A COMPARATIVE STUDY OF THE SPEECH AND LANGUAGE DEVELOPMENT IN NORMAL CHILDREN AND CHILDREN WITH LEARNING DISABILITY

A Thesis
Submitted for the award of Degree of Philosophy in Speech & Hearing
Of the University of Mysore, Mysore.

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2003

CERTIFICATE

This is to certify that the thesis entitled "A comparative study of the Speech and Language skills in normal children and children with Learning Disability."Submitted by Ms Swapna Sebastian for the Degree of Ph.D in the University of Mysore, Mysore is the work done by her at the All India Institute of Speech & Hearing, Mysore, under my guidance.

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CERTIFICATE

This is to certify that the thesis entitled "A comparative study of the Speech and Language skills in normal children and children with Learning Disability."Submitted by Ms Swapna Sebastian for the Degree of Ph.D in the University of Mysore, Mysore was carried at the All India Institute of Speech & Hearing, Mysore.

Dr Jayaram
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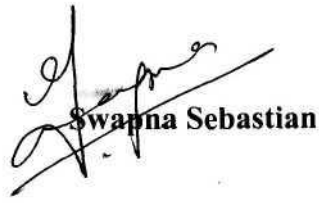
Declaration

I declare that this thesis entitled "A comparative study of the Speech and Language skills in normal children and children with Learning Disability."submitted herewith for the award of the Degree of Ph.D in the University of Mysore,Mysore ,is the work done by me at the All India Institute of Speech & Hearing ,Mysore,under the guidance of Dr Shyamala K.C,HOD,Department of Speech Pathology, All India Institute of Speech & Hearing ,Mysore.

I further declare that the results of this work have not been submitted for any other Degree.



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*To God Almighty.

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Introduction

Young children normally interact with families and friends, and gradually develop a complex linguistic system of their own.They are hence equipped with innovative, rule governed language by the time they enter school. This oral language skill initially leads the way to written language. The relationship between spoken and written language is essentially reciprocal and dynamic in nature young children use their oral language skills to learn to read, while older children use their reading ability to further their language learning.

There is no doubt that reading and writing skills are highly valued and important in today's scientific technological society. The child who does not meet the expectations for academic performance in school but has intelligence in the normal range has been a subject of research for many years. Apart from the many social, economic or medical reasons that prevent a child from being educated, a potent obstacle to normal academic performance is Learning Disability.

"A learing disability is a discorderd in one or more of the basic phychological processes involvled in understanding or using spoken or written longuage.Alearingdisabilitymaybemanifestedindisorderofthinking. listening, talking, reading, writing, spelling or arithmetic. It includes conditions, which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and development aphasia. It does not include learing problem which are due primarily to visual, hearing or motor handicaps. mental retaration, emotional disturbances, or envirnmental disadvantage. " Public Law 94-142 by the U.S. Office of Education (1979). In 1981 a more realistic definition was proposed by the National Joint Committee for Learning Disabilities (Hammill , Leigh, , McNutt. , & Larsen, 1981) "Learing disabilities is a generic

term that refers to a heterogeneous group of disorder manifested by significant difficulties in the acquisition and use of listening speaking reading writid.

reasaning or mathematical abilities. These discorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur nervous system dysfunction. Even thoud a

(e.g sensory impairment, mental retardation. social and emotional disturbance) or enveonmentsl influences (e.g cultural difference.insuffifient or inappropriate instruction. psychogenic factors), it is not the result of those conditions or

influence."

The cause of learning disability has been debated over years. Earlier it was thought to be a deficit in visual memory. Subsequently, the scientists focused on structural/ functional brain damage and cerebral dominance. But in recent years the emphasis has moved towards a linguistic and cognitive basis. "While approximately 80% of children develop phonological awareness (use of phonological information i.e., the sounds of one's language in processing written and oral language) without much difficulty, the remaining 20% are confused by the system" (Lyon, 1995). Many researchers have suggested that problems in establishing complete phonological representations in long-term memory may be an underlying cause of developmental reading difficulties (Katz 1986; de Gelder and Vroomen l991).

A growing body of empirical evidence now supports observations that young children ,with overt as well as subtle speech and language problems, are at risk for learning disabilities at a later stage. Various studies carried out have shown a co-existence of problems in both verbal as well as reading and written language. It is essential for a speech language pathologist to know the relationship between

the two, so that early identification and remediation can be carried out.

Despite the growing body of literature on L.D. there have been relatively few studies carried out in the Indian context. The aim of this study is to find out the language characteristics in the learning disabled children whose mother tongue is Malayalam. It will entail an investigation of the relation ship between speech and language skills, and the various problems in reading and writing as seen in learning disabled children .It may also serve as a guideline for early intervention, since intervention prior to entering school could prevent many of the frustrations and emotional disturbances that the child would eventually experience in a school setting.

Review of literature at a glance:

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2. Definition
3. Prevalence
4. Etiology
   a. Heredity
   b. Brain differences
   c. Selective attention and attention deficit disorder
   d. Middle ear problems
   e. Cognitive rigidity and learned helplessness
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HISTORICAL PERSPECTIVE

Historically four separate strands of thought have emerged about children's learning problems in the fields of special education, neurology, pediatrics and psychoanalysis. Each discipline has its own language for describing these children. The labels assign responsibility to a child's brain, personality, parents, school or society. The first strand is the field of Special education, which evolved from Jean Itard's work in the early 1800's with the "Wild boy of Aveyron". The second is based upon the concept of dyslexia as derived from the neurological study of adult stroke victims later in the 19th century. The third arose from the linkage of hyperkinetic children with Kurt Goldstein's description of brain-injured soldiers in World War I and of victims of the encephalitis epidemic of 1918. The fourth was the application of psychoanalysis to education during the second and third decades ofthe 19th century. (Westman 1990)

Weiderholt (1974) divided the history of learning disabilities into three distinct periods.

The foundation phase (1800-1930)

The transition phase (1930-1960)

The integration phase (1960-1980)

The foundation phase is marked by basic scientific investigations of brain function and dysfunction. Many clinical studies of speech and language disorders were reported; among the best known are those of Broca, Wemicke etc. The major goals of their work was to document the specific loss of various speech and language function in adults who had previously shown these abilities and the type of brain damage associated with different kinds of functional disturbances.Their

work established the fact that very specific types of mental impairment can occur as a result of damage to isolated regions of brain, which was of paramount relevance to the study of Learning Disability.

In 1676, Schmidt described the loss of reading ability, which Kussmaul termed alexia, or word blindness, in 1877. Berlin (1887) suggested the term dyslexia for the partial loss of reading ability and Morgan (1895) described congenital word blindness in a 14-year old boy, who was among the brightest in his school and had exceptional talents in mathematics. To account for his reading difficulty, Morgan further suggested that there was under-development of the angular gyrus of the parietal lobe. Thus the notion of variation in the maturation of areas of the brain sub-serving reading thus was conceived.

In 1902 Still, an English pediatrician, described children with "defects of moral control" characterized by temper tantrums, disobedience and impulsivity. Many of these children were believed to be brain damaged as a result of tumors, infectious diseases, or head injuries (Still 1902). Tredgold (1908) proposed that hyperkinetic children might have suffered mild brain injuries at birth.

In 1917, Hinshelwood, a Scottish ophthalmologist published a report on visual perceptual problems which he termed as "word blindness", and defined as an inability to interpret printed language despite normal vision. His study was considered to be the first systematic clinical study of specific reading disability.

In the later years scientific studies of the brain were applied to the clinical study of children and translated into ways of teaching. This phase (about 1930-1960) represents the transition phase. The professionals developed assessment and treatment methods for these children and studied specific types of learning disorders found in children.

Among the several professionals who played important roles in developing the field, Orton (1937) was a pioneer whose theory of the lack of cerebral dominance as a cause of children's language disorders led to the development of a teaching method known as Gillingham method. At a mental hygiene clinic in lowa City, Iowa, Orton saw many children who appeared to be bright but had difficulty with reading, writing, spelling and speech; Many of these children also showed confusions in time, space and directional orientation. They really were not word blind. They could see and copy words but were unable to understand their meanings. Orton thought that the fundamental problem lay in translating between heard and written words and proposed the term strephosymbolia (twisted symbols) to replace congenital word blindness.

Orton's approach to reading was as a stage of language development, proceeded by spoken language and later. expressed in writing which involved spelling. He looked upon language as a hierarchy of complex integrations in the nervous system, culminating in unilateral control by one of the two brain hemispheres. He worked during an era in which many left-handed children were being trained to be right-handed. He proposed that the cause of strephosymbolia was a failure in the development of a clearly dominant cerebral hemisphere with resulting indistinct image formation. He preferred the term developmental to congenital in order to take into account the interaction of heredity and environment in producing this state (Orton 1937). Grace Femald (1943), an educator also contributed to this period of growth. She developed a remedial approach to teaching, reading and spelling.

As a results of his work with brain injured soldiers in Europe during World War I. Kurt Goldstein was able to describe the severely brain-damaged adult as

stimulus bound, perseverative, unable to deal with abstractions, incapable of differentiating between figure and ground, and prone to catastrophic emotional reactions. The application of these findings to children led to various inferences such as extreme temper tantrums were attributable to catastrophic reactions (Goldstein, 1954; Ross, 1977).

In the United States, brain damage became an explanation of behavioral and educational problems in children following the epidemic of Von Economo's encephalitis in 1918. In its wake was a group of post-encephalitic children who manifested restlessness, insomnia, irritability, distractibility and emotional lability. Although these behavioral disturbances diminished with the passage of time, many of the children never completely recovered. Hohman (1922) and Ebaugh (1923) described these post-encephalitic children as antisocial, irritable, impulsive and hyper-kinetic. Kahn and Cohen (1934) used the term organic driven ness to describe this behavior pattern, also found in children with no known brain damage and presumed that hyperkinesis resulted from inadequate cortical inhibition of sub cortical responses.

Two of Goldstein's students, Strauss and Werner (1940), found figure ground problems, difficulties in abstracting, stimulus-bound behavior and perseveration among mentally retarded children and inferred underlying brain damage. Werner and Strauss(1940) conducted the research and clinical activity that led most directly to the initial establishment of a formally organized field of learning disabilities.

Later Strauss and Lehtinen (1947) in their influential book "Psychopathology and Education of the Brain Injured Child" defined a brain injured child as one who, before, during, or after birth, had received an injury to or

suffered an infection of the brain with resulting disturbances in perception that impeded learning. They emphasized (he cardinal features of brain injury: hyperkinesis, impulsivity, distractibility, emotional lability, and perseveration. Perceptual disturbances and neurological abnormalities also were described. This clinical picture was widely constructed as a prima facie indication of brain injury (Strauss and Lehtinen 1947).

Questions about the term "brain injured" arose soon after the publication of Strauss and Lehtinen's book in 1947.There was criticisms which pointed out that the term was confusing and that not all children with brain injuries have learning disorders. In response to such criticism several other terms were suggested for describing these children.

The "Strauss Syndrome" was one such term recommended by Stevens and Bitch (1957) characterized by severe behavioral problems like hyperactivity, distractibility, faulty perceptions poor organization of behavior etc.

Minimal brain dysfunction was another term recommended by Clements in 1966 to describe the child with near-average intelligence and with certain learning and behavioral disorders associated with deviations or dysfunction's of the central nervous system.This was a disorder designated at one end of a scale, at the opposite end of which are children with obvious brain damage such as cerebral palsy or epilepsy.

Although many different terms were recommended, none of them received general acceptance. Therefore a term that accurately and meaningfully described the behavioral symptoms was needed.

The term "learning disability" was proposed first by Kirk in 1963 at a meeting of concerned parent and professional (Kirk, 1963). It was described as an

umbrella concept, encompassing many diverse types of learning disabilities without identifying the specific area of the student's learning deficiencies. Its advantages were enumerated that it avoids the medical complications, focuses on the educational problems and seems to be acceptable to parents, teachers and students. The term "learning disability" was accepted immediately and continues to be used and appears to be a satisfactory term for the present.

During the integration period (about 1960- 1980) learning disabilities became an established discipline within the schools in the Unitede States of America. Assessment techniques, teaching strategies, a variety of theories and the enactment of legislation designed to protect the right of handicapped children and youth were developed.

Another landmark during this period was the development of learning disabilities organizations like the Counsel for Learning Disabilities (CLD) and the Association for children and Adults with Learning Disabilities (ACALD) in 1963. These organizations were effective in bringing together the parents, teachers and other professionals who deal with these children to develop school programs.

For the first time, the field of learning disabilities was acknowledged in federal law when Congress passed the children with specific Learning Disabilities Act of 1969 (PL 91-230, 1969).ln 1975; the learning disability field achieved a firm basis in law with the passage of PL. 94-142 in the United states of America. Under this landmark legislation all handicapped children and youth aged 3-21 have the right to a free and appropriate public education.

To update the literature, a fourth period namely the contemporary phase (1980 to the present) is also described. This period has seen many changes in direction, and development of new concepts and ideas. Earlier, the trend was to

remove learning-disabled students from regular class, and place them in special education classes, but now the trend is reversed and they are brought back to regular classroom for integration. Regular teachers and special educators are beginning to share the responsibility of teaching learning disabled children (Green, 1988. Reynold, Wang and Walberg, 1987).

On consideration, the history of development of the concept of Learning Disability - although in four distinct phases- is relatively short, and yet extremely complex.

DEFINITION:

The definition of learning disabilities has been debated endlessly over the years with no apparent resolution. The question of who is learning disabled is, obviously, one of the most critical questions for the field especially for those involved in research and clinical practice

As a reflection of its ambiguous nature, the definition of learning disabilities has been continually revised over the years.

The term learning disability became popular when the Association for Children with Learning Disabilities was organized in 1963. Samuel Kirk appropriately suggested the term as preferable to causatively oriented labels, such as cerebral dysfunction and brain injury (Kirk & Kirk, 1983). A number of efforts to define learning disabilities have evolved since that time patterned after one that was formulated in 1969 by the Division for Children with Learning Disabilities of the Council for Exceptional Children (Haring & Bateman 1969):"A child with learing disability is one with adeqate mental ability. sensory processes and

emotional stability who has specific deficits in perceptual. intergrative or expressive

More recent definitions of learning disabilities have been influenced by the regulations for implementing Public Law 94-142 by the U.S. Office of Education (1979):"A learning disabilty is disorder in one or more of the basic psychological processes involved in understanding or using spoken or wrirren language. A leaning disability may be manifested in disorder of thinking. listening. talkong, reasing, writing, spelling or arithmetic. It includes conditions. which have been referred to as perceptual handicaps. brain injury. minimal brain dysfunction. dyslexia, and developmental aphasia. it does not handicaps. mental problems which are due primarily to visual. hearing or motor handicaps. mental retardation, emotional disyurbances. or enveronmental disadvantage."

There has been a tendency both to include (Cruikshank,l979) and exclude (Kronick 1981) the mentally retarded from the ranks of the learning disabled. This has been a particularly troublesome point because 85 % of the mentally retarded are mildly disabled, and when their clinical states are carefully examined, many disclose histories of having been within learning disability in the past (Bernstein & Menolascino 1970).

Definitions of learning disability thus imply the presence of central nervous system dysfunction that is responsible for suboptimal academic learning (Kirk & Kirk, 1983). Most important, the resulting handicap is in learning specific academic subjects rather than in a child's general ability to learn. This distinction is essential because a specific problem in learning an academic subject need not imply impaired learning of non-academic tasks. Moreover, the definitions do not require positive evidence of cerebral disorder; rather they are deduced from the exclusion of known causes of learning problems, such as emotional disturbance,

environmental disadvantage, sensory deficits, or classical neurological disorders (Schain. 1977). A learning disability, then. has been construed to be a significant discrepancy between expected intellectual ability and actual academic performance without a social, educational, or emotional cause (Ohlson, 1978; Rudel, 1980).

Until recently the definitions of learning disabilities have narrowed the focus from the general population of children with learning problems to a presumed subgroup. In 1981 a more realistic definition was proposed by the National Joint Committee for Learning Disabilities(NJCLD) (Hammill. Leigh, . McNutt . & Larsen. 1981):'Learing disabilities is a generic term that refers to a heterogeneous and use of listening, speaking, reading, writing, reasoning, or ocquisiton and use of lisening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual and disadbility to the due to central nervous system dysfunction. Even though a learing disability may occur concomitantly eith other handicapping conditions (e.g sensory impairment. mental retarding factors), it is not the direct of those conditions or enveronmental influences (e.g cultural differences. insuffucuent or inappropriate instruuctions, psychogenic factors). it is not the direct results of the those conditions or influences."

The NJCLD modified its definition which reads as "Learning disabilities are a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing reasoning or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviour, social perception. and social interaction may exist with learning disorders but donot by themselves

constitute a learning disability. Although learning disabilities may occur concomitant]y with other handicapping conditions. (eg.sensory impairment, mental retardation, serious emotional disturbances) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instructions) they are not the result of those conditions or influence" (NJCLD, 1994).

When the various definitions of learning disabilities are considered, they have several common elements, which are

Neurological dysfunction

Uneven growth pattern

[Difficulty in academic and learning tasks

Discrepancy between achievement and potential

Deduced by the exclusion of other causes.

Each of the terms in Table 1. offers an explanation of a child's teaming difficulty and the illusion of scientific understanding.

QUALIFIER	AREA OF INVOLVMENT	PROBLEM
SECONDARY	NERVOUS	DEFICIT
MINIMAL	BRAIN	DYSFUNCTION
MILD	CEREBRAL	DAMAGE
MINOR	NEUROLOGICAL	DISORDER
CHRONIC	NEUROLOGIC	DESYNCHRONIZATION
DIFFUSE	CNS	HANDICAP
SPECIFIC	LANGUAGE	DISABILITY
PRIMARY	READING	RETARDATION
DEVELOPMENTAL	PERCEPTUAL	DEFICIENCY

DISORGANIZED		IMPULSIVE	IMPAIRMENT
ORGANIC		VISUAL - MOTOR	PATHOLOGY
CLUMSY		BEHAVIOR	SYNDROME
FUNCTIONAL		PSYCHONEUROLOGIC	COMPLEX

Table 1. Do-it-yourself terminology generator. Select any word from first column, add any word from second column, and then add any word from third column. If you don't like the result, try again. it will mean about the same thing. (Based on E. Fry. "Do-lt-Yourself Terminology Generator", Journal of Reading, 11, 1968, 428)

For practical purpose like diagnosis and classification, a stipulated definition needs to be operationalized.The operational definition issued by the U.S Office of Education (USOE.1976) is as follows:

"A specific learning disability may be found if a child has a severe discrepancy between achievement and intellectual ability in one or more of several areas, oral expression, written expression, listening comprehension or reading comprehension, basic reading skills, mathematics calculation, mathematics reasoning or spelling. A "severe discrepancy" is defincd to exist when achievement in one or more of the areas falls at or below 50% of the child's expected achievement level, when age and previous educational experiences are taken into consideration".

The operational definition suffered a fundamental flaw in that it did not bear much resemblance to what was stipulated in the formal definition.Kavale and Forness (1995), Semmel (1986), Adelman (1989) provided an example of what an operational interpretation of LD should be.

1. It must result in an ordered, sequenced decision-making process.

2. It must produce improved educational outcomes.

3. It must give attention to such dimensions as problem severity, pervasiveness and chronicity.

Although attempts have been made to operationalize the LD definition (Shaw, Cullen, Mc Guire & Brinckerhoff, 1995.). these efforts are limited by the fact that if elements from an existing stipulative definition may be right or wrong, any operational definition based on it may also be right or wrong.

PREVALENCE

The number of children and youth identified as learning disabled vary depending on the definition and identification procedures selected.

In one early study of 2,800 third and fourth grade pupils, the researchers found that 7-8 percentages had learning disability (Myklebust & Boshes, 1969).

Meier (1971) found that 15% out of 3,000 2nd grade children had LD. An estimate of approximately 30 % hyperactive children was found to be learning disabled according to Safer and Allen (1976).

In a legislative report regarding PL 94-142 (U.S. Department of Education 1991) it was stated that approximately 5 % of the population (aged 6-17) were receiving learning disability services.

Lemer, (1993) noted that the estimates of the population of LD range from 1 percent to 30 percent depending on the criteria used to determine the label. In a recent study Lyon (1996) noted that approximately 5 percent of all public school students are identified as having LD.According to Shaywitz (1998) 8-10 % of the population is affected by dyslexia.

Failure to define terms precisely had led to confusion over prevalence rates. The identification of learning disabilities has increased dramatically in the past 20 years.

In the Indian context, Suresh and Swapna (1997) conducted an epidemiological survey of developmental language disorders and learning disability among school children in Kerala. The results revealed that 20% of schoolchildren were found to be learning disabled. According to Swathi and Shyamala (1994) and Rama (1992) maximum number of learning disabled children identified in India were within 6-12 years of age.

Information is available on sex difference also. Boys are diagnosed as being Teaming disabled four to eight times as often as girls (Marsh, Gearhart and Gearhart, 1978). Studies done in India by Swalhi and Shyamala (1994) found the male: female ratio to be 4:3.

ETIOLOGY

The causes of specific reading disabilities have received considerable research and debate.

4. Heredity

Pennington (1989) stated that dyslexia is familial substantially heritable, and heterogeneous in its genetic mechanisms. At least some forms of familial dyslexia appear to be autosomal dominant, with linkage studies supporting both a major locus on chromosome 15 and genetic heterogeneity.

Preliminary results of a 10-year study of 14 families with a three-generation history of relatively pure dyslexia have been reported by Lubs ,Duara, Levin, Jallad, Lubs, Rabin, Kushch, & Gross Glenn. (1991). They recognized an

interaction between a gene(s) for "dyslexia, sex hormones, and possibly even concomitantly caused immunologic responses in the development of brains in dyslexia". Findings from two linkage studies suggest that dyslexia may be associated with chromosomes 15 and 6. They observed that: "these variant genes must have been present 10,000 years ago, long before reading and writing began".

B.Brain differences

Galaburda (1987) found that the right hemisphere in brains of dyslexics have "too many brain cells, suggesting that something has interfered with normal pruning process".

Galaburda (1991) reported that the left hemisphere planum temporal was larger in the brains of reading disabled persons, suggesting a generalized problem with necessary developmental pruning of some neuronal substrates. According to Galaburda, an optimal match is needed between the number of neurons and their connections in a neural net so that a particular behavior can be achieved. Too many or too few neuron match-ups can be deleterious Tor the developing skill. Galaburda (1991) hypothesized "that the neurons in question arc not only misplaced, but the affected cortex is different in terms of its cellular and connectional architecture, hence its functional architecture as well".

Cotman and Lynch (1988) discussed the malfunction that results when damage occurs in various brain circuitries. They cited research that shows cortical alterations in brains of dyslexic individuals as a result of "focal injury to the developing brain during late gestation or soon thereafter". These researchers suggested that injurious events during early neural development "lead to the anomalous organization of regional circuitries in portions of the brain involved in language function in developmental dyslexia".

Cotman and Lynch (1988) explained that damage to the developing nervous system cannot be treated by simply removing portions of specific circuits.The brain is equipped with the ability to repair itself especially when it has incurred minor injury. If damage occurs to critical elements during the development of a memory circuit. residual circuitry begins to reorganize with healthy neurons sprouting and replacing connections lost through a process of "axon sprouting or reactive synaptogenesis".They proposed that in minor injury, the axon sprouting is "probably compensatory", helping to maintain the system. Loss would reduce the redundancy of the system, but the newly formed circuits "would be expected to be minimally abnormal, much as natural ncuronal loss occurs in the course of development". Major damage to the system, on the other hand, "can result in entirely bizarre circuitries, even the emergence of new pathways, which could impact on the primary as well as ancillary circuitries".

Findings from a series of studies beginning in the 1970's , led Tallal and colleagues to conclude that some students with developmental language and reading problems demonstrate a "severe developmental deficit in processing brief components of information that enter the nervous system in rapid succession, and a concomitant motor deficit in organizing rapid sequential output (Tallal, Miller, & Fitch, 1993). They described this deficit as "highly specific, impinging primarily on neural mechanism underlying the organization of information within the tens of millisecond range.

Galaburda and Livingstone (1993) compared brains of five dyslexic subjects with five non-dyslexic subjects. They reported significant cellular differences in the magnocellular layers in the lateral geniculate nuclei of the thalamus, which is responsible for transmitting visual information to the cortex. They noted, "The cell

bodies appeared generally smaller and more variable in size and shape". Begley (1994) summarized findings by Rosen, Galaburda and Menard that brains of five dyslexic subjects had fewer neurons in the medial geniculate nucleus of the thalamus. that part of the brain responsible for relaying auditory information to the cortx. Specifically, the language processing left side of this relay station had fewer of the neurons that process fast, staccato sounds- such as ba, da, ka, and ta- than did the brains rains of normal readers. The so-called stop consonants last a mere .04 second, rather that the .1 second of a vowel such as "aaaahh" (Begley, 1994).

C. Selective attention and attention deficit disorder

Selective attention develops with maturation and learning. A lag in its development can contribute to difficulties in reading, writing and spelling.

When more than one learning disability co-exists with dyslexia, the co-mordib condition is called "dyslexia plus syndrome" (California Department of Education, 1994). Keller (1992) explained that children diagnosed with attention deficit disorder with hyperactivity (ADHD) have difficulty remaining on task and focuing attention. "It is believed that they are distractible both auditorally as well as visually: however, their inability to remain attentive might also cause them to seek out distractions". According to the DSM-IV (1994), the essential feature of ADHD is a "persistent amount of inattention and or/hyperactivity-impulsivity that is more frequent and severe than typically observed in individuals at a comparable level of development"

Attention deficit hyperactivity disorder has been implicated as a contributing factor to specific reading disability and, in many cases, co-occurs with it Dykerman, and Oglesby (1979) speculated that the problems children with hyperactivity have in sustaining attention, thinking, remembering, and suppressing

extraneous responses to distracting stimuli, and aggressive or impulsive behavior are due to dysfunctional "wiring" in the inhibitory connections of the frontal-limbic system.

D.Middle ear problems

Although there is presently little empirical evidence of a relationship between middle ear problems and reading disabilities, the relationship between otitis media, with and without effusion, and delayed language acquisition has been recognized for some time. Menyuk (1992) reported that otitis media results in a variety of differences in language acquisition during different periods of development and causes consistent delays in acquisition across-the board between 2 and 3 years of age. Menyuk (1992) explained that the following, complex defects of language processing may result from early otitis media: attention problems and distractibility affecting the ability to process narratives, problems retrieving morphological endings as distinct from word stems, and deficient confrontation naming and rapid retrieval of lexical items. Zinkus (1996) hypothesized that -intermittent hearing loss and distortion of auditory signals secondary to chronic ear disease during the early years of language acquisition could be associated with Development of auditory processing disturbances and subsequent deficiencies in academic performance".

E. Cognitive rigidity and learned helplessness

Coles (1987) cautioned that children get caught in a web of unwarranted expectations. He maintained that learning and reading disabilities might result when the school's erroneous expectations and teaching methods doesn't match with the child's acquisition of prerequisite abilities. Bristow (1985) proposed that the passivity observed in poor readers is tied to inappropriate materials that frustrate

students and repeated failure leads to learned helplessness.

CHARACTERISTICS AND CLASSIFICATION

The term learning disabilities encompasses a cluster of disorders, and a given individual may not display all of them. There are so many learning disabilities that it is almost impossible to classify them or even draw up a specific list of different types.

There have been many attempts to categorize the various characteristics of learning disability. One of the earlier attempts was conducted by Task force on learing disabilities (Clements, 1966) and identified 10 characteristics, which represented the prevalent theories at that time (i.e. learning disabilities were neurologically based). The task force characteristics are

Hyperactivity

Impulsivity

Perceptual - motor impairments

Disorders of memory and thinking

Emononal Lability

Specific learning disability

General co-ordination deficits

Disorders of speech and hearing

Disorder of attention

Equivocal neurological signs.

D S M III-R has classified learning disability under the category of developmental disorders. Some terms associated with L.D. have been defined in this classification as

1. Developmental Arithmetic Disorders (Dyscalculia): Impairment in the

development of arithmetic skills.

2. Developmental Expressive language Disorder (Expressive Dysphasia): Limited expressive language affecting oral vocabulary, sentence structure organization.

3. Developmental Receptive language Disorder (Receptive Dysphasia): Impairment in comprehension of spoken word.

4. Devetopmental Reading Disorder (Dyslexia): Impairment in the written word recognition and / or comprehension.

5. Developmental Expressive writing Disorder: Limited ability to compose written text, marked by spelling errors, grammatical or punctual errors and / or poor paragraph organization. Thus many include Dysgraphia, which refers to difficulties ranging fron an inability to form letters & words, to putting linguistic concepts into writen form.

Dyspraxia, which is a marked difficulty in planning and performing complex organized motor movements, may be another manifestation of Learning Disability.

According to Kirk (1987) learning does not suddenly begin when the child reaches 6 years and enters school. During the pre-school years, children actively engage in the learning process, acquiring many pre- academic skills that are needed later tor learning academic subjects, (Kirk, 1987). The pre-academic areas of learing include understanding and using language, learning to attend, developing memory skills and learning various perceptual skills. Kirk (1987) and Kirk and Chalfant (1984) thought of learning disability in two broad ways, developmental and academic learning disabilities. Developmental learning disability encompasses dificits in those skills , which are more basic to the complex school tasks. It included motor, perceptual, cognitive, social and most importantly, language skills.

Academic learning disability refers to the deficits in school tasks like reading, writing. spelling and mathematics.

DEVELOPMENTAL LEARNING DISABILITIES:

This term essentially includes deviations from normal development in psychological and linguistic functions. Often these disabilities are related to information processing, the way the individual receives, interprets and responds to sensory input.

Attention disorder:

The most important prerequisite to learn a task at hand is attention. Students with attention problem display such characteristics as distractibility, impulsivity and hyperactivity. Teachers and parents of these children often characterize them as being unable to stick to one task for very long, tailing to listen to others, talking non-stop, blurting out the first thing on their mind etc.

Estimates available indicate that at least 33 percent of students with LD also have attention problems (Shaywitz & Shaywitz 1987) although a student with attention disorder may or may not have LD.

Dykman & Ackerman (1991) found that almost half of their large sample of ADD children also met the criteria for LD. Similarly Cantwell and Baker (1991) found a strong correlation between LD and ADHD. In a clinic referred sample, Beitchman, Hood, and Inglis (1990) observed that approximately 30%-38% of young adults with language learning disability as compared with 5% of young adults without language learning disability, had a diagnosis of ADHD.

Cohen, Davine, Horodezky, Lipzett & Issacson (1992) reported that children with both ADHD and a landuage learing disability have significantly more severe problems formulating grammatically correct sentences than their normal

peers.

Menory disorders:

There is ample evidence suggesting that learning disabled children have memory problems they can have difficulty or complete failure of the ability to use strategies that facilitate remembering For example Hallahan, Kauffman and Llyod (1985) noted that many students with learning disability are passive learners who do not use strategies (e.g. rehearsal, mnemonic uses) as skillfully as their normal peers.

Kops (1985) also indicated that students with learning disability are poor task planners and organizers. The inability to use strategies and other organizational skills as well as their inability to regulate those skills are referred to as meta cognitive deficit.

Visual and auditory perception and perceptual motor disorders

One of the most prominent characteristics of the Field of learning disabilities has been the overriding concern with perceptual abilities. LD children with visual perception problem may not understand road signs and children with auditory perception difficulties may not be able to understand or interpret spoken language, the latter group are able to identify objects/symbols by sight , but they cannot respond when the same stimuli are presented aurally.

Other motor perceptual problems reported in these children were disability in left- right orientation, body image, spatial orientation, motor teaming and visual closure. A student might also have a problem in both the perceptual and motor area. Inability to copy geometric figures is one such problem.

Although many children who have LD exhibit poor performances on variety of perceptual and motor tasks (Reid and Husko, 1981) the effects ,or at least relationship, such deficits with learning is unclear.

Mental operation disorder:

The definition of learning disability mentions deficits in thinking. Many students with learning disability have difficulties in both cognition and metacognition. The general area of thinking and cognition is complex and includes a number of specific sub areas like memory, strategy thinking and attention. A distinction is made here between intelligence and cognition. Although there are students with learning disability having a lower than average IQ, many have high IQ's, sometimes in the gifted range (Franklin & Rykman 1984; Brody & Millis 1997.).

Expressive and Receptive language charecteristics:

Research shows that a general category of students with learning disabilities have problems in both the above areas compared with normally achieving students (Semel and Wiig, 1975), although it is generally accepted that they have greater difficulty with expressive language (Hallahan, Kauffman and Lloyd, 1985).

It is important to identify language problems because many note that they are directly related to academic areas, particularly reading (Vogel, 1975). Language has many components including phonology, syntax, semantics and pragmatics. Any one or all of the areas can be affected in learning disabilities.

Studies have reported that LD children have problems in employing thepast-tense form, and have specific problems with syntax, which often continue into adolescence and adulthood. In addition, they seem to have problems in the understanding and usage of passives & negatives/contradictions,and with the processing and production/usage of certain words(viz. Complex action verbs,similar sounding verbs,"to be" verbs,and certain adjectives and adverbs)(Wiig and Semel, 1984). But the relation between semantics and LD

remains somewhat unclear (Hallahan, Kauffman, and Lloyd 1985).

Many students with LD seem to have difficulties in comprehending who. hat where and how questions, as well as in assessing pronouns and possessives appropriately (Bernstein and Tiegerman, 1955).

Lapadat (1991) reported that students with LD had consistent and pervasive problems in conversational skills caused more by a lack of pragmatic skills than insufficient social knowledge.

Language disorders are the most common learning disability noted at the preschool age. Generally the child does not talk age appropriately like normal peers or does not usually respond adequately to verbal statements.

ACADEMIC LEARNING DISABILITIES:

The academic deficits in children are usually the hallmark of LD. The 3 major characteristic features in the area of academic problems are,

- Reading
- Writing
- Arithmetic

This is known as the 3R's of learning disability. Academic skills mainly refer to school acquired learning, which also includes spelling and handwriting other than the 3R's.

READING

Reading disability is the most frequently reported academic problem for students with learning disability (Dishler, schumaker and Lenz 1984). Reading is a very important skill that is directly related to overall academic problems.Individuals with reading problems were referred to in the past as "Word blind" and "strephosymbolic". The term "Dyslexia" has also been used and this term has

evaded a tremendous amount of confusion and miscommunication within the field of special education. Hallahan, Kauffman, and Lloyd (1985) indicated that dyslexia usually implies a more severe reading disability for which redemption is difficult.

As a group, students with reading problems can display a number of characteristics either in mispronunciation, skipping, adding or substituting words (Hallahan, Kauffman, J., and Lloyd 1985) as well as problems in remembering letters/ words and blending sounds together (Wallace & Me Loughlin, 1988). Most of these problems result in oral reading deficits. Another major problem seen is difficulty in reading comprehension, and although the reasons for this vary, it is related to oral reading problems themselves. (Pflaum and Bryan, 1981).

Many people feel that the terms learning disability and reading disability are inter changeable. There are however students with LD who do not have difficulty in reading, although the estimates of those students who do not have reading problems are extremely high.

WRITING AND WRITTEN LANGUAGE CHARACTERISTICS:

Another major problem seen in learning disability children, which is of academic interest, is writing. Over all the general area of writing problems includes the specific disabilities of handwriting (sometimes referred to as dysgraphia) spelling and written language or written expressions (e.g. punctuation, vocabulary, sentence structure).

For a learning disabled child with handwriting problem, writing may take longer, and hence lead to loss of concentration on spelling. (Hallahan, Kauffman, J.. and Lloyd 1985). The handwriting problems seen in these children can be attributed to many causes like poor fine, motor co-ordination, difficulty in relating visual

impression and inability to transfer the input of visual information to the output of fine motor movement (Lemer, 1993)

Spelling:

Spelling can be a significant problem because of the difficulty in grapheme-phoneme correspondence. Boder (1976) identified 3 types of spelling problems in learning disabled children. They were spellers who made phonetically in inaccurate errors. Those in the first group are often thought as visual spellers and will often have the right letters but in the wrong order (e.g.: - hwert re for whether). The second group is auditory speller's i.e. they make errors trying to sound out the words (e.g.: - Psishun for position). The third group will show both errors. According to Mercer (1992), a student can misspell a word because of poor visual memory, auditory memory, and visual discrimination and or motor skills.

Written expression:

Many students with learning disabilities who have written language problem will continue to have these problems into adolescence and adulthood (Blalock. 1981). These children had particular difficulty in areas such as capitalization. punctuation, written syntax etc.

ARITHEMETIC PROBLEMS:

Mathematical disabilities sometimes referred to as dyscalculia; include any number of mathematical problems. This is another area in which a student with LD might experience problems. Most children with mild learning problems will have some difficulty performing the basic math skills required to understand higher level math (Peters, Lloyd, Hasselbring, Coin, Bransford, and Steen 1987). Specific deficits of math concepts such as spatial relations, right-left orientation, and shape

and size discrimination lead to difficulty in computation and problem solving.

According to Montague and Boss (1990) however, the poor performances of students with learning disabilities on mathematical word problems was due to difficulties in selecting and applying problem solving strategies rather than the computational errors.

SOCIAL AND EMOTIONAL CHARACTERISTICS:

Not all students with learning disability show social and emotional problems. Studies comparing students with learning disability to their peers ha\c shown that they are more anxious and withdrawn (Cullinan, Epstein and Llyod. 1981). Lack of sensitivity to people and poor perception of social situations is seen in these children the observable characteristics related to a deficit in social perception .LD children are inept in judging moods and attitudes of people' insensitive to the atmosphere of a social situation and arc wont to displaying inappropriate behavior and making inappropriate remarks.

Another area that has been investigated is the self-concept and self-perception of students with learning disability. Schneider (1984) noted that many students had very little insight into the nature of their problems and attributed them to lack of effort.

RELATIONSHIP BETWEEN PHONOLOGICAL PROCESSING AND READING.

Reading and writing problems demonstrated by students with reading disabilities are obvious, but these symptoms may be manifestations of underlying language deficits. Phonological processing refers to "the use of phonological information (i.e., the sounds of one's language) in processing written and oral language". (Wagner & Torgesen, 1987). "While approximately 80% of children

develop this phonological awareness without much difficulty, the remaining 20% is confused by the system" (Lyon, 1995)

Swank (1994) proposed a specific phonological coding impairment construct which consists of five components (phonological encoding, phonological awareness, phonological coding in the context of lexical access, phonological coding in working memory and expressive phonological coding) to explain the relationship between phonological processing and reading.

Swank (1994) defined phonological encoding as "the ability to process rapidly paced human speech that requires the listener to impose a phonemic identity on incoming speech sounds".

Tallal (1988) suggested that delayed language acquisition may result from a specific neurological temporal mechanism that disrupts phoneme perception and production". Tallal (1988) hypothesized that certain developmental oral and written Language disabilities "may result from the same underlying neurological deficit and may differ only in the age of the child and in the learning skills being acquired at different ages".

Phonological awareness (linguistic awareness /phonological awareness/phoneme segmentation/phonemic analysis) refers to the metalinguistic ability that allows a language user to perceive spoken words as consisting of a series of individual speech sounds.(Torgcsen , Wagner & Rashotte (1994).According to Brady (1991), since the phonological component is invoked in both phonological awareness tasks and reading , limitations in creating and using phonological representations might impede discovery of the phonological structure of words and delay mastery of an alphabetic writing system. Liberman, Shankweiler, & Liberman (1989) considering phonological awareness to be the

acid test of reading an alphabetic orthography,believed that becoming phonologically aware is essential for discovering the alphabetic principle.

Swank (1994) defined Phonological coding in the context of lexical access (also phonemic recoding) as the ability includes retrieval and use of the phonological code "to access the lexicon". When accessing the name of something, either the name of a pictured object or a printed word, a phonological representation of that word is temporarily stored in a buffer zone short-term or working memory - and then produced verbally (Libermann, 1983).

Blachman (1994) stressed the importance of "accurate phonological representations and short-term memory coding", and described what occurs when the meaning of a printed word is accessed: the decoded word is translated into its phonological buffer zone until mapped on its paired entry in the lexicon. Phonological recording of print, then, involves converting the printed features of words into corresponding sound or phonological equivalents through application of the alphabetic principle or grapheme-phoneme conversion. The printed form of the word is converted (recoded) into sound, allowing for sub-vocal rehearsal and access to its lexical referent (Aaron, 1989). The beginning reader must leam to decode a series of visually presented letters, temporarily store the sound the letters make, and blend the contents of the temporary store to form words (Wagner & Torgesen, 1987).

Catts (1989) summarized a number of studies which suggested that phonological receding problems are associated with word-finding problems in students with specific reading disabilities. Naming problems were observed in the following tasks: recalling memorized lists of alphabet letters and months of the year: picture confrontation naming; and rapid naming of a scries of alphabet letters,

numbers, colors or objects. Wagner and Torgesen (1987) interpreted the observation that poor readers experience extreme difficulty in decoding nonsense words (pseudo words, e.g., "hake") as suggesting that at least some of their difficulties in word reading are due to problems in generating the phonological code required to access the lexicon". Sawyer (1985) noted that about half of the students in her reading clinic produced "odd" utterances, for example, "my ear sight is good" in response to being told his hearing would be tested, of "banana sundae split" in response to being asked to name a favorite ice cream treat. Interestingly. none of the students indicated that they recognized their errors.

Swank (1994) proposed that phonological coding in working memory is "the ability to maintain phonological information on-line in working memory until a specified task is complete which is a necessary skill in early reading". Braddeley (1982) maintained that spoken words are automatically registered in the phonological store, but printed information becomes registered in the phonological store by way of an articulatory loop that is activated when the reader sub vocalizes the information. Catts (1989) noted that students with specific reading disabilities typically need multiple presentations of new words before they can verbally produce them accurately and consistently. And, although good and poor readers perform similarly on nonverbal, visual memory tasks, for example: remembering faces (Liberman, Liberman, Mattingly, & Shankweiler 1980) poor readers perform significantly worse than good readers on memory span tasks.

According to Brady (1991) although deficiency in metaphonological awareness is certainly the language factor most strongly implicated in reading disability, the cause is a more basic problem . At the level of underlying language processes, perhaps the most striking characteristic of poor readers is the common

occurrence of verbal memory problem.

METALINGUISTIC SKILLS

Metalinguistic skills or language awareness refers to the ability to reflect consciously on the nature and properties of language (Vankkleeck, 1994). It is the ability to think about and reflect upon the structural and functional features of language or the ability to make judgement about those structures comprising language (Ehri 1978). it is also synonymously labeled as linguistic awareness. There are four levels of metalinguistic awareness. They are

1. Phonological Awareness
2. Word awareness
3. Form awareness
4. Pragmatic awareness

Many researchers believe metalinguistic skill to be crucial to achieving print literacy. Most of the studies have concentrated around phonemic awareness. grammatical rules and subsequent corrections of grammatically incorrect sentences. (Karmiloff-Smith, 1979, 1986) word conjugation (Vygotsky, 1986), judging as to which of the two sentences sound better (Devillirs, 1972) and children's understanding of the concept of word (Downing and Oliver, 1974).

Phonological Awareness:

It refers to one's awareness of and access to the phonology of one's language (Mattingly, 1972). Phonological awareness is demonstrated by successful performance on tasks such as tapping out the number of sounds in a word, reversing the order of sounds in a word, and putting together sounds presented in isolation to form a word (Lewkowicz, 1980).

Treiman (1987) and Bryant and Goswami (1987) have suggested that there arc different levels of phonological awareness- syllabic,intra-syllabic and phonemic, which may be important for the development of reading in different ways.

For reading instruction to be beneficial, children first need to understand that speech can be segmented. A child with this understanding is not perplexed when reading instruction refers to the sounds that letters make, and is able to make use of these relationships, to read and write novel words. The nature of relationship between phoneme awareness and early reading, changes once the child begins to make use of the alphabetic code. The child who is beginning to read has to realize that words can be broken into phonemes, and that the phoneme is typically the unit in the speech stream represented by the symbols in an alphabetic script (letters). Thus the child understands the systematic correspondence between sounds and letters that make up an alphabetic writing system. The alphabetic code becomes one of "mutual facilitation" (Perfetti,Beck, bell & Hughes 1987) or "reciprocal causation" (Liberman.Shankweiler, Fisher, & Carter 1974).

The development of phonological awareness can be top-down or bottom-up i.e., syllable to phoneme or phoneme to syllable. The most obvious hypothesis is that phonological awareness develops from an awareness of large units such as words or syllables, towards an awareness of small units, such as phonemes. The development could be disjoint, with access to phonemes occurring as a more or less sudden insight, perhaps resulting from the introduction of alphabetic literacy. Alternatively, it could be progressive, preceding from large structures (syllables),

(phonemes)(Trieman 1987).

A number of models were formulated in the 1970s and 1980s that described reading as developing in a sequence of stages, with the early stages making no use of phonological information.Frith (1985) formulated a three stage model that maintained that reading is initially "logographic", meaning that the child relies on 'recognizing cues to a word's identity based on gross features such as initial letter and shape. Although a modest sight vocabulary can be built up in this way, it seems taht there are inherent storage limitations to the number of words that can be recognized by visual features, and as vocabulary expands, similar looking words will be confused. At this point, the child moves on to an "alphabetic stage", in which word recognitions and written spellings are worked out from knowledge of grapheme -phoneme correspondences. Finally ,fluent reading and spelling are achieved when the child learns the particular orthographic patterns corresponding to each word ,and so can recognize and produce these immediately ,with out needing to do any conversion of graphemes into phonemes.

According to the classic Piagetian theory concrete operational thought doesn't develop before the age of 6-7 years. Consequently, one might believe that children were unable to reflect on the structure of language and unable to become aware of phonemes before that age (Tunmer 1991).However a number of studies have shown this to be a misconception. Even 3 year old children show clear signs of phonological sensitivity and ability to reflect on speech sound independent of the meaning of the words. Chaney(l992), for e.g., demonstrated that more than half of a group of 3 year old children were able to solve metalinguistic tasks at both phoneme, morpheme and word level. At the phoneme level, most of the children were able to synthesize phonemes into words ('h ...a. .t'= hat).At the morpheme level, the children were able to select the correct endings of words and sentences

(plural-/s/) and to correct other speaker's error. At the word level the children were able to segment word chains into single words (e.g. balloontreeshirt as balloon, tree, and shirt).They could distinguish real word from nonwords and between word and referent, and could answer questions using new words for familiar objects. About one-third of the children were both able to judge whether two words rhymed or not as well as produce rhymes themselves.

Stuart and Coltheart (1988) found that phonological awareness in preschool children was related to their subsequent progress during their first year of learning to read, and they concluded that children could make use of grapheme -phoneme correspondence from the outset if they had adequate phonological awareness.Goswami (1991) has provided evidence that beginning readers can make use of analogies with known words when learning to read or spell unfamiliar words (eg knowledge of "bag" can help them read "rag"), for which the child must have some awareness of how to decompose words into smaller units, and how to relate these to letter strings However this does not necessarily entail identification of individual phonemes ; provided the child can segment a syllable into onset and rime.

According to Treiman (1991) the child may succeed in segmenting syllables, but fail to classify those segments according to the adult phonological system. He found that some of the problems that normal children have in learning alphabetic principles can be explained by assuming that they try to map graphemes on to a nonadult phonological system.

The relationship between phonological awareness and reading ability appears to be one in which causation is bi-directional. That is phonological awareness may be both an antecedent of reading development and a consequence of

reading experience.

Researchers such as Adams (1991) and Wagner and Torgesen (1987) are convinced that phonological abilities both precede and lead directly to the development of word identification skills. Some researchers like Fox and Routh (1976). Bryant, Bradley, Maclean and Crossland (1989) also believe that phonological awareness is a prerequisite for reading. Research shows for example, that children who are phonologically aware prior to reading instruction learn to read better than those who are not (Wagner & Torgesen, 1987)

On the other hand researchers like Liberman (1983), Morais, Carry, Alergia and Bertleson (1979); Read, Zhang, Mic and Ding (1986) also believe that phonological awareness is a consequence of learning to read

Most of the studies of phoneme awareness have employed tasks that directly measure awareness. These tasks require children to play language "games" that manipulate the phonemes within a word in one way or another; counting them, deleting them, choosing words that contain the same phonemes etc. The use of these tasks has revealed that phoneme awareness develops later than phonetic perception and the use of phonetic representation and remains a chronic problem for those individuals who are poor readers. (Mann 1991)

Research involving such tasks began with a study by Libermann,Shankweiler,Fisher and Carter (1974) who enquired whether or not a sample of 4- 6 years olds could leam to play syllabic counting games and phoneme counting games in which the idea was to tap the number of syllables-phonemes in a spoken word . It was discovered that none of the nursery school children could tap the number of phonemes in a spoken word while half of them managed to tap the number of syllables. Only 17% of the kindergartners could tap phonemes, while

again about half of them could tap syllables. AT 6 years of age 90% of children could tap syllables, and 70% could tap phonemes From such findings about children's sensitivity to the number of phonemes and syllables in spoken words, it was found that the awareness of phonemes and syllables clearly develops considerably between the ages of 4years and 6 years. It is also clear that awareness of phonemes is slower to develop than awareness of syllables. Finally, both types of awareness markedly improve at just the age when children are learning to read (Libermann, Shankweiler, Fisher and Carter 1974)

According to Liberman Shankweiler. and Liberman (1989). what makes learning to read so much more difficult than learning to speak is the fact that mastery of the alphabetic principle requires explicit awareness of something that is previously only learned at an automatic, implicit level, that is, the internal phonological structure of syllables.

Children initially segment sentences into consistent words and then into syllables and then into sub syllabic units called onset and rime and finally into individual phoneme (Ehri, 1978; Tummer, Bouncy and Grieve, 1984; Treiman. 1983, 1987, 1991).

Several researchers have found that initial phonemes are easier for children to segment than final phonemes (Rosner and Siman, 1971; Trieman and Baron, 1981; Stanovich, Cunningham and Cramer, 1984) perhaps because the initial phoneme, if it is a consonant is also the onset of me syllable it occurs in.

A cross cultural study in American and Japanese children by Mann (1986) showed that in contrast to the American first graders who tend to be aware of both syllables and phonemes , almost all first graders in Japan were aware of mora (phonological units nearly equivalent to syllables) but relatively few were aware of

the phonemes. This difference could be attributed to the fact that Japanese first graders learn syllables whereas American first graders team to read alphabets and supports the hypothesis that awareness of phonemes strongly relies on the learning of an alphabet.

Phonological awareness was not found to be an important factor in children learning to read Kannada (Rekha 1997), and Malayalam (Dinesh 2002) which are languages represented by a semi-syllabic script.

Several studies show that awareness of syllable and awareness of phonological strings (i.e. sensitivity to rhyme) can precede literacy instruction in many children, while segmental awareness seems to require confrontation with the alphabetical code (Bradley and Bryant 1983; Liberman, Shanlweiler, Fischer and Carter 1984)

From the literature it is established that there are strong links between children's early knowledge of nursery rhymes and their reading abilities. There are many studies quoted in support of this observation. There are a few studies, which denote that children have sensitivity towards rhymes long before they go to school. Even four-year-old children (Knafle, 1973, 1974; Lene and Cantor 1981) and 3 - year-old children (MacLean, Bryan and Bradley, 1987) perform well above chance level in rhyme detection tasks.

Bryant, Bradley, MacLean and Crossland (1989) attempted to establish the relationship between the children's original knowledge of nursery rhymes and their progress several years later in learning to read and to spell. Their report contains longitudinal data from a group of 64 children of the age of 3 years to 6 years. They noted that there is a strong relation between early knowledge of nursery rhymes and success in reading and spelling over the next 3 years even after difference in social

background; 1Q and the children's phonological skill were considered.

Phonological awareness in Learning Disabled:

Numerous experiments involving widely diverse subjects. school systems. and measurement devices have shown a strong positive correlation between a lack of awareness about phonemes and current problems in learning to read. (Yopp. 1988). Also, evidence indicates that lack of awareness about syllables is associated with reading disability (Katz, 1986) Finally studies of kindergarten children provide evidence that problems with phoneme segmentation. (Blachman, 1994) and problems with syllable segmentation (Mann and Liberman. 1984) can give rise to future reading difficulty. For example it was found that 85 % of a population of kindergarten children who went on to become good readers in the first grade correctly counted the number of syllables in spoken words, whereas only 17% of the" future poor readers could do so (Mann and Libermann, 1984). In another study, a kindergarten battery of tests that assessed phoneme awareness accounted for 66% of the variance in children's first-grade reading ability (Stanovich, Cunningham & Cramerl984).

Rohl and Tunmer (1988) used an age matched design to test the hypothesis that deficits in phonologically related skills may be casually linked to deficit in acquiring basic spelling knowledge. The results indicated that compared to the poor spellers, the average and good spellers performed better on phoneme segmentation.

Majstereckand and Ellenwood (1995) found that good readers outperformed poor readers on a variety of phonological awareness tasks. Children with reading difficulties were more likely to exhibit poor phonological awareness.

Several researchers have attempted to identify specific skills at preschool (hat predict later problems. (Magnusson & Naucler, 1990; 1990; Menyuk, Chesnik.

Liebergott, Kamgold, D'Agostino & Belanger 1991) (Clark-Klein, 1994: Catts. 1993; Webster & Plante, 1992),. Global language abilities at preschool are thought to be associated with later reading comprehension, while phoneme awareness is considered a predictor of later reading decoding skills (Catts, 1993).

Research has suggested that children with phonological disorders at preschool may be at risk tor later spelling difficulties due to poor phonological awareness skills and a weakness in phonological coding in verbal memory (Clark - Klein, 1994; Webster. Plante, & Couvillion, 1997).

Naslund and Schnieder (1996) studied the kindergartener's letter knowledge, phonological skills and memory process and their effects on early literacy. They studied kindergarten children by comparing their performance on phonological awareness task to their later literacy performance independent of letter knowledge for a group of German children. Results showed that the phonological awareness tasks vary in their prediction of later literacy performance. which includes spelling and a variety of reading tasks in the first and second grade.

Studies examining early reading success have indicated that the skills of segmenting, blending, and deleting letter sounds (phonological awareness) are highly related to word identification skills (Stanovich, 1986; Wagner & Torgesen. 1987). Converging evidence can also be drawn from studies on developmental reading disabilities in which reduced ability to identify individual words has been linked with insufficiently developed phonological awareness skills (Bradley & Bryant, 1983; Velluntino & Scanlon, 1987).

Lundberg, Olofsson, and Wall (1980) reported that performance by 143 kindergarten children on a phoneme reversal task was highly correlated with reading and spelling achievement 2 years later.

Many researchers have suggested that problems in establishing complete phonological representations in long-term memory may be an underlying cause of developmental reading difficulties (Katz 1986; de Geldee and Vroomen 1991).

The survey of the literature on the relation between language-processing skills and reading problems indicates that poor readers- and children who are likely to become poor readers - tend to have problems with phoneme awareness and also with three aspects of language -processing skill: (1) Speech perception under difficult listening conditions; (2) vocabulary, especially when vocabulary is measured in terms of naming ability y: and (3) using a phonetic representation in linguistic short-term memory . A logical interrelation exists among these difficulties, for they all involve phonological processes that concern the sound pattern of language. Hence, we may speculate that the cause of many instances of reading disability is some problem within the phonological system, something that could be referred to as a phonological core deficit (Mann, 1986; Stanovich, 1988).

The distinctness hypothesis, which was first advanced by Elbro (1996), proposes that children who become dyslexic have poorer access to the most distinct forms of spoken words than other children. This poor access may have several causes which are not specified by the hypothesis:

1. Poor readers may not possess as distinct phonological representations of words as normal readers.
2. Their prototypical representation of many words may be less distinct.
3. They may have difficulties with association between different levels of distinctness.

Differences in distinctness explain deficits in phonological short term memory associated with dyslexia. A low level of distinctness may hamper both the

encoding and the retrieval of the material to be remembered. With real words, encoding is impeded because the words are less easily recognized and less unambiguously stored. In the case of non- word material, the representation is made even more difficult become there arc fewer distinctive features available for the representation of the spoken material. Poor readers do generally have smaller vocabularies, but even when this is not the case, they do worse on non-word repetition (Stone and Brady 1995). The more remote a non - word is from real words the fewer are the readily available distinctive features likely to be.

Persistence of phonological awareness deficits in older children with dyslexia was studied by Fawcett and Nicolson (1995). Three groups of children with dyslexia, with mean age 8, 13 and 17 years, together with three groups of normally achieving children matched for age and 1Q with the dyslexia group, undertook tests of sound categorization and phoneme deletion. A comparison was done not only across chronological age but also across reading age. The children with dyslexia performed significantly worse than their reading age controls on both tasks. The overall performance of the 17 year old children with dyslexia was closest, but inferior, to that of the 8 year old controls. Since the sound categorization task was designed to minimize working memory load, the results extend previous findings on the phonological awareness deficits in dyslexia by dissociating the deficit from memory load and by showing that it persists at least into late adolescence.

TRAINING FOR LEARNING DISABLED:

Training studies have provided evidence that pre-school children can benefit from early language games that direct their attention to phonemes (Bradley and

Brayant 1985; Vellutino and Scanlon 1987, Ball & Blachman 1991: Lundberg 1987).

Several field experiments have demonstrated the casual efficiency of phonemic awareness training in kindergarten on success in reading acquisition (Ball & Blachman, 1991; Kozminsky & Kozminsky, 1995; Lundberg, Forst, & Petersen, 1988; Olofsson, 1993; Schneider, Kuspert, Roth, Vise, & Marx, 1997). The obtained training effects indicate that particular environmental manipulations improve phonological awareness, but even after such instruction and training. individual difference still exist.

It was found that adult dyslexics are less phonologically aware than younger normal readers of similar reading ability and a deficit in phonological awareness is still apparent in dyslexics who have attained fluent reading ability through remedial teaching and much practice (Bruck 1990, Fowler and Scarbauargh 1993).

Some of the most selective studies into phonological awareness training demonstrate effects on spelling before the effects become significant in reading (Bradley and Bryant, 1985, Lunderberg, 1987).

Evidence supporting the idea that poor readers will improve their decoding speed by means of a training program that emphasizes syllable bound decoding comes from a study of Scheerer - Neumann (1981). She showed that poor readers do not use the orthographic structure of a word to the same extent as good readers of the same age and that they benefit from on intervention program in which they are taught to segment words into syllables.

Bradley and Bryant (1983, 1985) took four groups, which are homogenous regarding IQ, sex, age and performance in a phoneme classification test. Two groups were trained to classify words according to their initial, medium or final

phoneme in addition one of those two groups used plastic letters as a learning aid. The third group was trained to classify the words used by the previous groups but employing conceptual criteria. The fourth group had no training and was used a central group. The results showed a clear advantage of training to classify words by phoneme over training to classify by concept on both reading and writing tests. However this advantage was statistically reliable for the group using plastic letters but not the group trained to classify words by phoneme without the aid of plastic letters.

Cunningham (1990) included two training groups in her design. One was the skill and drill approach that consisted of teaching the procedural knowledge of how to segment and blend phonemes and the other a metacognitive approach that emphasizes the application value and utility of phonological awareness for learning to read in addition to teaching the procedural knowledge of segmentation and blending. The results showed that, as children in the two training groups made greater gains in reading than children in the control group. More importantly. the children who reflected upon and discussed the value, application and utility of phonological awareness in reading performed significantly better in a transfer measure of reading achievement than did the children who received only the skill and drill instructor.

Word Awareness:

As children become aware that spoken language comprises of individual words, they begin to break sentences down into their constituent words. This skill maybe related to word consciousness. Word consciousness focuses a child on the fact that words are separate from their referents.

When asked to define the term 'word' preschool children often suggest that words are words because they refer to concrete things. They define words as the act of speaking itself often giving as examples an entire sentence. (Berthoud-Papandropoulou 1978) e.g.: "Strawberry" is a word because it is grown in garden". For the same reason children will more readily identify concrete sounds and adjectives. as words than preposition. conjunctions. possessive pronouns and other types of function words. Children also do not consistently count articles and other function words until age eleven (Berthoud - Papandropoulou 1978). Word realism is demonstrated awhen asked to provide words having characteristics such as being long, short or difficult. Preschool children typically focus on the real-word referent. e.g.: providing, 'train' when asked for a long word (Berthoud - Papandropoulou 1978). A preschooler might also explain that 'chair' is a short word because "you sit on it, and the person that is sitting on it is taller than it"

3. Form awareness

Researchers have attempted to directly tap children's knowledge of the rule systems by having them make judgements about the grammatical correctness on grammaticaliy of sentences presented to them.

Boldgett & Cooper (1987) formulated a test called "The Practical test of Metalinguistics", to study the development of various types of grammatical judgement. The sub-test on repairing sentences when administered on children between the ages of 4 through 9 years and 11 months showed a distinct development progression for the word ordering skills. The clearest developmental trends emerged from ages 4 to 6 years. Word corrections, were the toughest. Children who were successful in accurately judging syntactic sentence rule violation were unsuccessful at judging acceptability judgement. At this age children

appeared to judge the truth value assertion of sentences rather than the linguistic form. The ability to consciously focus on language form is believed to be a prerequisite to later developing skills which are metalinguistic in nature.

In a study conducted by Karanth (1980) the syntactic section of the LPT was administered to elicit a quick measure of children's syntactic competence. In one of the very first studies using this test (Karanth 1984) a group of children ranging in age from 2 to 14 years, were studied. Of these children, those below the age of 5 to 6 years were unable to respond for all grammaticality judgement tasks and either accepted or rejected a given sentence without reflecting on their grammatical acceptability. Around 70 months of age children were observed to begin attempting the task and performing at the chance level, by about 150 months of age about 80/ proficiency in grammaticality judgement was observed, recording a sharp rise in this metalinguistic ability within the age of 6 to 9 years. In order to confirm these finding as also to obtain norms on a larger group of children for the LPT, a similar investigation was undertaken (Karanth and Suchithra 1993) with 150 children ranging in age from 6 to 11 years, 30 each from grade 1 through grade V. The results confirmed their earlier findings that beginning at age 6-7 years and with a rapid spurt at about 7-8 years, children become increasingly proficient in the grammatically judgement task by the age of 11 years, the upper limit of the age range covered here.Children's specificity to the grammaticality of given sentences was only about 80%.Given the overall correspondence of this data with the earlier finding, they speculated that adult like sensitivity to grammaticality is acquired by adolescent, since two of the 13 years olds in the llrst study performed at level of 90% accuracy.

Pragmatic awareness

AMBIGUITY:

Because language is arbitrary the same sound sequence can have very different meanings both across and within languages.

Ambiguity can occur at several levels of linguistic forms. Children's ability to resolve the various types of ambiguity in humor emerges over a number of years. Around 8-9 years of age children begin to comprehend humorous ambiguity. (Rosner 1979;Rosner& Simon 1971)

LANGUAGE PROBLEMS ASSOCIATED WITH L.D CHILDREN

It has been well documented that the language difficulties exhibited by most children with language impairment persist through out childhood and into early adolescence (Aram, Ekelman & Nation 1984: Aram & Nation 1980).

Speech and language problems are often the earliest indicators of learning disability. Disorders of speech and language development in children are common, with about 1% of children suffering from severe language delay and between 3 to 15% (depending on the definition and the population studied) having milder degrees of language delay (Silva 1987). These disorders are important because they interfere with the child's ability to communicate and learn. and because of their subsequent association with learning difficulty (Howling and Rutter 1987, Silva 1987).

Research has demonstrated that children with preschool speech and language disorders are at risk for school-age academic difficulties. Follow -up studies show that 40-100% of children with preschool speech and language disorders have persistent language problems, and 50-100% have academic difficulties (Aram &Hall, 1989; Bishop & Adams, 1990; Felsenfeld, Mc Gue, & Broen.1995; King , Jones, & Lasky, 1982; Menyuk, Chesnick, Liebergott,

Korngold, D' Agostino,& Belanger, 1991; Shriberg & Kwiatkowski. 1988). In a longitudinal study by Stothard, Snowing, Bishop, Chipchase. and Kaplan (1998). even children whose language had normalized by 5 1/2 years of age continued to have difficulty on phonological processing and literacy measures in adolescence. Similarly, Felsenfeld, Mc Gue & Broen (1995) found that adults with histories of disorders performed more poorly than control subject on measures of articulation and receptive and expressive language.

Investigators have found that pre school impairment in language skills are associated with later problems in reading and spelling, and that children with learning disabilities have particular problems with complex language demands such as narratives or story telling, lexical retrieval and recognition of melody patterns. (Denckla and Rudel, 1976, Donahue, 1984)

Several studies have sought to identify preschool predictors of later language, reading, and spelling skills. Preschool language status has been consistently identified as a predictor of later academic outcomes (Bishop & Adams. 1990, Hall & Tomblin, 1978).Preschool children with isolated phonology disorders arc accompanied by additional language problems (Hall & Tomblin. 1978). Children with isolated phonology disorders are less likely to have later reading and writing difficulties than children with combined phonology and language disorders (Aram & Hall, 1989; Larrivee & Catts, 1999; Lewis, O' Donnell, Free bairn. & Taylar. 1998). A recent study by Larrivee and Catts (1999) examined the early reading achievement of 30 children with expressive phonological disorders. poorer phonological awareness skills, and poorer language skills. The finding suggests that language impairment, rather than the speech sound disorders per se. may be primarily responsible for later emerging academic deficits.

Dyslexia is commonly associated with specific language disorders of both expression and reception such as development dysphasia (Taltal 1988. Geshwind 1982).Developmental dysphasia is a specific language impairment that results in the failure to develop receptive or expressive language in the absence of any other primary neurological or emotional deficits. (Tallal 1987). Specific language impairment is a developmental language disorder that cannot be explained by deficits in sensory perception, intellectual abilities, or motor or social- emotional functioning. Their difficulties with languages emerge as they develop. and parents begin to notice problems in their language development around the age of two. At this time, most normally developing children are adding new vocabulary words to their repertoires and are enthusiastic communicators. Language disordered children use far fewer words and are already having trouble in communicating their wants and needs. During the pre-school years, when most children are using a variety of syntactic structures and morphological elements, language disordered children often sound telegraphic in their speech. They use nouns and verbs but not grammatical morphemes. They increase their vocabulary during the pre-school years, but their knowledge of word meanings may continue to be limited (Rice. Buhr and Nemeth 1990).

Sawyer (1985) reported the following characteristics in children with language disorders : word -finding difficulties, limited spontaneous speech, use of immature grammatical forms, difficulty untangling relationships in complex sentences, and trouble remembering and repeating information orally for academic tasks, the children demonstrated poor spelling with poor decoding and reading comprehension in the early grades. It is apparent from these characteristics that even in the younger years, and with early intervention, many of these language

problems will likely continue to affect the child's performance as the emphasis shifts to the academic setting.

A review of the literature (Paul 1996, Rescorla & Lee, 2000) suggests the following language patterns in late talkers:(a) late talkers typically improve in vocabulary from ages 2-3.(b) may continue to show grammatical delays in the preschool years (c) most have normal language by the time they are 5 or 6 yearsold.

There is growing evidence that children with learning disability have delay or deviance in their developmental language scales that might underlie their language dysfunction. In early references to specific learning disabilities. many have acknowledged the existence of a significant language component. (Bateman 1964 : Cruickshank, Bentzen, Ratesburg and Tannhauser 1961, Kirk 1962. Me Grady 1967, Myers & Hammil 1969). More recently, others have also noted the significance of communication deficits of many children with learning disability (Feagans 1983 , Johnson & Morasky 1980, Mercer 1983, Scholl 1981, Wing & Semmel 1980, Wren 1983). Gibbs and Cooper (1989) studied the prevalence of communication disorders in a population of 242 children with learning disabilities between 8 and 12 years of age enrolled in a school system in Alabama. A speech. language or hearing problem was exhibited by 96.2% of learning disabilities. language deficits in 90.5%, articulation deficits in 23.5%, voice disorders in 12% and fluency disorders in 1.2% of the students with learning disabilities. Students diagnosed with learning disabilities are likely to have a higher incidence of concomitant communication disorders than the general population (Wiig & Semel.1984). Estimates of the co-occurrence of language disorders and learning disabilities range from 35% to 60% (Cantwell & Baker, 1992; Satz, Fletcher. Clark & Morris, 1981; Wiig & Semel, 1984). In fact, the primary presenting feature

among children and adolescents with learning disabilities is language disorder syndrome (Denckla, Rudel, & Broman, 1981). In the Indian context. Suresh & Swapna (1997) conducted an epidemiological survey of developmental language disorders and learning disability among school children in Kerala. The results revealed that 10% of child population in Kerala had one or other form of speech language problems and 20% were found to be learning disabled. A delay in language milestones were found in 28.5% of the learning disabled children. thus indicating a positive relationship between speech and language deficits and learning disability.

Lytinen, Poikkens, Laakso, Eklund and Lyytincn (2001) suggest that children with a familial risk for dyslexia coupled with a history of late talking are at higher risk for delays in language acquisition as compared to children without the familial risk for dyslexia.

A majority of language impaired children frequently develop reading problems similar to those seen in dyslexics (Tallal 1988). Because both disorders appear to be characterized by deficits in phonological awareness, it has been hypothesized that there may be a continuum between developmental language and reading disorders and these disorders may have a common neurological basis and thus share the same underlying processing deficit. (Tallal , Sainberg and Jernigan 1991).

Deficits in one or more component functions of phonological processing arc generally considered to be the most likely cause of dyslexia (Goswami & Bryant, 1990; Wagner & Torgesen, 1987. Phonological awareness (Stanovich. 1986: Wagner Torgesen 1987) and short-term verbal memory (Ackerman, Dykman. &

Gardner, 1990; Jorm, 1983; Torgesen 1987) have repeatedly been reported as deficient in children with dyslexia.

There is also intriguing evidence from research on children with dyslexia that phonological deficits may be a core issue antecedent to dyslexia (Rack. 1994. Elbro, 1996.)

Wiig and Semel (1980) stated that " Of all the problems experienced by children with learning disabilities, language may be the most pervasive " Oral language deficits can be of a receptive and / or expressive nature and include problems in word finding, semantics and / or syntax.

Scarborough (1990) summarized the early language picture of children who are dyslexics as typically evidencing vocabulary deficiencies, poor rhyming and recitation skills, and phonemic awareness deficits at 3 to 4 years of age: and as 2 years olds to have produced shorter and simpler sentences and to have more pronunciation problems than normally developing peers.

Chappel (1985) described difficulty in basic vocabulary and information processing. Larson and McKinley (1987) described problems in the cognition of linguistic features, narrative and conversational discourse, nonverbal communication, and survival language. Gerber (1993) characterized this population as having delayed phonological acquisition, difficulty with perception and production of complex phonemic configurations, and deficits in phonological awareness.

Children are aware of syntactic and morphological rules as they start their formal schooling. They will even start applying these rules while speaking and understanding speech. These rules are then generalized to their ability to read LD children are found to have problems in all these tasks. (Guthrie , 1973; Idol -

Maestas, 1980).

Research has shown that L.D students perform poorly on oral language tasks, which involves comprehension and the use of syntactic and morphological rules (Vogel, 1975) Children who have reading problems have an underlying verbal language deficit and young children who have verbal language deficits eventually display a reading disability. (Mann, 1986)

Donahue (1986) speculated that at least three subgroups of language disorders exist within the population of children with learning disabilities. "The identification of these subgroups depends not on their actual language characteristics at any particular point in time, but rather on their "developmental history"

a. The first group includes children who were referred for delayed speech and language development during preschool or kindergarten. This group "manifests the most severe and most general pattern of language delay within the LD population". Donahue (1986) described the oral language of this group as "characterized by obvious grammatical errors, simple sentence structure, and overt difficulties in expressing ideas and intentions". Scarborough and Dobrich (1990) explained that a temporary convergence of growth in language functions between the ages of 3 and 6 years appears as "recovery" from early preschool language problems. However this may be an "illusionary phenomenon", because it is not uncommon for some of these children to be referred back to the speech-language specialist at 7-8 years of age.

b. A second group of children presented with underlying, subtle, language problems, which remain, undetected until they are faced with the task of learning to read. According to Donahue (1986), their subtle, oral language problems are

usually noticed only "on structured comprehension measures that provide few contextual cues or on tasks requiring rapid word retrieval or the use of complex sentence structures". With the increased verbal demands in school content areas, "the gap in academic achievement between these students and their non-disabled classmates widens rapidly". For this group, reading and writing problems are the first indications of a language problem.

Stackhouse and Wells (1991) proposed that these children, who have intelligible speech and have never been evaluated by a speech and language specialist, are most "at risk" for remaining undetected.

c. A third group presents with normal oral language but deficits in attention or memory, decreased motivation, or variation in instructional techniques thatinterfere with acquisition of reading and writing skills. Donahue (1986) noted that "exposure to the complex semantic-syntactic features of expositor}' texts" ordinarily "boosts" students normally developing reading abilities "into the final stages of oral language acquisition". It is possible that reading difficulties experienced by Donahue's third group of students deprives them of "the opportunity to hear the more sophisticated vocabulary and syntactic structures not often available in oral discourse but that characterize writing discourse".

There is a growing consensus among dyslexia researchers that the key deficit in dyslexia is located at the word recognition level and that children with dyslexia have difficulties with several related phonological tasks, such as naming, the use of phonological coding in short -term memory, categorical perception, and speech production (Stanovich, 1988 , 1993).

It has been found that the most frequently identified characteristic in children with dyslexia, outside their reading impairment, is "subtle dysnomia"

(Gardner, 1979; Rudel, 1985). Wolf (1991) has suggested that many cognitive and linguistic sub processes underlying reading and naming are shared but differential!) accessed, depending on the particular type of naming and / or reading task, the learners age, and his or her level of achievement.

Researchers have demonstrated that the vast majority of children and adults with reading disabilities have pronounced difficulties when asked to name rapidly the most familiar visual symbols and stimuli in the language - letters, numbers. colors and simple objects. Deficits in rapid automatised naming are noticed in dyslexic children of all ages. These are normally theorized within lexical access accounts of dyslexia, as word finding difficulties. Tests of immediate memory for lists of names, without context must be stored largely by phonological structure and are especially good indicators at this age of unusual difficulty in verbal learning. (Denchla & Rudel, 1976).

The research in this area is based originally on work in the neurosciences. stemming from a hypothesis about color naming by Geshwind (1965). He suggested that the cognitive components involved in color naming.ie the components involved in attaching a verbal label to one abstract, visual stimulus - would make a good early predictor of later reading performance. which poses similar cognitive requirements. This hypothesis was investigated and developed by Denckla & Rudel (1976) who found that the speed, with which names were retrieved, rather than the accuracy in color naming or the naming itself. differentiated dyslexic readers from others.

Wolf (1991) has contended that it is misleading to consider naming speed as simply a phonological skill. One factor that might connect problems in naming speed to reading failure, she suggested, is an underlying timing mechanism

common to certain language and motor functions. This possibility is supported by the finding that children with dyslexia are often deficient in articulatory speed when compared to average -reading children (Ackerman, DvKman, & Gardner 1990: Carts, 1989; Rudel, Denckla, & Broman, 1978; Wolf & Goodglass, 1986).

Katz (1986) found that children who perform poorly on a decoding test are particularly prone to difficulties in producing low- frequency and polysyllabic names and suggested that, for such words, these children may possess less phonologically complete lexical representations than good readers do. On the basis of his research , he further suggested that, because poor readers often have access to aspects of the correct phonological representation of word, even though they are unable to produce that word correctly, their problem may be attributable to phonological deficiencies in the structure of the lexicon rather than to the process of lexical access, per se.

It has often been noted that poor readers tend to perform less well on the digit span test and are deficient in the ability to recall strings of letters, nonsense syllables, or words in order. whether the stimuli are presented by ear or by eye. Poor readers even fail to recall the words of spoken sentences as accurately as good readers do (Jorm, 1979). Evidence that these difference are not merely consequences of differences in readers ability has come from a longitudinal study which showed that problems with recalling a sequence of words can precede the attainment of reading ability and may actually serve to presage future reading problems (Mann and Liberman, 1984).

The indication in literature that linguistic materials such as letters, words, etc. are held in short-term memory through use of phonetic representation is an explanation for the above findings. Shankweiler, Liberman, Fowler and Fischer

(1979) were the first to suggest that the linguistic short-term memory difficulties of poor readers might reflect a problem with using this type of representation.

Several experiments have supported this hypothesis. When recalling letter strings (Shankweiler, Liberman, Fowler and Fischer, 1979), word strings (Mann, Shankweiler, Liberman, 1980; Mann and Liberman, 1984), and sentences (Mann, Shankweiler, Liberman 1980) poor readers arc much less sensitive than good readers to a manipulation of the phonetic structure of the materials (i.e... the density of words that rhyme). Poor readers and children who arc likely to become poor readers are for some reason less able to use phonetic structure as a means of holding material in their short term memory (Mann & Liberman 1984; Shankweiler, Liberman ,Mark,Fowler and Fischer 1979.).Poor readers employ a visual form of memory instead of a phonetic one (Mann, 1984), although there have been indications that they may place greater reliance on word meaning (Byrne and Shea, 1979). Evidence that poor readers are attempting to use phonetic representation has been found in the types of errors that they make as they attempt to recall or recognize spoken words in a short -term memory task (Brady, Shankweiler, Mann, 1983).These errors reveal that poor readers make use of many of the same features of phonetic structure as good readers do. They make the same sort of phonetically principled errors -they merely make more of them. (Mann 1991).

An accumulating body of evidence indicates that poor readers do not comprehend sentences as well as good readers do (Mann, Cowin, and Schoenheimer 1989). Many students with LD seem to have difficulty in comprehending who, what where and how questions as well as assessing pronouns and possessives appropriately (Bernstein and Tiegerman, 1955).

It has been shown that good and poor readers differ in the ability both to repeat and to comprehend spoken sentences that contain relative clauses such as "the dog jumped over the cat that chased the monkey "(Mann, Shankweiler and Smith 1985). They also perform less well on instruction from the Token Test such as "touch the small red square and the large blue triangle" (Smith ,Mann, Shankweiler 1986).The comprehension problems are predominantly due to the memory problems. Poor readers are just as sensitive to syntactic structure as good readers; they fail to understand sentences because they cannot hold an adequate representation of the sentence in short -term memory (Mann, Shankweiler and Smith, 1985, Mann, Cowin. and Schoenheimer 1989;)

Haynes , Moran & Pindzola. (1990) reported a significant number of common symptoms accorded to the older student that reflect difficulties in the semantic (e.g., word finding, limited vocabulary); syntactic / morphological (e.g., use of incorrect grammar, use of starters and stereotyped phrases); and pragmatic (e.g., use of redundancy, difficulty shifting style to fit social situations components of language.

According to Swathy and Shyamala (1994) and Prema (1994) misarticulations and stuttering may co-exist with LD. Shyamala (1997) also reported that LD children show lack of Phonological awareness, 'ability to blend phonemes, deficiencies in morphology, vocabulary and comprehension and expression of syntax in LD children.

A study done on 23 Hindi speaking L.D. Children (age range 6-15 yrs) have shown that, language abilities of L.D. children in terms of phonology, syntax and semantics are poorer compared to normal age-matched children. Syntax and semantics are more affected than phonology in L.D. children (Sharma, M. 2000,

unpublished study,) Similar results were reported on a study done on 23 Malayalam speaking L.D. children (6-15 years) George, N. 2001, unpublished study)

Compared to good readers, poor readers have been found to have smaller speaking vocabularies, inappropriate use of syntax, poor verbal fluency and organization of verbal concepts, poor word retrieval, history of oral language problems, differences in morphological usage, slower response time in vocalization and poor listening comprehension.(Shyamala l997)

In a longitudinal study of 32 children from dyslexic families, Scarborough (1990) found significant relation ships between reading problems in Grade 2 and the children's syntax and phonological production at 2 1/2 years of age.

Gerber and Bryen (1981) reported on the characteristics of adolescents with language -based learning disabilities involving both basic and higher level language tasks. The adolescents had difficulty with following oral directions. processing, retrieving words making inferences, and comprehending basic classroom vocabulary and concepts. General impairments of auditory memory, comprehension, and attention were also reported.

In the classroom, teachers often note that these students have more difficulty interacting appropriately with peers. They do not "get" jokes, and they have difficulty with adolescent banter (Gerber & Bryen, 1981: Mathinos, 1988; Rice, Sell, & Hadley, 1990). Rice (1993) made the point that when students are less adept at conversational skills, opportunities for social communicative interaction are lessened, and thus practice is lessened. Lapadal (1991) reported that students with LD had consistent and pervasive problems in conversational skills caused more by lack of pragmatic skills than insufficient social knowledge. The ability to monitor conversations and to function successfully in the roles of speaker and listener

constitute important aspects of the language demands in the classroom; the lack of such skills results in a considerable disadvantage. Pragmatic skills have therefore been of increasing interest in association with LD.Children with LD have been found to be less likely than average -achieving children to request clarification when a message is uninformative and less likely to initiate repair in the face of a communicative breakdown (Donahue, 1984: Donahue, pearl,& Bryan, 1980). Maclachlan and Chapman (1988) reported that interruptions in the flow of speech of school -age children with LD increased more demanding narration task. In a meta -analytic review, Lapadat (1991) found that, in comparison to non disabled children, children with learning disability were less able to apply speech acts appropriately (e.g., initiate queries and comments or acknowledge those of others) and were deficient in lexical specificity, accuracy, and cohesion. The use of unspecified referents, the inappropriate choice of lexical items and the failure to express ideas in a logical and sequential way often leads to misunderstandings (Prutting & Kirchner, 1987). Difficulties in selecting and using appropriate in selecting and using appropriate vocabulary were more characteristic of children with language disorders than of children diagnosed with LD, but the evidence implicated underlying language deficits for children with LD as well, suggesting a continuum of language failure (Lapadat 1991.)

De Hirsch (1968) proposed that children with dyslexia had difficulty organizing speech into a coherent whole. She described their speech as "jerky and as arrhythmic as their handwriting. The cluttered speech sounds the way their papers look". Kaschube (1972) summarized a number of descriptions of poor verbal output in students with dyslexia and noted that "their phraseology is poor, that they are unable to conceptualize the unity of objects, word configurations are unstable.

their oral output is disorganized, and their stories are poorly integrated and lacking cohesiveness".

Catts (1989) observed that most of the speech production errors produced by dyslexia college students were "slips of the tongue" involving the anticipation or perseveration of sound segments (e.g. blight blue beam for bright blue beam)". Text comprehension problems are usually less severe than decoding problems in early reading, and frequently not recognized until the student takes a standardized reading comprehension test in the third grade or later (Clark, 1988). Text comprehension problems may be related to several deficits, including listening comprehension and/or understanding complex sentences in speech and in reading. Phonological coding weaknesses may cause problems processing function words, including articles and conjunctions that connect syntactic relations, and may be responsible for the frequent omission and substitution of inflectional morphemes made by students with specific reading disability. Furthermore, because problems with text comprehension can result in a weak knowledge base, students with text comprehension problems depend on what Maria and MacGinitie (1982) called "non accommodating" strategy in listening and reading comprehension, which relies on past knowledge (or top-down processing) rather than knowledge obtained from reading the text. Because they devote excessive energy to recording print during reading, students devote little attention to comprehension. They may fail to grasp relations in the text that are signaled by syntax, tense markers, or pronoun referents. Failure to sequence the events they read also can create problems.

Controversy exists about whether differences in performance between children with reading disabilities and normally reading children should be construed as a deficit or a maturational lag (Satz, Fletcher, Clark, & Morris, 1981).

The deficit model implies that there is something atypical in the underlying cognitive and/or neurological structure (Denckla. 1979). The maturational lag model maintains that children with disabilities may eventually catch up with their normally learning peers. Results of longitudinal studies suggest that in the majority of children, reading disabilities persist into adolescence (Korhonen 1991; Schonhaunt & Satz, 1983) and are still present even in early adulthood (Spreen 1988). There is also evidence that some disruptions of cognitive processes observed in childhood may persist into adulthood (Spreen, 1989). Further, deficits in naming speed have been found in samples of adolescents and young adults with dyslexia (Hutchens, 1989; Kinsboume , Rufo; Gamzu , Plamer,& Berliner, 1991; Korhonen, 1991; Wolff, Michel,& Ovrul, 1990).Longitudinal results from rapid serial naming tasks indicate that problems in naming tasks persist at least into the early school years and even adolescence for some children with reading difficulties (Korhonen, 1991; Wolf,Bally, & Morris 1986; Wolf 1986 .Wolf& Goodglass, 1986). The fact that some children with naming speed deficits do not catch up with average readers by adolescence, and that some adults with adolescence, and that some adults with dyslexia have naming speed deficits, suggests that the development of naming deficits conforms to deficit model more than to a maturational lag model. The persistence of naming disorders from childhood into adulthood would further support the deficit model.

Snowling's (1985) study on reading disordered population indicated that there is often a history of late speech and language development, with persisting deficits involving speech perception, segmentation and blending, articulation, memory and sequencing, syntax and lexical development in this population. However it would be incorrect to say that all children with learning disability have

speech and language problems or that all children with speech and language problems have learning disability (Bishop and Adams, 1990).

In general, it has been well established that the majority of language problems uncovered in school years have their genesis in the preschool years. The literature demonstrates that children with a preschool language disorder constitute a high risk group for subsequent academic difficulties. Most academic subjects are based on language concepts and the child with a preschool language disorder appears to be at risk for experiencing later language learning problems. In the preschool years their problems in aural listening, following directions and formulating spoken responses are often attributed to general immaturity. Further, the preschool child's communicative competence is often facilitated by well developed nonverbal behaviors that cover up verbal deficits. When such language disordered children enter elementary school, they often come to be associated with LD. It is not that language disordered children radically change when they reach 6 or 7 years of age, rather their problems in processing and producing oral language make it difficult for them to acquire written language: the ability to read, spell and write composition (Shyamala 1997)

Early identification may be the most crucial factor influencing the eventual school success of children with learning disabilities. Early identification can prevent or lessen the frustration felt by many children with learning problem becomes a self-filling prophecy. Usually this identification has been based on patterns of performance across various measures of speech and language (Keogh 1977). Recent research has suggested that dyslexia to a large extent is a language based disorder and can be predicted from language development during the prereading stage (Catts, 1989, 1996; Scarborough, 1990, 1991). Strong predictive relationships

have been found in different area of phonological processing (Badian, 1994; Elbro, Borstom, & Petersen, 1998; Schneider & Naslund, 1993; Wagner & Torgesen, 1987. In particular, tasks demanding explicit phonological awareness, such as identifying the first sound in a word, or analyzing the constituent sounds in word, have emerged as effective predictors of reading development (Brady & Shankweiler, 1991; Elbro, 1996; Sawyer & Fox. 1991,

Hence, early prediction or identification of reading problem is a necessary condition for early remediation and prevention. II intervention can be initiated at an early stage , it may be more effective for several reasons: early intervention can stimulate more positive reading growth; the total amount of negative side effects from experiencing reading failure (Matthew effects) can be reduced; furthermore, there will be more time available for the development of compensatory abilities and strategies (Spear- Swerling & Stemberg 1994).

JUSTIFICATION FOR THE CURRENT STUDY:

It is apparent from this review that many studies done on L.D. children have noted that the deficit in verbal language is reflected in the reading and writing skills indicating an exact relationship between the language disorders and the learning disability. It is essential for a speech language pathologist to know the relationship between the two, so that an early identification and remediation can be carried out.

Methodology

The study was planned with the following objectives:

1. To compare the speech and language skills of children with specific developmental disorders of speech and language (developmental learning disability- based on the classification of Kirk 1962) with that of normal children.

2. To compare the speech and language skills of children with learning disability (academic learning disability-based on the classification of Kirk 1962) with that of normal children.

3. To compare the speech and language skills of children with specific developmental disorders of speech and language language (developmental learning disability) with that of children with Learning Disability disability (academic learning disability).

4. To find out whether the children with specific developmental disorders of speech and language (developmental learning disabilily)are prospective candidates for learning disability(academic learning disability).

SUBJECTS

To achieve the above goals, study was conducted on 4 groups of subjects - two experimental groups and two control group

The subjects selected were all Malayalam mother tongue speakers. (Malayalam is a Dravidian language spoken mainly in the state of Kerala)

EXPERIMENTAL GROUP

Two experimental groups were taken up.

The first experimental group consisted of 16 children between the age group of 3-5 years diagnosed as Specific developmental disorders of speech and language (developmental learning disability) by a multidisciplinary team consisting of a Neurologist, speech pathologist and Clinical Psychologist, at ICCONS (Institute for Communicative and cognitive Neuro Sciences, Trivandrum) & Child care centre. Cochin, which are centers catering to these children and Sree Chitra Thirunal

Institute For Medical Sciences and Technology, a Premier institute for Neurologic disorders in Trivandrum .

The second experimental group consisted of 34 children between the age group of 5-9 years diagnosed as Learning disability (academic learning disability) by a multidisciplinary team consisting of a Neurologist, Speech Pathologist and Clinical Psychologist at 1CCONS (Institute for Communicative and cognitive Neuro Sciences Trivandrum)& Child care centre .Cochin , which are centers catering to these children.

DSM-IV (given in the appendix) was used for the purpose of diagnosis.Based on DSM-IV the developmental learning disabled (Specific developmental disorders of speech and language) were catogorised into

(a) Expressive language disorder

(b) Mixed receptive expressive language disorder and

(c) Developmental articulation disorder .

All the children who participated in the study were right handed with normal hearing thresholds in both ears and had a full scale IQ of 90 or greater and were from middle and upper strata of the socio economic ladder. The profiles of the subjects are as in table 2 & table 3

Table 2 Profile of Children in the Experimental group I			
SL.No.	**Age**	**Sex**	**Diagnosis**
1	3yrs	M	Expressive dysphasia
2	4½	M	Developmental articulation disorder
3	*3½*	M	Expressive dysphasia
4	**3½**	M	Expressive dysphasia
5	4	M	Expressive dysphasia
6	3	M	Mixed receptive expressive
7	3	M	Mixed receptive expressive
8	4½	M	Developmental articulation disorder
9	3½	M	Expressive dysphasia
10	4	F	Mixed receptive expressive
11	4½	M	Mixed receptive expressive
12	5	M	Expressive dysphasia
13	4½	M	Expressive dysphasia
14	5	M	Developmental articulation disorder
[15	4	M	Developmental articulation disorder
16	3 ½	M	Expressive dysphasia

Following information were obtained about these children from the case file and during testing.

SL no 1 This child was bom at term by cesarean section. His hearing was normal. His expressive speech was restricted to two words "amma"(mother) and "acha"(father). His auditory comprehension was good. On VSMS he got a social age of 2yrs 10 months. Neurological evaluation revealed no cranial nerve dysfunction or motor or sensory deficits. Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. He was diagnosed as developmental expressive dysphasia.

SL no 2. He was the first child of a nonconsanguineous parentage. No significant antenatal, natal and postnatal history present The child started speaking first word by 1 yr 4 months of age. Expressive speech and auditors comprehension were age appropriate. He showed poor scores in the Articulation test administered. Neurological evaluation was unremarkable. He was diagnosed as developmental articulation disorder.

SL no 3.This child was bom of non consanguineous parentage after 11 years of marriage. Mother had undergone medication for conceiving. Prenatal, perinatal and postnatal history is reported to be normal. The child has a speaking vocabulary of 10-20 words and also uses few two word utterances. Auditory comprehension was found to be age appropriate Neurological evaluation revealed no cranial nerve dysfunction or motor or sensory deficits. Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. He was diagnosed as developmental expressive dysphasia

SL no 4.No significant antenatal, natal and postnatal history present. The child started speaking first word by 2 yrs of age. Expressive speech was restricted to two words "amma"(mother) and "acha"(father). Auditory comprehension was good. On VSMS he got a social age of 3yrs 6 months

Neurological evaluation revealed no cranial nerve dysfunction or motor or sensory deficits. Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. He was diagnosed as developmental expressive dysphasia.

SL no5. This child was bom at term by cesarean section. His hearing was normal. Expressive speech of the child was restricted to five to six words. Auditory comprehension was good. On VSMS he got a social age of 3yrs 6 months. Neurological evaluation revealed no cranial nerve dysfunction or motor or sensory deficits. Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. He was diagnosed as developmental expressive dysphasia.

SL no.6 This 3-year-old boy was bom uneventfully to healthy and nonconsanguineous parents. His birth weight was low. He started speaking first word "amma"(mother) at 1-1/2 years. His vocabulary is limited to "amma"(mother). He couldn't comprehend even simple words. Neurological evaluation revealed no cranial nerve dysfunction or motor or sensory deficits. Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. On Psychological evaluation the child was found to have average I.Q.He was diagnosed as mixed receptive expressive language disorder.

SL no 7. This 3-year-old child was the first child of a nonconsanguineous parentage. No significant antenatal and natal history present. He had an attack of febrile seizure at the age of 1 year. The child started speaking first word by 2 yrs of age. Expressive speech was restricted to two words "amma"(mother) and "tata". He couldn't comprehend even simple words. Neurological evaluation was unremarkable. His EEG (electro encephalogram) was normal. On VSMS he got

a social age of 3yrs He was diagnosed as mixed receptive expressive language disorders.

SL no 8. This 4-1/2 year old boy was bom uneventfully to healthy and nonconsanguineous parents. His birth weight was low. The child started speaking first word by 1 yr 4 months of age. Expressive speech and auditory comprehension were age appropriate. He showed poor scores in the Articulation test administered. On Psychological evaluation the child was found to have average IQ.Neurological evaluation was unremarkable. He was diagnosed as developmental articulation disorder.

SL no 9 He was the first child of a nonconsanguineous parentage. No significant antenatal and natal history present. The child started speaking first word by 2 yrs of age. He had a vocabulary of around ten words. His auditory comprehension was good. Neurological evaluation was unremarkable. He was diagnosed as developmental expressive dysphasia

SL no.10.This child was bom of nonconsanguineous parentage; 1-month post term by forceps assisted delivery after labor had been induced. She started speaking first word "amma"(mother) at 2 1/2 years. Her vocabulary is limited to "amma"(mother). She couldn't comprehend even simple words. Neurological evaluation revealed no cranial nerve dysfunction or motor or sensory deficits. Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. She was diagnosed as mixed receptive expressive language disorder.

SL no.l 1 This child was bom at term by cesarean section. His hearing was normal. His vocabulary was limited to around 10 words He was found to use jargons. He couldn't comprehend even simple words. Neurological evaluation revealed no cranial nerve dysfunction or motor or sensory deficits

Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. On Psychological evaluation the child was found to have adequate social age. He was diagnosed as mixed receptive expressive language disorder.

SL no.12.This 5-year-old child was delivered at the 8 th month of pregnancy and had low birth weight (1.9 kg). Babbling started at the age of one year and first word at 2 years. At present he can speak "papa"(father),"amma"(mother), 'ta"(give) and "va"(come). On V S M S he got a social age of 4 years 6 months. Neurological evaluation revealed no crania) nerve dysfunction or motor or sensory deficits. Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. He was diagnosed as developmental expressive dysphasia.

SL no. 13 This child was b o m of nonconsanguineous parents, at term by forceps assisted delivery. Mother was exposed to radiation during the first trimester and received medication for recurrent urinary tract infections and abdominal pain. Because of decreased foetal movements experienced during the 2 nd trimester, she was prescribed regular medication, the nature of which is not known. He started speaking first word "amma"(mother) at 2 years and two word sentences by 41/2 years. His auditory comprehension was good. On V S M S he got a social age of 4 years 3 months Neurological evaluation revealed no cranial nerve dysfunction or motor or sensory deficits. Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. He was diagnosed as developmental expressive dysphasia.

SL no. 14. This 5 year old child was b o m of nonconsanguineous parents, at term by forceps assisted delivery. On V S M S he got a social age of 5 years. Neurological evaluation revealed no cranial nerve dysfunction or motor or

sensory deficits. Fundi were normal. The deep tendon reflexes were normal and plantar responses were flexor. Expressive speech and auditory comprehension were age appropriate. He showed poor scores in the Articulation test administered He was diagnosed as developmental expressive dysphasia.

SL no 15. He was the first child of a nonconsanguineous parentage. No significant antenatal, natal and postnatal history present. The child started speaking first word by 1 yr 2 months of age. Expressive speech and auditory comprehension were age appropriate. On V S M S he got a social age of 4yrs 6 months He showed poor scores in the Articulation test administered. Neurological evaluation was unremarkable. He was diagnosed as developmental articulation disorder.

SL no 16.He was the first child of a nonconsanguineous parentage. No significant antenatal, natal and postnatal history present. The child started speaking first word by 2 yr. of age. Expressive speech was restricted to five to six words. Auditory comprehension was good. On V S M S he got a social age of 3yrs 6 months. Neurological evaluation was unremarkable except for impaired graphesthesia, asteriognosis and two-point discrimination. He was diagnosed as developmental expressive dysphasia.

Table 3 Profile of Children in the Experimental group II			
SI No,	Age	Sex	Grade
1	8	M	IV
2	8	M	IV
3	5 ½	M	I
4	6	M	11
5	7	M	III
6	6	M	II
7	7	M	III
8		M	III
9	7	M	III
10	6	M	II
11	9	M	V
12	9	M	V
13	9	M	V
14	7	M	III
15	8	M	IV
16	5 ½	F	I
17	8	M	IV
18	6	M	II
19	6	M	II
20	8	M	IV
21	8	M	IV

22	8	M	IV
23	6	M	II
24	7	M	III
25	7	M	III
26	7	M	III
27	8	M	IV
28	9	M	V
29	9	M	V
30	9	M	V
31	9	M	V
32	9	M	V
33	6	M	II
34	5	M	I

All these children were attending different regular schools. Speech therapy and psychological intervention were given to these children twice a week for one hour each at the respective departments.

General features of the Experimental group observed

* Majority of the subjects were males.

* Compared to the normal children the LD children took either longer time to respond or very less time to respond.

Following information was obtained about some of the LD children from the speech pathologist and during testing.

SL No.7 Was reported to be very irregular in attending school.

SI.No.22 was very calm and cooperative. He was very slow in reading and writing.

SI.No.32 and Sl.No.33 were twin brothers. Both of them had poor reading and writing skills

SI No.5 was found to be very enthusiastic in responding to the test but blurted out answers without thinking.

CONTROL GROUP

Two control groups were taken up

One control group consisted of 16 normal children in the age range of 3-5 years matched for sex and age. Another control group consisted of 34 normal children in the range of 5-9 years matched for sex and age.

Description of testing procedure

1. As part of the assessment, details regarding the history of delayed speech and language milestones were collected from the parents of these children.

2. The speech and language proficiency of both the control and experimental groups were tested by the following tools;

1. Malayalam diagnostic articulation test (Maya 1990)
2. Malayalam Language Test (Rukmini 1994)
3. Test for reading and metaphonological skills in Malayalam (Roopa 2000)

I. MALAYALAM DIAGNOSTIC ARTICULATION TEST

All the phonemes (11 vowels and 33 consonants) of Malayalam language were

tested in the diagnostic articulation test. in Malayalam, except for six (l, l, r, n, n, and m) consonants do not occur in the word final position. Hence the consonants, except these were tested only in the initial and medial positions.

Administration :Picture cards (86) were visually presented to the subjects in order to elicit the response. Audio stimulation was given in some cases when the child was unable to respond.

Scoring:Each correct response was given a score of one and total scores for each subject was computed.

II MALAYALAM LANGUAGE TEST

This test has two parts:
Part 1 Semantics & Part II Syntax

The semantics and syntax sections had 11 subsections each. All the subsections had 5 items each, for reception and expression except semantic discrimination and lexical category. Of these two, semantic discrimination had items only for testing comprehension and lexical category had items only for testing expression. All the subsections had practice items. A description of the sub sections and the items under each are given below.

I.Semantics

Here lexical items were discriminated on the basis of their semantic traits.

1. Semantic discrimination:

The two categories tested here were colors and body parts. For example the child was shown a test plate with colors and was asked to point to the one named by the tester.

2. Naming

This involved identifying the lexicon. In case of testing comprehension the child was shown a test plate with different object pictures and was asked to point to the one named by the tester. In case of expression he was required to name the item which was shown by the tester.

3. Lexical category

A unit of vocabulary is generally referred to as a lexical item. Here the child was instructed to name as many items as possible from a given lexical category for example: animals within a specified time (one-minute)

4. Synonymy

Lexical items, which have the same meaning, are synonyms and the relationship between them is one of synonymy. Here the child was given a pair of words and was instructed to indicate if they refer to the same thing or not like Door-window. The child was expected to respond with a yes or no answer accordingly .For testing expression the child was given a word say glass and was required to come out with another word which means the same. An acceptable response would be tumbler.

5. Antonymy

A term used in semantics to refer to oppositeness of meaning. Here the child was provided with a pair of words and was asked to say if they are opposites or not. Example: Big-small. For expression the child was given a word and is asked to name another one, which is an antonym.

6. Polar Questions.

A term used for the system of positive and negative contrastivity found in a language .For testing comprehension the child was given a question and was asked to give a yes or no response. Example: Is milk black in color? When expression was

being tested the child was given a pair of words and is asked to formulate a question using those. Example: Cow-milk and the response expected was does the Cow give milk?

7. Semantic Anomaly.

These are statements that contradict facts. In this case for testing comprehension, a statement was made and the child was required to say if it is correct or wrong. Example Fire is cold. For testing expression, a wrong statement was made and the child was asked to correct it. Example: Apple is a vegetable .The expected response was Apple is a fruit.

8. Paradigmatic realtions

It is a term in linguistics for the set of relationships a linguistic unit has with other units in specific context. Here the child was shown a test plate with pictures on it and was asked to point out 4 items that belong to the same category. Example: fruits, flowers etc. In the case of expression the child was given two items and was asked to name another, which belongs to the same category.

9. Syntagmatic relations

The relationship between constituents (syntagms refers to the sequential characteristics of speech) in a construction are called syntagmatic relation. For testing comprehension the child was given two pairs of words wherein one is right and the other may be right or wrong, Example Night-Moon, Day-Sun. For expression the child was given one pair of words which is right and was given another word for which the child had to name a suitable syntagm. Example: Rabbit-Fast, Tortoise:_____.

10. .Semantic contiguity.

These are the relationship between noun and verb. Here the testing of comprehension was done by providing the child with a pair of words and asking him if they are semantically contiguent or not, that is whether there is any sort of relationship between the two. Example: Lamp-Candle. For expression the child was given another word and was asked to name a semantically contiguent pair for it.

11. Semantic similarity

This expresses the inherent relationship between the items mentioned. Here for testing comprehension a pair of words was given to the child and he was asked if the relationship was semantically acceptable or not. Example: Song-sing. For expression the child was required to come out with a semantically related pair for the stimulus provided.

II. SYNTEX

1. Morophophonemic structures

These are special quasi-phonological units. In this case the child is provided with a pair of morphophonemes and was asked to choose the correct one among the two. For expression the child was shown a picture and was asked a question so as to elicit a suitable response.

2. Plurals:

Includes more than one. The testing was done using pictures, which had singulars and plurals of the same item.

3. **Tenses:**

A category used in the grammatical description of verb referring primarily

to the way the grammar marks the time at which the action denoted by the verb

took place. Here both comprehension and expression were tested for all the 3 tenses viz., present, past and future using pictured test plates

4. Person Number and Gender(PNG)Markers:

Person: A category used in the grammatical description to indicate the nature of the participants in a situation. Usually a three-way contrast is found. First person in which the speaker refers to himself, or to a group usual!) including himself, (e.g. I, We) . Second person, in which the speaker typically refers to the person he is addressing (eg.you) and third person, in which other people or things are referred to (e.g., she, it, they) The other two are self explanatory. This was tested using picture plates which convey ideas like he is sleeping; the) are sleeping etc, for both Reception and Expression.

5. Case markers

A grammatical category used in the analysis of word classes to identify the syntactic relation between words in a sentence through such contrasts as nominative, accusative etc or a form taken by a noun, pronoun or adjective to show its relation to neighboring words. Both reception and expression were tested using test plates. Examples are mother is taking water from the bucket, he is writing with a pen.

6. Transitives, Intransitives and Cousative

A category used in the grammar analysis of clause/sentence construction with particular reference to the verb relationship to dependent elements or structure. Transitive refers to a verb, which can take a direct object. (Example: he wants a ball). Causative is a grammatical category used to refer to the causal relationship between alternative versions of a sentence. Here too the testing was done using

picture cards. Some of the samples were: Mother is sleeping; Mother is making the child sleep.

7. Sentence Types.

Refer to different sentence types as simple, declarative, interrogative etc. this case comprehension was tested using sentences belonging to these different categories and the children were instructed to respond by pointing out the appropriate picture. Example: There are flowers in the pond. For expression the children were asked to come out with sentences in different forms, according to picture as requested by the tester.

8. Conjunctions and Quantities

These are terms used to connect both the meaning and the construction of sentence elements. Here picture plates were incorporated for testing both comprehension and Expression. Example: There is a book and a pen on the table

9. Comporatives.

A term used to characterize a major branch of linguistics in which the primary concern is to make statements comparing the characteristics of two different lexical items, which are semantically related. While testing comprehension the tester asked the child to show him an item in comparison to the stimulus item. Example: The tester pointed to the picture of a house and said " Show me the house that is bigger than this." Expression was also tested in a similar manner.

10. Conditional clauses

A term used in grammatical description to refer to clauses whose semantic role is the expression of hypothesis or conditions. (Example: if. unless) Here for testing the Receptive skills, the child was shown a picture card with several pictures

(Example: animals) and was told to respond in a particular manner if the stimuli choices have a particular stimulus. Example: Clap your hands if there is an elephant's picture. For testing expression he was asked questions which require answers employing the conditional clauses. Example: When do you drink water' An expected response was when 1 am thirsty.

11. Participal constructions

A traditional grammatical term used to refer to a word derived from a \erb and used as an adjective as in "a laughing face". Testing was done using test plates and some of the examples of stimuli used were: He is eating while reading He fell down while playing.

Scoring

The responses were recorded as correct, incorrect or No response. A correct response was one, which was the expected response or acceptable response for that particular item. An incorrect response was the wrong response. A partially correct response was the one wherein the response was acceptable but not totalk correct.

Scoring was done in the following manner for all others except lexical category, paradigmatic relations, plurals and tenses.

Correct Response-1

Partially correct response-1/2

In correct response or No responsc-0

For lexical category the scoring was as follows

Naming of a single item-0

Naming of 2 or 3 items-1/2

Naming of 4 or more items-1

For paradigmatic relations-comprehension the scoring was as follows

No response or identification of 1 item-0

Identification of 2 or 3 items-1/2

Identification of 4 items-1

For plural and tenses each item had two subitems and each subitem was provided

with a score of 1/2

III. TEST FOR READING AND METAPHONOLOGICAL SKILLS IN

MALAYALAM

This test consisted of 10 subtests .The subtests and their scoring pattern are as follows:

1. Oral reading test:

The test consisted of 150 Malayalam words arranged in simple to difficult order. The children were instructed to read the words clearly and as quickly as possible when the clinician says start. The errors committed by the reader were marked on a different test sheet. The subjects were asked to stop if five consecutive mistakes were committed. Total time taken to complete the test was recorded with the help of a stopwatch.

2. Rhyme recognition

The test consisted of 12 pairs of stimuli words-six rhyming and six nonrhyming words. Each pair was presented orally and the subject is asked to tell whether they are rhyming or not

3. Phoneme Oddity

The test consisted of 12 nonsense word items. There were totally 4 groups with each group having three items. The subjects were asked to say which the odd

one was. Group one was where the odd word is interms of first consonant, group two was interms of first vowel, group three was interms of second consonant and group four interms of second vowel.

4.Phoneme Stripping/deletion

There were 32, two or three syllable words. The words were read out after removing a part of it. The subjects were asked to say the remaining word.

5. Syllable stripping/deletion

The test consisted of 15 two or three syllabled words. The first, second or the third syllable was removed and the subject was asked to tell the remaining.

6. Phoneme reversal

The test consisted of 12 words .The subject was asked to reverse the word at phoneme level.

7. .Syllable reversal

The test consisted of 12 words. The child was asked to reproduce the word in the reverse order at syllable level.

8. Writing test

The test consisted of 15 words .The subjects were asked to write down the dictated words.

9. .Shwa test

The test had two parts i. Oral ii. Writing Oral test

This test consisted of 4 items. One new alphabet which doesn't have any script was introduced to the child and then a combination of that alphabet with a known alphabet was read out to child and the task was to combine them and to pronounce it together example; js+i=jsi

Writing test

One new alphabet which does not have any script in that particular language was introduced and one particular figure is given as the substitute for that alphabet The subjects were given a combination of that particular alphabet and a known one and were asked to combine them and write it as one word.eg ts + u =tsu

Scoring

A scoring of one was given for each correct response for all the subtests except oral reading test

Scoring was done in the following manner for the oral reading test

1. Number of words read correctly in first one minute

2. Total number of correct words read

3. Total time taken to read the whole test material

STATISTICAL ANALYSIS

Using the SPSS software, one way ANOVA and post-hoc Duncan test was done to analyze the significance of difference between the control and the experimental groups. ANOVA was done to find the interaction effect between the groups with respect to disability and age. Chi square test and risk ratios were calculated to find out whether a history of delayed speech and language milestones is predictive of academic learning disabilities during school years.

Results & Discussion

The present study examined the language skills of children with learning disability and without learning disability between the age group of 3-9 years Based on the classification of Kirk 1962, children between the age group of 3-5 years were diagnosed as developmental learning disability (Specific developmental disorders of speech and language) and children between the age group of 5-9 years were diagnosed as academic learning disability. Based on DSM-1V the developmental learning disabled (Specific developmental disorders of speech and language) were categorized into

(a) Expressive language disorder

(b) Mixed receptive expressive language disorder and

(c) Developmental articulation disorder.

The results obtained on the three different tests of Malayalam diagnostic articulation test, Malayalam language test and Test for reading and metaphonological skills in Malayalam by the learning disabled children and their normal peers are given below.

One way ANOVA and post-hoc test analysis were done to find out the significance in difference between learning disabled children and their normal peers. Chi square test was done to find out the risk ratios employing history of delayed speech and language milestones as a dichotomous variable (i.e., positive or negative) inorder to predict whether a child can have academic learning disabilities during school years.

The results of the study has been presented under the following headings:

i. Developmental progression

ii Group difference

iii Predictor of Learning disability

DEVELOPMENTAL PROGRESSION

It is clear from the data that there was a developmental progression on all the tasks with age, with the performance of the older children approaching ceiling.

a. Malayalam diagnistic articualation test

It was observed that the articulation scores were directly proportional to age in that the score increased as the age advanced. ANOVA (Table 4) revealed a highly significant difference between age groups (F=214.39,P<0.000) for the Malayalam diagnostic articulation test scores. From the mean values it is clear that higher age group of 5-9 years (Mean 85.19) was found to have significantly higher scores in the Malayalam diagnostic articulation test than that of lower age group of 3-5 years (Mean 52.33). It was observed that children in the lower age range of 3-5 years among the control group had low scores i.e., 83 whereas the children in the age range of 5-9 years

Table 4 Interaction effect between tested groups and age for Malayalam diagnostic articulation test.

Croup	Age	Mean	Std Deviation	rS
Exptl	3-5	19.75	27.33	16
	5-9	85.09	1.26	34
	Total	64.18	34.32	50
Ctrl	3-5	8100	1.12	16
	5-9	86.00	1.07	34
	Total	84 52	1.54	50
Total	3-5	52.33	37.17	32
	5-9	85.09	126	68
	Total	64.18	34.32	100

Tests of Between-Subjects Effects (ANOVA)

Source	Type III Sum	df	Mean Square	F	Sig
Group	22248.219	1	22248.219	188.732	0.000
Age	25272.775	1	25272.775	214.390	0.000
Group* Age	21948.044	1	21948 044	186 186	0.000
Error	11316.705	96	117.882		
Total	620959.000	100			

obtained a score of 86.00.The children in the lower age range of 3-5 years among the learning disabled children also had low scores i.e, 19.75 compared to the children in the age range of 5-9 years who obtained a score of 85.09.

The vowels were found to have acquired by all the children in the control group by the age of 3 years. Among the consonants the first to be acquired were unaspirated stops followed by fricatives and unaspirated stops. The unaspirated stops were found to have acquired as early as 3-31/2 years, the fricatives by 31/2 -4 years and the aspirated stops as late as 6-61/2 years. By the age of 7 years, all the children in the control group were found to have acquired adult phonetic system. The children with learning disability also did not show a delay in the acquisition of the phonemes.

However the children who belonged to the group of Specific developmental disorders of Speech and language showed a drastic delay in the acquisition of the phonemes.Acquisition of vowels were better compared to consonants. The children who belonged to the expressive language disorders group showed phonemic substitutions (f as t, t as k v as b, r as I) and omission of the phonemes t, n, r, ing and skr. The children who belonged to the mixed receptive expressive group did not acquire most of the consonants except k, m, p, t. Phoneme substitutions (mb as nk,

kr as kk, s as sh, 1 as I), phoneme omission (r) and phoneme distortions (ing, skr) were found among children with developmental articulation disorders

The interaction effect between tested groups and age (Table 4) was also found to be significant (F=186.186,,P<0.000) indicating that the pattern of Malayalam diagnostic articulation test was not similar for the children within the experimental group(developmental learning disability & academic learning disability) compared to the children belonging to the control group. There was a large discrepancy in the scores obtained by the developmental learning disabled children compared to the normally achieving children (3-5years age group) which supports the findings in literature that developmental learning disabled children show a lot of misarticulations (Scarborough 1990). There was no difference in the scores obtained by the academic learning disabled children compared to the normally achieving children (5-9 years age group).

6. Malayalam language test

ANOVA (Table 5) revealed that a highly significant difference existed among the different age groups for the scores obtained on the different subsections of the Malayalam language test also (semantic reception (F=85.144; P<0.000), semantic expression (F=168.1: p<0.000), syntactic reception (F=41.231, P<0.000) and syntactic expression (F=141.823. p<0.OOO)}.

Table5 Interaction effect between tested groups and age MLT

Semantic reception of MLT.

Group	Age	Mean	Std Deviation	N
Exptl	3-5	25.56	16.00	16
	5-9	41.21	4.04	34
	Total	36.20	11.99	50
Ctrl	3-5	37.35	441	16
	5-9	50.33	3.24	34
	Total	45.92	730	50

Total	3-5	31.64	12.96	32
	5-9	45.70	5.86	68
	Total	41.06	11.02	100

Tests of Between-Subjects Effects(ANOVA)

Source	Type III Sum	df	Mean Square	F	Sig
Group	2416.937	1	2416.937	45.471	0.000
Age	4525.674	1	4525.674	85.144	0.000
Group*.Age	39.171	1	39.171	0.737	0.000
Error	5102.712	96	53.153		
Total	180610.00	100			

Semantic expression of M L T .

Group	Age	Mean	Std Deviation	N
Exptl	3-5	7.75	10.85	16
	5-9	24.06	3.70	34
	Total	18.84	10.21	50
Ctrl	3-5	26.29	5.91	16
	5-9	43.15	4.65	34
	Total	37.42	9.52	50
Total	3-5	17.30	12.70	32
	5-9	33.46	10.48	68
	Total	28.13	13.55	100

Tests of Between-Subjects Effects(ANOVA)

Source	Type III Sum	df	Mean Square	F	Sig
Group	7824.473	1	7824.473	216.554	0.000
Age	6076.052	1	6076.052	168.163	0.000
Group*Age	1.662	1	1.662	0.046	0.000
Error	3468.654	96	36.132		
Total	97311.000	100			

Syntax reception

Croup	Age	Mean	Std Deviation	N
Exptl	3-5	26.19	16.03	16
	5-9	37.62	5.86	34
	Total	18.84	10.21	50
Ctrl	3-5	42.76	4.28	16
	5-9	51.91	2.26	34
	Total	48.80	5.33	50
Total	3-5	34.73	14.16	32
	5-9	44.66	8.45	68
	Total	41.38	11.59	100

Tests of Between-Subjects Effects(ANOVA)

Source	Type III Sum	df	Mean Square	F	Sig
Group	5263.380	1	5263.380	92.811	0.000
Age	2338.242	1	2338.242	41.231	0.000
Group*.Age	28.860	1	28.860	0.509	0.477
Error	5444.253	96	56.711		
Total	184540.00	100			

Syntax expression

Group	Age	Mean	Std Deviation	N
Exptl	3-5	4.31	6.25	16
	5-9	23.74	7.06	34
	Total	17.52	11.37	50
Ctrl	3-5	29.35	5.80	16
	5-9	44.55	7.31	34
	Total	39.38	9.94	50
Total	3-5	17.21	14.02	32
	5-9	33.99	12.68	68
	Total	28.45	15.28	100

Tests of Between-Subjects Effects(ANOVA)

Source	Type HI Sum	df	Mean Square	1	Sig
Group	11612.335	1	11612.335	248 829	0.000
Age	6618.596	1	6618.596	141.823	0.000
Group*Age	98.848	1	98.848	2.1 18	0.477
Error	4480.119	96	46.668		
Total	104061.00	100			

From the mean values it is clear that higher age group of 5-9 years is Found to have significantly higher scores than that of lower age group {for semantic reception 45.70 as compared to 31.64, for semantic expression 33.46 as compared to 17.30, for syntactic reception 44.66 as compared to 34.73 and for syntactic expression 33.99 as compared to 17.21}.

However, the interaction effect between groups and age groups for the

Malayalam language test (Table 5) indicated that there was no significant difference in the scoring by the children within the experimental group (developmental learning disability & academic learning disability) compared to the children belonging to the control group. {F=0.737,p=0.393 for semantic reception, F=0.046,P=0.837 for semantic expression, F=0.509,f=0.477 for syntax reception and F=2.188, P=0.149 for syntax expression}. The results indicated that the pattern of scoring across the age is similar for the children belonging to the experimental group (developmental learning disability & academic learning disability) compared to the control group(normally achieving group),but there is a lag in the development of the skills by the children in the experimental group(developmental learning disability & academic learning disability) compared to the control group(normally achieving children between the 3-5 yrs age group & 5-9 yrs age group.) The subsections of semantic discrimination, naming and lexical category were relatively easier for the children and had performed better compared to the other subsections of the semantic section In the syntax section, the subsections of comparatives and conditional clauses were found to be relatively easier.

From the above results it may be inferred that, while phonological problems are important at the earlier stages of literacy acquisition, by the time the children are 9 years of age, the semantics and syntax play a greater role than the phonology. The result is consistent with the findings of Larrivee and Catts (1999) which suggests that the language impairment, rather than the speech sound disorders per se, may be primarily responsible for later emerging academic deficits.

Developmental effects were evident on all measures of the test for reading and metaphonological skills in Malayalam also (Table 6). Between age groups a

significant difference existed (F=271.55,P <0.000). From the mean values it is clear that higher age group of 5-9 years (Mean 155.24) were found to have significantly higher scores in the Test for reading and metaphonological skills in Malayalam than that of lower age group (Mean 16.64). The interaction effect between groups and age groups is also found to be significant (F=40.266,P<0.000) indicating that the pattern of scoring for the Test for reading and metaphonological skills in Malayalam was not similar for the children within the experimental group (developmental learning disability & academic learning disability) compared to the children belonging to the control group.

Table 6 The interaction effect between tested groups and age Test for reading and metaphonological skills in Malayalam

Group	Age	Mean	Std Deviation	N
Exptl	3-5	4.75	7.33	16
	5-9	90.79	39.18	34
	Total	63.26	51.91	50
Ctrl	3-5	27.82	59.55	16
	5-9	221.64	37.38	34
	Total	155.74	103.31	50
Total	3-5	16.64	43.99	32
	5-9	155.24	76.09	68
	Total	109.50	93.68	100

Tests of **Between-Subjects Effects-ANOVA**

Source	Type III Sum	df	Mean Square	F	Sig
Group	130856.635	1	130856.635	82.138	0.000
Age	432615.104	1	432615.104	271.550	0.000
Group*Age	64152.694	1	64152.694	40.268	0.477
Error	152940.666	96	1593.132		
Total	2067792.00	100			

There was a large discrepancy in the scores obtained by the academic learning disabled children compared to the normally achieving children whereas the

discrepancy in the scores obtained by the developmental learning disabled children and normally achieving children was less.

The findings also indicate that performance varied greatly across different tasks. The younger age group normally achieving children responded only to the sub sections of Oral reading, rhyme recognition, phoneme oddity and writing test. The overall performance of the higher age group children was better, although in complex tasks like phoneme oddity, phoneme stripping and schwa test, hundred percent performance was not obtained even by the 9 year old normally achieving children. There was an increase in scores seen in the normally achieving children by the age of 5-6 years for all the subtests other than phoneme-related tasks and schwa test. The subtest of syllable stripping was found to be the easiest followed by rhyme recognition in both the learning disabled children and the normally achieving children. This is in agreement with the studies of Prakash (1989) and Karanth and Prakash (1996) which state that syllable stripping is the earliest indicator for a nonalphabetic reader. In the syllable-stripping task, it was observed that the initial syllable was the easiest followed by final syllable and the medial being the most difficult. This is in agreement with Goswami's (1991) who attributeted this to the difficulty in perceiving the intra syllabic differences.

The subtest of phoneme reversal was found to be the most difficult followed by phoneme stripping and schwa test for both the normally achieving children and children with learning disability. Even the 9 year old normally achieving children scored "0" on the task of phoneme reversal. Children tended to reverse the syllables instead of phonemes. Eventhough phoneme stripping was found to be difficult compared to syllable stripping, children found stripping of the"anuswara"(bangi as bagi.....akalam as akala

.....),"clusters" (pakshi as paki.....)and "hallandas"(pakal as paki,.....vaathil as vaathi.....mayil as mayi.....) to be easier than the regular phonemes. This may be because of the fact that these special phonemes enjoy independent graphemic status in Malayalam.This is in contrast to the observation made by Perfetti, Beck, Bell and Hughes (1988) that consonant blends such as (nt} resist segmentation into phoneme constituents. There was a difficulty noticed in stripping regular phonemes which donot have independent graphemes which suggests that inspite of having the knowledge about orthographic principles, children consider syllable as one composite unit.

For both normal children and LD children the syllable tests were easier than the phoneme tests which is in support of Liberman's (1980) statement that segmentation of words into syllables is easier than words into phonemes. Eventhough the phoneme tasks were found to be difficult for the children, among the higher age group children there is an increase in the scores on phoneme oddity and phoneme stripping indicating development of phoneme awareness at a later stage of reading. This result is in agreement with the study of Prema (1997) and the statement of Liberman and Mann (1981) that phoneme awareness develops with maturation.

GROUP DIFFERENCES

a. Malayalam diagnostic ariculation test

One way ANOVA and post-hoc Duncan test (Table 7) were done.One way ANOVA revealed that there is a highly significant difference ($F=4804.35: p<0.000$)

between the children with developmental learning disability (specific developmental disorders of speech and language) and the normally achieving children for the Malayalam diagnostic articulation test scoring.

Table 7Showing the results obtained using One way ANOVA and post-hoc Duncan test (Malayalam diagnostic articulation test)

Express	Devtal	Mixed	LD	Normal	Normal	F	Significance
	3-5 years		5-9 yrs	3-5 yrs	5-9 yrs		
		Mean Scores					
7	65	2.6	85.09	83	86.00	4804.35	0.000

Note: Post hoc Duncan test results are denoted using the letters a.b,c,d,e.Mean values with same letters are not significantly different from each other

Express= Expressive language disorder, Devtal= Developmental articulation disorder

Mixed= Mixed receptive expressive language disorder, LD=academic learning disability

The children with developmental learning disability performed significantly lower than the normally achieving children whereas the scores obtained by the academic learning disabled children were in par with the scores obtained by the normally achieving children in the Malayalam diagnostic articulation test.

All the different sub types of the developmental learning disability group(Specific developmental disorders of speech and language) fared badly in the Malayalam diagnostic articulation test.The scores obtained by the developmental articulation disorders group(mean=65) was better than the group with Expressive language disorder (mean=7)and Mixed receptive expressive language disorder(mean =2.6). The above results are in support of the studies by Aram and Nation (1980), Where they found that most children with Specific language impairment have phonological difficulties.

The post -hoc Duncan test (denoted using the letters a, b, c, d, e in the Table no.7) revealed that the mixed receptive expressive group (denoted using the letter

a), expressive group (denoted using the letter b) and the developmental articulation group (denoted using the letter c) differed significantly from each other and also with the learning disabled children, normally achieving children between the age group of 3-5 years and 5*9 years (denoted using the letter d). The learning disabled children, normally achieving children between the age group of 3-5 years and 5-9 years (denoted using the letter d) scored almost equally.The scores obtained by the children with academic learning disability (85.09) were in par with the scores obtained by the normally achieving peers (85.30).The learning disabled children between the age group of 5-9 years did not show any articulation problems . whether these children had shown articulation/phonological disorders in the earlier age is a matter of research interest however.The speculation of Johnson and Morasky (1980) and Wren (1983) as to the unusually high prevalence of articulation disorders expected among individuals with learning disability gained weak support in the present study.

From the analysis it is clear that articulatory errors were found in all the 16 children with Specific developmental disorders of Speech and Language.Consonantal errors were more compared to the errors made in vowels. The errors in vowels were in terms of distortion of the front unrounded vowel "i"and back rounded vowel "o". Consonant omissions were noticed while producing blends by both the expressive dysphasic group and the developmental articulation disorders groupeg. P for pr ,b for br.k for ks.t for tr.

Table 8.The type of errors shown by the DLD's arc as follows

Type of disorder	Type of errors	
Expressive Dysphasia	Phoneme substitution*	f as t, t as k, v as b, r asl
	Phoneme Omission**	t,r,n, ing,skr
Mixed Receptive Expressive dysphasia	No response was obtained for most of the sounds tested	
Developmental Articulation Disorder	Phoneme substitution	- mb as nk, kr as kk ,s as sh,t as 1
	Phoneme Omission	r
	Phoneme distortion	ing,skr

*Phonemic substitution = use of one phoneme/sound instead of the correct one
**Phonemic distortion=
use of one phoneme/sound which is not the intended one but similar to the intended one
***Phonemic omission = absence of a particular phoneme /sound in the production.

The children who belonged to the expressive language disorder group showed phonemic substitutions (f as t,t as k v as b,r as I) and omission of the phonemes t ,n , r, ing and skr.The children who belonged to the mixed receptive expressive group did not give any response to most of the phonemes tested other than k,m,p,t..Phoneme substitutions (mb as nk, kr as kk, s as sh, I as I), phoneme omission (r) and phoneme distortions (ing,skr) were found among children with developmental articulation disorders.

b.Malayalam language test

Semantics

One way Anova and post-hoc Duncan test were done. (Table 9).One way ANOVA revealed that the children with learning disability (both developmental and

academic learning disability) performed significantly poorer than the normal!) achieving children on measures of both semantic reception (F=141.70:P<0.0000) and semantic expression (F=165.2 P<0.000) tasks. However, there were variations in the scores obtained among the different types of learning disability.Among the subtypes of developmental learning disability(3-5 years) the scores obtained by the developmental articulation disorder group(mean=40) and the expressive dysphasic children(mean =31.13) were comparable with the normally achieving children(41.21) for the sub sections of semantic reception.

Table 9.Showing the results obtained using One way ANOVA and post-hoc Duncan test- Malayalam Language test.

Sub test	Express	Devtal 3-5 years	Mixed	LD 5-9 yrs	Normal 3-5 vrs	Normal 5-9 yrs	F	Significance
SR1	7.38	8.00	0	9 12	8.29	9.85	147.8I	0 000
SR2	5.00	5.00	0	4.91	5.00	5.00	652.77	0.000
SR3	0.50	2.00	0	3.09	2.00	3.82	46.98	0.000
SR4	0.00	0.00	0	0.74	0.18	3.18	42.449	0.000
SR5	3.13	5.00	0	4.38	4.06	4.91	83.433	0.000
SR6	3.38	4.00	0	3.38	3.59	4.79	42.39	0.000
SR7	3.00	4.00	0	3.94	3.00	4.82	55.51	0.000
SR8	3.13	4.00	0	4.47	3.76	4.85	75.86	0.000
SR9	2.75	4.00	0	3.47	3.35	4.21	62.98	0.000
SR10	2.88	4.00	0	3.71	4.12	4.91	64.56	0.000
Total semantic reception								
TotSR	31.13	40	0	41.21	37.35	50.33	141.70	0.00

Semantic Expression

Sub test	Express	Devtal 3-5 years	Mixed	LD 5-9 yrs	Normal 3-5 yrs	Normal 5-9 yrs	F	Significance
		Mean Scores						
SE1	0.00	4.75	0	4.85	5.00	5.00	965.08	0.000
SH2	1.00	5.00	0	4.71	4.35	4.94	127.52	0.000
SE3	0.00	0.00	0	0.94	0.59	3.48	42.46	0.000
SE4	0.00	0.00	0	0.47	0.24	3.36	34.92	0.000
SE5	0.00	0.00	0	0.00	0.18	2.58	20.77	0.000
SE6	0.38	3.00	0	0.85	3.00	4.82	153.79	0.000
SE7	0.63	1.75	0	3.76	3.06	4.85	106.96	0.000

SE8	0.38	3.75	0	3.88	3.65	4.91	117.623	0.000
SE9	0.13	4.00	0	2.29	3.12	4.30	61.327	0.000
SE10	0.50	2.75	0	2.29	3.12	4.91	86.821	0.000
Total semantic expression								
TotSE	3.00	25	0	24.06	26.29	43.15	165.2	0.000

Note: Post hoc Duncan test results are denoted using the letters a,b,c,d,e. Mean values with same letters are not significantly different from each other

Note: Post hoc Duncan test results are denoted using the letters a,b,c,d,e. Mean values with same letters are not significantly different from each other'

But for the subsection of semantic expression the expressive dysphasic children also scored poorer(score=3) compared to their normally achieving peers(score=26.29).

The children with academic learning disability (5-9 years) obtained poorer scores than their normally achieving peers on the measures of semantic reception 41.21 as compared to 50.33) and semantic expression (24.06 as compared to 43.15) Noteworthy is the fact that the scores obtained by them were in the same range as that obtained by the normally achieving children of 3-5 years of age. (37.35 for semantic reception & 26.29 for semantic expression). This finding supports the previous finding that semantic development is impaired in learning disabled children.(Haynes , Moran & Pindzola. .1990). The subsections of semantic discrimination, naming and lexical category were relatively easier for the children and had performed better compared to the other subsections

The post -hoc Duncan test (denoted using the letters a, b, c, d, e in the Table no.9) revealed that the mixed receptive expressive group (denoted using the letter a) and expressive group (denoted using the letter b) differed significantly from each other and also with the and the developmental articulation group, learning disabled chiildren, normally achieving children between the age group of 3-5 years and 5-9 years (denoted using the letter c). The developmental articulation group, learning disabled children, normally achieving children between the age group of 3-5 years

and 5-9 years(denoted using the letter c) scored almost equally for the semantic reception of the M L T .

For the semantic expression section of M L T , the mixed receptive expressive group(denoted using the letter a) , expressive group(denoted using the letter b) , normally achieving children between the age group of 5 9 years differed significantly from each other and also with the developmental articulation group ,learning disabled children ,normally achieving children between the age group of 3-5 years(denoted using the letter c). The developmental articulation disorders group ,learning disabled children , and normally achieving children between the age group of 3-5 years(denoted using the letter c). scored almost equally for the semantic expression of the M L T .

Syntax

One way Anova (Table 10)revealed that the children with learning disability (both developmental and academic) performed significantly poorer than the normally achieving children for both syntax reception (F=122.432:p<0.000) and syntax expression (F=89.312) However, there were variations in the scores obtained among the different types of learning disability. Among the subtypes of developmental learning disability (3-9 years), the scores obtained by the developmental articulation disorder group (mcan=36.5) and the expressive dysphasic children (mean =34.13) were comparable with the normally achieving children (42.76) for the sub sections of syntax reception.

Table 10.Showing the results obtained using One way ANOVA and post-hoc Duncan test -Malayalam Language test-Syntax Section

Syntax Reception

Sub test	Express	Devtal 3-5 years	Mixed	LD 5-9 yrs	Normal 3-5 yrs	Normal 5-9 yrs	F	Significance
			Mean Scores					
SYR1	0.00	0.00	0	2.32	0.41	3.36	46.654	0.000
SYR2	2.88	1.5	0	2.79	3.12	4.82	63.816	0.000
SYR3	1.63	2.75	0	2.74	2.88	4.52	30.246	0.000
SYR4	3.5	3.75	0	2.76	3.65	4.55	38.410	0.000
SYR5	3.88	4.5	0	2.91	5.00	5.00	84.385	0.000
SYR6	3.25	4.5	0	3.53	4.41	4 .73	51.238	0.000
SYR7	4.25	4.5	0	3.65	4.41	4.97	57.156	0.000
SYR8	3.88	4.00	0	4.32	4.53	4.97	97.887	0.000
SYR9	3.75	3.75	0	4.09	5.00	5.00	102.445	0.000
SYR10	2.25	3.25	0	5.00	4.35	5.00	270.077	0.000
SYR11	3.88	4.00	0	3.50	5.00	5.00	168.764	0.000
Total syntax reception								
TotSYR	34.13	36.5	0	37.62	42.76	51.91	122.432	0.000

SyntaxExpression

Sub test	Express	Devtal 3-5 years	Mixed	LD 5-9 yrs	Normal 3-5 yrs	Normal 5-9 yrs	F	Significance
SYE1	0.13	3.00	0	2.82	3.94	4.79	52.296	0.000
SYE2	0.25	0.75	0	3.12	2.00	4.79	63.185	0.000
SYE3	0.25	1.00	0	1.71	1.94	4.06	62.696	0.000
SYE4	0.13	1.25	0	1.88	3.35	4.79	134.858	0.000
SYE5	0.25	1.5	0	2.5	4.35	4.79	113.71	0.000
SYE6	0.25	2.00	0	2.18	3.00	3.79	37.639	0.000
SYE7	0.25	1.25	0	2.06	1.41	2.91	29.147	0.000
SYE8	0.00	0.75	0	1.62	2.35	2.94	38.076	0.000
SYE9	0.13	0.75	0	2.32	3.53	3.27	35.121	0.000
SYE1O	0.25	1.25	0	2.56	0.94	4.S2	93.445	0.000
SYE11	0.00	0.00	0	0.97	5.00	3.6	3.905	0.003
Total syntax expression								
TotSYR	1.88	13.50	0	23.74	29.35	44.55	89.312	0.000

But for the subsection of syntax expression the expressive dysphasic children (score=1.88) and the children with developmental articulation disorders

(13.50) also scored poorer compared to their normally achieving peers (score=26.35).

The children with academic learning disability (5-9 years) obtained poorer scores than their normally achieving peers on the measures of syntax reception (37.62 as compared to 51.91) and syntax expression (23.74 as compared to 44.55). Noteworthy is the fact that the scores obtained by them were lower than the scores obtained by the normally achieving children of 3-5 years of age. (37.62 as compared to 42.76 for syntax reception &23.74 as compared to 29.35 for syntax expression).This is in support of the finding that learning disabled children have difficulty with comprehension and production of complex syntactic structures (Wiig & Semel 1984). In the syntax section, the subsections of comparatives and conditional clauses were found to be relatively easier.

The post -hoc Duncan test (denoted using the letters a,b,c,d,e in the Table no.9) revealed that the mixed receptive expressive group(denoted using the letter a) ,normally achieving children between the age group of 3-5 years(denoted using the letter c) and 5-9 years(denoted using the letter d) differed significantly from each other and also with expressive group,the developmental articulation group and the learning disabled(denoted using the letter b). The expressive group,the developmental articulation group and the learning disabled(denoted using the letter b)scored almost equally for the syntax reception of the M L T .

For the syntactic reception section of M L T , the mixed receptive expressive group(denoted using the letter a) , expressive group(denoted using the letter b) . developmental articulation disorders group (denoted using the letter e) nomially achieving children between the age group of 5 -9 years (denoted using the letter e) differed significantly from each other and also with the learning disabled children

,normally achieving children between the age group of 3-5 years(denoted using the letter d). The learning disabled children ,normally achieving children between the age group of 3-5 years(denoted using the letter d) scored almost equally for the syntactic reception of the MLT.

In general the results obtained on the Malayalam language test indicate that there is a considerable lag in the development of both semantics and syntax in the learning disabled children(both developmental & academic) compared to the normally achieving children. This finding is consistent with other studies that have suggested that children with dyslexia perform more poorly than the normally achieving children on the tasks of semantics and syntax. (Me Doughall. Hulme. Ellis & Monk 1994; Nittrouer 1999;Siegel & Ryan 1988;Ehri & Wilce 1983;Fletcher, Satz & Scholes 1981;Siegel & Faux 1989). Noteworthy is the fact that the performance of learning disabled children (between the age group of 5-9 years) were almost equal or even below the performance of the normally achieving children between the age group of 3-5 years in many of the skills measured which supports the discrepancy definition of Learning Disability. (Ohlson, 1978: Rudel. 1980).

Among the developmental learning disabled group, the scores obtained by the expressive dysphasic children were comparable to that of the age matched control group for the sub sections of semantic reception and syntax reception. The group with developmental articulation disorders also obtained scores, which were comparable to that of the age matched control group for all the sub sections of MLT.However the mixed expressive receptive dysphasic group performed poorly in all the subsections of MLT.

The semantic and syntactic comprehension ability was found to be better than the expression ability in both the learning disabled children and the normally achieving children. In the semantic section the subsections of semantic discrimination, naming and lexical category were relatively easier for the children and had performed better compared to the other subsections .In the syntax section,the subsections of comparatives and conditional clauses were found to be relatively easier.

c.Test for reading and metaphonological skills in Malayalam

As shown in the table 11, One way ANOVA revealed a highly significant difference (F=88.533;p<0.000) between the children with learning disability (academic learning disability) and the normally achieving children in the scoring of the Test for reading and metaphonological skills in Malayalam.The academic learning disabled children performed significantly poorer than the normally achieving peers.

Table 11. Showing the results obtained using One way ANOVA and post-hoc Duncan test (Test for reading and metaphonological skills in Malayalam.)

Sub test	Express	Devtal 3-5 years	Mixed	LD 5-9 yrs	Normal 3-5 yrs	Normal 5-9 yrs	F	Significance
MPT1	0.00	1.5	0	12.56	3.35	29.73	22.99	0.000
MPT2	0.00	8.25	0	54.33	14.41	133.61	99.12	0.000
MPT3	1.13	4.75	0	5.59	5.88	10.52	87.50	0.000
MPT4	0.00	0.00	0	3.4	0.59	6.97	24.94	0.000
MPT5	0.00	0.00	0	0.00	0.18	2.67	37.79	0.000
MPT6	0.00	0.00	0	6.12	0.88	15	263.89	0.000
MPT7	0.00	0.00	0	0.00	0.00	0.00	-	0.000
MPT8	0.00	0.00	0	3.82	0.71	11.18	147.	0.000
MPT9	0.00	2.25	0	6.06	1.82	10.91	86.38	0.000
MPT 10	0.00	0.00	0	0.32	0.00	0.48	1.46	0.20
MPT 11	0.00	0.00	0	0.15	0.00	0.5	3.23	0.10
Total M P T								
TotMPT	1.13	16.75	0	90.79	27.82	221.64	88.533	0.000

Note: : Post hoc Duncan test results are denoted using the letters a,b,c,d,e.Mean values with same letters are not significantly different from each other.

The post -hoc Duncan test (denoted using the letters a,b,c,d,e in the Table no. 11) revealed that the developmental articulation disoders group(denoted using the letter b) , the learning disabled group (denoted using the letter d), normally achieving children between the age group of 3-5 years(denoted using the letter c) and 5-9 years (denoted using the letter e)differed significantly from each other and also with expressive group(denoted using the letter a) and mixed receptive expressive group(denoted using the letter a) in terms of their scores obtained on the Test for reading and metaphonological skills in Malayalam.The expressive dysphasic group and mixed receptive expressive dysphasic group(denoted using the letter a) scored almost equally . The normally achieving children between the age group of 5-9 years (denoted using the letter e) scored the maximum.

On comparison with the normally achieving children it was found that the children with learning disability (academic learning disability) scored poor in all the subsections of the test for reading and metaphonological skills in Malayalam. This finding is consistent with other studies that have suggested that children with dyslexia perform more poorly than the normally achieving children on the tasks of phonological awareness, (Frith 1981,Torgensen 1985) . The significantly poorer scores obtained by the learning disabled children on the test of metaphonological skills(Table 15) and almost equal scores as compared to the normal peers on the articulation test (Table 10)suggests that the knowledge of the phonological constraints or rules of the language spoken(phonological awareness) is important for acquisition of academic skills and not the ability to articulate phonemes.

There was a difference noticed across the different tasks interms of their discriminating ability between LD (academic) and normally achieving children.

From table 15. it is clear that the subtest of schwa (writing) showed maximum discrepancy in the scores between the between LD and normally achieving children which revealsaq that LD children have a deficit in blending two sounds. The other two tasks which showed a large discrepancy in the scores between LD and normally achieving children were writing to dictation followed by syllable stripping task.

The developmental learning disabled (3-5 yrs) children and their normal peers (3-5 yrs) did not show much discrepancy in their scores compared to the academic learning disabled children, since the scores obtained by the normally achieving children also on many of the tasks were either zero or very poor . This is because the normally achieving chidren also were found to acquire these skills only by the age of 5-6 yrs and hence had poor scores at the age of 3-5 yrs. This is in agreement with the study of Dinesh (2001) where he compared the metaphonological skills of LD children with that of normally achieving children between the age of 5 to 15 years.

In general the study shows that LD children differ from the normal children in terms of their language skills.The issue now is the individual differences in which of the skills is most crucial for the variance in reading ability.Stanovich (1985) argue that individual differences in phonological processing skills can explain the variance in reading ability to a large extent.Another view explains it interms of the poor reader's inferior semantic or syntactic skills (Katz 1986; Mann, Shankweiler and Smith 1985)The results of the present study shows that children identified as having specific difficulty in acquiring literacy ,despite adequate learning experiences, were shown to perform more poorly than age matched controls on tasks tapping syntactic and semantic skills as well as metaphonological

skills and hence suggests that it is not a question of only one aspect of language being associated with learning disability ,all the three linguistic aspects are implicated.

QUALITATIVE ANALYSIS

There were important qualitative differences noticed between the learning disabled children and their normally achieving peers.During the testing it was difficult to convey the instructions to the LD children.

For the Malayalam language test ,the learning disabled children tended to respond in single words or phrases that were inappropriate or inadequately marked for syntax.Examples for the responses obtained from the LD children are given below.

1.Comparatives (expression): The response "This is good" was given instead of the correct response "This is big/ small/ bigger/smaller." To the question "How is this?''

2.Conditional clauses (expression): The response "In the morning/evening" instead of the correct response "When I am thirsty/When the power goes off" to the questions "When do you drink water? / When do you light a candle?"

3.Participal constructions (expression) The response "He is playing while falling down " instead of the correct response "He fell down while playing" was given by many LD children.

4.Conjunctives (expression): The response "There is a book, there is a pen " instead of the correct response "There is a book and a pen on the table" was given by many LD children to the question "What are all there on the table?"

The LD children's performance was poor on certain tasks of auditory verbal comprehension involving syntactic markers of causatives.For example,there was confusion shown by many children between the following:

"Child is sleeping/eating" and 'Mother/father is making the child sleep/eat"

There were many qualitative differences noticed between the learning disabled children and their normally achieving peers in the response given to the test of reading and metaphonological skills in Malayalam also. The rate of reading was very less in the L D children compared to the normally achieving children. The reading errors noticed were as follows:

1. Difficulty in reading words with other than CV/ VC syllable structure.

2. Confusion in the use of vowels in terms of

a. Substitution of one vowel instead of another

eeNu instead ofeeNi (ladder)

uNNu instead of uNNi (baby)

b. Use of long vowel instead of short vowel

aaRa instead ofaRa (measuring vessel)

aala instead of ala (wave)

iila instead of ila (leaf)

c. Use of short vowel instead of long vowel.

Pava instead of paava (doll)

paDam instead of paaDam (field)

paniyam instead of paaniyam(liquid)

3.Insertion of vowels in between clusters.

Patharam instead of pathram (news paper)

deyivam instead of daivam(god)

sandhiya instead of sandhya(night)

4.Omission of middle syllables.

makam instead of maarakam(dangerous)

5.Confusion between unaspirated, voiced phonemes and aspirated voicelessphonemes.

ghanam instead of kanam (heavy)

nakham instead ofnakham (nail)

6.Cluster reduction.

Pashi instead of pakshi (bird)

7.Confusion between voiced and voiceless consonants.

buthi instead of budhi(intelligence)

8. There was a very interesting observation made in the reading of a 6 year old LD child who would change the short vowel infront of a geminate (cluster) into a long vowel and the reduction of the geminate (cluster) into a single phoneme.

chuTTa instead of chuuTa (dried coconut leaf)

kuTTa instead of kuuTa (nest)

The writing skills trailed the reading skills in performance.Some of the writing errors noticed were as follows:

1 .Substitution of "nda" for "nta" was noticed. This may be because the two alphabets (letters) sound the same in spoken form but take on different forms in writing.

2. Substitution of visually similar alphabets.

Chibanam instead of chihnam (symbol)

Uunta instead of uuNa (meals)

3.There was a very interesting orthographic error noticed in the writing of a 9 year old LD child who would split the geminate (cluster) into two and translocate the initial vowel in between the geminate (cluster).

Predictor of Learning disability

Chi square test was employed to determine if the percentage of children with a history of delayed speech and language milestones were predictive of academic learning disability.As shown in the Table 12 ten children with academic learning disability (29.4%) had a history of delayed speech and language whereas only one child in the control group(normally achieving children) (2.9%) had a history of delayed speech and language milestones.

Table 12.Showing the results obtained using Chi square test (Risk ratios calculated employing history of delayed speech and language milestones as a dichotomous variable (ie positive or negative)

HISTORY*GROUP Cross tabulation

			GROUP		
			LD	**Normal**	**Total**
HISTORY	0.00*	Count	24	33	57
		%	70.6%	97.1%	83.8%
	1.00 **	Count	10	1	11
		%	29.4%,	2.9%	16.2%,
Total		Count	34	34a	68
		%	100%	100%	100%

a. X2 =6.941 p=.008 hsig (Note: 0.00*=No history of delayed speech and language milestones. 1.00** =History of delayed speech and language milestones present.)

Risk Estimate

		95%Confidence interval	
	Value	lower	upper
OddsRatio* For History** 0.00/1.00	.073	.009	.607
For cohort Group(LD)	.463	.324	.662

(Note:. Odds ratio*** represent the increased risk of a child to have a learning disability with an additional child affected by delayed speech and language milestones. The risk ratio is the risk of a child with a history of delayed speech and language milestones to have a learning disability compared to a child with no history of delayed speech and language milestones.LD=academic learning disability)

Hence it may be inferred that history of delayed speech and language milestones predicted later academic learning disability.

Risk ratios were calculated employing history of delayed speech and language milestones as a dichotomous variable (ie positive or negative) In this

analysis , it was found that the risk ratio of a child with a history delayed speech and language milestones to have an academic learning disability,compared to a child with no history of delayed speech and language milestones was statistically significant(0.463)and hence showed an association between history of delayed speech and language milestones and academic learning disability at school age. The results of this study arc consistent with previous findings showing that school age children with histories of preschool speech and language disorders are at risk for later learning disabilities. (Aram & Hall, 1989; Bishop & Adams 1990;Catts 1991: 1993;Larrivee & Catts, 1999) and strongly suggests that there is continuity from early development of language skills and phonological awareness skills to learning to read and write later in the school years.

CONCLUSIONS AND IMPLICATION

The results of the study suggest that there is a significant difference in the speech and language skills of children with specific developmental disorders of speech and language(developmental learning disability) and learning disability (academic learning disability) with that of normal children measured using the Malayalam language test and Test for metaphonological skills and reading in Malayalam.. It is apparent from this study done on L.D. children that the deficit in \erbal language is reflected in the reading and writing skills indicating an exact relationship between the language disorders and the reading disorders. This study demonstrates that children with a preschool language disorder constitute a high risk group for subsequent academic difficulties since most academic subjects are based on language concepts.

The findings of this study have several clinical implications. First. Children with preschool language impairments should be followed carefully into

elementary school as they are at risk for school age language impairment and learning disability. It also suggests the need for developing screening devices for identifying children at risk for early reading problems. The findings are also of interest to those who are concerned with the remediation of learning disabilities.

There is also a critical need to evaluate the effects of learning disabilities across the life span (longitudinal study) since they will need professional assistance e\en during their adolescent ages.

Summary and conclusions

The child who does not meet the expectations for academic performance in school but has intelligence in the normal range has been a subject of research for many years. Though there are many social, economic or medical reasons that prevent a child from being educated, an important stumbling block is Learning Disability.

The cause of learning disability has been debated over years. Earlier it was thought to be a deficit in visual memory. Later the scientists focused on structural/ functional brain damage and cerebral dominance. But in recent year. more stress is given to linguistic and cognitive basis. "While approximately 80% of children develop phonological awareness (use of phonological information i.e.. the sounds of one's language in processing written and oral language) without much difficulty, the remaining 20% are confused by the system" (Lyon. 1995). Many researchers have suggested that problems in establishing complete phonological representations in long-term memory may be an underlying cause of developmental reading difficulties (Katz 1986; de Gelder &Vroomen 1991).

A growing body of empirical evidence now supports observations that young children with overt as well as subtle speech and language problems are at risk for later learning disabilities. Various studies carried out have shown a co-existence of problems in verbal as well as reading and written language. It is essential for a speech language pathologist to know the relationship between the two, so that an early identification and remediation can be carried out.

Despite the growing body of literature on L.D. there haven't been many such studies in India. The study was planned with the following objectives:

1. To compare the speech and language skills of children with specific developmental disorders of speech and language (developmental learning disability- based on the classification of Kirk 1962) with that of normal children.

2. To compare the speech and language skills of children with learning disability (academic learning disability-based on the classification of Kirk 1962) with that of normal children.

3. To compare the speech and language skills of children with specific developmental disorders of speech and language language (developmental learning disability) with that of children with Learning Disability disability (academic learning disability).

4. To find out whether the children with specific developmental disorders of speech and language (developmental learning disability)are prospective candidates for learning disability(academic learning disability).

SUBJECTS

To achieve the above goals, study was conducted on 4 groups of subjects -two experimental groups and two control groups.The subjects selected were all Malayalam mother tongue speakers. (Malayalam is a Dravidian language spoken mainly in the state of Kerala)

EXPERIMENTAL GROUP

Two experimental groups were taken up.

The first experimental group consisted of 16 children between the age group of 3-5 years diagnosed as Specific developmental disorders of speech and language (developmental learning disability).

The second experimental group consisted of 34 children between the age group of 5-9 years diagnosed as Learning disability (academic learning disability).

DSM-IV (given in appendix) was used for the purpose of diagnosis. All the children who participated in the study were right handed with normal hearing thresholds in both ears and had a full scale IQ of 90 or greater and were from middle and upper class families.

CONTROL GROUP

Two control groups were taken up

One control group consisted of 16 normal children in the age range of 3-5 years matched for sex and age. Another control group consisted of 34 normal children in the range of 5-9 years matched for sex and age.

Testing procedure and Analysis

1. As part of the assessment, details regarding the history of delayed speech and language milestones were collected from the parents of these children.

2. The following tools tested the speech and language proficiency of both the control and experimental groups;

1. Malayalam diagnostic articulation test (Maya 1990)

2. Malayalam Language Test (Rukmini 1994)

3. Test for reading and metaphonological skills in Malayalam (Roopa 2000)

Using the SPSS software, one way ANOVA and post-hoc Duncan test were done to analyze the significance of difference between the control and the experimental groups. Two way ANOVA was done to find the interaction effect between the groups with respect to disability and age.

Chi square test was done to find out the risk ratios employing history of delayed speech and language milestones as a dichotomous variable(i.e, positive or negative

) inorder to predict whether a child can have academic learning disabilities during school years.

The results of the study suggest that there is a significant difference in the speech and language skills of children with specific developmental disorders of speech and language(developmental learning disability) and learning disability (academic learning disability) with that of normal children measured using the Malayalam language test and Test for metaphonological skills and reading in Malayalam.. It is apparent from this study done on L.D. children that the deficit in verbal language is reflected in the reading and writing skills indicating an exact relationship between the language disorders and the reading disorders. This study demonstrates that children with a preschool language disorder constitute a high risk group for subsequent academic difficulties since most academic subjects are based on language concepts.

The findings of this study has several clinical implications. First, Children with preschool language impairments should be followed carefully into elementary school as they are at risk for school age language impairment and learning disability. It further suggests the need for developing screening devices for identifying children at risk for early reading problems. The findings are also of interest to those who are concerned with the remediation of learning disabilities.

There is also a critical need to evaluate the effects of learning disabilities across the life span (longitudinal study) since they will need professional assistance e\en during their adolescent ages.

References

Aaron, P.G. (1989). Dyalexia and hyperlexia. Diagnosis and minagement of developmental reading disabilities. Norwell, MA: Kluwer Academic Publishers.

Ackerman, P.T., Dykman, R.A., & Gardner, M.Y. (1990). Counting rate, naming rate, phonological sensitivity, and memory span: Major factors in dyslexia. Journal of Learning Disabilities 23, 325-327.

Adams, M.J. (1991). Beginning to reas: learing and thinking about print. Cambridge, M.A: MIT Press.

Adelman, H.S. (1989) Towards solving the problems of misidentification and limited intervention efficacy. Journal of Learning Westman, 22, 609-612.

Adler, M. (1977). In the Nature of Learning, Westman, J.C. Hadbook of Learning Disabilities: A multi sensory Approach. Pg. 299. Boston: Allyn and Bacon.

Alamback (1995) Cited in Hirsh, K.. Jansky, J.J. & Langford. W.S. (1966). Predicting rreading failure. New York: Harper and Row publishers.

Ames, L.B. (1978) is your Child in the Wrong Grand?. Lumberville. PA: Modem Learning Press.

Andersen, V.A. (1953). Cited in Hirsh, K., Jansky, J.J. & Langford. W.S. (1966). Predicting reading failure. New York: Harper and Row publishers.

Angela, J.F., & Roderick, I.N. (1995) Persistence of phonological awareness deficits in older children with dyslexia. Reading and Writing: An interdisciolinary journal. Vol l, No. 4. 361-376.

Aram, D., Ekelman, B and Nation, J. (1984). Preschoolers with language disorders: 10 years later. Jouranl of Speech and Hearing Research, 27, 232-244.

Aram, B.M., & Hall, N.C. (1989).Longitudinal follow-up of children with preschool communication disorders: Treatment implications. School Psychology

Review, 18(4), 487-501.

Aram, D., and Nation, J (1980). Pre-school language disorders and subsequent language and academic difficulties Jouranl of Speech and Hearing

Research, 13,159-170.

Association for children and adults with learning disabilities (1963). In Historical Perspectives and Emerging Direction. Lemer, J. (Ed.). Learning Disabilities - Theories, Diagnosis and Teaching strategies. Boston: Houghton Mifflin Company.

Baddeley, A. (1982). Reading and working memory. Bullentin of the British Psychological Society; 35, 414-417.

Baddeley, A. (1992).Is working memory working? The Fifteenth Bartlett Lecture, The Quarterly Journal of Experimental Psychology. 44A:1-31

Badian, N.A. (1994).Preschool prediction: Orthographic and Phonological skills and reading. Annals of Dyslexia, 44, 3-25.

Ball, E.W., & Blachman, B.A. (1991) Does phoneme segmentation training in kindergarten make a difference in early word recognition and developmental spelling? Reading Research Quartely, 26, 49-66.

Bardian,N.,Duffy,F. & Mc Anulty,F., (1970).Cited in Catts,H.W.(1997).The early identification of language based reading disabilities.Jounal og Language, Speech and Hearing Services in School,28,86-89.

Bateman, B., (1964) Learning disabilities-Yesterday, today and tomorrow. Exceptional Children; 31,167-177.

Beitchman, J.H., Hood, J., & Inglis, A. (1990) Psychiatric risk in children with speech and language disorders. Journal of Abnormal Child Psychology 18,283-296.

Begley, S. (1994). Why Johnny and Joanie can't read. Newsweek. New York: Newsweek Inc.

Berlin, I.N. (1981) Psychotherapy with M B D Children and Their Parents. In Ochroch, R. (Ed.), The Diagnosis and Treatment of Minimal Brain Dysfunction in Children; A Clinical Approach. New York: Human Sciences Press.

Berthoud - Papandropoulou, J. (1978). An experimental study on children's ideas about language. In: A. Sinclair, R.J.Jaivclla & W.J.M, Levelt (Eds). The Child's Consception of language. New York: Springer Verlag.55-64.

Bender, W., and Smith, J. (1990). Classroom behavior of children and adolescents with learning disabilities. Journal of Learing Disabilities, 23. 298-305.

Bernstein, D., and Tiegerman, E. (1955). In students with Learning Disabilities. Taylor, R.L., Stemberg, L., and Richards, S.B. (Ed.). Exceptional Children - Integrating Research and Teachong. San Diego: Singular Publishing Group, Inc.

Berlin (1887) cited by Westman J.C., Handbook of learning disabilities. A multi system Approach, Allyn and Bacon, A division of Simon and Schuster, Inc.

Berlin, I.N. (1977) Some Lessons Learned in 25 Years of Mental Health Consultation to Schools. In Plog, S.C. and Ahmed. P.I. (Eds.), Principal and Teaching of Mental Health Consultaion. New York: Plenum.

Bernstein, N.R. & Menolascino, F.J. (1970) Apparent and Relative Mental Retardation; Their Challenges to Psychiatric Treatment. In Menolascino, F.J. (Ed.),

Psychiatric Approaches to Mental Retardation. New York: Basic Books.

Bishop, D.V.M., & Adams, C. (1990). A prospective study of the relationship between specific language impairment, phonological disorders, and reading retardation. Journal of Child Psychology and Psychiary . 31.1027-1057.

Blachman, B.A. (1994). Early literacy acquisition: The role of phonological awareness. In G.P. Wallach & K G . Butler (Eds.), Language learing disabilities in school-age children and adolescents: some principal and applications. 253-274. New York: Macmillan.

Blalock, J. (1981). In students with Learning disabilities. Taylor. R.L.. Stemberg L. and Richards, S.B (Ed.). Exceptional Children - Integrating Reseach and Teaching. San Diego; Singular Publishing Group, Inc.

Boder, E. (1976). In students with learning disabilities. Taylor, R.L., Stemberg L. and Richards, S.B (Ed.). Exceptional Children Integrating Research ang Teachong. San Diego: Singular Publishing Group, Inc.

Boldgett & Cooper (1987) cited in Hirsh, K., Jansky, J.J. & Langford. and W.S. (1966). Predicting reading failure. New York: Harper and Row publishers.

Braddeley. (1982). In Developmental reading disabilities: A Language based treatment approach. Goldsworthy C.L. (1996). San Diego: Singular Publishing Group, Inc.

Bradley, L., & Bryant, P.E. (1983). Categorizing sounds and learning to read- a causal connection, Nature 301:419-421.

Bradley, L., & Bryant, P. (1985). Rhyme and reason in reading and spelling. Ann Arbor, MI: Ann Arbor Press.

Brady, S.A. (1991). The role of working memory in reading disability. In S.A. Brady, & D. P. Shankweiler (Eds.), phonological processes in literacy; A

tribute to Isabelle Y. Liberman. 129-152. Hillsdale, NJ: Lawrence Erlbaum.

Brady, S.A & Shankweiler, D.P. (Eds.). (1991/ Phonological processes in literacy. Hillsdale, NJ: Erlbaum.

Brady, S., Shankweiler, D, and Mann.V. (1983). Speech perception and memory coding in relation to reading ability. Journal of Exceptional Child Psychology.35, 345-367. (Eds.). (1991

Bristow, P.S. (1985). Are poor readers passive readers? Some evidence, possible explanations, and potential solutions. The Reading Teacher, 39,318-325.

Brody, L.E. & Mills, C.J. (1997) Gifted children with learning disabilities: A review of the issues. Journal of Learning Disabilities. (282-296)

Bruck, M. (1990). Word recognition skills of adults with childhood diagnoses of dyslexia, Develpmental Psychology 26:439-454.

Bruner, J.S., (1975). The antegenesis of speech acts, Journal of learning disability: 2,1-19.

Bryant, P., Bradley, L., Crossland, J. & Maclean, M. (1989). Nursery rhymes, phonological skills and reading. Journal of Chuld landuage, 16(2), 407-428.

Bryant, P. E. & Goswami, U. (1987). Cited in Goswami, U.Recent works on reading and spelling development. In M.Snowling, & M.Thomas, (1991). (Eds). Dyslexia, Intergrating theory and practice. (108-121). London & Ne Jersey: Whurr Publishers Ltd.

Burd L. 1992. "Tourette Syndrome and learning disabilities", Journal of Learning Disabilities, 25, 598-604.

Byrne, B., and Shea, P. (1979). Semantic and phonetic memory in beginning readers. Memory and Congnition .7,333-338.

California Department of Education. (1994). I can learn: A handbook for parents, teacher, and students. Sacramento: California Department of Education.

Cantwell, D., and Baker, L. (1991). Association between Attention Deficit - Hyperactivity Disorder and Learning Disorder. Journal of Learning Disabilities, 24, 598,604

Catts, H.W. (1989). Phonological processing deficits and reading disabilities. In A.G. Kamhi & H.W. Cans, (Eds.), Reading disabilities: A developmental language perspective .101-132. Boston, M A : College-Hill Press.

Catts, H.W. (1989). Defining dyslexia as a developmental language disorder. Annals of Dyslexia, 39,50-64.

Catts, H.W. (1993). The relationship between speech-language impairments and reading disabilities. Journal of Speech and Hearing Research , 36,948-958.

Catts, H.W. (1996). Defining dyslexia as a developmental language disorder: An expanded view. Topics in Language Disorders 16,14-29.

Catts, H.W. (1991). Speech production deficits in developmental dyslexia. Journal of Speech and Hearing Disorders, 54,422-428.

Chaney, C. (1992). Language development, metalinguistic skills, and print awareness in 3 year old children. Applied Psycholinguistics.13,485-514.

Chappel, G. (1985). Description and assessment of language disabilities of junior high school students. In C.Simon (ED.), Communication skills and classroom success .207-242.Eau Claire, W l : Thinking Publications.

Clark, D.B. (1988). Dyslexia. theory and practice of remedial instruction. Parkton, M D : York Press.

Clark-Klein, S.M. (1994) Expressive phonological deficiencies: Impact on spelling development. Topics in Language Disorders, 14(2), 40-55.

Clements, S. (1966). In Historical Perspectives and Emerging Direction. Lemer, J. (Ed./ Learing Disabilities - thories Diagnosis and Teaching Strategies. Boston: Houghton Mifflin company.

Cohen, N., Davine, M., Horodezky, N., Lipsett, L., & Issacson, L. (1992) Unsuspected language impairment in psychiatrically disturbed children: Pre\alence and language and behavioral characteristics. Journal of American Acodemy of child and Adolescent Psychiatry, 32,595-603.

Coles, G. (1987). The Learning mystique. New York: Pantheon Books.

Cotman, C.W., & Lynch, G.F. (1988). The neurobiology of learning and memory. In J.F. Kavanagh & T.J. Truss (Eds.), Learning disabilities Proceedings of the national conference. 1-69. Parkton, MD: York Press.

Crook W. 1983; "Let's look at what they eat". Academic therapy 629-631.

Cruickshank, W.M, Bentzen, F.A, Ratzeburg, F.H and Tannhauser, M.T.. (1961) A traching method for brain injured and hyperactive children. Syracuse. NY; Syracuse University Press

Cruickshank, W.M. (1979) Learning Disabilities; A Definitional Statement. In Polak, E. (Ed.) Issues and Initiatives in Learning Disabilities. Ottawa, Cananda; from the First National Conference on Learning Disabilities. Ottawa, Canada: Canadian Association for Children with Learning Disabilities.

Cullinan, D., Epstein, M., and Lloyd, J. (1981). School behavior problems of learning disabled and normal girls and boys. Learning disability Quarterly, 4, 163-169.

Cunningham, A. (1990). Explicit versus implicit instruction in phonemic awareness. journal of Experimental Child Psychology.50, 429-444.

De Fries J., R. Plomin. And M.La Buda. 1987. "Genetic stability of

cognitive development from childhood to adulthood". Developmental Psychology. 23,4-12.

de Gelder, B.,& Vroomen,J.(1991).In Elbro,C.(1996).Early linguistic abilities and reading development. A review and a hypothesis, Reading and writing: An interdisci[linary journal. Vol.8, No.6. 453-485.

de Hirsch, K. (1968). Clinical spectrum of reading disabilities: Diagnosis and treatment. Bulletin of the New York Acodemy of Medicine , Second Series. 44, 470-477.

Denckla, M B . (1979). Childhood learning disabilities. In K.M.Heilman & E.Valenstein (Eds), Clinical neuropsychology.535-537). New York: Oxford University Press.

Denckla, M B . and Rudel, R.G. (1976). Naming objects by dyslexic and other learning disabled children. Brain and language, 3, 1-15.

Denckla, M.B. and Rudel. R.G. & Broman. M. (1981). Tests ihai discriminate between dyslexic and other learning disabled boys. Brain and Language, 13,118-129.

De Villers, P.A., & DE Villiers, J.G. (1972). Early judgement of semantic and syntactic acceptability by children. Journal Psycholingnistic Research1(4). 294-310.

Diagnostic and Statistical Manual of Mental disorders. -IIIrd Eds Revised (DSM-III R) . (1987) Washington, DC ; American Psychiatric Association.

Diagnostic and Statistical Manual of Mental disorders. - IV th Eds (DSM-IV). (1994) Washington, DC ; American Psychiatric Association.

Dinesh.K(2002); Metaphonological dissertation submitted to the University of Disabled . Unpublished Dissertation submitted to the University of

Mangalore, Mangalore.

Dishler, D.D., Schumaker, J.B., and Lenz, B. (1984). In Reading. Lerner, J. (Ed). Learning Disabilities - Theories Diagnosis and Teaching Strategies. Boston: Houghton Mifflin Company.

Donahue, M. (1984). Learning disabled children's conversational competence: An attempt to activate the inactive listener, Applied Psychoinguistics. 5,21-35.

Donahue, M. (1986). Cited in Kamhi. A.G. and Catts, H.W. (1989). Reading disabilities. pp 35-66. Boston: Allyn and Bacon.

Donahue, M., Pearl, R., & Bryant, T. (1980). Learning disabled children's conversational competence: Response to inadequate message, Applied Psycholinguistics, 1,387-403.

Downing, J. & Oliver, P (1974). The child's concept of a word. Reading

Research, 9, 568-582.

Dykman, R., and Ackerman, P. (1991). Attention Deficit Disorder and Learning Disability: Separate but often overlapping disorders. Journal of Learning Disabilities, 24, 96-103.

Dykman, R.A., Ackerman, P.T., & Oglesby, D.IV1. (1979). Selective and sustained attention in hyperactive, learning-disabled, and normal boys. journal Nervous and Metal Disease, 167,288-297.

Ebaugh, F.G. (1923). Neuropsychiatric sequelae of acute epidemic encephalitis in Children.American Journal of Diseases of Children.25 :89-97.

Education for all Handicapped Children Act (1975). In Learning Disabilities - Field in Transition. Lerner, J. (Ed). Learning Disabilities - Theories Diagnosis and Teaching Strategies. Boston: Houghton Mifflin Company.

Ehri, L.C. (1978). Cited in Lombardino, L.J., Morris, D., Mvcado, L., De Fillipo, F., Sanisky, C, &-Montgomery. (1999). The early reading screening instrument: A method for identifying kindergartners at risk for learning to read. International Journal of Language and Communication Disorders, 34(2), 135-150.

Ehri, L.C & Wilce L.S. (1983) Development of word identification speed in skilled and less skilled beginning readers, Journal of Educational Psychology 75: 3-18.

Elbro, C. (1996). Early linguistic abilities and reading development: A review and a hypothesis about distinctness of phonological representations. Reading and Writing, 8,453-485.

Elbro, C, Borstrom, I., & Petersen, D,K. (1998) Predicting dyslexia from kindergarten. The importance of distinctness of phonological representations of lexical items, Reading research quarterly, 33,36-60.

Feagans L., (1983) Discourse process in learning disabled children. In J D. Mc Kinney & L. Feagans (Eds) Current topics in learning disabilities 87-118.

Felsenfeld, & Me Gue, M., & Broen, PA. (1995) Familial aggregation of phonological disorders: Results from a 28-year follow up. Journal of Speech and

Hearing Research, 38,1091-1107.

Femald, G. (1943). In History. Boder, L.A. Reading Diagnosis and Remediation in classroom and clinic. New York: Mac Millen Publishing Co. Inc.

Fletcher, J.M., Satz, P. & Scholes, R.J. (1981) Developmental changes in the linguistic performance correlates of reading achievement, Brain & Language.13: 78-90.

Franklin, R., and Rykman, D. (1984). In students with Learning Disabilities. Taylor, R.L., Sternberg, L., and Richard, S.B. (Ed.). Exceptional

Children - Integrating Research and Teaching. San Diego: Singular Publishing Group, Inc.

Frith, U. (1981) Experimental approaches to developmental dyslexia-an introduction, Psychological Research, 43,97-109.

Frith.U. (1985). Beneath the surface of developmental dyslexia. In E.Patterson, J.C.Marshall, & M.Coltheart (Eds). Surface Dyslexia (pp30l-330). London: Lawrence Erlbaum.

Fowler, A.E and Scarbauargh, H.S (1993). Should reading-disabled adults be distinguished from other adults seeking literacy instruction? A review of theory and research. Philadelphia, PA: National Center on Literacy, Technical report TR93-97.

Fox, B. & Routh, D.K. (1976). Phonemic analysis and synthesis as word attack skills, Journal of Educational Psychology 68:70-74.

Galaburda, A.M. (1987). Quoted in update, Preview Issue, Chevy Chase, MD: National Institute of Dyslexia.

Galaburda, A.M. (1991). Anatomy of dyslexia; Argument against phrenology. In D.D. Duane & D.B. Gray. (Eds). The reading brain: The biological basis of dyslexia. 119-131. Parkton, MD: York Press.

Galaburda, A., & Livingstone, M. (1993). Evidence for a magnocellular defect in developmental dyslexia. In P. Tallal, A.M. Galaburda, R.R. Llinas, & C.von Euler (Eds.), Annals of the New York Academy of Sciences, Vol.682. Temporal information processing in the nervous system: Special reference to syslexia and dysphasia. 70-82. New York: The New York Academy of Sciences.

Gall, J. Cited by Torgesen, J.K. Learning Disabilities: Historical and conceptual Issues. In Wong, B.Y.L. (Ed). Learning about learnong disabled. New York: Academic Press, Inc.

Gardner, R.A. (1979). The objective diagnosis of minimal brain dysfunction. Cresskill, NJ: Creative Therapeutics.

George, N. (2001) Language skills of Malayalam speaking Learning Disabled children. Unpublished Dissertation submitted to the University of Mangalore, Mangalore.

Gerber, A. (1993) Language related disabilities Baltimore: Brookes.

Gerber, A., & Bryen, D. (1981) Language and learning disabilities. Baltimore: University Park Press.

Geshwind, N; (1965). Cited in Wolf, M., Bowers, P.G., Biddle, K (2000). j Naming speed processer timing and reading. A conceptual review. Journal of Learning Disbilities., 33(4),387-407.

Geshwind, N; (1982) Why Orton was right. Annals of Dyslexia, 32; 13-30.

Gibbs, D.P. & Cooper E.B. (1989) Prevalence of communication disorders in students with learning disabilities. Journal of Learning Disabilities .22: 60-63.

Goldstein, K. (1954) The Brain Injured Child. In Michael - Smith. H. (Ed), Periatric Problems in Clinical Practice. New York: Grune & Stratton.

Goody, W. & Reinhold, M. (1961) Congenital Dyslexia and Asymmetry of Cerebral Function, Brain 84; 231-242.

Goswami, U. (1991). Learning about spelling sequences: The role of onsets and rimes in analogies in reading. Child development, 62,1110-1123.

Goswami, U. & Bryant, P. (1990). Phonological skills and learning to read. Hove, UK: Lawrence Erlbaum.

Graham, S., and Harris K (1988). Research and instruction in written language: Internatioal of the special issue - exceptional children 54,495-496.

Green, J.V. (1988). In Historical Perspeciives and Emerging Direction. Lerner, J. (Ed.)., Learning Disabilities - Theories. Diagnosis and Teaching Strategies. Boston: Houghton Mifflin Company.

Guthrie, J. (1973); Semantics, In Wren (Ed.) Language L.D., Rockville. Aspen.

Hall, P.k. & Tomblin, J.B. (1978) A follow up study of children with articulationa and language disorder. Journal of Speech and Hearing Disorders, 43,227-241.

Hallahan, D., Kauffman, J., and Lloyd, J. (1985). In students with Learning Disabilities. Taylor, R.L., Stemberg, L., and Richards, SB. (Ed)., Exceptional Children - Integrating Research and Teaching. San Diego: Singular Publishing Group, Inc.

Hamill, D. (1990). Cited by Torgesen, J.K. Learning Disabilities: Historical and Conceptual Issues. In Wong, B.Y.L. (Ed).. Learning about learning disabled. New York: Academic Press, Inc.

Hammill, D. D. Leigh, J.E., McNutt. G., & Larsen, S.C. (1981) A New Definition of Learning Disabilities. Learning Disabilities Quarterly 4:336-342.

Hammill, D.D.& Bartel, N. (1978) Teaching Children with Learning and Behavior Problems, Boston; Allyn & Bacon.

Haray, W. (1962). Cited in Hirsh, K., Jansky, J.J.& Langford, W.S. (1966). Predicting reading failure. NewYork: Harper and Row publishers.

Hahng & Batman (1969) cited by Westman Jack, Handbook of learning disabilities. A multi system Approach, Wisonsin Allyn and Bacon, A division of Simon and Schuster, Inc.

Haynes, W., Moran, J., & Pindzola, R. (1990) Communication disorders in classroom. Dubuque, IA: Kendall/Hunt.

Hier (1978) cited by Katz, J., & Wilde, L., Auditory Processing Disorders. Katz, J (Ed), (1994); Handbook of clinical Audilolgy. USA: William Wilkins.

Hinshelwood J. (1985) cited by Westman J.C, Handbook of learning disabilities. A multi system Approach, Wisonsin Allyn and Bacon, A division of Simon and Schuster, Inc.

Hohman, L.B. (1922) Postencephalitic Behaviour Disorders in Children. Johns Hopkins Hospital Bulletin 33; 372-375.

Hollingworth L.S. (1923) special Talents and Defect. New York: Macmillan.Honghton Mifflin Company Boston, Dallas Geneva, HI Palo Alto Princeton; N.J.

Howling, P., Rutter M. (1987). 'The consequences of languages delay for other aspects of development, Nos. 101 / 102. London; Mac Keith press with

Hutchens, T.A. (1989,July). Automatized processing in learning disabled adults: RAN, RAS, and reading. Paper presented at the 12th European Conference of the International Neuropsychological Society. Antwerp, Belgium.

Idol - Maestas, L. (1980); Oral language responses of children with reading difficulties. Journal of Special Education 1, 335-404.

Itard, J.M.C. (1962) The Wild Boy of Aveyron (translated by George & Muriel Humphrey). New York: Appleton-Century-Crofts.

Johnson, S.W. (1965) cited in Hirsh, K., Jansky, J.J. & Langford, W.S. (1966). Predicting reading failure. New York: Harper and Row publishers.

Johnson, S W & Morasky, R.L (1980) Learning Disabilities (Ed 2) Boston: Allyn & Bacon., 190. Keogh, B.K Major-Kingsley, S.M., Omori Gordon, J., &

Reid, H.P (1982) A system of marker variables for the field of learning disabilities. Syracuse University Press.

Jorm, A.F. (1983). Specific reading retardation and working memory: A review. British Journal of Psychology, 74,311 -342.

Kahn, E., &Cohen, L.H. (1934) Organic Driveness: A Brain-stem syndrome and an experience. New England Journal of Medicine.210: 748-756.

Karanth, P. (1980). A comparative analysis of aphasic and schizophrebic lauguage. Doctoral thesis, University of Mysore, India.

Karanth, P. (1984). Inter-relationship of linguistic deviance and social deviance-ICSSR Young Social Scientist's Fellowship Report.Mysore, CIIL.

Karanth and Prakash (unpublished)"A developmental investigation of onset, progress and stages in the acquisition of literacy. Project funded by NCERT, India.

Karanth, P., & Suchitra, M.G. (1993). Literacy acquisition and grammatically judgements in children. In R.Scholes & B.Willis (Eds), Literacy: Linguistic and cognitive perspectives. London: Lawrence Erlbaum Associates.

Karmiloff - Smith, A.L. (1986). From metaprocesses to conscious access; Evidence from children's metalinguistic and reparai data. Codnition, 23, 95-147.

Kasehube, D.V. (1972). Dyslexia: A language disorder. Anthropological Linguistics, 14, 339-356.

Katz, R. (1986). Phonological deficits in children with reading disability. Evidence from an object-naming task. Cognition, 22,225-257.

Kavale, K., & Fomess. S.R. (1995) What definition of learning disability say and don't say: A critical analysis, Learning disabilities.33 (3), 239-256.

Keller, W.D. (1992). Auditory processing disorder or attention deficit disorder? In J. Katz, N.A. Steeker, & D. Henderson (Eds.), Central Auditory

Processing: A transdisciplinary view (pp. 107414) St. Louis, MO: Mosby-Year Book.

Kemper (1984) cited by Katz J., & Wilde, L., Auditory Processing Disorders Katz, J. (Ed), (1994): Handbook of Clinical Audiology. USA: William & Wilkins.

Keogh, B (1977). Early identification, selective perception and perceptive selection, Academic Therapy, 12, 267-274.

Kinsboume, M.., Rufo. D.T., Gamzu, E. Palmer, R.L., & Berliner, A.K. (1991). Neuropsychological deficits in adults with dyslexia. DevelopMental Medicine and Child neurology. 33, 763-775.

Kinsboume, M. & Warrington, E.K. (1964) Disorders of Spelling. Joural of Neurology and Psychiatry 27:224-228.

Kirk, S.A., (1962) Educating exceptional chilren (1st Ed) Boston: Houghton Miflin.

Kirk, S. (1963). Behavoioral diagnosis and remediation of learning disabilities. In proceedings of the conference on the exploration into the problems of the Perceptually Handicapped Child. Evanston, IL: Fund for the Perceptually Handicapped Child.

Kirk, S.A. (1987). The learning-disabled preschool child. Teaching Exceptioanal Children, 19(2), 78-80.

Kirk, S. McCarthy, J & Kirk, W. (1968) Illinois test of Psycholinguistic Abilities, University of Illinois Press Urbana, USA.

Kirk, S.A. & Chalfant, J.C. (1984) Academic and Developmental Learning Disabilities. Denver, CO: Cove Publishing Company. A practical ontroduction to

techniques in specialized eduction.

Kirk, S.A. & Kirk, W.D. (1983) On Defining Learning Disabilities. Journal of Learning Disabilities 16:20-21.

Knafle, J.D. (1973). Auditory perception of rhyming in kindergarten children, Journal of Speech and Hearing Research. 16: 482-487.

Knafle, J.D. (1974). Children's discrimination of rhyme, Journal of Speech and Hearing Research .17:367-372.

Kops, C. (1985). Planning and organising skills of poor school achievers. Jiournal of Learning Disabilities, 18,8-14.

Korhonen, T.T. (1991). Neuropsychological stability and prognosis of subgroups of children with learning disabilities. Jiournal of Learning Disabilities, 24,48-57.

Kozminsky, L., & Kozminsky, E., (1995). The effects of early phonological awareness training on reading success. Learning and Instruction, 5,187-201.

Kronick, D. (1981) Social Development of Learning Disabled Persons. San Francisco; Jossey-Bass.

Kussmanl (1877) cited by Westman Jack C, Handbook of learning disabilities. A multi system Approach, Wisconsin Allyn and Bacon, A division of Simon and Schuster, Inc.

Lapadat, J. (1991). Pragmatic language skills of students with language and for learning disabilities: A quantitative synthesis. Journal of Learning Disabilities, 24, 147-158.

Larrivee, L.S., & Catts, H.W. (1999). Early reading achievement in children with expressive phonological disorders, American Journal of Speech Languade Pathology,8,ll8-l28.

Larson.V. and McKinley, N. (1987). Communication assessment and

intervention strategies for adolescents. Eau Claire, Wl: Thinking Publications.

Lerner, J. (1985) Learning Disabilities: Theories. Diagnosis and Teaching Strategies (2nd ed.). Boston: Houghton Mifflin Company. A useful introductory text to the learning disabilities field.

Lerner, J. (1993). In students with Learning Disabilities. Taylor, R.L., Stemberg, L., and Richards, S.B. (Ed.). Exceptional Publishing - Integrating Research and Yeachong. San Diego: Singular Publishing Group, Inc.

Lewis, B.A., O' Donnell, B., Free bairn, L.A., & Taylor, H.G. (1998). Spoken language and written expression-interplay of delays. American Journal of Speech - Language Pathology, 7,77-84.

Lewkowicz, N.K. (1980). Cited in Wagner, R.K & Torgesen, J.K. (1987). The nature of phonological processing and its causal role in the acquisition of reading skills. Psychological Bulletin, 101(2), 192-212.

Liberman, I.Y. (1983). A language-oriented view of reading and its disabilities. In H.R. Myklebust (Ed.), Progress in learning disabilities (Vol. 5, pp. 81-101). New York: Grune & Stratton.

Liberman, I.Y., Shankweiler, D., & Liberman A.M. (1989). The alphabetic principle and learning to read. In Shankweiler & l.Y.Libermann (Eds), Phonology and reading disability: Solving the reading puzzle (pp. 1-33). IARLD monographs no.6. Ann Arbor: University of Michigan Press.

Liberman I.Y., Liberman, A.M., Mattingly, I.G., & Shankweiler, D. (1980). Orthogrophy and the beginning reader. In J.F.Kavanagh & R. Venezky (Eds), Orthography, reading and dyslexia (pp. 137-153). Baltimore, MD: University Park Press.

Liberman, L, & Shankweiler, D. (1991). Phonology and beginning reading:

A tutorial. In: L.Rieben & C.A.Perfetti (Eds), Learning of read: Basic Research and its implication (pp.3-17). Hillsdale, NJ: Erlbaum.

Liberman, I., Shankweiler, D., Fisher, F. & Carter, B. (1974). Explicit syllable and phonemic segmentation in the young child. Jiournal of Experimental Child Psychology. 18, 201 -212.

Lubs, H. Duara, R., Levin, B., Jallad, B., Lubs, M. L., Rabin, M., Kushch, A., & Gross Glenn, K. (1991). Dyslexia subtypes: Genetics, behavior, and brain imaging. In D.D. Duane & D.B. Gray (Eds.), The reading brain: The biological basis of dyslexia (pp. 89-118), Parkton, MD: York Press.

Lundberg, I. (1987). Phonological awareness facilitates reading and spelling acquisition. In W.Ellis (Ed), Intimacy with louguage (pp.56-63). Baltimore, MD: Orton Dyslexia Society.

Lundberg, I., Frost, J., & Peterson, O.P. (1988) Effects of an extensive program for stimulating phonological awareness in preschool children. Reading Research Quaeterly 23,263-284.

Lundberg, I., Olofson, A., & Wall, S. (1980) Reading and spelling skills in the first school years predicted from phonological awareness skills in kindergarten. Scandinavian Journal of Psychology, 21,159-173.

Lyon, G.R. (1983) Learning - Disabled Readers; Identification of Subgroups. In Myklebust, H.R. (Ed.), Progress in Learning Disabilities. Volume V. New York: Grune & Straton.

Lyon, G.R. (1995). Toward a definition of Dyslexia, 45,3-27.

Lyon, G.R. (1996) Learning Disabilities. Future child, 6(1), 54-76.

Lyytinen, P, Poikkeus, A; Laakso, M; Eklund, K; Lyytinen, H (2001) Language development and symbolic play in children with and with out familial

risk for dyslexia. Journal of Speech, Language & Hearing Research. vol 44,873-885.

MacLachlan, B.C., & Chapman, R.S. (1988). Communication breakdowns in normal and language learning -disabled children's conversation and narration. Jiournal of Speech and Hearing Disorders, 53,2-7.

MacLean, M., Bryant, P. & Bradley, L (1987). Rhymes, nursery rhymes and reading in early childhood, Merril Palmer Quarterly 33:255-281.

Magnusson, E., & Naucler, K. (1990). Reading and spelling in language disordered children-linguistic and metalinguistic prerequisites, report on a longitudinal study. clinical Linguistics and Phonetics, 4(1), 49-61.

Magnusson, E., & Naucler, K. (1990). Can preschool data predict language disordered children's reading and spelling at school? Folia Phoniatrica, 42,277-282.

Majstereck, D.J., & Ellenwood.A.E. (1995). Phonological awareness and beginning reading: Evaluation of a school based screening procedure. Jiournal of Learning Disabilities (7), 449-456.

Male, M. (1988). In Historical Perspectives and Emerging Direction. Lerner. J. (Ed.)., Learning Disabilities - theories Diagnosis and Teaching Strategies. Boston: Houghton Mifflin Company.

Mann, V.A. (1984). Longitudinal prediction and prevention of early reading difficulty. Annals of Dyslexia .34, 117-136.

Mann, V.A. (1986); The contribution of difficulties with language processing and psychological sophistication to early reading difficulties. In J.K.. Torgeen and B.Y. Wong (Eds). Learning Disabilities. Some new perspective. Academic Press, New York.

Mann, V.A. (1991). Language problems: A key to early reading problems. Learning about Learning Disabilities. Academic Press. 129-162.

Mann, V.A. & Liberman, I.Y. (1984) Phonological awareness and verbal short-term memory: Can they presage early reading success? Jiournal of Learning Disabilities 17,592-598.

Mann, V.A.., Shankweiler, D.,. & Liberman, l.Y. (1980) Children's memory for sentences and word strings in relation to reading ability. Memory and Cognition.8,329-335.

Mann, V.A.., Shankweiler, D., and Smith, S.T. (1985) The association between comprehension of spoken sentences and early reading ability: The role of phonetic representation. Jiournal of Child Language. 11,627-643

Mann, V.A, Cowin, E., and Schoeheimer, J. (1989). Phonological processing, language comprehension and reading ability. Journal of Learning Disabilities. 22, 76-89.

Maria, K., & MacGinitie, W.H. (1982). Reading comprehension disabilities: Knowledge structures and non-accomodating text processing strategies. Annals of Dyslexia, 32, 33-59.

Marsh, G.E., Gearhart and Gearhart. (1978). In Brown, F.R. III., Ayleward, E.H., and Keogh, B.K. (Ed)., Diagnosis and Management of Learning Disabilities - An interdisciplinary lifespan approoch. California: Singular Publishing Group.

Mathinos, D A. (1988). Communicative competence of children with: learning disabilities. Jiournal of Learning Disabilities, 21,437-443.

Mattingly, I.G. (1972) Reading, the linguistic process and linguistic awareness. In J.Kavanagh & I. Mattingly (Eds), language by ear and eye (pp. 133-147). Cambridge, M A : M I T Press.

Maya. S. (1989), Malayalam Ariticulation test: An unpublished Masters Dissertation, University of Mysore.

Mc Dougall, S., Hulme, C, Ellis, A., &Monk, A. (1994). Learning to read: The role of short term memory and phonological skills. Journal of Experimental Child Psychology, 58,112-133.

McGrady, H.J (1967) Language pathology and learning disabilities. In H. Myklebust (Ed), Progress in learning disabilities; 1:215 New York; Grune & Sratton.

Meier, J. (1971). Prevalence and characteristics of learning disabilities in second grade children. journal of Learning Disabilities , 4, 6-21.

Menyuk, P. (1992). Relationship of otitis media to speech processing and language development. In J. Katz, N.A. Stecker, & D. Henderson (Eds.), Central auditory processing: a transdisciplinary view (pp. 187-198). St. Louis, MO: Mosby-Year Book.

Menyuk, P., Chesnik, M., Liebergott, J.W., Karngold, B.D., D'Agostino, R., & Belanger, A. (1991) Predicting reading problems in at-risk children. Journal of Speech and Hearing Research, 34,893-903.

Mercer, C, D., (1983). Students with learning disabilities. In H. Myklebust (Ed), progress in learning disabilities; 1; 215. New York ; Grune & Stratton.

Mercer, C, D., (! 983) Student with learning disabilities (2nd Ed) Columbus, OH, Merril.

Mercer, C. (1992). In students with Learning Disabilities. Taylor, R.L., Stemberg, L., and Richards, S.B. (Ed.)., Exceptional Children - Integrating Research and Teaching. San Diego: Singular Publishing Group, Inc.

Miller, T.L. & Davis, E.E. (1982) The Mildly Handicapped Student, New York: Academic Press.

Montague, M., and Boss, C.S. (1990). The effect of cognitive strategy verbal math problem- solving performance of learning disabled adolescents. Jiournal of Learning Disabilities, 19(1), 26-33.

Morais, J., Gary, L., Alergia, L. and Bertelson.P. (1979). Cited in Wagner, R.K. & Torgesen, J.K. (1987). The nature of phonological processing and its causal role in the acquisition of reading skills. Psychological Bulletin, 101(2), 192-212.

Morgan, W.P. (1896) A Case of Congenital Word Blindness, British Medical Journal 2; 1378-1379.

Myers, P. & Hammill, D (1969), Methods for learning disorders. New York. Wiley, Rao G. Potter, (1981) informal reading diagnosis - a practical guide for the class room teacher. prentice Hall New Jersey.

Myklebust (1963) Cited in Hirsh, K., Jansky, J.J.& Langford, W.S. (1966). Predicting reading failure. NewYork: Harper and Row publishers.

Myklebust, H., and Boshes, B. (1969). In Learning Disabilities - A Field in transition. Lerner, J. (Ed)., Learning Disabilities - theories Diadnosis and Teaching Stratergies. Boston: Houghton Mifflin Company.

Naslund, J.C., & Schneider, W. (1996) Cited in Wolf, M., Biddle, K. & Bowers, P.G. (2000). Naming speed processes, timing and reading: A conceptual review. Jiournal of Learning Disabilities 33(4) 3S7-407.

National Joint Committee on Learning Disabilities. (1981). In Learning Disabilities - A Field in transition. Lemer, J. (Ed)., Learning disabilities - Theories, Diagnosis and teaching Strategies. Boston: Houghton Mifflin Company.

National Joint Committee on Learning Disabilities. (1994). What definition of learning disability say and don't say; A critical analysis. Jiournal of Learning Disabilities. 33(3), 239-256.

Nittrouer, S. (1999). Do temporal processing deficits cause phonological processing problems? Journal of Speech, Language, 42,925-942.

Ohlson, E.L. (1978) Identification of Specific Learning Disabilities. Champaign. IL; Research Press.

Olofsson, A. (1993). The relevance of phonological awareness in learning to read: Scandinavian longitudinal and quasiexperimental studies. In R.M.Joshi & C. Leogh (Eds), Reading disabilities: Diagnosis and component processes (pp. 185-198). Dordrecht, The Netherlands: Kluwer.

Orthography and the beginning reader. In J.F. Kavanagh & R. Venezky (Eds.), Orthography, reading. and dyslexia (pp. 137-153). Baltimore, MD: University Park Press.

Orton, S.T. (1937). Cited by Torgesen, J.K. Learning Disabilities: Historical and Conceptual Issues. In Wong, B.Y.L. (Ed).. Learning about learning disabled. New York: Academic Press, Inc.

Ohlson, E.L. (1978) Identification of Specific Learning Disabilities. Champaign. IL; Research Press.

Paul, R. (1996) Clinical implications of the natural history of slow expressive language development. American Lournal of Speech-Language Pathology, 5(2), 5-21.

Perfetti, C.A., Finger, H., & Hogaboam, T. (1978). Sources of vocalization latency differences between skilled and less skilled young readers. Journal of Educational Psychology, 70,730-739.

Perfetti, C.A., Beck, 1., Bell, L. & Hughes, C. (1987). In Ball, E.W. (1993). Phonological awareness-What's important and to whom? Readning and Writing: An interdisciplinary Journal 5 (2), 141-159.

Perry, S.E. (1966) Notes for Sociology of Prevention in Mental Retardation. In Phillips, I. (Ed.), Prevention and Treatment of Mental Retardation. New York: Basic Books.

Peters, E., Lloyd 1, Hasselbring, T., Coin, L., Bransford, J., and Steen, M. (1987). In students with Learning Disabilities. Taylor. R.L., Stemberg. L , and Richards, S.B. (Ed.)., Exceptional Children - Integrating research and Teaching. San Diego: Singular Publishing Group, Inc.

Pennington, B.F. (1989). Using genetics to understand dyslexia. Annals of Dyslexia, 39, 81-93.

Pflawn, S., and Bryan, T.(1981). in students with Learning Disabilities Taylor, R.L., Sternderg, L., And Rihard, S.B,(Ed.).,Exceptional Children-Interating Research and Teaching. San Diego: Singular Publishing Group, Inc.

Prakash, P. (1989) Language representation in Kannada-a South Indian language. In P.G.Aaron and R.M Joshi (Eds) Reading and Writing disorder in different orthographic system, Kluwer Academic Pub, London.

Prema.K (1994). The role of Speech Language Pathologist in the Rehabilitation of Specific Reading Disability. Journal of All India Instituti of Speech and Hearing. Vol 24-25; 30-34.

Prema.K (2000). reading acquisition profild in Kannnada. Unpublished study

done as part of fulfillment for the Ph.D. program in Speech and Hearing, Mysore University.

Prutting, C.A., & Kirchner, D.M. (1987). A clinical appraisal of the pragmatic aspects of language. Journal of Speech and Hearing Disorders.52, 105-119.

Rack, J. (1994). Dyslexia: The phonological deficit hypothesis. In A.Fawcett & R. Nicolson (Eds), Dyslexia in children: Multidissciplinary perspections (pp.5-37). London: Harvester.

Rama (1992). Handbook of Disability Regional College of Education.Mysore.

Read, C, Zhang, Y., Nie, H. &Ding, B. (1986). The ability to manipulate speech sounds depends on knowing alphabetic spelling, Congnition. 24: 31-44.

Reid, K., and Hresko, W. (1981). In students with Learning Disabilities. Taylor, R.L., Stemberg, L., and Richards, S.B. (Ed.)., Exceptional Children - Integrating Research and Teaching. San Diego: Singular Publishing Group, Inc.

Rekha, D. (1997). Reading Acquisition and metaphonological awarenss: A logitidinal study. Doctoral thesis. University of Mysore.Mysore.

Rescorla, L & Lee, e.c (2000) Language impairment in young children. In T Layton & L Watson (Eds), Handbook of early language impirment in children Volume I: Nature.Newyork.Delmar.

Reynolds, M., Wang, M., and Walberg, H. (1987). In Historical Perspectives and Emerging Direction. Lerner, J. (Ed.)., Learning Disabilities - Theories. Diagnosis and Teaching Streategies Boston: Houghton Mifflin Company.

Rice, M. (1993). Don'T talk to him; he's weird: A social consequences account of language and social interaction. In A Kaiser & D. Gray (Eds),

Enhancing children's communication: Research foundations for interbention. Baltimore: Brookes.

Rice, M.L., Buhir J.C., and Nemeth, M. (1990). Fast mapping word-learning abilities of language- delayed pre-schoolers, Journal of Speech and Hearing disorder, 55:33-42.

Rice, M., Sell, M.A., & Hadley, P.A. (1990). The social interactive coding system: An online clinically relevant descriptive tool. Language. Speech and Hearing Servies in Schools, 21,2-14.

Rohl, M. &Tunmer, W.E. (1988). Phonological awareness and reading acquisition. In: D.J.Sawyer & B.J.Fox (Eds). Phonological awareness in reading. The evolution of current perspectiver (pp 1-30). New York: Springer Verlag.

Roopa., (1999). Test for reading & metaphonogical skill in Malayalam An unpublished Masters Dissertation, University of Mysore.

Rosner, J. (1975). Helping children overcome learning difficulties. NewYork: Walker and Company.

Rosner, J. & Simon, DP. (1971). The auditory analysis test: An initial report, Journal of Learning Disabilities.4:1 -15.

Ross, A.O. (1977) Learning Disability: The Unrealized Potential. New York: McGraw-Hill.

Rovert J. 1993. "The Psycho educational characteristic of Children with Turner Syndrome". Journal fo Learning Disabilities, 26, 333-341.

Rudel, R.G. (1980) Learning Disability: Diagnosis by Exclusion and Discrepancy. Journal of child Psychiatry . 19:547-569.

Rudel, R. (1985) the definition of dyslexia: Language and motor deficits. In F.H.Duffy & N.Geshwind (Eds), Dyslexia: A neuroscientific approach to clinical evelututions (pp.33-53). Boston: Little, Brown.

Rudel, R., Denckla, M., & Broman, M. (1978). Rapid silent response to repeated target symbols by dyslexic and non dyslexic children. Brain and Language, 6,52-62.

Rukmini A.P (1994) Malayalam Language Teat, An unpublished Masters Dissertation, University of Mysore.

Safer, D., and Allen, R. (1976). In Brown, F.R. III., and Aylward, E.H. and Keogh, B.K. (Ed.)., Diagnosis and Management of Learning Disability - An interdisciplinary Life Span Approach. California: Singular Publishing Group, Inc.

Sawyer, D.J.(1985). Language problems observed in poor readers. In C.S. Simon (Ed.), Communication skills and classroom success: assessment of language-learning disabled students (pp. 317-335). San Diego, CA: College-Hill Press.

Sawyer, D.E., & Fox, B.J. (Eds)(l991). Phonological awareness in reading The evolution of current perspectives. New York: Springer Verlag.

Satz, P., Fletcher, J.M., Clark, W., &Morris, R. (1981). Lag, deficit, rate, and delay constructs in specific learning disabilities. In A.Ansara, N.Geshwind, A.. Galaburda, M.Albert, & N.Cartell (Eds), Sex differences in dyslexia (pp. 129-150). Towson, MD: The Orton Dyslexia Society.

Scarborough, H.S (1990). Very early language deficits in dyslexic children. Child Development, 61,1728-1743.

Scarborough, H.S. (1991). Early syntactic development of dyslexic children. Annals of Dyslexia, 41,207-220.

Scarborough, H.S. & Dobrich, W. (1990). Development of children with early language delay, journal of Speech and Hearing Research, 33, 70-83.

Schain, RJ. (1977) Neurology of Childhood Learning Disorders (2nd ed.). Baltimore, MD: Williams & Wilkins.

Scheerer - Neumann, G. (1981). The utilization of intraword structure in poor readers: Experimental evidence and a training program, Psychological research. 43:155-178.

Schmidt (1676) cited by Westman Jack C, Handbook of Learning disabilities. A multi system Approach Allyn and Bacon, A division of Simon and Schuster, Inc.

Schneider, B. (1984). LD as they see it: Perception of adolescents in a special residential school. Journal of Learning Disabilities, 17, 533-535.

Schneider, W.,Kuspert, P.,Roth,E.,Vise,M.,&Marx,H.(1997). Short and long term effects of training phonological awareness in kindergarten:Evidence from two German studies. Journal of experimental Child Psychlogy, 66,311-340.

Schneider, W., & Naslund, J.C. (1993). The impact of early metalinguistic competemcies and memory capacity on reading and spelling in elementary school: Results of the Munich longitudinal stuy on the genesis of individual competencies (LOGIC). European Journal of Psychology of Education, 8,273-287.

Scholl, H.M., (1981) Language disorders related to learning disabilities. In J. Gottlieb & S.S Strichart (Eds) Developmental theory and research in learning disabilities. Baltimore; University Park press.

Schonhaut, S., & Satz, P. (1983) Prognosis for children with learning disabilities: A review of follow up studies. In M.Rutter (Ed), Developmental neuropsychilaty (pp.542-563). New York: Guillford.

Sell E., J. Gaines, et. al. (1985). "Early identification of learning problems in neonatal intensive care graduates ". Journal of the diseases of children 139, 460-463.

Semel, E., and Wiig. E. (1975). Comprehension of syntactic structures and critical verbal elements by children with learning disabilities. journal of Learning Disabilities, 14, 192-198.

Semmel, M.I. (1986). special education in the year 2000 and beyond. A peoposal action agenda for addressing selected issues. Proceedings of the C E C Invitational Symposium on the Future of Special Education, Council for Exceptional Children, Reston, V.A.

Shankweiler, D., Liberman, I.Y., Mark, L.S., Fowler, C.A.and Fischer, F.W. (1979). The speech code and learning to read. Journal of Exceptional Psychology Human Perception and Performance,5,531-545.

Sharma, M. (2000); Language skill din children with Learning Disability. Unpublished Dissertation submitted to the University of Mangalore, Mangalore.

Shyamala, K.C. (1997). Language disorder among the learning disabled Paper presented in workshop on learning disability at R1E, Mysore.

Shaywitz, S.E., (1998). Dyslexia. The New England Journal of Medicine 338.307-312

Shaywitz, S.E., and Shaywitz, B.A. (1987). In Learning Disabilities. Hallhan, D.P., and Kauffman, J.M. (Ed/, Exceptional Children - Introduction to Special education. Boston: Allyn and Bacon, Inc.

Shaw, S.F., Cullen, J.P., Mc Guire, J.M. & Brinckerhoff (1995). Operatioanalizing a definition of learning disabilities, 28,585-597.

Shriberg, L.D., && Kwiatkowski, J. 1988). A follow up of children of

phonological disorders of unknown origin. Journal of Speech and Hearing research, 53,144-155.

Siegel, L.S & Faux, D. (1989) Grapheme-phoneme correspondence in normally achieving and disabled readers, Reading and writing: An interdisciplinary Journal1:37-52.

Siegel, L.S & Ryan, E.B (1988). Development of grammatical-sensitivity, phonological and short term memory skills in normally achieving and learning disabled children, Development Psychology:24:28-37.

Silva P.A. (1987) " Epidemiology, longitudinal course and some associated features; an update. In Yule, W., Rutter M (Eds) Language Disorders. Clinics development Medicine, nos 101/102. London: Mac Keigh press with Blackwell scientific; Philadelphia; Lippincott. pp 1-15.

Smith S. 1992. "Familial patterns of learning Disabilities", Annals of Dyslexia,42, 143-158.

Smith, S.T., Mann, V.A., and Shankweiler, D.C. (1986). Spoken sentence comprehension by good and poor readers: A study with the token test. Cortex 22,627-632.

Snowling, M. (1985). Cited in Catts, H.W. (1997). The prediction of language based reading disabilities. Journal of Language, Speech and Haearing service in schools, 28, 86-89.

Snowling M., N. Goulandris et. Al. 1985. "Segmentation and speech perception and relation to reading skill: A developmental analysis". Journal of Experimental child Psychology, 41, 489-507.

Spear-Swerling, L., & Stemberg, R.J. (1994). The road not taken: An integrative theoretical model of reading disability. Journal of Learning Disabilities,

27,91-103.

Spreen, O. (1988). Learning disabled children growing up: A follow up into adulthood. New York: Oxford University Press.

Spreen, O. (1989). Learning disability, neurology, and long term outcome: Some implications for the individual and for society. Journal of Clinical and Experimental Neuropsychology, 11,389-408.

Stackhouse, J., & Wells, B, (1991). The obvious and hidden speech and language disorder. In M. Snowling & M. Thomson (Eds.), Dyslexia: Integrating theory and practice (pp. 185-194). London: whurr.

Stanovich, K.S. (1985). Explaining the variance in reading ability interms of phonological processes. What have we learned? Annals of Dyslexia 35:67-69.

Stanovich, K..S. (1986) Matthew effects in reading.: Some consequences of individual differences in the acquisition of literacy. Reading Research Quarterly, 21,360-407.

Stanovich, K.S. (1988) Explaining the difference between the dyslexic and garden variety poor reader: The phonological core variable-difference model. Journal of Learning Disabilities 21,590-612.

Stanovich, K.E. (1993). Problems in the differential diagnosis of reading disabilities. In R.M.Joshi & C.L E O N G (Eds), Reading disabilities: diadnosis and component processes (pp3-31). Dordrecht, The Netherlands: Kluwer.

Stanovich, K., Cunningham, A.E & Cramer, B.B. (1984). Assessing phonological awareness in kindergarten children: Issues of task comparability, Journal of Experimental Child Psychology 38: 175-190.

Stevens, G., and Birch, J. (1957). A proposed clarification of the terminology to describe brain-injured children. Exceptional Children, 23,346-349.

Still, G.F. (1902) The Coulstonian Leltures on some Abnormal Condition in Children, haneet 1:1008-1012,1077-1082,1163-1168.

Stone, B., & Brady, S. (1995) Evidence for deficits in basic phonological processes in skilled readers. Annals of Dyslexia.45, 51 -78.

Stothard, S.E., Snowing, M.J., Bishop, D.V.M., Chipchase, B.B., and Kaplan, C.A. (1998). Language impaired pre-schoolers: A follow-up into adolescence. Journal of Speech and Hearing Research., 41,407-418.

Strauss, A. (1943). Cited by Torgesen, J.K. Learning Disabilities: Historical and Conceptual Issues. In Wong, B.Y.L. (Ed)., Learning about learning disabled. New York: Academic Press, Inc.

Strauss, A., and Lehtinan, L. (1947). Psychopathology and education of the brain-injured child. New York: Grune & Stratton.

Strauss, A. & Werner H (1940). Cited by Torgesen, J.K. Learning Disabilities: Historical and Conceptual Issues. In Wong, B.Y.L. (Ed)., Learning about learning disabled. New York: Academic Press, Inc.

Stuart.M., & Coltheart, M. (1988). Does reading develop in a sequence of stages? Cognition. 30,139-181.

Suresh, P.A., & Swapna S (1997) "An epidemiological survey of development language disorders and learning disability among school children in Kerala", Project report submitted to KRPLLD, CDS.

Swank, L.K. (1994). Phonological coding abilities: Identification of impairments related to phonologically based reading problems. Topics in Language Disorders.

Swathi, K and Shyamala, K C (1994) Learning disability and some concurrent factors; An exploratory study, Journal of All India Institute of Speech

and Hearing. Vol 24-25; p34-39.

Tallal P (1987) Developmental dysphasia. In encyclopedia of Neuroscience vol 1. Edited by Adelman G. Boston; Birkhauscr; 351-353.

Tallal P (1988); Developmental language disorders. In learning disabilities; Proceedings from the National Conference. (Edited) Kavanagh J, Truss. Tarkton, M D ; York Press; 181-272.

Tallal P, Sainberg R. Jemgan T (1991): Neuropathology of developmental dysphasia. Reading and writing. 465-79.

Tallal, P. (1993). Preface. In P. Tallal, A.M. Galaburda, R.R. Llinas, & C. von Euler (Eds.), Annals of the New York Academy of Sciences. Vol. 682. Temporal information processing in the nervous system: Special reference to dyslexia and dysphasia (p. ix). New York: The New York Academy of Science.

Tallal, P., Miller, S., &Fitch, H. (1993). Neurobiological basis of speech: A case for the pre-eminence of temporal processing. In P.Tallal, A.M.Galaburda, R.R.Llinas, &C.von Euler (Eds), Annals of NewYork Academy of Sciences, Vol.682.Temporal information processing in the nervous system: Special reference to dyslexia and dysphasia (pp.27-47). New York: The New York Academy of Sciences.

The ICD-10 classification of Mental and Behavioral Disorders. Clinical Description and Diagnostic Guidelines. Geneva: World Health Organisation 1992: 232-52.

Torgeson, J.K. (1985). In H.W.Catts & A.G.Kamhi,"The linguistic basis of reading disorders", Language. Dpeech and Hearing Services in School, 17, (329-341).

Torgeson, J.K. (1987). Historical and Conceptual issues. In Wong, B.Y.L.

(Ed)., Learning about Learning disabled. New York: Academic Press, Inc.

Torgeson, J.K., & Bryant, B.R. (1994). Test of Phonological awareness. Austin, TX: Pro-Ed.

Torgeson, J.K., Wagner, R.K., &Rashotte. C.A. (1994). Longitudinal studies of Phonological processing and reading. Journal of Learning Disabilities. 27, 276-286.

Treiman, R. & Baron, J. (1981). Segmental analysis ability: Development and relation to reading ability .In: G.E.MacKinnon & T.g.Waller (Eds), Reading Research: Advences in theory and practice (pp. 159- 198). New York: Academic Press.

Treiman, R. (1983). The structure of spoken syllables: Evidence for novel word games, Congnition. 15:49-74.

Treiman, R. (1987). On the relationship between phonological awareness and literacy, Cahiers de Psychologic Congnitive .7:524-529.

Treiman, R. (1991). Phonological awareness and reading acquisition. In: D.J.Sawyer & B.J.Fox (Eds) Phonological awareness in reading: the evolution of current perspectives (pp 161-189). NewYork: Springer Verlag.

Treiman, R. (1992). The role of intrasyllabic units in learning to read and spell. In: P.Gough, L.Ehri & R.Trieman (Eds) Reading Acquisition (pp.65-106). Hillsdale, NJ: Lawrence Erlbaum Associates.

Tredgold (1908) cited by Westman Jack C, Handbook of Learing disabilities. A multi system Approach, Allyn and Bacon, A division of Simon and Schuster, Inc.

Tunmer, W.E. (1991). Phonological awareness and literacy acquisition. In L.Rieben & C.A.Perfetti (Eds) Learning to raed: Basic research and its implications (pp 105-119). Hillsdale, NJ: Erlbaum.

Tummer, W., Booney, J. & Grieve (1984). Metalinguistic awareness and reading acquisition. In W.Turner, C.Prat & M.Heriman (Eds). Metalinguistic awareness in children: Theory research and inplications Berlin: Springer.

Tunmer, W.E.& Rohl, M. (1991). Phonological awareness and reading acquisition. In: D.J.Sawyer & B.J.Fox (Eds). Phonological awareness and reading. The evolution of current perspectives (pp 1-30). New York: Springer Verlag.

U.S. Department of Education. (1991). In students with Learning Disabilities. Taylor, R.L., Stemberg, L., and Richards, S B. (Ed)., Exceptional Children - Integrating Research and Teaching. San Diego: Singular Publishing Group, Inc.

U.S. Office of Education (1976). What definition of learning disability say and don't say; A critical analysis. journal of Learning disabilities. 33(3), 239-256.

U.S. Office of Education. (1979). In Learning Disabilities - A Field in Transition. Lerner, J. (Ed/, Learning Disabilities - theories Diagnosis and teaching Strategies. Boston: Houghton Mifflin Company.

U.S. Office of Education. (1991). In Learning Disabilities - A Field in Transition. Lemer, J. (Ed)., Learning Disabilities - Theories Diagnosis and Teaching Strategies. Boston: Houghton Mifflin Company

Vallet, R (1969) Programming learing disabilities. Belmont, CA; Fearon.

Van Dyke D., A. Fox. 1996. "Fetal drug exposure and its possible implication for learning in the preschool and school age population" Journal of Learning Disabilities, 23, 160-163.

Vankleeck. (1994). Metalingusistic development. In G.P. Wallach & K.G. Butter (Eds). Language learning disabilities in school age children and adolescents: some principal and application. 53-98. Macmillian publishing company.

Vellutino F.R & Scanlon, D M . (1987) Phonological coding, phonological awareness and reading ability: Evidence from a longitudinal and experimental study, Merrill-palmer Qualerly 33,321-363.

Vogel, S. (1975). In students with Learning Disabilities. Taylor, R.L., Stemberg, L., and Richards, S.B. (Ed.)., Exceptional Children _ integrating Research and Teaching. San Diego: Singular Publishing Group.

Vygotsky, C.S. (1986). Thought and language. In A. Kazulin (Ed). Cambridge: M I T press.

Wagner, R.K., & Torgesen, J.K. (1987). The nature of phonological processing and its causal role in the acquisition of reading skills. Psychological Bulletin, 101,192-212.

Wallace, G., and Mc Loughlin, J. (1988). In students with Learning Disabilities. Taylor, R.L., Stemberg, L., and Richards, S.B. (Ed.)., Exceptional children - Integrating research and Teaching. San Diego: Singular Publishing Group, Inc.

Webster, T.G. (1970) Unique Aspects of Emotional Development in Mentally Retarded Children. In Menolascino, F.J. (Ed). Psychiatric Approachs to Mental retardation. New York: Basic Books.

Webster, P.E., Plante, A.S.(1992).Effects of phonological impairment on word,syllable, and phoneme segmentation and reading. Language, Speech and Hearing Services in the School, 23,176-182.

Webster, P.E., Plante. AS.. & Couvillion. L.M. 1997). Phonological impairment and prereading: update on a longitudinal study. Journal of Learing Disabilities, 30,365-375.

Weiderholt, J.L. (1974). Cited by Torgesen, J.K. Learning Disabilities: Historical and Conceptual Issues. In Wong, B.Y.L. (Ed)., Learning about learning disabled. New York: Academic Press, Inc.

Werner, H., & Strauss, A. (1940). Causal factors in low performance. American Journal of Mental Deficiency, 45,213-218.

Westman.J.C. (1990) Handbook of learning disabilities. A multi system Approach, Wisconsin Allyn and Bacon, A division of Simon and Schuster, Inc.

Wiig, E.H., Semmel, E.M (1980). Intervention for the learning disabled. Columbus, OH; Merrill.

Wiig, E. And Semel, E. (1984). In students with Learning Disabilities. Taylor, R.L., Stemberg, L, and Richards, S.B. (Ed.)., Exceptional Children - Integrating Research anf Teaching. San Diego: Singular Publishing Group, Inc.

Wolf, M. (1986). Rapid alternating stimulus naming in the developmental dyslexias. Brain and language, 27,360-379.

Wolf, M. (1991). Naming speed and reading: The contribution of the cognitive neurosciences. Reading Research Quarterly, 26,123-141.

Wolf, M., Bally, H., & Morris, R. (1986). Automaticity, retrieval processes, and reading: A longitudinal study in average and impaired readers. Child Development, 57,988-1000.

Wolf, M., & Goodglass, H. (1986). Dyslexia, dysnomia, and lexical retrieval: A longitudinal investigation. Brain and language, 27,360-379.

Wolf, M., Michel, G., & Ovrut, M. (1990) Rate variables and automatized

naming in developmental dyslexia, Brain and Language, 556-575.

Wren, C.T. (1983). language learning disabilities. Rockville, M D ; Aspen systems.

Yopp, H.K. (1988). The validity and reliability of phonemic awareness tests, reading research Quarterly 23:159-177.

Zinkus, P.W. (1986). Perceptual and academic deficits related to early chronic otitis media. In J.f. Kavanagh (Ed.), Otitis media and child developement . 107-116. Parkton, M D : York Press.