemed to be very less in other age group.
- In the age of 5.6 years boys (62%), girls (76%) had the ability to compare the items.

Mean scores obtained by children

- Regarding screening schedule there was no significant difference between both boys and girls as they are deprived of healthy atmosphere and surroundings.

Grades derived by the Anganwadi children

- Considering the grades more than boys, girls obtained "good" in all age group where as the other children seemed to be under "average" category.

Developmental abilities of infants

- Bayley's scale reveals that below (50%) of the children were under the "Average" category for both "MDI" and "PDI" only few children seemed to be "Good" and "Very good".
- Incase of mental and motor abilities of infants the percentile values of both MDI and PDI did not show any much difference in all the age group.

Recommendations

- Anganwadi teachers can be given an in service training to improve skills in children.
- Programme modification can be done for the development of positive emotion and concepts.
- Bayley's scale can be administered to exceptional children and a comparative study can be carried out with the normal children.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Aeri .P and Singh .V, (2004), Journal of Psychological Researchers, Volume 48, No.1, Pp.48-50.
- Akhtar, N., Jipson, J., and Collanon, M.A., (2001), "Learning Words through Overhearing", Child Development, Vol.72, Pp.416-430.
- Bamji, A., (2003), "A Textbook of Human Nutrition", IBH Publishing Co. Pvt. Ltd., New Delhi, P.157.
- Bangele etal, Child Development, January / February 2004, Volume 62, Number 2, Pp.89-99.
- Basotia, G.R., and Sharma, K.K., (2002), Research Methodology, Mangal Deep Publications, New Delhi, Pp.26-27.
- Bee, H., (1997), The Developing Child, 5th Edition, New York, Harper Collins Publishers, Pp.420-421.
- Behrman et al, (2000), Nelson Textbook of Pediatrics, 16th Edition, Harcourt Asia, A Harcourt Publishers International Company, Pp.86-92.
- Bell, M.A., and Christy, D.W., (2004), "Emotion and Cognition: An Intricately Bound Developmental Process", Vol.75(2), Pp.366-370.
- Bellamy, C., (1998), The state of the World's Children Oxford University Press, New York, Pp.61-72.
- Bentzen, W.R., (2000), "Seeing your Child", 4th Edition, Thomson Learning, Australia, Pp.28-30.
- Berk, E.L., (1999), Infants, Children and Adolescents, London, Allyn and Bacon, Pp.98-110.
- Bowditch, H.P., (1995), The Growth of Children, Annual Report Mass, State Board of Health, No.8, Pp.273-323.

- Breckenridge, M.E., Vincent, E.L., (1996), Child Development Physical and Psychological Growth through Adolescence, London.
- Brodzinsky, et al, (1993), Understanding Motor Development, Lifespan Human Development, 5th Edition, Hariourt Brace Jovanovich College Publishers, Tokyo, Pp.59-61.
- Bronfenbirenner,V.,and Ceci, S.J., (1994), "Nature Nurtures Reconceptualised Developmental Perspective : A Bioecological Mode", Psychological Review, Vol.101, Pp.568-586.
- Burchinal, M.R., Peisner – Feinberg, E., Bryant, D.M., and Clifford, R., (2000), Children's Social and Cognitive Development and Childcare Quality; Testing for Differential Associations Related to Poverty, Applied Developmental Science, Pp.149-165.
- Burtis et al, (1998), Applied Nutrition and Diet therapy, W.B. Saunders Company, New York, Pp.368.
- Choi, S., (2000), "Caregiver in Put in English and Korean - Use of Nouns and Verbs in Book Reading and Toy Play Contexts", Journal of Child Language, Volume XXVII, Pp.67-96.
- Clarke, A., Santrock and Friedman, S. (1989), Child Development – Infancy through Adolescence Canada : Johnson Wilsey and Sons, INC., USA, Allyn and Bacon, P.470.
- Corbin, C.B., (1993), A Text book of Motor Development, 2nd edition, Lea and Febiger Publishing Co., Philadelphia, P.180.
- Dacey and Travers (1998), Human Development (Across the Life Span) 3rd Edition, New York, McGraw Hill, Pp.28-37.
- Daniel, P., (2005), "A Journey begins", The Hindu, March 11th

- Deitz, W.H., (1994), Critical periods in childhood for the Development of obesity, American Journal of Clinical Nutrition, P.16.
- Denny, F.W., and Clyde, W.S., (1983), Acute Respiratory Tract Injections – An Overview, Pediatric Research, Pp.1026-1029.
- Derryberry, D., and Rothbart, M.K., (1997), Reactive and Effortful Processes in the Organizations of Temperament Development and Psychopathology, Pp.633-652.
- Desai, (2000), The Whole Child, Mirror Publishers Company Melbourne, Pp.313-344.
- Devadas, R.P., Jaya, N., (1999), Child Development, New Delhi, MacMillan India Ltd., Pp.175-185.
- Dinkmeyer, C., (1987), Child Development – The Emerging Self, New Delhi, Prentice Hall, Pp.257-314.
- Drzal, E.V., Coley, R.L., and Lausdale, L.C., (2004), "Childcare and Low Income Children's Development : Direct and Moderated Effects, Child Development, Vol.75, No.1, Pp.296-312.
- Dutt, S., (1998), The Child and Personality Development, Anmol Publications, New Delhi, P.105.
- Dworetzky, J.P., Nancy, T., (1990), Human Development, U.S., Daniwest Publishing Company, P.308.
- Dworetzky, P.J., Davis, J.N., (1999), Human Development (A life span approach), New York, West publishing Company, Pp.112-138
- Dworkin, H.P., (1998), Current Problems in Pediatrics, Elsevier Science, INC., Pp.79-134.

- Eastwood, M., (1997), Principles of Human Nutrition, Chapman and Hall, Madras, P.853.
- Elizabeth, K.E., (2000), Fundamentals of Pediatrics, Para Medical Publishers, Hyderabad, Pp.1-25.
- Farrar, M.J., (1995), "Discourse and the Requisition of Grammatical Morphemes", Journal of Child language, Vol.17, Pp.607-624.
- Feldman, R.S., (1999), Child Development, Prentice Hall, New Jersey, Pp.55-61.
- Frienberg, A.L., (1997), Human Development, New York : McGraw Hill, P.117.
- Fuller, .J (2000), Health Assessment (A Nursery Approach) 3rd Edition, Philadelphia, Jennifer Schaller Ayers, Lippincott, Pp.126-128.
- Galler et al, (1995), A Follow up Study on the Effects of Early Malnutrition on Subsequent Development, 11 Pediatric Research, Pp.518-523.
- Gibb's, E.D., and Teti, D.M., (1990), Interdisciplinary Assessment of Infants, McGraw Hill, America, Pp.92-98.
- Gill .D., and O' Brein, N., (1993), Pediatric Clinical Examination, Churchill Living Stone, New York, Pp.196-197, 189.
- Goel, (1968), Developmental Psychology, Washington : American Psychological Association, Vol.18, August, P.3.
- Gregory, R.J., (2000), Psychological Testing, History, Principles and Application, 3rd edition, Boston, Allyn and Bacon, Pp.204-207.

- Grieve, K.W., (1992), Play Based Assessment of the Cognitive Abilities of Young Children, Unpublished Doctoral Thesis, Unisa, Pretoria, Pp.5.6-5.21.
- Gupta, .S (2001), The short text book of Paediatrics, (9th Millennium Edition) Jaypee Brothers, Medical Publishers Pvt. Ltd., New Delhi, Pp.26-50.
- Gupta, S., (2003), Research Methodology and Statistical Techniques, New Delhi, Deep and Deep Publications Pvt. Ltd., Pp.104-105.
- Gupta, S.P., (2001), Statistical Methods, New Delhi : Sultan Chand and Sons Publishers, Pp.897-898.
- Haffman (1996) as cited by Feldman, R.S., (1998), Child Development, New Jersey : Prentice Hall, Upper Saddle River, P.416.
- Henderson, B., and Moore, S.G., (1989), Developmental Psychology Academic Press, New York, Pp.113-119.
- Hetherington, E.M., and Parke, R.D., (1999), Child Psychology, McGraw Hill Company, New York, P.274.
- Hurlock, E.B., (2001), Developmental Psychology, Tata McGraw Hill Publishing Company Limited, New Delhi, Pp.2-7.
- ICMR, (1998), Dietary Guidelines for Indians, National Institute of Nutrition, Hyderabad, P.42.
- Illingsworth et al, (1995), Relation to Birth Weight to Physical Development of Childhood, Lancet, Pp.46-60.
- Jelliffee, D.B., and Jelliffee, E.F.P., (1991), Community Nutritional Assessment, Oxford Medical Publications, New Delhi, Pp.181-183.

- Johnson and Melvin, (1994), Physical Examination Health Assessment, Philadelphia, W.B. Saunders Company, Pp.11-46.
- Junn, E.N., (1995), Child Growth and Development, California : Dushkin Publishing Group, INC., P.115.
- Karmal, M.O. and Karmal, L.J. (1984), Growing and Becoming Development from Conception through Adolescence, McMillan Publishing Company, New York, Pp.301-350.
- Kothari, C.R., (2001), Research Methodology Methods and Techniques, New Delhi : Vishwa Prakashan, P.151.
- Kumar, .A (2002), Child as Human Resource (Polices and Approaches), Sarnp and Sons, New Delhi, Pp.47-62.
- Lowenberg, M.E., (1998), Food Preference of young children, Journal of American Dietetic Association, Pp.24-43.
- Mahan, L.K., and Stump, S.E., (2004), "Krause's Food Nutrition and Diet therapy", 11th edition, Elsevier, USA, P.947.
- Malina, R.M. and Bouchard, C., (1991), Growth, Malnutrition and Physical activity, Champaign, IL, Human Kinetics, Pp.241-243.
- Manocha and Sangwar Child Development, July / August, 2004, Vol.74, No.4, Pp.238-256.
- Margaret et al, (1989), Early Human Development, Volume 3, No.1, Elsevier Science Ireland Ltd., Pp.1-19.
- Mohanty, J., and Mohanty, B., (2000), "Early Childhood Care and Education", Deep and Deep Publications Pvt. Ltd., New Delhi, P.74.

- National Institute of Child Health and Human Development Early Childcare Research Network (2002), Does Quality of Child Affect Child Outcomes at age 4½ Years, Development Psychology, Pp.451-469.
- Nirmala Niketan, Research reach, Journal of Home Science, Vol.2, No.1, January (2003), Research Unit, College of Home Science, Mumbai.
- Panda, K.C., (1998), Elements of Child Development, Kalyani Publishers, Ludhiana, Pp.16-120.
- Papallia, D.E., and Olds, S.W., (1992), Human Development, McGraw Hill Book Company, New York, Pp.191-194.
- Patnam et al, (2004), Indian Psychology Review, Vol.62, No.2, Pp.89-99.
- Peekanpaugh, N.J., and Poleman, C.N., (1999), Nutrition Essential and Diet Therapy, W.B. Saunders Company, London, Pp.283-291.
- Pick, A.D., Eraukel, D.G. and Hers, V.L., (1995), "Children's Attention the Development of Selectively", Review of Child Development Research, Vol.5, P.1104.
- Popkin, B.M., and Doak, C.M., (1998), The Obesity Epidemic is a World Wide Phenomenon, Nutrition Reviews, Pp.106-114.
- Prasad, P. (1996), Psychological Studies, Volume 4, No.1 & 2, Pp.55-60.
- Purohit, M. and et al (1997), Effect of Various Factors Influencing Physical Growth of Indian Infants from Birth to Six Months, Indian Journal of Pediatrics', P.321-331.
- Rao et al (2003), Text of Human Nutrition, 2nd Edition, New Delhi, IBH Publishing Co. Pvt. Ltd.
- Rice, F.P., (2001), "Human Development, A Life Span Approach" Prentice Hall, New Jersey, Pp.117-720.

- Riter, S.H., (1995), Assessment of Preschool Children, Eric Digest.
- Rodrigues, M., (2000), Linking Classroom Assessment Practices to Large Scale Test Performance, Paper Presented at the Annual Meeting of the American Education Research Association, New Orleans.
- Rosen Holtz, (1995), Child Growth and Development, California : Dushkin Publishing Group, INC, P.115.
- Saylor, M.M., and Sabbagh, M.A., (2004), "Different Kinds of Information Affect Word Learning in the Preschool Years: The Care of Part Term Learning", child development, Vol.75(2), Pp.395-408.
- Schiamberg, L.B., (1998), Child and Adolescent Development, New York : MacMillan Publishing Company, P.604.
- Shaffer, D.R., (2002), Developmental Psychology Childhood and Adolescence, U.S. : Wordsworth and Thomson learning, Pp.417-431.
- Sharma, R., and Sharma, R., (2002), "Child Psychology", Atlantic Publishers and distributors, New Delhi, Pp.125-148.
- Singh, D., (1995), Child Development, Kanishka Publishers Distributors, Delhi, Pp.1-12.
- Smolin, A., and Grosvenors, M.B., (2000), Nutrition Science and Application.
- Steinberg, R.J., (2000), "Pathways to Psychology", Mar Court College Publishers, New York, Pp.229.
- Stewart, A.C., Friedman, S., (1997), Child Development – Infancy through Adolescence, Canada : John and Wiley Sons, INC, Pp.393-394.
- Stuart, H.C., (1996), Normal Growth and Development during Adolescence, Journal Medicine, New England, P.732.

- Sula Wolff, (1998), Childhood and Nature (Development of Personality), Roultedge, London, Pp.93-94.
- Suriakanthi, A., (1999), "Child Development an Introduction Kavitha Publications, Gandhigram, Pp.84-86.
- Tanner, J.M., (1990), Forties Into Man, Second Edition, MA : Harward University Press, Cambridge, Pp.91-103.
- Tarachand, (1997), Modern Child Psychology, New Delhi, Anmol Publications Pvt. Ltd., Pp.52-63.
- The Hindu, (2000), Low Birth Weight Haunts Indian Children, In the Hindu, October 25, P.16.
- Trahms, C.T., and Pipers, P.C., (1997), Nutrition in Infancy and Childhood, 6th edition, WCB / McGraw Hill, St.Louis, Pp.13-23.
- Vander Zanden, W.J., (1997), Human Development, New York : McGraw Hill, Publications, Pp.249-257.
- Verderber, R.F., and Verderber, K.S., (2002), "Communicate", Wadsworth, Thomson learning, Australia, P.6.
- Walker, N.R., (1992), Early Childhood Research, Volume 7, No.1, Elsevier Science, INC, Pp.21-43.
- Williams, H.G., (1993), "Perceptual and Motor Development", Englewood Cliffs, New Jersey, Pp.141-147.
- Zechmeister et al, (2000), Research Methods in Psychology, 5th Edition United States, McGraw Hill, Pp.121-124.

WEBSITES

- www.amazon.com
- www.baby.center.com
- www.babycenter.com
- www.cdc.gov.com
- www.cdcgrowthchart.com
- www.censusindia.net
- www.childdevelopmentinfo.com
- www.ciccparenting.org
- www.edu.com
- www.kidsource.com
- www.medic8.com/health/guide
- www.ncbi.nlm.nih.gov
- www.niu.ed.com
- www.portageproject.org
- www.priory.com
- www.questia.com
- www.scienceblog.com/community
- www.sciencedirect.com
- www.springerlink.metapress.com
- www.vh.org
- www.zerotothree.org

APPENDIX

APPENDIX 2

BAYLEY SCALE OF INFANT DEVELOPMENT

MENTAL SCALE ITEMS

1. Name of the child :
2. Age :
3. Height :
4. Weight :
5. Assessed by :

S.No.	Item	Yes	No	Omit
1.	Responds to bell			
2.	Quiets when picked up			
3.	Responds to sound of rattle			
4.	Responds to sharp sound; click of light switch			
5.	Momentary regard of red ring			
6.	Regards person momentarily			
7.	Prolonged regard of red ring			
8.	Horizontal eye coordination – red ring			
9.	Horizontal eye coordination – light			
10.	Eye follows moving person			
11.	Responds to voice			
12.	Vertical eye coordination; light			
13.	Vocalizes once or twice			
14.	Vertical eye coordination – red ring			
15.	Circular eye coordination – light			
16.	Circular eye coordination – red ring			
17.	Free inspection of surroundings			
18.	Social smile : E talks and smiles			
19.	Turns eyes to red ring			
20.	Turns eyes to light			

21.	Vocalizes at least 4 times			
22.	Anticipatory excitement			
23.	Reacts to paper on face			
24.	Blinks at shadow of hand			
25.	Visually recognizes mother			
26.	Social smile : E smiles, quiet			
27.	Vocalizes of E's social smile and talk			
28.	Searches with eye for sound			
29.	Eyes follow pencil			
30.	Vocalizes 2 difference sounds			
31.	Reacts to disappearance of face			
32.	Regards cube			
33.	Manipulates red ring			
34.	Glances from one object to another			
35.	Anticipatory adjustment to lifting			
36.	Simple play with rattle			
37.	Reaches for dangling ring			
38.	Follows ball visually across table			
39.	Fingers hand in play			
40.	Head follows dangling ring			
41.	Head follows vanishing spoon			
42.	Aware of strange situation			
43.	Manipulates table edge slightly			
44.	Carries ring to mouth			
45.	Inspects own hands			
46.	Closes on dangling ring			
47.	Turns head to sound of bell			
48.	Turns head to sound of rattle			
49.	Reaches for cube			
50.	Manipulates table edge actively			
51.	Eye hand co-ordination in reaching			
52.	Regards pellet			
53.	Mirror image approach			

54.	Picks up cube			
55.	Vocalizes attitudes			
56.	Retains 2 cubes			
57.	Exploitive paper play			
58.	Discriminates strangers			
59.	Recovers rattle in crib			
60.	Reaches persistently			
61.	Likes frolic play			
62.	Turns head after fallen spoon			
63.	Lifts inverted cup			
64.	Reaches for 2nd cube			
65.	Smiles at mirror image			
66.	Bangs in play			
67.	Sustained inspections of red ring			
68.	Exploitive string play			
69.	Transfers object hand to hand			
70.	Picks up cube deftly and directly			
71.	Pulls string secures ring			
72.	Interest in sound production			
73.	Lifts cup with handle			
74.	Attends to scribble			
75.	Looks for fallen spoon			
76.	Playful response to mirror			
77.	Retains 2 of 3 cubes offered			
78.	Manipulates bell interest in detail			
79.	Vocalizes 4 different syllables			
80.	Pulls string adaptively secures ring			
81.	Co-operates in games			
82.	Attempts to secure 3 cubes			
83.	Ring bell purposively			
84.	Listens selectively to familiar words			
85.	Says "da – da" or equivalent			
86.	Uncovers toy			

87.	Fingers holes in peg board			
88.	Picks up cup secures cube			
89.	Responds to verbal request			
90.	Puts cube in cup on command			
91.	Looks for contents of box			
92.	Stirs with spoon in imitation			
93.	Looks at pictures in books			
94.	Inhibits on command			
95.	Attempts to imitate scribble			
96.	Unwraps cover			
97.	Repeats performance laughed at			
98.	Holds crayon adaptively			
99.	Pushes car along			
100.	Puts 3 or more cubes in cup			
101.	Abutters expressively			
102.	Uncovers blue box			
103.	Turns pages on book			
104.	Pats whistle doll, in imitation			
105.	Dangles ring by string			
106.	Imitates words			
107.	Puts beads in box			
108.	Places 1 peg repeatedly			
109.	Removes pellet from bottle			
110.	Blue board places 1 round block			
111.	Builds tower of 2 cubes			
112.	Spontaneous scribble			
113.	Says 2 words			
114.	Puts 9 cubes in cup			
115.	Closes round box			
116.	Uses gestures to make wants known			
117.	Shows shoes or other clothing or own toy			
118.	Pegs placed in 70 seconds			
119.	Builds tower of cubes			

120.	Pink board places round block			
121.	Blue board places 2 round blocks			
122.	Attains toy with stick			
123.	Pegs placed in 42 seconds			
124.	Names 1 object			
125.	Imitates crayon stroke			
126.	Follows directions, doll			
127.	Uses words to make wants known			
128.	Points to part of doll			
129.	Blue board places 2 round and 2 square blocks			
130.	Names 1 pictures			
131.	Finds 2 object			
132.	Points to 3 pictures			
133.	Broken doll mends marginally			
134.	Pegs placed in 30 seconds			
135.	Differentiates scribble from stroke			
136.	Sentence of 2 words			
137.	Pink board : completes			
138.	Names 2 objects			
139.	Points to 5 pictures			
140.	Broken doll : mends approximately			
141.	Names 3 pictures			
142.	Blue board : places 6 blocks			
143.	Build tower of 6 cubes			
144.	Discriminates 2 : cup, plate, box			
145.	Names watch, 4^{th} picture			
146.	Names 3 objects			
147.	Imitates strokes : vertical and horizontal			
148.	Points to 7 pictures			
149.	Name 5 pictures			
150.	Names watch, 2^{nd} pictures			
151.	Pink board : reversed			
152.	Discriminates 3 : cup, plate, box			

153.	Broken doll : mends exactly			
154.	Train of cubes			
155.	Blue board : completes in 150 seconds			
156.	Pegs placed in 22 seconds			
157.	Folds paper			
158.	Understands 2 prepositions			
159.	Blue board : completes in 90 seconds			
160.	Blue board : completes in 60 seconds			
161.	Builds tower of 8 cubes			
162.	Concept of one			
163.	Understands 3 prepositions			

MOTOR SCALE ITEMS

1. Name of the child :
2. Age :
3. Height :
4. Weight :
5. Assessed by :

S.No.	Item	Yes	No	Omit
1.	Lifts head when held at shoulder			
2.	Postural adjustment when held at shoulder			
3.	Lateral head movements			
4.	Crawling movements			
5.	Retains red ring			
6.	Arm thrusts in play			
7.	Mg thrusts in play			
8.	Head erect : vertical			
9.	Head erect : and steady			
10.	Lifts head : dorsal suspension			
11.	Turns from side to back			
12.	Elevates self by arms : prone			
13.	Sits with support			
14.	Holds head steady			
15.	Hands predominantly open			
16.	Cube : ulnar – palmar pretension			
17.	Sits with slight support			
18.	Head balanced			
19.	Turns from back to side			
20.	Effort to sit			
21.	Cube : partial thumb opposition			
22.	Pulls to sitting position			
23.	Sits alone momentarily			

24.	Unilateral reaching			
25.	Attempts to secure pellet			
26.	Rotates wrist			
27.	Sits alone 30 seconds or more			
28.	Rolls from back to stomach			
29.	Sits alone, steadily			
30.	Scoops pellet			
31.	Sits alone, good co-ordination			
32.	Cube : complete thumb opposition (redial – digital)			
33.	Pre – walking progression			
34.	Early stepping movements			
35.	Pellet : partial finger pretension (inferior pincer)			
36.	Pulls to standing position			
37.	Raises self to sitting position			
38.	Stands up by furniture			
39.	Combines spoon or cubtes : midline			
40.	Stepping movements			
41.	Pellet : fine pretension (neat pincer)			
42.	Walks with help			
43.	Sits down			
44.	Pat – a – cake : midline skill			
45.	Stands alone			
46.	Walks alone			
47.	Stands up : I			
48.	Throws ball			
49.	Walks side ways			
50.	Walks back ward			
51.	Stands on right foot with help			
52.	Stands on left foot with help			
53.	Walks up stairs with help			
54.	Walks down stairs with help			
55.	Tries to stand on walking board			

56.	Walks with one foot on walking board			
57.	Stand up : II			
58.	Stands on left foot alone			
59.	Walks on line, general direction			
60.	Stands on right foot alone			
61.	Walks on line, general direction			
62.	Walking board : stands with both feet			
63.	Jumps from bottom step			
64.	Walks up stairs alone : both feet on each step			
65.	Walks on tiptoe, few steps			
66.	Walks down stairs alone : both feet on each step			
67.	Walking board : attempts step			
68.	Walks backward, 10 feet			
69.	Jumps from second step			
70.	Distance jump : 4 to 14 inches			
71.	Stands up : III			
72.	Walks up stairs : alternating forwards foot			
73.	Walks on tiptoe, 10 feet			
74.	Waking board : alternates steps part way			
75.	Keeps feet on line, 10 feet			
76.	Distance jump : 14 to 24 inches			
77.	Jumps over string 2 inches high			
78.	Distance jump : 24 to 34 inches			
79.	Hope on one foot 2 or more hops			
80.	Walks down stairs : alternating forward foot			
81.	Jumps over string 8 inches high			

MDI Equivalents of Raw Scores

The Mental Development Indexes given on the following pages range from 50 to 150, covering more than three standard deviations on either side of the average MDI for each age. Scores for exceptional Children falling above or below this range should be reported as "above 150" or "below 50" respectively.

The age shown at the top of each column in the table includes the range of ages shown immediately below it in months (m) and days (d).

Mental Scale
Ages 2-3½ mos.

MDI Equivalents of Raw Scores

Age Group ——> (months)	2	2½	3	3½
Age Range ——> (months and days)	1m 24d through 2m 7d	2m 8d through 2m 23d	2m 24d through 3m 7d	3m 8d through 3m 23d
MDI	Raw Scores			
150	40	48	60	65
149	—	—	—	—
148	—	—	59	—
147	—	47	—	64
146	39	—	58	—
145	—	—	—	63
144	—	46	57	—
143	—	—	—	62
142	38	45	56	—
141	—	—	—	61
140	—	—	55	—
139	—	44	—	60
138	—	—	54	—
137	37	—	—	59
136	—	43	53	—
135	—	—	—	58
134	—	—	52	—
133	—	42	—	57
132	36	—	51	—
131	—	—	—	56
130	—	41	50	—
129	—	—	—	55
128	—	—	49	—
127	35	40	48	54
126	—	—	—	—
125	—	—	47	53
124	34	39	—	52
123	—	—	—	—
122	—	—	46	51
121	33	38	—	—
120	—	—	—	50
119	32	—	45	—
118	—	37	—	49
117	—	—	—	—
116	31	—	44	48
115	—	—	—	—
114	—	36	—	47
113	30	—	43	—
112	—	—	—	—
111	—	35	—	46
110	29	—	42	—
109	—	—	—	—
108	—	34	—	45
107	28	—	41	—
106	—	33	—	—
105	27	—	—	44

Mental Scale Ages 2-3½ mos.

Age Group ——> (months)	2	2½	3	3½
Age Range ——> (months and days)	1m 24d through 2m 7d	2m 8d through 2m 23d	2m 24d through 3m 7d	3m 8d through 3m 23d
MDI	Raw Scores			
104	—	32	40	—
103	26	—	—	43
102	—	31	39	—
101	—	—	—	42
100	25	30	37	—
99	—	—	—	—
98	—	29	37	41
97	—	—	—	—
96	24	28	36	40
95	—	—	—	—
94	—	27	35	39
93	23	—	—	—
92	—	26	34	38
91	22	—	33	—
90	—	25	32	37
89	21	—	—	—
88	—	—	31	36
87	20	24	30	—
86	—	—	—	35
85	—	—	29	34
84	19	23	—	—
83	—	22	28	33
82	—	—	27	32
81	—	21	—	—
80	18	—	26	31
79	—	20	25	30
78	—	—	—	—
77	17	19	24	29
76	—	—	—	—
75	16	—	23	28
74	—	18	22	27
73	15	—	—	—
72	14	17	21	26
71	—	—	20	25
70	13	16	19	—
69	—	—	—	24
68	12	15	18	23
67	—	14	—	22
66	11	—	17	—
65	—	13	16	21
64	10	—	—	20
63	—	12	15	19
62	9	—	—	—
61	—	11	14	18
60	8	10	13	—
59	—	—	—	17
58	7	9	12	16
57	—	—	—	—
56	6	—	11	15
55	—	8	10	—
54	5	—	—	14
53	—	7	9	—
52	4	—	—	13
51	—	6	—	—
50	3	5	8	12

Mental Scale Ages 4-5½ mos.

Age Group ——> (months)	4	4½	5	5½
Age Range ——> (months and days)	3m 24d through 4m 7d	4m 8d through 4m 23d	4m 24d through 5m 7d	5m 8d through 5m 23d
MDI	Raw Scores			
150	71	76	77	82
149	—	—	—	—
148	—	—	—	—
147	70	75	76	81
146	—	—	—	—
145	69	74	—	—

Mental Scale
Ages 4-5½ mos.

Age Group ——> (months)	4	4½	5	5½
Age Range ——> (months and days)	3m 24d through 4m 7d	4m 8d through 4m 23d	4m 24d through 5m 7d	5m 8d through 5m 23d
MDI	Raw Scores			
144	—	—	75	—
143	68	73	—	80
142	—	—	—	—
141	67	—	74	—
140	—	72	—	—
139	66	—	—	79
138	—	71	—	—
137	65	—	—	—
136	—	—	—	78
135	64	70	73	—
134	—	—	—	—
133	63	69	—	—
132	—	—	—	—
131	62	68	—	—
130	61	—	—	77
129	—	—	72	—
128	60	67	—	—
127	—	—	—	—
126	59	66	—	76
125	—	—	71	—
124	58	65	—	—
123	—	—	70	75
122	57	64	—	—
121	—	—	—	74
120	56	63	69	—
119	—	—	—	—
118	55	62	68	—
117	—	61	—	73
116	54	—	—	—
115	—	60	67	—
114	53	—	—	—
113	52	59	—	72
112	—	—	66	—
111	51	58	—	—
110	—	—	65	71
109	50	57	—	—
108	—	—	64	70
107	49	56	—	—
106	—	55	63	69
105	48	—	—	—
104	—	54	62	68
103	—	—	61	—
102	47	53	—	67
101	—	—	60	—
100	—	52	—	—
99	46	51	59	66
98	—	—	58	65
97	—	50	—	—
96	45	49	57	64
95	—	—	—	—
94	44	48	56	63
93	—	—	55	62
92	43	—	—	61
91	42	47	54	—
90	—	—	—	60
89	41	46	53	—
88	—	—	—	59
87	40	—	52	58
86	39	45	51	—
85	—	—	50	57
84	38	44	49	56
83	—	—	—	55
82	37	43	48	—
81	—	—	—	54
80	36	42	47	—
79	—	—	—	53
78	35	41	46	52
77	34	40	—	51
76	—	39	45	50
75	33	—	—	49
74	32	38	44	—
73	—	—	—	48

Mental Scale Ages 4-5½ mos.

Age Group ——> (months)	4	4½	5	5½
Age Range ——> (months and days)	3m 24d through 4m 7d	4m 8d through 4m 23d	4m 24d through 5m 7d	5m 8d through 5m 23d
MDI		Raw Scores		
72	31	37	—	—
71	—	—	43	47
70	30	36	—	46
69	—	—	42	—
68	29	35	—	45
67	28	—	41	44
66	—	34	40	—
65	27	33	39	43
64	26	32	—	—
63	—	—	38	42
62	25	31	—	—
61	24	—	37	41
60	23	30	36	40
59	22	29	—	39
58	—	—	35	—
57	21	28	—	38
56	20	—	34	37
55	19	27	33	36
54	18	26	—	35
53	—	—	32	34
52	17	25	31	33
51	—	—	—	—
50	16	24	30	32

Mental Scale Ages 6-9 mos.

Age Group ——> (months)	6	7	8	9
Age Range ——> (months and days)	5m 24d through 6m 15d	6m 16d through 7m 15d	7m 16d through 8m 15d	8m 16d through 9m 15d
MDI		Raw Scores		
150	85	90	96	103
149	—	—	—	—
148	—	—	—	102
147	—	—	—	—
146	—	—	95	101
145	—	89	—	—
144	84	—	—	—
143	—	—	94	100
142	—	—	—	—
141	—	—	—	—
140	—	88	93	99
139	83	—	—	—
138	—	—	92	—
137	—	—	—	—
136	—	87	—	98
135	—	—	91	—
134	82	—	—	—
133	—	—	—	97
132	—	86	—	—
131	—	—	—	—
130	—	—	90	—
129	81	—	—	96
128	—	85	—	—
127	—	—	—	—
126	—	—	—	95
125	—	—	—	—
124	80	—	89	—
123	—	84	—	94
122	—	—	—	—
121	—	—	—	—
120	79	—	—	93
119	—	83	88	—
118	—	—	—	—
117	—	—	—	92
116	78	—	—	—
115	—	82	—	—
114	—	—	87	91
113	—	—	—	—

Mental Scale
Ages 6-9 mos.

Age Group ——> (months)	6	7	8	9
Age Range ——> (months and days)	5m 24d through 6m 15d	6m 16d through 7m 15d	7m 16d through 8m 15d	8m 16d through 9m 15d
MDI	Raw Scores			
112	—	—	—	—
111	—	81	—	90
110	77	—	86	—
109	—	—	—	—
108	—	—	—	—
107	—	80	—	89
106	—	—	85	—
105	76	—	—	—
104	—	—	—	—
103	—	—	—	88
102	75	79	—	—
101	—	—	84	—
100	74	—	—	—
99	—	78	—	87
98	73	—	83	—
97	—	—	—	—
96	72	—	—	86
95	—	—	82	—
94	71	77	—	—
93	—	—	—	85
92	70	—	81	—
91	69	76	—	—
90	—	—	—	—
89	68	—	80	84
88	67	75	—	—
87	—	—	—	—
86	66	74	—	83
85	65	—	—	—
84	64	—	79	—
83	—	73	—	82
82	63	—	—	—
81	62	72	78	81
80	61	—	—	—
79	—	71	—	—
78	60	—	77	80
77	59	70	—	—
76	58	69	76	—
75	—	—	—	—
74	57	68	—	79
73	56	—	75	—
72	55	67	—	78
71	—	—	74	—
70	54	66	—	—
69	53	65	—	77
68	52	—	73	—
67	51	64	—	76
66	50	—	72	—
65	49	63	—	75
64	—	—	71	—
63	48	62	—	74
62	47	61	70	—
61	46	—	—	—
60	45	60	69	73
59	44	—	—	—
58	43	59	68	72
57	42	—	—	—
56	—	58	67	—
55	41	57	—	71
54	40	—	66	—
53	—	56	—	70
52	39	—	65	—
51	—	55	—	—
50	38	54	64	69

Mental Scale
Ages 10-13 mos.

Age Group ——> (months)	10	11	12	13
Age Range ——> (months and days)	9m 16d through 10m 15d	10m 16d through 11m 15d	11m 16d through 12m 15d	12m 16d through 13m 15d
MDI	Raw Scores			
150	113	117	122	126
149	—	—	—	—
148	112	—	—	—
147	—	116	121	125
146	111	—	—	—
145	—	115	120	—
144	—	—	—	124
143	110	—	—	—
142	—	114	119	123
141	—	—	—	122
140	109	—	118	—
139	—	113	—	—
138	108	—	—	121
137	—	112	117	—
136	107	—	—	120
135	—	—	—	—
134	106	111	116	—
133	—	—	—	119
132	105	—	—	—
131	—	110	115	118
130	104	—	114	—
129	—	109	—	—
128	—	—	113	117
127	103	108	—	—
126	—	—	112	—
125	—	—	—	116
124	102	107	—	—
123	—	—	—	—
122	101	106	111	115
121	—	—	—	—
120	100	—	—	114
119	—	105	110	—
118	—	—	—	113
117	99	104	109	—
116	—	—	—	—
115	—	—	108	112
114	98	103	—	—
113	—	—	—	—
112	—	—	107	111
111	97	102	—	—
110	—	—	—	110
109	—	101	106	—
108	96	—	—	—
107	—	—	—	109
106	—	100	105	—
105	95	—	—	108
104	—	99	—	—
103	—	—	104	—
102	94	98	—	107
101	—	—	—	—
100	—	—	103	106
99	93	97	—	—
98	—	—	102	—
97	—	—	—	105
96	92	96	101	—
95	—	—	—	—
94	91	—	—	104
93	—	95	100	—
92	—	—	—	—
91	90	—	99	103
90	—	94	—	—
89	—	—	98	102
88	89	93	—	—
87	—	—	—	101
86	88	—	97	—
85	—	92	—	—
84	87	—	—	100
83	—	—	96	—

Mental Scale Ages 10-13 mos.

Age Group ——> (months)	10	11	12	13
Age Range ——> (months and days)	9m 16d through 10m 15d	10m 16d through 11m 15d	11m 16d through 12m 15d	12m 16d through 13m 15d
MDI	Raw Scores			
82	86	91	—	99
81	—	—	95	—
80	—	—	—	98
79	85	90	—	—
78	—	—	94	—
77	84	—	—	97
76	—	89	93	—
75	—	—	—	—
74	83	—	92	96
73	—	88	—	—
72	82	—	—	95
71	—	87	—	—
70	—	—	91	94
69	81	86	—	—
68	—	—	—	93
67	80	85	—	—
66	—	—	90	—
65	—	84	—	92
64	79	—	—	—
63	—	—	89	—
62	78	83	—	91
61	—	—	—	—
60	77	82	88	—
59	—	—	—	90
58	76	81	87	—
57	—	—	—	89
56	75	80	86	—
55	—	—	—	88
54	74	79	85	—
53	—	—	—	87
52	73	78	84	—
51	—	—	—	—
50	72	77	83	86

Mental Scale Ages 14-17 mos.

Age Group ——> (months)	14	15	16	17
Age Range ——> (months and days)	13m 16d through 14m 15d	14m 16d through 15m 15d	15m 16d through 16m 15d	16m 16d through 17m 15d
MDI	Raw Scores			
150	129	136	140	143
149	—	—	—	—
148	—	135	—	—
147	128	—	139	142
146	—	134	—	—
145	127	—	138	—
144	—	133	137	141
143	—	—	—	—
142	126	132	—	140
141	—	—	136	—
140	—	131	—	—
139	125	—	135	139
138	—	130	—	—
137	—	—	134	—
136	124	129	—	138
135	—	—	133	—
134	—	128	—	137
133	123	—	132	—
132	—	127	—	136
131	122	—	131	—
130	—	126	—	135
129	—	—	130	—
128	121	125	—	—
127	—	—	129	—
126	120	124	—	133
125	—	—	128	—
124	119	123	—	132
123	—	—	127	—
122	118	—	—	131

Mental Scale
Ages 14-17 mo

Age Group ——> (months)	14	15	16	17
Age Range ——> (months and days)	13m 16d through 14m 15d	14m 16d through 15m 15d	15m 16d through 16m 15d	16m 16d through 17m 15d
MDI	Raw Scores			
121	—	122	126	—
120	—	—	—	130
119	117	—	125	—
118	—	121	—	129
117	—	—	124	—
116	116	120	—	128
115	—	—	123	—
114	—	119	—	127
113	115	—	—	—
112	—	118	122	126
111	114	—	—	—
110	—	—	—	125
109	—	117	121	—
108	113	—	—	124
107	—	116	120	—
106	112	—	—	123
105	—	—	119	—
104	—	115	—	—
103	111	—	—	122
102	—	—	118	—
101	—	114	—	—
100	110	—	—	121
99	—	—	117	—
98	—	113	—	120
97	109	—	116	—
96	—	—	—	—
95	108	112	—	119
94	—	—	115	—
93	—	—	—	—
92	107	111	—	118
91	—	—	114	—
90	106	110	—	—
89	—	—	—	117
88	105	—	113	—
87	—	109	—	116
86	—	—	112	—
85	104	—	—	—
84	—	108	—	115
83	—	—	111	—
82	103	107	—	—
81	—	—	110	114
80	102	106	—	—
79	—	—	—	—
78	—	105	109	113
77	101	—	—	—
76	—	—	108	112
75	100	104	—	—
74	—	—	107	111
73	—	103	—	—
72	99	—	106	110
71	—	—	—	—
70	98	102	105	—
69	—	—	—	109
68	97	—	—	—
67	—	101	104	108
66	—	—	—	—
65	96	100	—	107
64	—	—	103	—
63	95	—	—	106
62	—	99	102	—
61	94	—	—	105
60	—	98	101	—
59	93	—	—	104
58	—	97	100	—
57	—	—	—	—
56	92	96	99	103
55	—	—	—	—
54	91	95	98	102
53	—	—	—	—
52	90	94	97	101
51	—	—	—	—
50	89	93	96	100

Mental Scale
Ages 18-21 mos.

Age Group ——> (months)	18	19	20	21
Age Range ——> (months and days)	17m 16d through 18m 15d	18m 16d through 19m 15d	19m 16d through 20m 15d	20m 16d through 21m 15d
MDI		Raw Scores		
150	148	152	153	154
149	—	—	—	—
148	—	—	—	—
147	—	—	—	—
146	147	151	—	153
145	—	—	152	—
144	—	—	—	—
143	—	150	—	—
142	146	—	—	152
141	—	—	—	—
140	145	149	151	—
139	—	—	—	—
138	144	—	—	—
137	—	148	—	—
136	143	—	—	—
135	—	147	150	—
134	142	—	—	151
133	—	146	—	—
132	141	—	—	—
131	—	145	149	—
130	140	—	—	—
129	—	144	—	—
128	139	—	148	—
127	—	143	—	150
126	138	142	147	—
125	—	—	—	—
124	137	141	146	—
123	136	—	—	—
122	—	140	145	149
121	135	—	—	—
120	—	139	144	148
119	134	—	—	—
118	—	138	143	147
117	133	—	142	—
116	—	137	141	146
115	132	136	—	—
114	—	—	140	145
113	131	135	—	144
112	—	—	139	—
111	130	134	—	143
110	—	—	138	—
109	129	133	—	142
108	—	132	137	141
107	128	—	136	—
106	—	131	—	140
105	127	—	135	—
104	—	130	—	139
103	126	—	134	—
102	—	129	—	138
101	—	—	133	137
100	125	128	132	—
99	—	—	—	136
98	124	—	131	—
97	—	127	130	135
96	123	—	—	—
95	—	126	129	134
94	—	—	—	—
93	122	125	—	133
92	—	—	128	—
91	—	124	—	132
90	121	—	—	—
89	—	123	127	131
88	120	—	—	—
87	—	—	126	130
86	—	122	—	—
85	119	—	125	129
84	—	—	—	—

Mental Scale Ages 18-21 mos.

Age Group ——> (months)	18	19	20	21
Age Range ——> (months and days)	17m 16d through 18m 15d	18m 16d through 19m 15d	19m 16d through 20m 15d	20m 16d through 21m 15d
MDI	Raw Scores			
83	—	121	124	128
82	—	—	—	—
81	118	120	123	127
80	—	—	—	—
79	—	—	122	126
78	117	119	—	—
77	—	—	—	125
76	116	—	121	—
75	—	118	—	124
74	—	—	120	—
73	115	—	—	—
72	—	117	—	123
71	—	—	119	—
70	114	116	—	122
69	—	—	118	—
68	113	115	—	121
67	—	—	—	—
66	112	—	117	120
65	—	114	—	—
64	111	—	116	119
63	—	113	—	—
62	110	—	115	118
61	—	112	—	—
60	109	—	114	117
59	—	—	—	—
58	108	111	113	116
57	—	—	—	115
56	107	110	112	—
55	—	—	—	114
54	106	109	111	—
53	—	—	—	113
52	105	108	110	—
51	—	—	—	—
50	104	107	109	112

Mental Scale Ages 22-25 mos.

Age Group ——> (months)	22	23	24	25
Age Range ——> (months and days)	21m 16d through 22m 15d	22m 16d through 23m 15d	23m 16d through 24m 15d	24m 16d through 25m 15d
MDI	Raw Scores			
150	155	158	160	162
149	—	—	—	—
148	—	—	—	—
147	—	—	—	—
146	—	—	—	—
145	154	157	—	161
144	—	—	—	—
143	—	—	159	—
142	—	—	—	—
141	—	—	—	—
140	—	156	—	160
139	153	—	—	—
138	—	—	—	—
137	—	—	158	—
136	—	—	—	—
135	—	155	—	159
134	—	—	—	—
133	152	—	—	—
132	—	—	157	—
131	—	154	—	—
130	—	—	—	158
129	—	—	—	—
128	—	153	—	—
127	151	—	156	—
126	—	—	—	—
125	—	—	—	157
124	—	152	—	—
123	—	—	155	—
122	—	—	—	—

Mental Scale
Ages 22-25 mos.

Age Group ——> (months)	22	23	24	25
Age Range ——> (months and days)	21m 16d through 22m 15d	22m 16d through 23m 15d	23m 16d through 24m 15d	24m 16d through 25m 15d
MDI	Raw Scores			
121	150	—	—	156
120	—	151	—	—
119	—	—	154	—
118	—	—	—	—
117	149	—	—	155
116	—	150	153	—
115	148	—	—	—
114	—	—	152	154
113	147	—	—	—
112	—	149	151	—
111	146	—	—	153
110	—	148	—	—
109	145	—	150	152
108	144	147	—	—
107	—	—	—	151
106	143	146	149	—
105	—	—	—	—
104	142	145	148	150
103	141	—	—	—
102	—	144	147	149
101	140	—	—	—
100	—	143	146	148
99	139	142	—	—
98	—	—	145	147
97	138	141	—	—
96	137	—	144	146
95	—	140	—	—
94	136	139	143	145
93	135	—	142	—
92	—	138	—	144
91	134	137	141	—
90	—	—	—	143
89	133	136	140	142
88	—	135	139	—
87	132	—	138	141
86	—	134	—	—
85	131	133	137	140
84	130	—	136	139
83	—	132	135	138
82	129	—	—	—
81	—	131	134	137
80	128	130	133	136
79	—	—	132	135
78	127	129	—	—
77	—	—	131	134
76	126	128	130	133
75	—	127	—	132
74	125	—	129	—
73	—	126	—	131
72	124	—	128	130
71	—	125	127	—
70	123	—	—	129
69	—	124	126	128
68	122	—	—	—
67	—	123	125	127
66	121	—	124	126
65	—	122	—	—
64	120	121	123	125
63	—	—	—	124
62	119	120	122	—
61	—	—	121	123
60	118	119	—	—
59	—	—	120	122
58	117	118	—	121
57	—	—	119	—
56	116	117	—	120
55	—	—	118	—
54	115	—	—	119
53	—	116	117	—
52	114	115	—	118
51	—	—	—	—
50	113	114	116	117

Mental Scal
Ages 26-30 m

Age Group ——> (months)	26	27	28	29	30
Age Range ——> (months and days)	25m 16d through 26m 15d	26m 16d through 27m 15d	27m 16d through 28m 15d	28m 16d through 29m 15d	29m 16d through 30m 15d
MDI	Raw Scores				
150					
149					
148					
147	163				
146	—				
145	—	163			
144	—	—			
143	162	—			
142	—	—			
141	—	—	163		
140	—	—	—		
139	161	162	—		
138	—	—	—		
137	—	—	—	163	
136	—	—	—	—	
135	—	—	—	—	
134	—	—	162	—	
133	160	161	—	—	163
132	—	—	—	—	—
131	—	—	—	—	—
130	—	—	—	—	—
129	—	—	—	162	—
128	—	—	161	—	—
127	159	—	—	—	—
126	—	160	—	—	—
125	—	—	—	—	—
124	—	—	—	—	162
123	—	—	—	161	—
122	158	—	160	—	—
121	—	—	—	—	—
120	—	159	—	—	—
119	—	—	—	—	—
118	157	—	—	—	—
117	—	—	159	160	161
116	—	—	—	—	—
115	—	—	—	—	—
114	156	158	—	—	—
113	—	—	—	159	—
112	—	—	158	—	160
111	155	—	—	—	—
110	—	157	—	—	—
109	—	—	—	158	159
108	154	—	157	—	—
107	—	156	—	—	—
106	153	—	156	157	158
105	—	—	—	—	—
104	152	155	—	156	157
103	—	—	155	—	—
102	—	154	—	—	156
101	151	—	154	155	—
100	—	153	—	—	—
99	150	—	153	154	155
98	—	152	—	—	—
97	149	—	—	153	154
96	148	—	152	—	—
95	—	151	—	—	153
94	147	—	—	152	—
93	—	150	151	—	—
92	146	149	—	—	152
91	—	148	150	151	—
90	145	—	149	—	—
89	—	147	—	150	—
88	144	—	148	—	151
87	—	146	—	149	—
86	143	—	147	—	150
85	142	145	—	148	—

Mental Scale
Ages 26-30 mos.

Age Group ——> (months)	26	27	28	29	30
Age Range ——> (months and days)	25m 16d through 26m 15d	26m 16d through 27m 15d	27m 16d through 28m 15d	28m 16d through 29m 15d	29m 16d through 30m 15d
MDI			Raw Scores		
84	—	—	146	—	149
83	141	144	—	147	—
82	—	—	145	—	148
81	140	143	—	146	—
80	139	142	144	—	147
79	138	—	143	145	—
78	—	141	—	—	146
77	137	140	142	144	—
76	136	—	141	143	145
75	—	139	—	—	—
74	135	138	140	142	144
73	134	—	—	141	143
72	133	137	139	—	—
71	132	136	138	140	142
70	—	—	137	—	141
69	131	135	136	139	—
68	130	134	—	138	140
67	—	133	135	137	—
66	129	132	134	136	139
65	128	—	—	—	138
64	—	131	133	135	137
63	127	130	132	134	136
62	126	129	131	—	—
61	125	128	130	133	135
60	—	—	—	132	134
59	124	127	129	131	—
58	—	126	128	130	133
57	123	125	—	—	132
56	122	—	127	129	131
55	121	124	126	128	130
54	—	—	—	—	—
53	120	123	125	127	129
52	—	—	124	126	128
51	—	122	—	—	—
50	119	121	123	125	127

PDI Equivalents of Raw Scores

The Psychomotor Development Indexes given on the following pages range from 50 to 150, covering more than three standard deviations on either side of the average PDI for each age. Scores for exceptional children falling above or below this range should be reported as "above 150" or "below 50," respectively.

The age shown at the top of each column in the table includes the range of ages shown immediately below it in months (m) and days (d).

PDI Equivalents of Raw Scores

MOTOR SCALE
Ages 2-3½ mos.

Age Group ——> (months)	2	2½	3	3½
Age Range ——> (months and days)	1m 24d through 2m 7d	2m 8d through 2m 23d	2m 24d through 3m 7d	3m 8d through 3m 23d
PDI	Raw Scores			
150	17	20	21	23
149	—	—	—	—
148	—	—	—	—
147	—	—	—	—
146	—	—	—	—
145	—	19	—	—
144	—	—	—	22
143	16	—	—	—
142	—	—	20	—
141	—	—	—	—
140	—	18	—	—
139	—	—	—	—
138	—	—	—	21
137	—	—	—	—
136	—	—	—	—
135	—	—	—	—
134	—	17	19	—
133	15	—	—	—
132	—	—	—	—
131	—	—	—	20
130	—	—	—	—
129	—	—	—	—
128	—	—	—	—
127	—	—	—	—
126	—	16	—	—
125	—	—	18	—
124	—	—	—	19
123	—	—	—	—
122	—	—	—	—
121	—	—	—	—
120	—	—	—	—
119	—	—	—	—
118	—	—	—	—
117	—	15	17	18
116	—	—	—	—
115	13	—	—	—
114	—	—	—	—
113	—	—	—	—
112	—	—	—	—
111	—	—	—	—
110	—	—	—	17
109	—	14	—	—
108	—	—	16	—
107	—	—	—	—
106	12	—	—	—
105	—	—	—	—
104	—	—	—	—
103	—	—	—	16
102	—	13	—	—
101	—	—	15	—
100	—	—	—	—
99	11	—	—	—
98	—	—	—	—
97	—	—	—	—
96	—	12	—	15
95	—	—	—	—
94	—	—	14	—
93	10	—	—	—
92	—	—	—	—
91	—	—	—	—
90	—	11	—	14
89	—	—	—	—
88	—	—	13	—
87	—	—	—	—
86	9	—	—	—
85	—	10	—	—
84	—	—	—	13
83	—	—	12	—
82	—	—	—	—
81	—	—	—	—

MOTOR SCALE Ages 2-3½ mos.

Age Group ——> (months)	2	2½	3	3½
Age Range ——> (months and days)	1m 24d through 2m 7d	2m 8d through 2m 23d	2m 24d through 3m 7d	3m 8d through 3m 23d
PDI	Raw Scores			
80	—	9	11	—
79	8	—	—	12
78	—	—	—	—
77	—	—	10	—
76	—	—	—	—
75	—	8	—	11
74	—	—	9	—
73	—	—	—	—
72	7	—	—	—
71	—	—	—	10
70	—	—	8	—
69	—	—	—	—
68	—	7	—	—
67	—	—	—	9
66	6	—	—	—
65	—	—	—	—
64	—	—	—	—
63	—	—	7	8
62	—	6	—	—
61	5	—	—	—
60	—	—	—	—
59	—	—	—	7
58	—	—	—	—
57	4	5	6	—
56	—	—	—	—
55	—	—	—	—
54	3	—	—	6
53	—	4	5	—
52	—	—	—	—
51	—	—	—	—
50	2	3	4	5

MOTOR SCALE Ages 4-5½ mos.

Age Group ——> *(months)*	4	4½	5	5½
Age Range ——> (months and days)	3m 24d through 4m 7d	4m 8d through 4m 23d	4m 24d through 5m 7d	5m 8d through 5m 23d
PDI	Raw Scores			
150	25	28	33	37
149	—	—	—	—
148	—	—	—	—
147	—	—	32	36
146	—	—	—	—
145	—	27	—	—
144	24	—	—	35
143	—	—	31	—
142	—	—	—	—
141	—	—	—	34
140	—	26	—	—
139	23	—	30	—
138	—	—	—	—
137	—	—	—	33
136	—	—	—	—
135	—	25	29	—
134	—	—	—	32
133	—	—	—	—
132	—	—	—	—
131	22	—	28	—
130	—	24	—	31
129	—	—	—	—
128	—	—	27	—
127	—	—	—	—
126	—	—	—	30
125	21	23	—	—
124	—	—	26	—
123	—	—	—	—
122	—	—	—	29
121	—	—	—	—
120	20	—	25	—
119	—	22	—	—

MOTOR SCALE
Ages 4-5½ mos.

Age Group ——> (months)	4	4½	5	5½
Age Range ——> (months and days)	3m 24d through 4m 7d	4m 8d through 4m 23d	4m 24d through 5m 7d	5m 8d through 5m 23d
PDI		**Raw Scores**		
118	—	—	—	28
117	—	—	—	—
116	—	—	—	—
115	—	—	24	—
114	19	21	—	27
113	—	—	—	—
112	—	—	—	—
111	—	—	23	—
110	—	—	—	26
109	—	20	—	—
108	18	—	—	—
107	—	—	—	—
106	—	—	22	25
105	—	—	—	—
104	—	—	—	—
103	—	19	—	—
102	17	—	21	24
101	—	—	—	—
100	—	—	—	—
99	—	—	—	23
98	—	—	—	—
97	—	18	20	—
96	16	—	—	—
95	—	—	—	22
94	—	—	—	—
93	—	—	—	—
92	—	—	19	—
91	—	17	—	21
90	15	—	—	—
89	—	—	—	—
88	—	—	—	—
87	—	—	—	20
86	—	16	—	—
85	14	—	18	—
84	—	—	—	—
83	—	—	—	19
82	—	—	—	—
81	—	15	—	—
80	13	—	17	—
79	—	—	—	—
78	—	—	—	18
77	—	—	—	—
76	—	14	—	—
75	12	—	16	—
74	—	—	—	17
73	—	—	—	—
72	—	—	—	—
71	—	13	—	—
70	11	—	15	—
69	—	—	—	16
68	—	—	—	—
67	—	12	—	—
66	—	—	14	—
65	10	—	—	15
64	—	—	—	—
63	—	—	—	—
62	—	11	13	—
61	—	—	—	14
60	9	—	—	—
59	—	—	—	—
58	—	10	12	13
57	8	—	—	—
56	—	—	—	—
55	—	—	—	—
54	7	9	11	12
53	—	—	—	—
52	—	—	—	—
51	—	—	—	—
50	6	8	10	11

MOTOR SCALE
Ages 6-9 mos.

Age Group ——> (months)	6	7	8	9
Age Range ——> (months and days)	5m 24d through 6m 15d	6m 16d through 7m 15d	7m 16d through 8m 15d	8m 16d through 9m 15d
PDI	Raw Scores			
150	40	43	45	48
149	—	—	—	—
148	—	—	—	—
147	—	—	—	—
146	39	—	—	—
145	—	—	—	—
144	—	42	—	47
143	38	—	44	—
142	—	—	—	—
141	—	—	—	—
140	—	—	—	—
139	—	—	—	46
138	37	41	—	—
137	—	—	—	—
136	—	—	—	—
135	—	—	—	—
134	—	—	—	45
133	36	—	43	—
132	—	40	—	—
131	—	—	—	—
130	—	—	—	—
129	35	—	—	—
128	—	39	—	—
127	34	—	—	44
126	—	—	—	—
125	—	38	—	—
124	33	—	42	—
123	—	—	—	—
122	—	—	—	—
121	—	37	—	—
120	32	—	—	—
119	—	—	41	43
118	—	—	—	—
117	—	36	—	—
116	31	—	—	—
115	—	—	—	—
114	—	—	40	—
113	—	35	—	—
112	30	—	—	—
111	—	—	—	42
110	—	34	39	—
109	—	—	—	—
108	29	—	—	—
107	—	—	—	—
106	—	33	38	—
105	—	—	—	41
104	28	—	37	—
103	—	—	—	—
102	—	32	—	—
101	—	—	36	—
100	27	—	—	40
99	—	31	—	—
98	—	—	—	—
97	—	—	35	—
96	26	—	—	39
95	—	30	—	—
94	—	—	34	—
93	—	—	—	—
92	25	—	—	38
91	—	29	—	—
90	—	—	—	37
89	24	—	—	—
88	—	—	—	—
87	—	28	33	36
86	23	—	—	—
85	—	—	—	—
84	—	27	—	—

MOTOR S
Ages 6-9 r

Age Group ——> (months)	6	7	8	9
Age Range ——> (months and days)	5m 24d through 6m 15d	6m 16d through 7m 15d	7m 16d through 8m 15d	8m 16d through 9m 15d
PDI	Raw Scores			
83	22	—	32	35
82	—	—	—	—
81	—	—	31	—
80	21	26	—	34
79	—	—	—	—
78	—	—	—	—
77	20	—	30	—
76	—	25	—	33
75	—	—	—	—
74	57	68	—	79
73	56	—	75	—
72	55	67	—	78
71	—	—	74	—
70	54	66	—	—
69	53	65	—	77
68	52	—	73	—
67	51	64	—	76
66	50	—	72	—
65	49	63	—	75
64	—	—	71	—
63	48	62	—	74
62	47	61	70	—
61	46	—	—	—
60	45	60	69	73
59	44	—	—	—
58	43	59	68	72
57	42	—	—	—
56	—	58	67	—
55	41	57	—	71
54	40	—	66	—
53	—	56	—	70
52	39	—	65	—
51	—	55	—	—
50	38	54	64	69

MOTOR SCALE
Ages 10-13 mos.

Age Group ——> (months)	10	11	12	13
Age Range ——> (months and days)	9m 16d through 10m 15d	10m 16d through 11m 15d	11m 16d through 12m 15d	12m 16d through 13m 15d
PDI	Raw Scores			
150	50	54	57	59
149	—	—	—	—
148	—	—	—	—
147	—	53	56	58
146	—	—	—	—
145	—	—	—	—
144	—	—	—	57
143	49	52	55	—
142	—	—	—	—
141	—	—	—	56
140	—	—	—	—
139	—	51	54	—
138	—	—	—	—
137	—	—	—	55
136	48	50	53	—
135	—	—	—	—
134	—	—	52	—
133	—	—	—	54
132	—	—	—	—
131	47	—	—	—
130	—	49	—	—
129	—	—	—	53
128	—	—	51	—
127	—	—	—	—
126	—	—	—	—
125	—	—	—	52
124	46	48	—	—
123	—	—	—	—
122	—	—	50	—

MOTOR SCALE
Ages 10-13 mos.

Age Group ——> (months)	10	11	12	13
Age Range ——> (months and days)	9m 16d through 10m 15d	10m 16d through 11m 15d	11m 16d through 12m 15d	12m 16d through 13m 15d
PDI	Raw Scores			
121	—	—	—	—
120	—	—	—	51
119	—	—	—	—
118	—	47	—	—
117	—	—	49	—
116	45	—	—	—
115	—	—	—	50
114	—	—	—	—
113	—	—	—	—
112	—	—	—	—
111	—	46	48	—
110	44	—	—	49
109	—	—	—	—
108	—	—	—	—
107	—	—	—	—
106	—	—	—	—
105	—	—	47	—
104	43	45	—	48
103	—	—	—	—
102	—	—	—	—
101	—	—	—	—
100	—	—	—	—
99	—	—	—	47
98	—	44	46	—
97	42	—	—	—
96	—	—	—	—
95	—	—	—	—
94	—	—	—	—
93	—	—	—	46
92	—	43	45	—
91	—	—	—	—
90	41	—	—	—
89	—	—	—	—
88	—	—	—	—
87	—	—	—	45
86	—	42	44	—
85	—	—	—	—
84	40	—	—	—
83	—	—	—	—
82	—	—	—	44
81	39	—	—	—
80	—	41	43	—
79	—	—	—	—
78	38	—	—	—
77	—	—	—	—
76	—	—	—	43
75	37	40	42	—
74	—	—	—	—
73	—	—	—	—
72	36	39	—	—
71	—	—	—	42
70	—	—	41	—
69	35	38	—	—
68	—	—	—	—
67	—	37	—	—
66	34	—	40	41
65	—	—	—	—
64	—	36	—	—
63	33	—	39	—
62	—	—	—	40
61	—	35	—	—
60	32	—	38	—
59	—	—	—	39
58	—	34	37	—
57	31	—	—	—
56	—	—	—	38
55	—	—	36	—
54	30	33	—	—
53	—	—	—	37
52	—	—	35	—
51	—	—	—	—
50	29	32	34	36

MOTOR SCALE
Ages 14-17 mos.

Age Group ——> (months)	14	15	16	17
Age Range ——> (months and days)	13m 16d through 14m 15d	14m 16d through 15m 15d	15m 16d through 16m 15d	16m 16d through 17m 15d
MDI	Raw Scores			
150	61	63	64	65
149	—	—	—	—
148	—	—	—	—
147	60	—	—	64
146	—	62	63	—
145	—	—	—	—
144	59	—	—	—
143	—	61	—	—
142	—	—	62	63
141	58	—	—	—
140	—	60	—	—
139	—	—	61	—
138	57	—	—	62
137	—	59	—	—
136	—	—	—	—
135	56	—	60	—
134	—	58	—	61
133	—	—	—	—
132	—	—	59	—
131	—	57	—	—
130	—	—	—	60
129	55	56	58	—
128	—	—	—	—
127	—	—	—	—
126	—	—	—	59
125	54	—	57	—
124	—	55	—	—
123	—	—	—	58
122	53	—	56	—
121	—	—	—	—
120	—	—	—	—
119	—	—	—	57
118	52	54	—	—
117	—	—	—	—
116	—	—	55	—
115	—	—	—	56
114	51	53	—	—
113	—	—	—	—
112	—	—	—	—
111	—	—	—	—
110	—	52	54	—
109	50	—	—	—
108	—	—	—	55
107	—	—	—	—
106	—	51	53	—
105	—	—	—	—
104	—	—	—	—
103	49	—	—	—
102	—	—	52	54
101	—	—	—	—
100	—	50	—	—
99	—	—	—	—
98	—	—	51	—
97	48	—	—	53
96	—	—	—	—
95	—	49	—	—
94	—	—	—	—
93	—	—	50	52
92	47	—	—	—
91	—	—	—	—
90	—	48	—	51
89	—	—	49	—
88	—	—	—	—
87	46	—	—	—
86	—	—	—	50
85	—	47	—	—
84	—	—	48	—
83	—	—	—	—
82	45	—	—	49

MOTOR SCALE
Ages 14-17 mos.

Age Group ——> (months)	14	15	16	17
Age Range ——> (months and days)	13m 16d through 14m 15d	14m 16d through 15m 15d	15m 16d through 16m 15d	16m 16d through 17m 15d
PDI	Raw Scores			
81	—	46	—	—
80	—	—	47	—
79	—	—	—	—
78	44	—	—	48
77	—	45	—	—
76	—	—	46	—
75	—	—	—	—
74	—	—	—	47
73	—	44	—	—
72	43	—	45	—
71	—	—	—	46
70	—	—	—	—
69	—	—	44	—
68	—	43	—	45
67	42	—	—	—
66	—	—	—	—
65	—	—	43	44
64	—	—	—	—
63	—	42	—	—
62	41	—	—	—
61	—	—	42	43
60	—	—	—	—
59	—	—	—	—
58	40	41	—	42
57	—	—	41	—
56	—	—	—	—
55	39	—	—	—
54	—	40	—	41
53	—	—	40	—
52	—	—	—	—
51	—	—	—	—
50	38	39	39	40

MOTOR SCALE
Ages 18-21 mos.

Age Group ——> (months)	18	19	20	21
Age Range ——> (months and days)	17m 16d through 18m 15d	18m 16d through 19m 15d	19m 16d through 20m 15d	20m 16d through 21m 15d
PDI	Raw Scores			
150	66	68	69	71
149	—	—	—	—
148	—	—	—	—
147	65	67	—	70
146	—	—	68	—
145	—	—	—	—
144	—	66	—	—
143	64	—	—	69
142	—	—	67	—
141	—	65	—	—
140	—	—	—	68
139	—	—	—	—
138	63	—	66	—
137	—	64	—	—
136	—	—	—	67
135	—	—	—	—
134	—	—	65	—
133	62	63	—	—
132	—	—	—	—
131	—	—	64	66
130	—	—	—	—
129	61	—	—	—
128	—	62	—	—
127	—	—	63	65
126	—	—	—	—
125	—	—	—	—
124	60	61	—	64
123	—	—	62	—
122	—	—	—	—

MOTOR SCALE
Ages 18-21 mos.

Age Group ——> (months)	18	19	20	21
Age Range ——> (months and days)	17m 16d through 18m 15d	18m 16d through 19m 15d	19m 16d through 20m 15d	20m 16d through 21m 15d
PDI	Raw Scores			
121	—	—	—	63
120	59	—	—	—
119	—	60	61	—
118	—	—	—	—
117	58	—	—	62
116	—	—	—	—
115	—	59	—	—
114	—	—	60	—
113	57	—	—	61
112	—	58	—	—
111	—	—	—	—
110	—	—	59	—
109	—	—	—	—
108	—	—	—	60
107	56	57	—	—
106	—	—	58	—
105	—	—	—	—
104	—	—	—	59
103	—	—	—	—
102	—	56	57	—
101	—	—	—	—
100	55	—	—	58
99	—	—	—	—
98	—	—	—	—
97	—	—	56	—
96	—	55	—	57
95	—	—	—	—
94	54	—	—	—
93	—	—	—	—
92	—	—	—	56
91	—	—	55	—
90	—	54	—	—
89	—	—	—	—
88	53	—	—	—
87	—	—	—	55
86	—	—	—	—
85	—	53	54	—
84	52	—	—	—
83	—	—	—	—
82	—	—	—	—
81	51	—	—	—
80	—	52	53	54
79	—	—	—	—
78	50	—	—	—
77	—	—	—	—
76	—	51	—	—
75	49	—	52	53
74	—	—	—	—
73	—	50	—	—
72	48	—	—	—
71	—	—	51	—
70	—	49	—	52
69	—	—	—	—
68	47	—	50	—
67	—	—	—	—
66	—	48	—	51
65	46	—	—	—
64	—	—	49	—
63	—	—	—	—
62	45	47	—	50
61	—	—	—	—
60	44	—	48	—
59	—	46	—	—
58	—	—	—	49
57	43	—	—	—
56	—	45	47	—
55	42	—	—	—
54	—	—	—	48
53	—	44	46	—
52	41	—	—	—
51	—	—	—	—
50	40	43	45	47

MOTOR SCALE
Ages 22-25 mos.

Age Group ——> (months)	22	23	24	25
Age Range ——> (months and days)	21m 16d through 22m 15d	22m 16d through 23m 15d	23m 16d through 24m 15d	24m 16d through 25m 15d
PDI	Raw Scores			
150	72	73	74	75
149	—	—	—	—
148	—	—	—	—
147	—	—	—	—
146	71	—	73	—
145	—	72	—	74
144	—	—	—	—
143	—	—	—	—
142	70	—	—	—
141	—	71	72	73
140	—	—	—	—
139	—	—	—	—
138	69	—	—	—
137	—	70	—	—
136	—	—	71	72
135	—	—	—	—
134	68	—	—	—
133	—	—	—	—
132	—	69	—	—
131	—	—	70	71
130	67	—	—	—
129	—	—	—	—
128	—	68	—	—
127	—	—	—	—
126	66	—	69	70
125	—	—	—	—
124	—	67	—	—
123	—	—	—	—
122	65	—	68	—
121	—	—	—	69
120	—	66	—	—
119	64	—	—	—
118	—	—	67	—
117	—	65	—	68
116	63	—	—	—
115	—	—	—	—
114	—	64	66	—
113	—	—	—	67
112	62	—	—	—
111	—	63	65	—
110	—	—	—	—
109	—	—	—	66
108	61	—	64	—
107	—	62	—	—
106	—	—	—	65
105	—	—	63	—
104	60	61	—	—
103	—	—	—	64
102	—	—	62	—
101	59	—	—	—
100	—	60	—	63
99	—	—	61	—
98	—	—	—	—
97	58	59	—	62
96	—	—	60	—
95	—	—	—	—
94	—	58	—	—
93	57	—	59	61
92	—	—	—	—
91	—	—	—	—
90	—	57	58	60
89	56	—	—	—
88	—	—	—	—
87	—	—	57	59
86	—	56	—	—
85	—	—	—	58
84	55	—	—	—
83	—	—	—	—
82	—	—	56	57

MOTOR SCALE Ages 22-25 mos.

Age Group ——> (months)	22	23	24	25
Age Range ——> (months and days)	21m 16d through 22m 15d	22m 16d through 23m 15d	23m 16d through 24m 15d	24m 16d through 25m 15d
PDI	Raw Scores			
81	—	—	—	—
80	—	55	—	—
79	—	—	—	—
78	—	—	—	56
77	54	—	55	—
76	—	—	—	—
75	—	—	—	—
74	—	54	—	—
73	—	—	—	55
72	53	—	—	—
71	—	—	54	—
70	—	—	—	—
69	—	53	—	—
68	—	—	—	54
67	52	—	—	—
66	—	—	53	—
65	—	—	—	—
64	—	52	—	53
63	51	—	—	—
62	—	—	—	—
61	—	—	52	—
60	50	51	—	52
59	—	—	—	—
58	—	—	—	—
57	—	50	51	—
56	49	—	—	51
55	—	—	—	—
54	—	—	50	—
53	48	49	—	50
52	—	—	—	—
51	—	—	—	—
50	47	48	49	49

MOTOR SCALI Ages 26-30 mos

Age Group ——> (months)	26	27	28	29	30
Age Range ——> (months and days)	25m 16d through 26m 15d	26m 16d through 27m 15d	27m 16d through 28m 15d	28m 16d through 29m 15d	29m 16d through 30m 15d
PDI	Raw Scores				
150	77	79	80	81	81
149	—	—	—	—	—
148	—	—	—	—	—
147	—	78	79	80	—
146	76	—	—	—	—
145	—	—	—	—	80
144	—	77	—	79	—
143	75	—	78	—	—
142	—	—	—	—	—
141	—	—	—	—	—
140	74	76	—	—	79
139	—	—	77	78	—
138	—	—	—	—	—
137	—	75	—	—	—
136	73	—	—	—	—
135	—	—	76	—	78
134	—	74	—	77	—
133	—	—	—	—	—
132	—	—	75	—	—
131	72	—	—	—	—
130	—	73	—	—	—
129	—	—	74	76	77
128	—	—	—	—	—
127	—	—	—	—	—
126	71	72	—	75	—
125	—	—	73	—	—
124	—	—	—	—	—
123	—	—	—	74	76
122	—	—	—	—	—

MOTOR SCAI
Ages 26-30 mo

Age Group ——> (months)	26	27	28	29	30
Age Range ——> (months and days)	25m 16d through 26m 15d	26m 16d through 27m 15d	27m 16d through 28m 15d	28m 16d through 29m 15d	29m 16d through 30m 15d
PDI	Raw Scores				
121	70	71	—	—	—
120	—	—	72	—	75
119	—	—	—	73	—
118	—	—	—	—	—
117	—	—	—	—	74
116	69	70	71	—	—
115	—	—	—	—	—
114	—	—	—	72	—
113	—	—	—	—	73
112	68	—	—	—	—
111	—	—	70	—	—
110	—	69	—	71	—
109	—	—	—	—	—
108	67	—	—	—	72
107	—	—	—	—	—
106	—	68	69	70	—
105	—	—	—	—	—
104	66	—	—	—	71
103	—	—	—	—	—
102	—	67	68	69	—
101	65	—	—	—	—
100	—	—	—	—	70
99	—	66	67	—	—
98	64	—	—	68	—
97	—	—	—	—	69
96	—	—	66	—	—
95	63	65	—	67	—
94	—	—	—	—	68
93	—	—	—	—	—
92	—	64	65	66	—
91	62	—	—	—	67
90	—	—	—	—	—
89	—	63	64	65	—
88	—	—	—	—	66
87	61	—	—	—	—
86	—	—	63	64	—
85	—	62	—	—	65
84	60	—	—	—	—
83	—	—	62	63	—
82	—	—	—	—	64
81	59	61	—	62	—
80	—	—	61	—	—
79	58	—	—	—	—
78	—	60	—	61	62
77	57	—	60	—	—
76	—	—	—	60	61
75	—	59	—	—	—
74	56	—	59	—	60
73	—	58	—	59	—
72	—	—	58	—	59
71	—	57	—	58	—
70	55	—	57	—	58
69	—	56	—	57	—
68	—	—	56	—	57
67	—	—	—	56	—
66	—	55	—	—	56
65	54	—	55	—	—
64	—	—	—	55	—
63	—	—	—	—	55
62	53	54	—	—	—
61	—	—	54	54	—
60	—	—	—	—	54
59	—	53	—	—	—
58	52	—	53	53	—
57	—	—	—	—	53
56	—	52	—	—	—
55	51	—	52	52	—
54	—	—	—	—	52
53	—	51	—	—	—
52	50	—	51	—	—
51	—	—	—	51	—
50	49	50	50	50	51

DEVELOPMENTAL ASSESSMENT OF CHILDREN

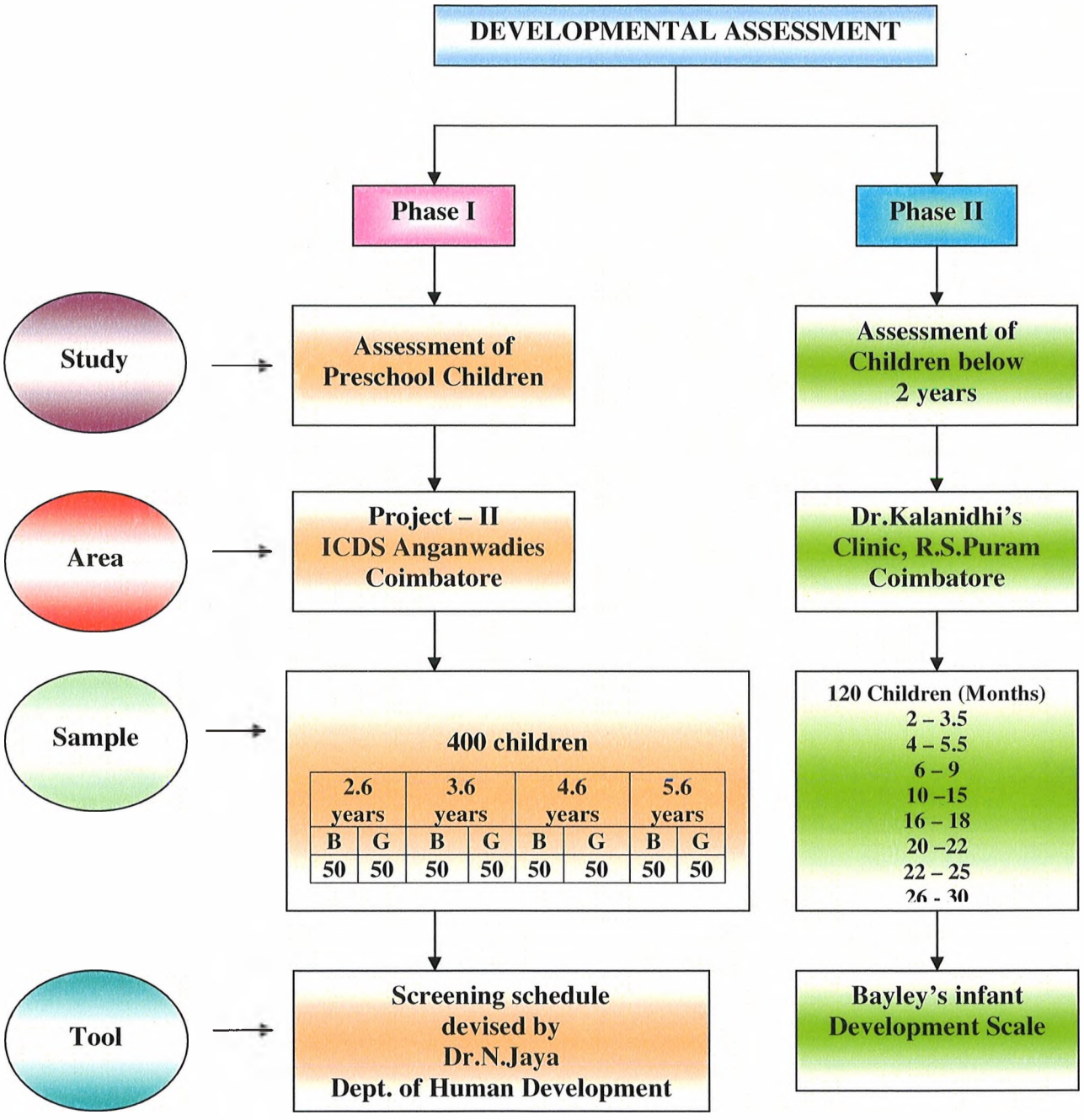


Figure - 1

READING SKILLS OF ANGANWADI CHILDREN

Identifies alphabet				
Boys	16%	26%	42%	66%
Girls	18%	34%	58%	74%

Recognizes name in print				
Boys	-	-	16%	24%
Girls	-	-	18%	32%

Skills Developed

Try to read along with others				
Boys	14%	18%	24%	42%
Girls	10%	26%	32%	48%

Reads stories				
Boys	-	26%	56%	66%
Girls	-	34%	62%	72%

Learns new words				
Boys	-	-	22%	36%
Girls	-	-	26%	32%

Talks about people and things in the story				
Boys	8%	40%	62%	80%
Girls	14%	52%	64%	76%

- 2.6 Years
- 3.6 Years
- 4.6 Years
- 5.6 Years

Figure 6

KITS USED FOR ASSESSING CHILDREN

Developmental screening of preschool children

Bayleys infant development scale

Plate 1

ANTHROPOMETRIC MEASUREMENTS OF ANGANWADI CHILDREN

HEIGHT

WEIGHT

CHEST CIRCUMFERENCE

HEAD CIRCUMFERENCE

Plate 2

MENTAL AND MOTOR ABILITIES OF INFANTS

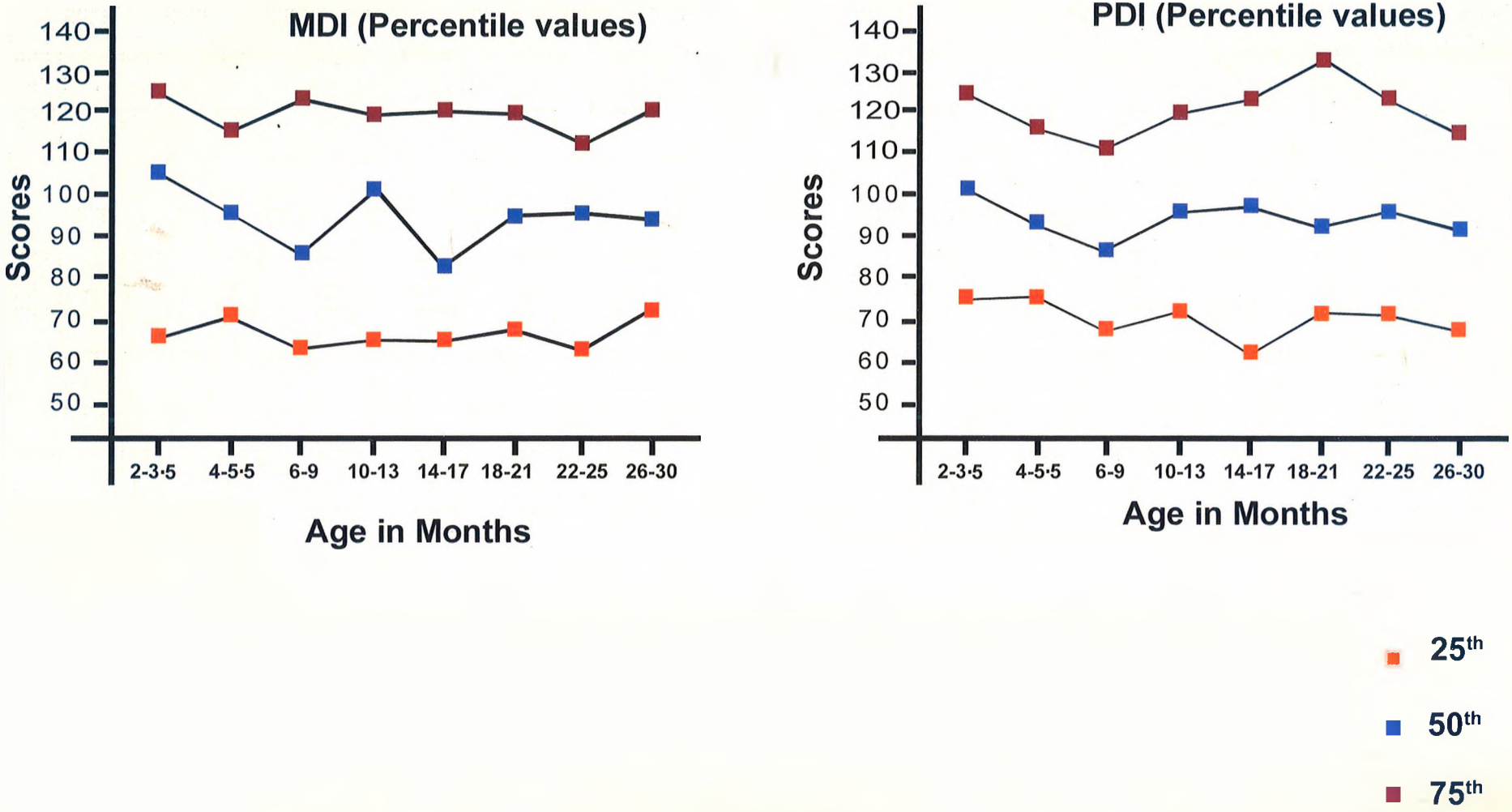


Figure 8

CONCEPT DEVELOPMENT IN ANGANWADI CHILDREN

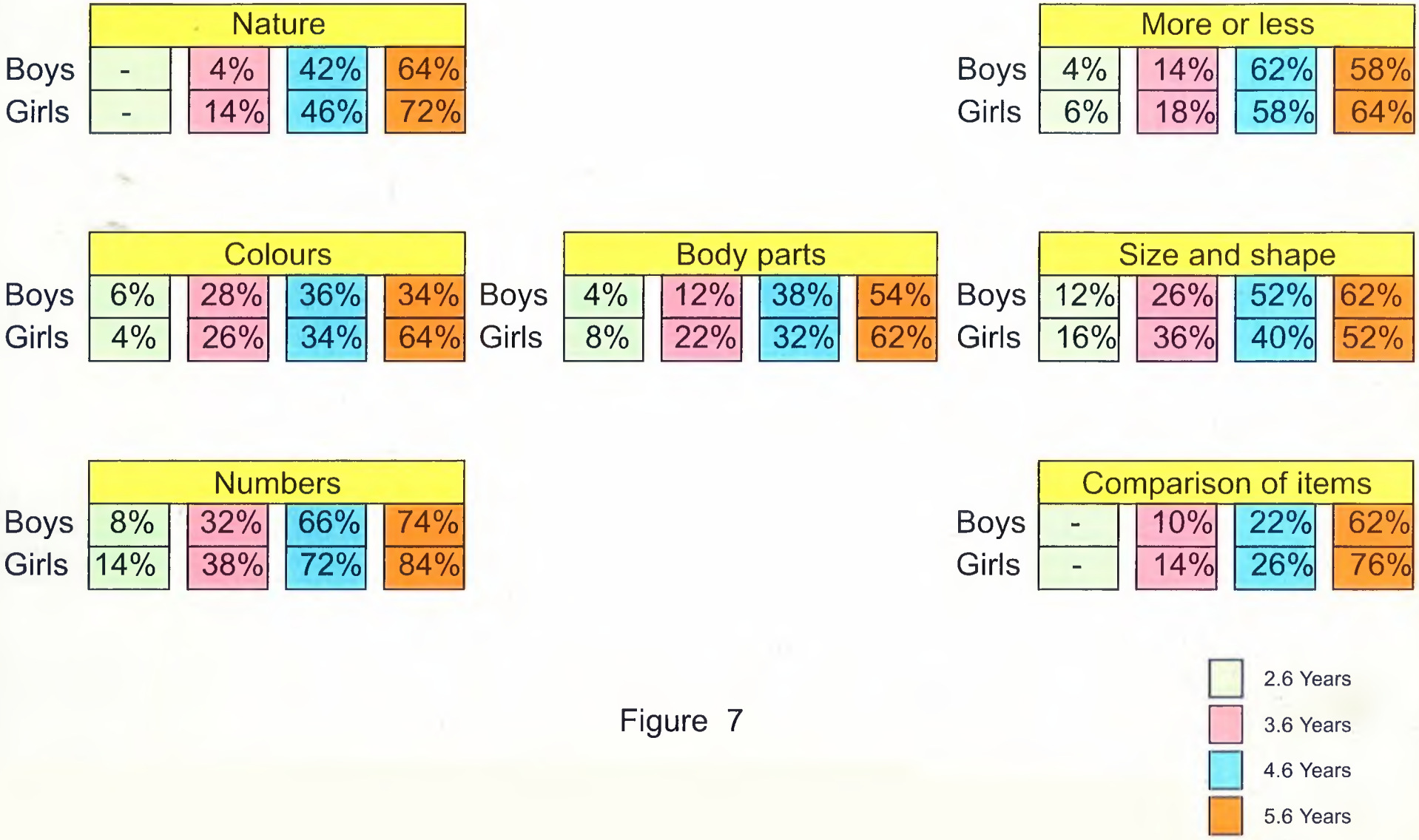


Figure 7

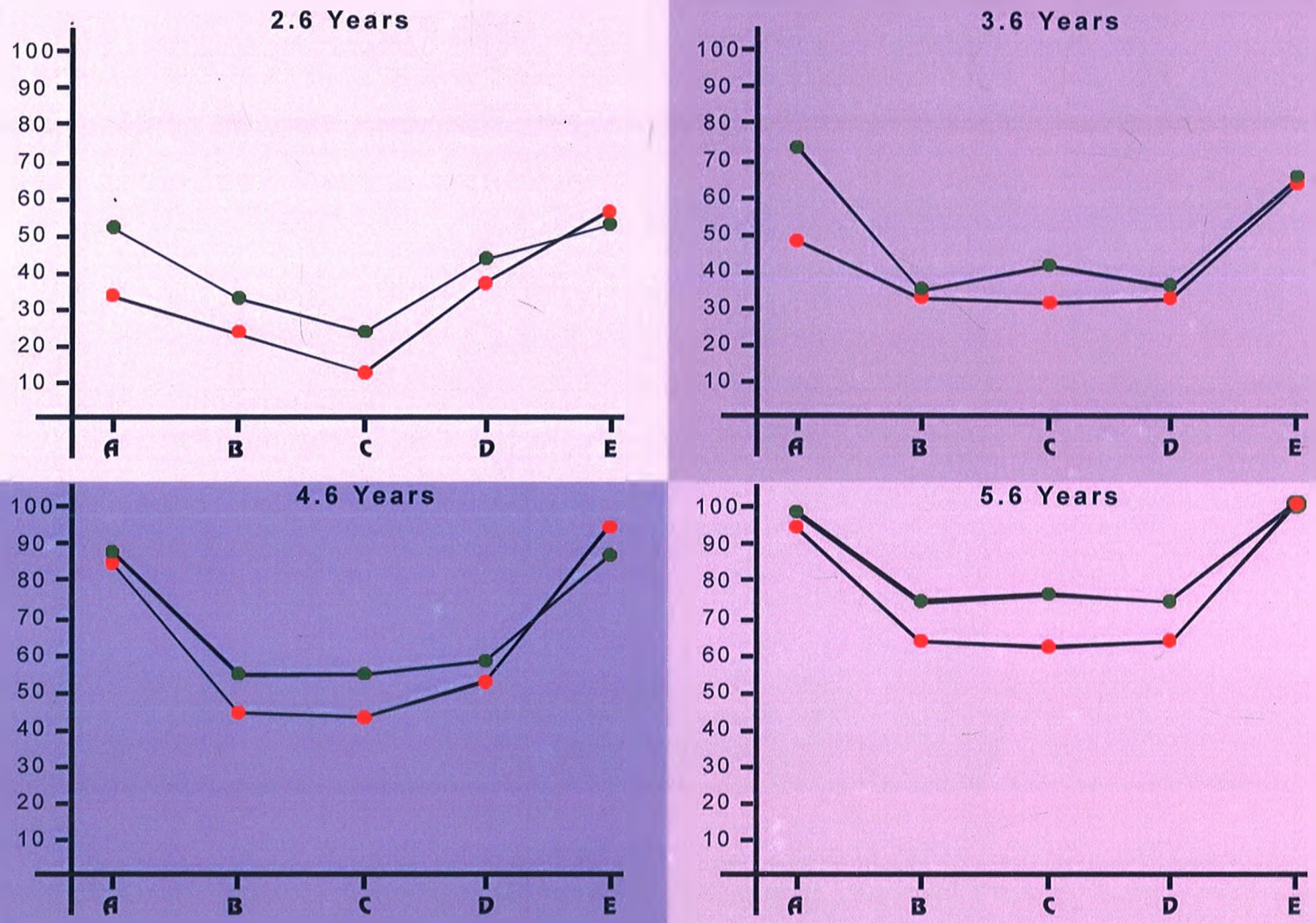
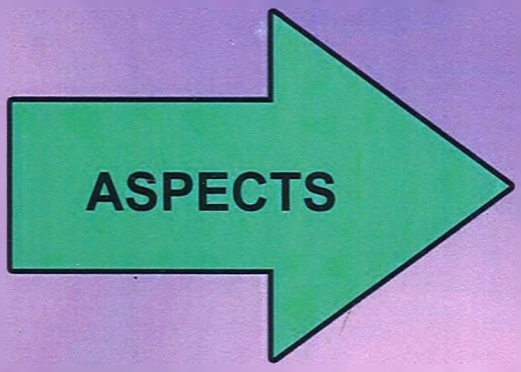

2.6 Years
3.6 Years
4.6 Years
5.6 Years
100
90
80
70
60
50
40
30
20
10
A
B
C
D
E
Boys
Girls
A : Talk
B : Use descriptive language
C : Recite nursery rhymes
D : Expresses spontaneously
E : Have clarity in speech

Figure 5

SOCIAL AND EMOTIONAL DEVELOPMENT OF ANGANWADI CHILDREN



Has Friends

Boys	64%	86%	84%	94%
Girls	72%	76%	84%	92%

Respects others

Boys	38%	48%	78%	76%
Girls	44%	54%	66%	82%

Likes to play in group

Boys	84%	76%	94%	100%
Girls	76%	72%	82%	100%

Imitate adult behaviour

Boys	66%	78%	58%	94%
Girls	56%	48%	72%	94%

Interact with adults

Boys	42%	76%	82%	92%
Girls	54%	64%	94%	98%

Relax and have fun

Boys	64%	72%	74%	66%
Girls	74%	54%	68%	74%

Helps others

Boys	42%	68%	54%	74%
Girls	64%	74%	70%	78%

Solves problem using words

Boys	34%	66%	92%	90%
Girls	42%	58%	84%	96%

Manifest spontaneous reactions

Boys	64%	72%	74%	94%
Girls	74%	58%	86%	82%

Express positive feelings

Boys	58%	54%	52%	70%
Girls	62%	46%	78%	74%

2.6 Years

3.6 Years

4.6 Years

5.6 Years

Figure 4

GROSS MOTOR SKILLS OF SELECTED CHILDREN

Enjoys outdoor play

Years	2.6	3.6	4.6	5.6
Boys	42%	86%	86%	94%
Girls	36%	76%	78%	84%

Climbs on stairs

Years	2.6	3.6	4.6	5.6
Boys	36%	34%	82%	86%
Girls	22%	54%	74%	76%

Throws and bounces ball

Years	2.6	3.6	4.6	5.6
Boys	54%	56%	94%	96%
Girls	32%	48%	78%	80%

Lifts objects

Years	2.6	3.6	4.6	5.6
Boys	26%	36%	72%	80%
Girls	30%	74%	94%	88%

Rides tricycle

Years	2.6	3.6	4.6	5.6
Boys	64%	20%	92%	92%
Girls	42%	56%	66%	92%

Moves body actively

Years	2.6	3.6	4.6	5.6
Boys	82%	80%	98%	88%
Girls	66%	76%	86%	82%

Figure 3

FINER MOTOR SKILLS OF ANGANWADI CHILDREN

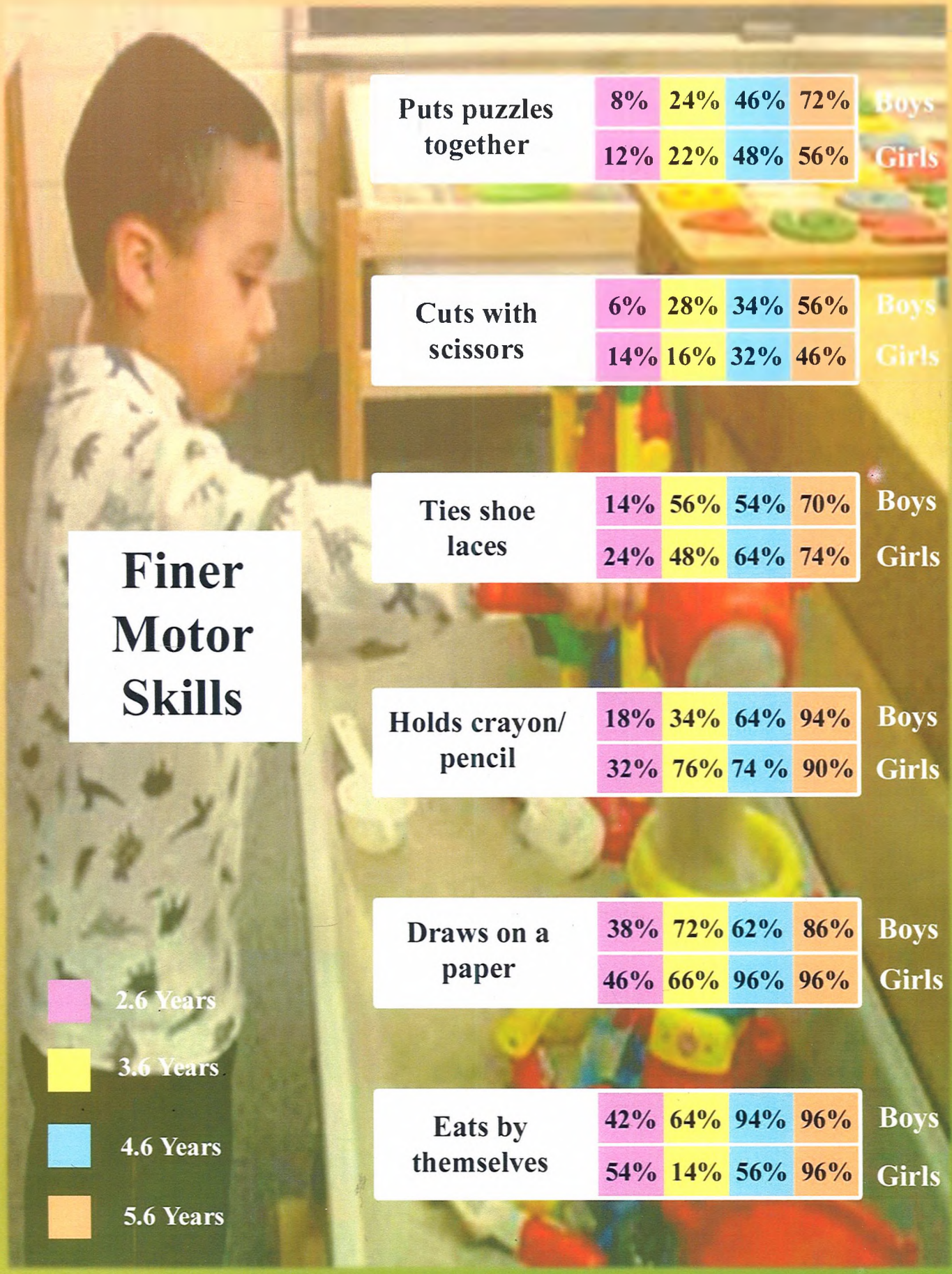


Figure 2