CHECKLIST FOR SCREENING LANGUAGE BASED READING DISABILITIES (Che-SLR) IN CHILDREN

Register No. M 9921

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A dissertation submitted in part fulfillment of the final year M.Sc, (Speech and Hearing), University of Mysore, Mysore.

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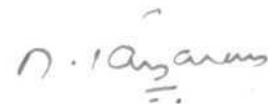
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MAY, 2001

Dedicated to

my

Achan & Amma

CERTIFICATE

This is to certify that this dissertation entitled **"CHECKLIST FOR SCREENING LANGUAGE BASED READING DISABILITIES (Che-SLR) IN CHILDREN"** is the bonafide work in part fulfillment of the degree for Master of Science (Speech and Hearing) of the student (Register no. M 9921).

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CERTIFICATE

This is to certify that this dissertation entitled **"CHECKLIST FOR SCREENING LANGUAGE BASED READING DISABILITIES (Che-SLR) IN CHILDREN"** has been prepared under my supervision and guidance. It is also certified that this dissertation has not been submitted earlier in any other University for the award of any Diploma or Degree.

Guide

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<u>DECLARATION</u>

This dissertation entitled **"CHECKLIST FOR SCREENING LANGUAGE BASED READING DISABBLITIES (Che-SLR) IN CHILDREN"** is the result of my own study under the guidance of Dr. Prema K.S., Lecturer in Language Pathology, Department of Speech Pathology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier in any other university for the award of any Diploma or Degree.

Mysore

May, 2001

Reg. No. M 9921

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Komal, Aruna . . . . .When things go wrong with me & I feel like confide in to somebody, I always approach you guys. Thanks a lot for listening to me and sorry for boring you guys at times.

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CHAPTER 1

INTRODUCTION

The schoolmaster who taught him for some years says that he would be the smartest lad in school if instructions were entirely oral.

W. Pringle Morgan (1896)

One of the today's major social problems is the enormous number of children who, as a result of severe reading, writing and spelling disabilities, are unable to realize their intellectual and educational potentials. According to Pennington (1991) 15-25% of the population may have learning disorders which can be described as specific learning difficulties. Reading disability is but one of those.

Many different terms have been used to label individuals who demonstrate reading problems. Some of the more frequently used terms are specific reading disability, reading disability, dyslexia and developmental dyslexia. The term language learning disabled has been used in recent years by many speech-language pathologists to describe school-age children who have spoken and written language deficits.

During the past years many writers have suggested several causal factors for reading disability. The heterogenous etiologies include organic

damage to brain, environmental or social emotional influences innate or constitutional endowment with some evidence of hereditary predisposition.

The lack of agreement about how best to label and define reading disabilities is reflected in the problems researchers have had in classifying and sub-typing individuals with reading disabilities. Classification obviously differs according to the population sampled. The sub-types were based on (1) causal factors and associated abilities (Kinsbourne and Warrington, 1963). (2) The nature of reading disability and errors exhibited (New Combe (1973) and Boder (1973) (3) Combination of 1 and 2 and 4 (Doehring, Trites, Patel and Fiedorowicz, 1981), (4) Language abilities (Donahue, 1986).

To understand reading disabilities, we must ultimately face the question of what is the best way to describe and explain these disabilities. The characterization of reading disabilities as a language based disorder seems appropriate at a descriptive level. The notion of a language - based disorder seems to capture the essence of reading disability. Reading as defined by Kamhi, (1989) language based disorders and hence, language based reading disorders would encompass all children who have phonological processing deficits, higher-level language deficiencies, and vocabulary deficits. The co-existence of language disorder and reading disorders that is often seen is suggestive of the underlying intricate relationship between the two facilities.

Language and Reading:

Reading proficiency is rooted in language abilities. For more than 30 years, researchers have been investigating aspects of language knowledge as well as discrete language processing abilities in an attempt to specify those abilities that contribute to reading acquisition.

Reading for meaning has been considered a complex activity that mobilizes a number of processes that are grounded in language. Most researchers seem to agree that the key components of reading comprehension include phonological processing of letters and the sounds that they represent, retrieval of lexical information, use of knowledge about the syntactic structure of language to understand and predict upcoming information in a sentence and discourse processing, i.e., the mobilization of word knowledge to organize and construct an interpretation of information contained in a passage or text (Just and Carpenten, 1987; Kamhi and Catts, 1989; LaBerge and Samuels, 1974: Perfetti, 1985; Ramuehat, 1977). Given the nature of the above processes and their deficits in children with reading disability, attempts at early identification have been proposed keeping language as the prime focus of evaluation.

Early Identification of Reading Disability:

Traditionally, reading / learning disabilities have been identified primarily on the basis of reading problems. As a result, most children with these

disabilities have not been identified until they have entered school and experienced significant difficulties learning to read. Children who encounter early reading problems often become less motivated to read, develop lower expectations of their abilities, and gain less practice reading than do good readers. Consequently, they may fall farther and farther behind their peers in reading and academic achievement.

Hence, over several years attention has moved towards the assessment of children for reading disabilities, if any at a much earlier age. Early identification initiatives British Dyslexia Association, a national charitable network for families, has promoted early identification with some success. Both an information booklet (Brereton and Cann, 1993) and a video (British Dyslexia Association, 1995) have been produced. Above all the hope has been that an early detection screening system could be applied to all children at an early age, before or just after the start of schooling. So that children likely to become reading disabled could be caught early.

As mentioned earlier, current research suggest that in many cases, reading disabilities are language based disorders (Carts, 1989a, Kamhi and Carts 1989; Wagner and Torgesen, 1987). And that, these disorders generally manifest themselves in terms of difficulties in oral language development are of the opinion that children at risk for reading disabilities may demonstrate early problems in expressive morphology or syntax, difficulties in understanding words and sentences, comprehension of

language etc.. (Menyuk etal, 1991) Hence, studies of the recent past emphasize evaluation of language skills in preschool aged children in order to identify potential "at risk" children for reading disability that would help to reduce the gravity of the problem in school years.

As most of the language deficits described above can be observed in at - risk children before the beginning of formal reading instruction, that would serve as early indicators of a potential reading disability it allows us to identify children who are at risk for reading before beginning reading instruction. Once identified, early intervention may help to reduce reading failure and the negative consequences of this failure (Fey, Carts and Larrivee, 1995).

The foregoing review suggests that there is an underlying relationship between language and reading and hence, majority of children with reading disability invariably manifest deficits in language. Consequently, it is also proposed by researchers that identification of children at risk for reading disability is possible through evaluation of various linguistic skills in their preschool years. Studies are unequivocal regarding the fact that the early identification of children with reading disability has an important bearing on the eventual school success. Hence the objectives of the present study are

1. Develop a checklist for children with language based reading disabilities and to administer the checklist on normal children who are native speakers of Malayalam.

2. Assessment of linguistic skills in preschool children from 3 to 5 years of age to look out for age and sex related changes, if any, in performance on the skills enlisted in check list.

3. To identify the "at risk" children for language based reading disabilities, with the help of Che-SLR.

4. Identify the variable/s, if any, that would help in identification of 'at risk' children for language based reading disabilities.

CHAPTER 2

REVIEW OF LITERATURE

Reading is essential for educational and vocational success in our society, and the ability to read newspapers, magazines and books adds greatly to the quality of life. Reading ability depends upon the ability to process verbal information also. We usually come across the terms reading and language as having a generalized usage in the educational field. Such a view makes one lose sight of the fact that reading is an important modality of language.

Language:

All living creatures communicate, only humans exchange information using a code that we call language. Only the human species has devised an elaborate system of shared symbols and procedures for combining them into meaningful units. Language has been defined in a variety of ways. One of the broad definitions is that language is a system which implies an order or regularity in the supply of symbols; that these symbols are shared or hold common meanings for a group of persons; and that there are procedures or rules, concerning how to array or join the symbols into messages. The following five characteristics are common to all languages.

    1. the use of symbols;

2. a limited (finite) set of different sounds or phonemes.

3. a vocabulary or lexicon of meaningful combinations of these

   phonemes into units called morphomes.

4. a set of rules for linking these units together and

5. a set of rules for using language in a social context.

ASHA (1983) incorporates in its definition of languages three major components   1. Form, 2. content and 3. use. (which includes talking listening, reading and writing.)
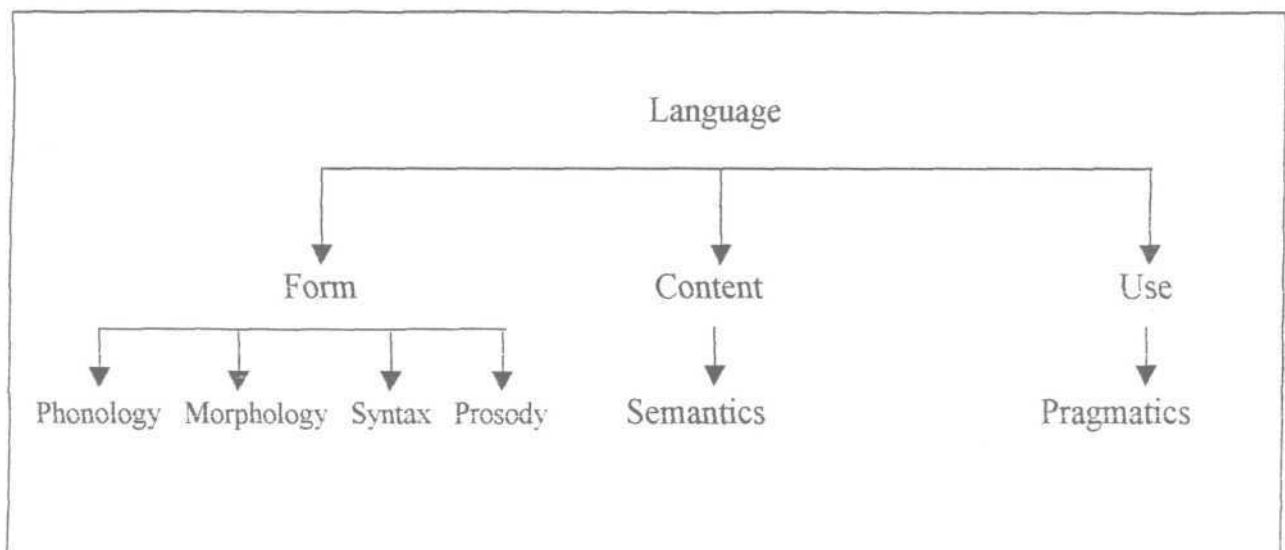
Fig. 1.

ASHA (1983) defines language as "a complex and dynamic system of conventional symbols that is used in various modes for thought and communication; contemporary views of human language hold that (a) language evolves within specific historic, social and cultural contexts, (b)

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language as rule governed behaviour is described by at least five parameters - phonologic, morphologic, syntactic, semantic and pragmatic *(use.)* language learning and use are determined by interaction of biological, cognitive, psychosocial and environmental factors and (d) effective use of language for communication requires a broad understanding of human interaction including such associated factors as non-verbal cues, motivation and socio-cultural roles".

Some of the definitions of language referring only to the oral aspects of language, others including written language and some including all aspects of human communication. Lamb's definition (1972) of language emphasize both the graphic as well as oral aspect of language while oral language is a further form of symbolic communication involving encoding and decoding it also becomes a pre-requisite for graphic language, otherwise known as reading.

Reading :

Reading, a visual auditory task, involves obtaining meaning from symbols (letters and words). It is a basic tool that serves an individual for a lifetime. The ability to read permits a person to develop and maintain employable skills; participate in social, cultural and political affairs and fulfill emotional and religious needs. In addition, reading offers recreation and enjoyment (Kirk, Kliebhan and Lerner, 1978).

As we look into Reading as such, the basic components involved are word recognition (decoding) and comprehension. Definitions of reading can be divided according to whether the decoding or comprehension aspects of reading are emphasized. Reading defined as decoding ability is the skill of transforming printed words into spoken words. This definition considers to be a narrower one but its advantage is that it delineates a restricted processes to be examined (Perfitti, 1986).

Reading achievement depends to a greater extent on the ability to process verbal information. Vellutino (1978) and others suggest that deficiencies in the verbal processing ability cause reading disability and dyslexia. The concept of Reading disability has undergone radical changes since 1950. Research into the possible origins of this problems suggests varied causes such as hereditary.   (Hallgren, 1957; de Hirsch 1957), poor associational learning (Otto. 1961). auditory discrimination problems (Myklebust and Johnson, 1962),   non reading skill deficits such as poor Verbal IQ (VIQ) than Performance IQ (PIQ) was also speculated upon by Rabinovitch et al as early as 1954. Doehring (1968) found 31 non -reading skill deficits which comprised largely visual - verbal abilities. The literature shows a host of factors associated with reading comprehension skills, among which met linguistic awareness i.e. ability to focus upon, think about or make judgments about the structures comprising language (Ehri, 1978) assumes an increasingly important role in developing child's ability to read

and comprehend. Good and poor readers differ with respect to their skills in acquiring the fundamental concepts of language.

From the literature it suggest that the process of reading involves a number of component skills. Despite the complexity of the reading mechanism, a deficiency in underlying verbal language skill is noted as a common feature in many studies on reading disability. This supposition may be further substantiated by Liberman's (1983) model of speech & reading.

Model of Reading and Oral language Processing
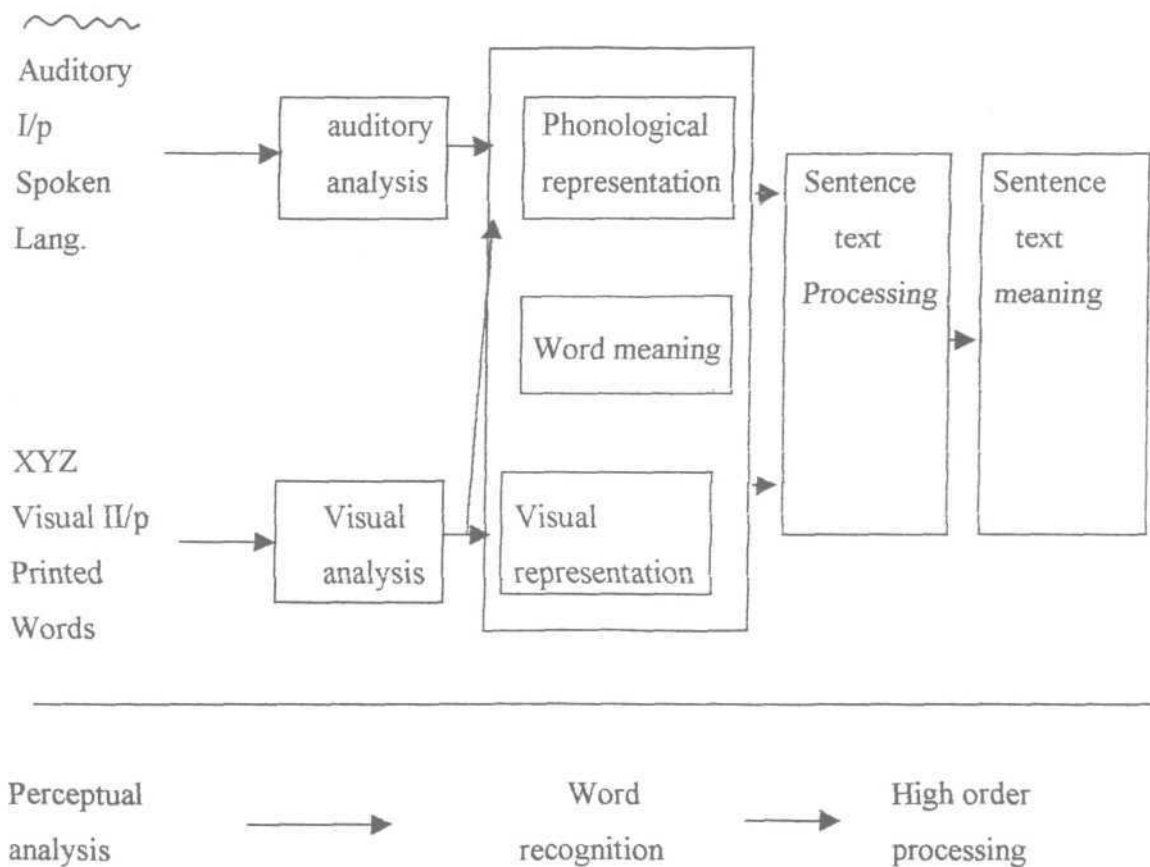
Fig. 2

Liberman (1983) suggests that Speech and reading are two facets of language and that reading shares much in common with oral language. The model putforth by him views the process of normal reading as parallel to oral language development.

Some of the skills such as auditory discrimination, auditory perception ability, use of symbolic representation are common to both language and reading, attainment of reading is dependent, among other skills, on the child's language ability.

Given the inter-relationship between language and reading, researchers have investigated into the language learning disabilities of children as related to their reading function.

They propose 3 sub groups of children with language disorders (Donahue, 1986).

I)   The first group are children who have a pre-school language impairment. Most of these children have subsequent problems to read (Aram and Nation, 1980).

II) The second group of children are not identified until they enter school and have problems learning to read. Although these children generally have age-appropriate spoken language abilities, when they enter school, spoken language deficiencies become

more noticeable with the increased importance to class room & narrative discourse abilities.

III)   Children of third group have age appropriate oral language skills, but have difficulty leaning to read for other reasons. e.g. attentional, motivational, or instructional factors. The reading problem caused in the child having less exposure to new vocabulary and sophisticated syntactic structures.

Although, language learning disabilities are often mentioned among children with Reading disabilities (R.D.), identification of children with R.D. usually begins when a teacher suspects that child has a learning or behaviour problems.

Identification of children with R.D. has been going on all these years, mainly through,

a) Teachers observation of students activities / performance inside and outside the class room situations.

b) Informal teaching and evaluation through question and answer techniques, providing activities / tasks of children i.e. using behavioral check list.

Identification of R.D., after the child has experienced continuous failure in academic learning has its own negative consequences like frustration, fear of failure, aversion towards schoolings etc. This emphasizes the need for early identification i.e. at pre-primary stage itself (between 3 to 5 years) as early identification may be a crucial factor influencing the eventual school success of children with reading disabilities.

Also, early identification helps in taking proper remedial measures at the right time so that further problems be either prevented or reduced.

Current research suggests that children at risk for reading disabilities can be identified before experiencing failure in learning to read (Bardian, McAnulty, Duffy, Als, 1990, Carts, 1991).

The investigative research by Kamhi, and Catts 1986, has evidenced that there are similarities between language delayed and reading impaired children in their linguistic and metalinguistic abilities.

A child's growing awareness that language consists of elements that are combined in systematic ways is the crux of many metlinguistic skills. The elements and rules of language and the skills that demonstrate an awareness of them are shown in Figure 3.

Figure –3
Language is Systematic
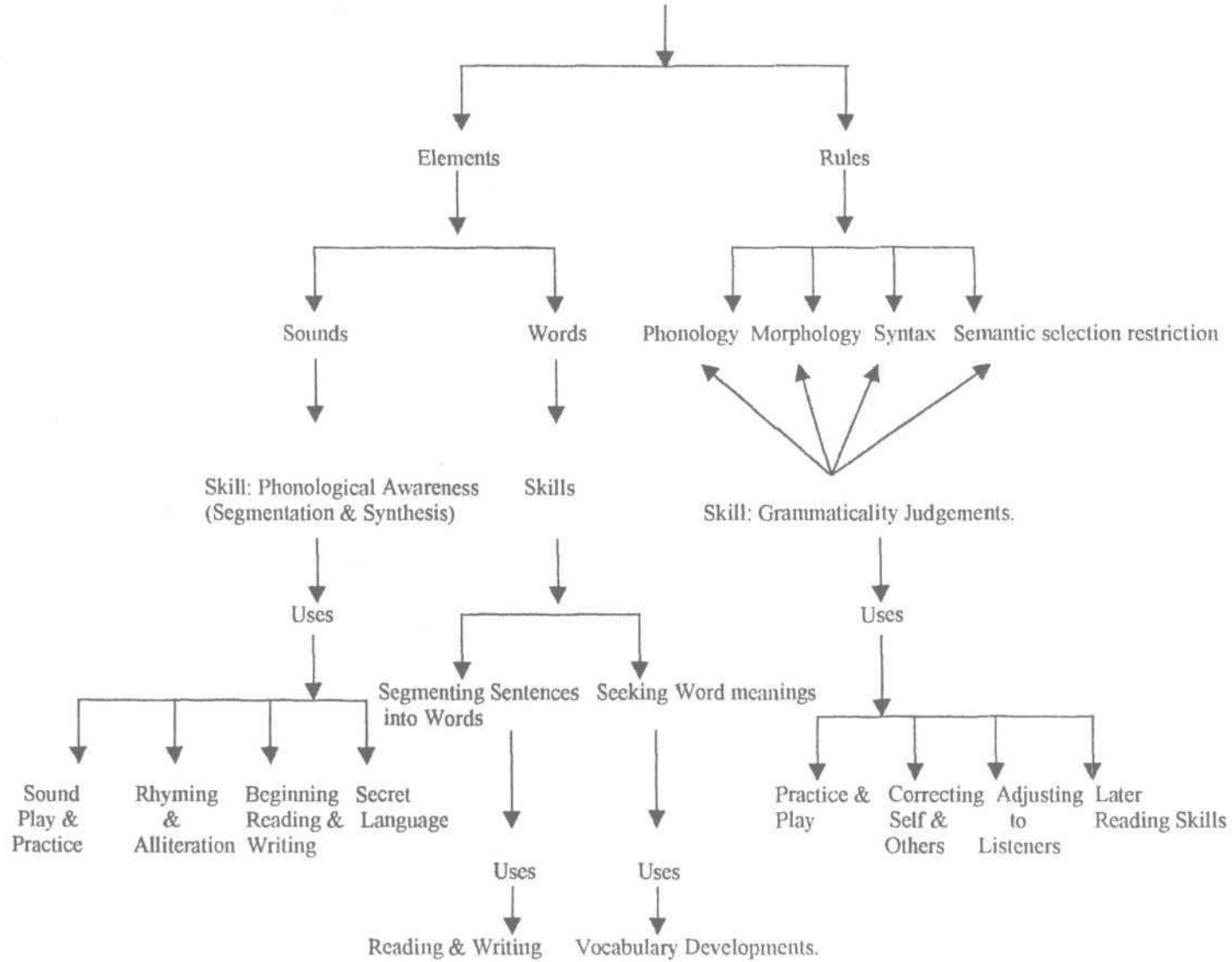
The practical applications (as denoted in Fig.3) include sound play and practice, rhyming and alliteration, beginning reading and writing, vocabulary development etc., Metalinguistic development affects a wide variety of skills that children need to effectively use the linguistic code in ongoing social interaction and to achieve success in the highly verbal and print literate environment of our schools.

From the review of literature it is evident that there are many metalinguistic skills that are indicators of future language ability of the children. There are many investigative reports at present which focus on language deficits as a crucial indicator of dyslexia; several studies have been carried out in this aspect in the recent years. (Turner, 1997)

Precursors of dyslexia :

Pre cursors are developmental features of the pre-literate child. It fades as learning and maturation take place. (Turner, 1997) Speech delay and word finding difficulties are good examples. Children who present as dyslexic aged 8 or 10 were;

• Frequently late developing speech initially;

• Either weeks or months later than their first birthday in producing their first words;

- Later than 18 months in producing words in combination or in producing thousands (of syntactic types) before the third birthday (Pinker, 1995).

Though review of researches does not unequivocally implicate language delay as a precursor of dyslexia, it must be regarded as a risk factor.

1. Non Verbal Imitation:

Deficient in Nonverbal imitation skills is also found to be indicator of dyslexia. Study by Hardy (1962) suggests that the ability to perceive, to process, and to reproduce sequences is a pre-requisite for spoken and printed language. Some children experience difficulty even with non verbal sequences. Ability to imitate tapped patterns, according to Atam-back (1951), increase with age and Myklebust (1963) maintains that this ability differentiates normal children from those with learning disorders.

Anderson (1953) observes that the ability to recall patterns of sounds and to organize them into language units matures slowly in a number of children. That the sequencing of auditory events plays a major part in oral language functioning is well known. Some children have a difficult time recalling nursery rhymes; they often fail to produce the correct no. of syllables in spelling words. Johnson (1965) and Reynolds (1953) commented on the relationship between auditory memory span and reading competence.

2. Language Skills :

Study on language comprehension by Plessas, 1963 shows that comprehension of simple story lead insight into grammatical relationships and ability to process and retain material heard. Both are of importance in reading, which requires the integrations of context into an existing frame work.

Teachers observe that some children are able to produce a story or event a vivid and logical account with a wealth of details, while others are either entirely unable to tell story or tend to ramble. Weiner and Feldman (1965) found story telling to be predictive of end of first grade reading performance; Wiig and Semel (1976) again highlighted the deficits in language learning disabled child that are linguistic and metalinguistic in nature, such as inability to sit through a story, learn the alphabets; word rhyming, finger plays or songs or make one to one correspondence between sounds and letters in the kindergarten level, problems in same different discrimination of sounds, in analyzing and synthesizing phoneme sequences in segmenting words into smaller grammatical units and in forming stable sound - symbol association in first grade level.

Recent studies give much more specific results on the effect of language impairment on reading disability. A study by Bishop and Adams (1990) in a longitudinal investigation of 83 children with speech language

impairment reported that MLU at 4 1⁄2 and 5 1⁄2 years of age was a good predictor of reading achievement at age 8. Their results predicated that a measure of receptive syntactic abilities contributed significantly to predicting reading achievement.

The ability to rapidly identify words out of context is one of the hall marks of skilled readers (Perfetti 1986, Ehri 1992). In learning to read, a child must learn to recognize printed words accurately, rapidly and completely (Ehri 1980, 1992, Adams 1990). Although both sight word and word attack (decoding) skills are necessary, decoding is the fundamental skill needed for learning to read an alphabetic language (Liberman et al 1974, 1977; Fox and Routh 1975).

Numerous researchers have shown that knowledge of grapheme-phoneme correspondence is intimately related to the acquisition of early reading skills (Tunmer and Rohl, 1991), while initial sight word reading is related to visual recognition of words from repeated exposure, Ehri (1992) maintains that even sight word reading beyond the most elemental level is a product of efficient phonological coding.

3. Phonological Awareness :

Children's awareness that word in language are composed of a variety of untis of sound (syllable, the sub syllabic units of onset and rime and phonemes) is referred to as phonological awareness. From the literature it is

found that some authors have argued that phonological awareness is a crucial precursor of reading Regardless of how phonological awareness is assessed, results from numerous studies, shows that sensitivity to the sound structure of language is related to success in learning to read (Blackman 1984, 1989, Stanovich et al 1984, Ehri and wilce 1985, Wagner and Torgesen 1987, Adams 1990, Torgesen et al 1994).

Various levels of phonological awareness have been assessed through a no. of tasks that require manipulation of linguistic units at both the syllabic and phonemic levels. Torgesen et al (1994) found that the phonological skills of blending and segmentation were the strongest predictor of later word recognition.

Phonological awareness found in children's play with language Van Kleeck and Schuele (1987) presented numerous examples of phonological awareness found in children's play with language. One example "tri, ya ya ya yangle" was produced by a child aged 2.5 (Van Kleeck and Br vant, 1984). Cazden (1974) hypothesized a connection between language play and later print literacy development, in that play makes literacy easier to achieve because the child's attention has been focused on the means, the forms of language, where as in normal communicative contexts, his attention is focused on the end."

Many authors focused on the view that, whether phonological awareness is a cause or an effect of reading, the existence of a strong correlation between the two has been frequently demonstrated. (Bradley and Bryant, 1978, 1983; Calfee 1977; Calfee, Lindamood and Lindamood 1973; Liberman, Shankweiler, Fischer & Carter, 1974; Perfetti, Beck, Bell and Hughes 1987; Rosner and Simon 1971).

Phonological awareness need not be limited to an awareness of the constituent phonemes in words. However, if other phonological skills such as an awareness of rhyme and alliteration are counted as demonstrating phonological awareness then there are strong grounds for believing that such phonological skills measured before reading commences are an important predictor of later reading success.

One possible explanation of the link between auditory organization skills and reading is that the ability to attend to similarities and differences in the sounds of words may be important for noticing how these similarities and differences are represented alphabetically. A child who can categorise 'pat', 'pig' and pen as beginning with the same sound should have less difficulty in understanding that all these words begin with the same letter than a child who is poor at this auditory categorization. Similarly, a child who can hear that "bat" and "hat" rhyme should find it easy to understand that the spelling pattern at the end of these words is the same.

A more specific form of hypothesis about how auditory organisation may affect learning to read proposed is, concentrates on rhyming. The argument is that the strong link found between rhyming and reading may arise because children's experience with rhymes may help them to make orthographic analogies when they begin learning to read (Bryant and Goswami, 1987 a; Goswami and Bryant, 1986, 1990) when a child makes an analogy between "beak" and "Peak" (the kind of orthographic analogy which children make most easily). The similarity in spelling forms the basis for a prediction about the sound of the unknown word; this prediction involves rhyme. It is therefore possible that a child's rhyming ability is a good predictor of his or her later reading skills partly because rhyming leads a child naturally to use orthographic analogies. Words which rhyme generally share the same spelling patterns at the ends ("beak" 'weak", "peak", "Creak") and a child who has grouped words by rhyming sound before learning to read may thus be altered to similarities in spelling once reading commences.

4. Rhyming And Alliteration:

From the literature it is established that there are strong link between children's early knowledge of nursery rhymes and their reading abilities. There are many studies quoted in support of this; The work by Trevaithen (1986, 1987) has shown that mothers who recite nursery rhymes to infants as young as three months, and has also established that there are striking

temporal regularities in the way in which mother sing or speak nursery rhymes and lullabies.

The research has continued to know what kind of influence could nursery rhymes have, whether they may help syntactic or semantic development, However, language in a rhyme is often as simple, syntactically and semantically.

Another possibility is that they enhance children's phonological skill. Rhymes Eg. (Jack and Jill went up the hill) and half rhymes (Goosey, Goosey gander where do you wander) are a necessary, frequent and usually heavily stressed part of nursery rhymes. So it is quite possible that young with the help of these traditional routines, rhyme and alliteration are significant phonological phenomena.

There are few studies which denote that children have this sensitivity long before they go to school. Four years (Knafle 1973, 1974, Lenel and Cantor 1981) and even 3 year old children (Maclean, Bryan and Bradley, 1987) perform well above chance level in rhyme detection tasks. Some authors state that rhyme and alliteration tests are the only measures of phonological sensitivity which one can rely on to produce above chance level results is pre-school children. Tasks with involve detection of single phonemes are usually too difficult for children who have not yet learned to read. (Bruce 1964, Liberman et al 1974, Liberman et al 1978, Bryant and

Gowswami 1987). They also cause a great deal difficulty to adults, and to older children, who are not learned an alphabetic script (Morais et al 1986, Morais and Bertelson et al 1986, Read et al 1986).

Bryant et al (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 to spell. Their report contains longitudinal data from a group of 64 children from the age of 3; 4 to 6; 3. They noted 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, IQ and the children's phonological skill also were considered. The results point to the knowledge of nursery rhymes enhances children's phonological sensitivity which in turn helps them to learn to read. This also support the idea of this path from nursery rhymes to reading. Nursery rhymes are related to the child's subsequent sensitivity to rhyme and phonemes. Moreover the connection between knowledge of nursery rhymes and reading and spelling ability disappears when controls are made for differences in these subsequent phonological skills.

Rhyming skills and later reading, the one reason for this relationship may be that children who have put words into rhyming categories before they begin school may be quick to realize that these words also tend to share the same spelling patterns, and may then use such similarities in spelling to

make predictions (analogies) about how new written words will sound. The study by Goswami (1990) tests one aspect of this hypothesis, with is that children who make more analogies in reading are also better at rhyming than children who do not

5. **Rapid Automatized Naming:**

Almost 3 decades of research now demonstrate 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, colours and simple objects. Many of these children and adults do not have blatant word finding difficulties but are nevertheless significantly slower than their average reading peers on continuos naming or naming speed tasks, in which they are required to retrive names for common, serially presented stimuli under conditions requiring time.

```
0    a    S    d    P    a    0    S    P    d

S    d    a    P    d    0    a    P    S    0

a    0    S    a    S    d    P    0    d    a

d    S    P    0    d    S    a    S    0    P

S    a    d    P    a    P    0    a    P    s
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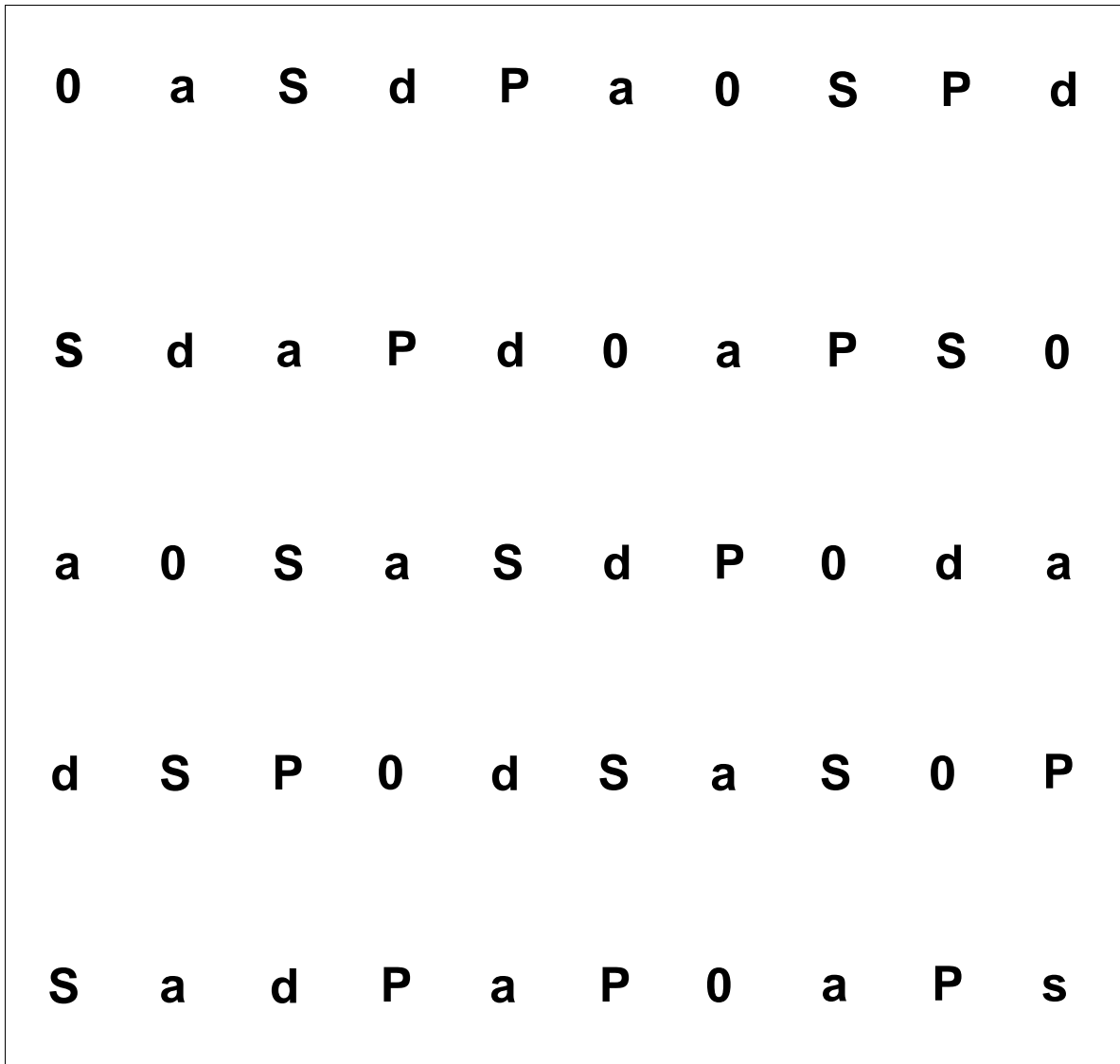
Example of most commonly used naming - speed task, the Rapid
Automatized naming (RAN) test.

Deficits in rapid automatised naming are well attested in dyslexic
children of all ages (Denckla & Rudel, 1976). These are normally
theorized, within lexical access accounts of dyslexia, a word finding

difficulties. Tests of immediate memory for lists of names, without context must be stored largely by phonological structure, are especially good indicators at this age of unusual difficulty in verbal learning.

The research in this area is based originally on work in the neurosciences, stemming from a hypothesis about color naming by Geshwind (1965). Geshwind (1965) suggested that the cognitive components involved in colour naming - i.e. those components involved in attaching a verbal label to an 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 (1972) who in collaboration with Rudel (Denckla and Rudel, 1974, 1976 a, 1976 b) found that the speed with which names were retrieved, rather than the accuracy in colour naming or the naming itself, differentiated dyslexic readers from others. These researchers were the first to design a rapid automatised naming (RAN) task to measure continuous, serial naming speed performance on common visual stimuli. The RAN task measure the speed with which children can verbally name a serial array of most basic visual symbols and are the prototypical tasks used in most of the research.

Several authors have done research that, naming speed differences have been demonstrated among dyslexic readers across languages of varying degrees of orthographic regularity, including German (Naslund & Schneider

et al, 1991) two language with a more transparent or regular orthography than English naming speed appears a more robust predictor of reading performance than phonological awareness measures. The importance of these cross linguistic findings is that they eliminate the irregularity of English orthography as a possible explanatory factor in the naming speed findings. Moreover they suggest that, in languages where a regular structure can be decoded using relatively lower levels of phonological skill than needed in English the speed - of processing variable emerges as a strong predictor of reading performance than phonological awareness task.

It has been found that, children in the pre-school years tend to pick up recognition of letters and numbers spontaneously, whether or not they attend play groups, nurseries and pre school. Parents of dyslexic children, however, frequently report an absence of interest in books and a lack of facility with letters and numbers even when these have been introduced in a semi formal learning environment.

In addition Carts 1989b, Wag ner and Torge sen 1987, have proposed that these problems include a lack of sensitivity or awareness of the speech sounds in words eg: phonological processing deficits further include problems in word retrieral (Bardian, Mc Anulty, Duffy, Als. 1970). Verbal short term memory (Torgesen, 1985) and speech production (Carts, 1989 c, Snowling 1985).

From the above mentioned literature it is evident that there are many related linguistic skills established to find out the ' at risk' for R.D. children. With this knowledge there were many attempts for early prediction of R.D. in literature.

Identification Of Reading Disability:

A number of clinical and more formal studies had objective of prediction of reading success or failure. Among the statistical investigators some researchers have used single variables, such as auditory discrimination, visuo-motor competence, anxiety level or self concept as measured in kindergarten first grade to predict reading competence from 9 to 12 months later. A few investigators constructed a battery of predictive tests, one of the earliest and best tests was constructed by Monroe (1935) His investigation differ power others in three respects (1) it explores a longer section of the   child's perceptuomotor and linguistic organization than do other projects (2) it predicts spelling and writing in addition to reading achievement and (3) the interval between prediction and outcome is more than twice as long as in most other studies.

Schools have assessed children's readiness for years, relying basically on three type of evaluation.

1) Reading - readiness tests

2) Determination of I.Q. (mostly of a group variety).

3) Informal "Sizing up" of the child by the kindergarten teacher

The disadvantage found from these techniques were, Reading-readiness tests do not always reveal enough about a child's specific weaknesses and strengths to assist the teacher in the planning of educational strategies and also reading readiness tests fail to predict writing and spelling achievement.

Reliance on intelligence tests has been challenged because (1) Severe reading disabilities are known to occur on virtually all intellectual levels;

2) An IQ represents at best a global rather than a differentiated evaluation of a child's potential and

4) And IQ does not necessarily take into account important perceptuomotor factors that are significant for reading success or failure.

The developmentally oriented kindergarten teacher's assessment of a child although often remarkably accurate, can not be easily duplicated.

The need for using statistical tools also highlighted in few studies. Hirsch and Jansky (1966) highlighted the need for using statistical tools for predicting R.D. In order to shape an instrument for the schools that would enable them to identify what termed as "academic high risk" children at early ages, would have to (1) use an instrument that was relatively untainted by subjective clinical judgment and (2) use in addition to a clinical group, an instrument that would be representative of a school population.

Hirsch and Jansky 1966, reported a study done on a sample of 53 children from the general population and a sample of 53 prematurely born subjects. The heart of the investigation consisted of an attempt to determine which of 37 perceptuomotor linguistic, and reading readiness tests administered at the kindergarten level would prove to be potential predictor of reading, writing and spelling abilities 2 ½ years later. A further goal was to combine the best potential predictors to yield an instrument of wide spread applicability.

These attempts were summarized by Hirsch & Jansky (1966) in their article, since development is a consistent and lawful process, a kindergarten child's perceptuomotor and oral language status would forecast his performance on such highly integrated tasks as reading, writing and spelling. The tests administered covered several broad aspects; behavior and motility patterning, large and fine motor co-ordination, figure-ground discrimination,

visuo-motor organization, auditory and visual perceptual competence and use of oral language, and more specifically, reading readiness.

In the recent years the university based research initiatives to develop screening measures have won publicity. The university of Hull psychology department Dr. Chris Singleton and his colleagues, taking a pragmatic approach, have turned their attention to the development of diagnostic software that could prove useful in the infant departments of schools (Singleton, Thomas and Leedale, 1995). To date, their resulting software suite, Co Ps or cognitive profiling system, a set of games - formant tests with which the young child interacts directly through a key board.

The rationale for this development accepts that 'Cognitive precursors of dyslexia' include aspects of 'memory, sequential information processing, phonological awareness and in some cases, visual perceptual difficulties.

A parallel development has been the work of Angela Fawcett r and Rod Nicolson at Sheffield University Psychology Department (Fawcett, Pickering and Nicolson, 1992). This proceeds squarely from their well known theoretical perspective that an automatisation deficit, originating in cerebellar dysfunction impedes the learning of basic skills in dyslexia, as well as primitive motor skills such as balance.

Most of the earlier screening instruments were include the tasks of psychological ability items, motor ability items, with linguistic items. The recent screening tests give more importance to linguistic items, because it proves from literature as a best predictor of R.D. Similar attempt was found in the Dyslexia Early Screening Test (DEST) by the psychological co-operation UK early in 1996, the test is normed for children aged 4; 6 to 6; 5. Requiring pencil and paper only and a minimum equipment, the DEST is capable of being administered to a child in just half an hour. It comprises 10 subtests, the native of which arises directly from dyslexia research.

1. Rapid automatised naming of pictures of common objects.

2. bead threading

3. Phonological discrimination (minimal word pairs)

4. Postural stability.

5. Rhyme detection and alliteration.

6. Forward digit span,

7. naming of printed digits.

8. naming of printed letters.

9. Sound order (temporal auditory integration Eg:-which came first, the duck or the mouse?)

10. Shape copying.

Firm performance criteria are specified, as are clear procedures for deriving an "at risk" quotient. Clearly this is a test and will be judged by conventional psychometric criteria.

A pure linguistic based screening check list was developed by (Catts, 1998) for identifying at risk children for R.D. The items in the checklist are listed below. The checklist is designed to administer on kindergarten children. The domains included in the check lists are :

- Speech sound awareness

- Sound production / perception

- Language expression

- Verbal memory

- Word retrieval

- Other important factors.

With the tools, devices developed to screen the ' at risk' children many studies have been carried out in recent years. There have been a no. of longitudinal studies of children with dyslexia or learning disabilities (eg. Finucci, Gott fredsen; childs 1985, Forell and Hood, 1985: Michelson, Brying & Bjorlkgren 1985 ; Scarborough, 1984, Silver and Hagin, 1964,

Spreen, 1982). These studies have investigated educational and vocational outcomes in adolescence or early adulthood. Reviews of such studies include those by Finucci(1986), Horn O'Donnel, and Vitulano (1983), Schonhaut and Satz (1983) and Spreen (1982). The general conclusion from a review of studies was that the academic outlook for children with early learning problems is poor, although high socio economic status (SES) has mitigating effect (schonhaut and satz, 1983).

Spreen (1982) came to the conclusion that out come studies over the previous 25 years tended to show minimal or no effect of increasing attempts at intervention except for students with high intelligence attending private schools.

The gap between learning disabled and normal learners was greater at follow-up than at the time of the initial assessment was found in a review by Horn et al (1983). They concluded that children with learning disabilities do not appear to catch up in basic skill areas.

Finucci (1986) in her review concluded that both IQ and socio-economic status (SES) have a positive effect on remedial success, but also that there is insufficient data on educational and occupational attainment or social and martial adjustment. The Colorado Reading project is an ongoing longitudinal study for reading disabled children, their matched controls, and the parents and siblings of each group. Some of the Colorado 5-years follow

up findings have been reported (Defries, 1985; De Fries & Baker 1983). A follow up of 69 matched pairs, tested at mean age of 9.4 and 14.8 years, showed that reading disabled and control children differed substantially in reading at both ages, but by a constant amount. DeFries concluded that the results clearly demonstrate longitudinal stability was less for reading disabled children.

Early Identification of learning disabilities using the meeting street school screening test was conducted by Rafoth, M.A (1988). The Meeting street, a screening test developed by Hainsworth and siqueland 1969 designed to identify learning disabilities, has 3 subtests that yield scale scores; motor patterning, visual perceptional motor and language. Cut off scores based on raw scores points are given in the manual for children in kindergarten and first grade. Test administered in first grade was expected to be a better predictor of later placement in learning disabilities program than the recommended cut off scores. As reported by Swanson, Payne & Jackson, 1981, the meeting street has been shows to be a valid predictor of end of year first grade reading achievement.

The efficacy of screening 2 - year old children for language delay using a parent - report questionaire was investigated by a language development survey (Rescorla, 1989). The language development survey was mailed to 650 families at the time of their child's second birthday. 53%

of the surveys received by parents were completed and returned. Screening outcome were then compared, in double blind fashion, with the results of comprehensive clinical evaluations at ages 2 (N=64) and 3 (N=36). Parent's report of the size of their children's expressive vocabularies was highly correlated with clinical language measures at age 2. Children who screened positive performed significantly poorer than children who screened negative of standardized language tests and or measures taken from spontaneous conversation. The screening program demonstrated excellent sensitivity and specificity for identifying language delay at age 2 but somewhat lower levels for predicting developmental status one year later.

Early predictors of reading problems in children at risk for such problems determined by a study designed by a Menyuk et al (1991). 3 groups of children participated in the study those with SLI, those who presumably had a language delay or disorder early in life and had no or a mild disorder at present; and a group of premature children. The data collected were standard speech and language test measure, given as the children entered the study, measures of language met processing abilities on an experimental battery, given 6 months after they entered the study, and standard measures of reading, given when the children were aged 80 to 96 months. Many significant relations were found between measures of oral languages ability and meta-processing ability at an earlier age and reading ability in first and second grade.

Attempts to design reliable tool or device for early identification of reading disability continue in recent years also. A study by Lombardino et al (1997) was designed to provide speech language pathologists and educators with a method for identifying children at risk for reading failure. The early reading Instrument (ERIS) was given to 149 end of the year kindergarten children. Half of the sample was tested 1 year later with standardized reading measures WRM T-R. Total ERSI scores from the kindergarten children strongly correlated with reading skills in first grade. Reading comprehension in first grade was the skill most strongly predicted by the subjects, total ERSI scores. The word recognition and invented spelling subtests of the ERSI were best variables to be selected as predictors of first grade word analysis, word identification and passage comprehension skills.

There are many similar studies have reported in Indian situations also.

Indian Studies:

Mohanty (1990) investigated the degree of relationship between reading comprehension and various measures of metalinguistic skills and also compared the performance characteristic of good and poor readers on the metalinguistic measures. Forty children selected from class four of the

university U.P. School Bhubeneswar were administered a test of Reading comprehension and several seven other measures of metalinguistic ability. Analysis of variance compared the performance characteristics of the top 15 and bottom 15 readers, and revealed that the good readers were better able to use the words flexibly and in a context free manner, and were able to differentiate between words on the basis of their salient characteristics. Their abilities to interchange words and detect inconsistencies in the text message were better compared to poor readers. The Correlational analysis revealed the nature of homogeneity of the battery of metalinguistic tests, at the same time suggested that the battery could be broken down into several groups, each meant to capture down into several groups, each meant to capture a unique and specific aspects of metalinguistic abilities.

Jagadish (1991) explored logographic reading skills during the initial stages of learning to read. She presented 47 items (with consisted of familiar television advertisements) in four formats and noted the responses 45 pre school children age-ranges-2-3 ½ ; 31/2 - 41/2; 41/2 - 51/2 years. The results indicated the presence of logographic reading skills and a developmental trend in the acquisition of reading skills.

Gokani (1992) compared the extent of relationship between phonological awareness and orthographic features in learning to read. Sixty children from Gujarathi speaking families were selected as subjects from

two schools in Bombay. The test of listening comprehension, (subtest of the Boder Test of reading spelling patterns) word reading (English medium) and word recognition (Gujarathi medium) and measure of speech segmentation was administered the results showed - (1) No significant - difference in speech segmentation ability of children exposed to either alphabetic or semi syllabic script, (ii) Rhyme recognition scores of the two groups are almost similar (iii) syllable stripping scores of the children exposed to semi-syllabic script are slightly better than these exposed to alphabetic script, however, the difference was not significant, (iv) there was a significant difference in phoneme stripping task between English and Gujarathi medium children in favour of the English medium children. This shows that such phoneme level tasks are sensitive to orthographic variations, (v) word reading and speech segmentation ability are highly correlated for English medium children correlations between these tasks was low to moderate or even negative at times for Gujarathi medium children.

Loomba (1995) investigated the sequential progression of English reading skills in jlndian children. She administered the informal reading diagnosis proposed by Rae and Patter (1975) on forty normal school going children studying in the class range of first to eight. All the subjects were Hindi speaking with their mother tongue as the same or Punjabi. They had no exposure to English at home and had started learning English only in school. The results indicated that acquisition of reading skills followed the

normal developmental pattern. The sequence of progression of reading skills was in consonance with acquisition of reading by native speakers of English. However, a lag was observed in all the skills which is attributed to the fact that English reading instruction and exposure to the language begin only in the school for these children.

Mullimani (1997) evaluated the listening and reading comprehension difficulties in primary school children of grade III and IV. She found a moderate correlation (0.5448) between reading and listening comprehension among grade III Children and a similar moderate correlation of 0.6042 between reading comprehension and listening comprehension among grade IV children.

Prema (1997) profiled acquisition of reading and writing skills in children learning to read and write kannada. The results showed that;

i)   There was a developmental change along the four major areas of reading acquisition (language and metaphonology) reading and writing, knowledge of orthographic principles and reading comprehension across the 5 grades under the study and the changes were not uniform.

ii)   There was a hierarchy of skills which could be considered as predictors of reading ability in learning to read Kannada.

iii) The reading and writing behaviour of children learning to read and write kannada reflects the influence of the features of Kannada orthographic system.

iv) The profile for reading and writing behaviour of a given child, helps in identifying reading disability if any.

Anne (2000) in her study derived at a need for developing a screening tool to identify children with reading disability. The objectives of the study were to find out there is any relationship between reading comprehension and listening comprehension and also any difference in performance of III graders and IV graders in reading comprehension and listening comprehension. A moderate correlation was found to exist between reading comprehension and hstening comprehension among III & IV graders. There was no difference between the performance of girls and boys in reading comprehension and listening comprehension.

Akhila (2000) studied the relationship between phonological awareness and orthographic skills in Tamil speaking children. Tests for phonological awareness and orthographic principles were administered on 40 children from Tamil medium, in Grade III and Grade IV. Results found that there is significant relationship between phonological awareness (rhyming, syllable oddity, and syllable reversal) and orthographic skills, there is no significant difference in the performance of children from graft III and grade IV on phonology and orthographic skills. Results of the study

also indicate that syllabic awareness is acquired earlier to phoneme awareness in an alphabetic script.

A reviews of the Indian studies point towards the lack of adequate, quick screening tool to identity children with reading disability in the pre school year.

The review highlight the need for appropriate language based tool to identify and arrers children with reading disability.

In earlier tools for reading assessment of 1930's and 1940's concentrated on assessing skills like reading speed, reading accuracy, reading efficiency etc., and also they usually assessed children in the higher grades. Later with the increasing knowledge of deficiencies in the domains of linguistic and meta linguistic skills with children with reading disabilities, particularly is the pre school years, the need for developing language based tools tests to screen emerged.

In our country such a tool for early identification of R.D. is lacking in Indian languages. As mentioned earlier, early identification of children with R.D. has an important bearing on the eventual school success.

Hence, the primary objective of the present study was

1. To develop a checklist in Malayalam to identify language Based R.D and identify children with language based R.D. in pre-school children, who are native speakers of Malayalam (a South - Indian language, spoken in the state of Kerala)

2. To compare the responses of different skills (tasks) between groups.

3. To compare the sex difference of performance of different skills among groups.

4. To identify "at risk" children for language based reading disabilities, with the help of Che SLR.

5. To identify the potential parameters which would help in prediction of reading activities.

CHAPTER 3

METHODOLOGY

The primary objective of the study is to develop a checklist to identify
children with language based reading disabilities.

A. Subjects :

24 children (12 males and 12 females) who were native speakers of
Malayalam in the age range of 36 months to 60 months were selected for the
study.

The children were grouped into 4 categories, as shown in Table No.l :

Groups	Age in months	Nos.	
		M	F
Group I	36-42	3	3
Group II	42-48	3	3
Group III	48-54	3	3
Group IV	54-60	3	3

Subjects

The following criteria were used for selecting the subjects,

1. Children should be native speakers Malayalam,

2. They should not have exposure to any other language.

3. They should not have any significant pre-natal / peri-natal / post-natal illnessed and complications.

4. They should not have any physical, sensory and / or psychological problems as reported by parents. In addition to the above, all the children were screened for speech and language and hearing deficits if any, by a qualified speech language hearing pathologist by adopting a screening check list (Appendix 1).

B. Test Material:

Catts's (1995) check list for language based reading disabilities (Appendix 2)served as a basis for developing the 'check list for screening language based Reading disabilities" (Che-SLR).   However, suitable modifications were adopted to the check list given by Catts on account of the following reasons:

a) The number of items listed under each domain are not uniform,

b) It does not mention the test materials that need to be used to check for the skills.

c) It has not been administered either on normal or on clinical population (known through personal communication by the guide).

d) Review of literature suggested that testing for a few more domains would be helpful in evaluating language based reading disabilities.

Hence, in developing the 'Che-SLR', other than the domains proposed in Catts's check list, additional domains were incorporated. Also, among the domains retained from Catts's check list, some modification were adopted in the tasks. Some of the domains were given a different label in order to comply better with the tasks enlisted.

Table 2:   TEST domains.

Catts's Check list	Modified Check list Che-SLR
• Speech sound awareness. *	• Rhyming and alliteration.
• Word retrieval.	• Verbal Memory
• Verbal Memory.	• Word - Retrieval.
• Speech production / perception.	• Rapid naming (RAN).*
• Comprehension.	• Comprehension of Language.
• Language expression.	• Speech production.
• Other important factors.	• Language expression.
	• Listening Skills.*
	• Non - Verbal limitation. *
	• Other important factors.

 * Indicates additional domains in the Che-SLR.

** The domain "speech sound awareness" was relabeled as "Rhyming & alliteration".

The sources from which additional items were extracted were

- Illinois test of psycholinguistic Abiliteis (ITPA)

   (Samuel et al, 1968).

- Quick neurological screening test (QNST)

   (Margeret et al. 1968).

- Revised token test in Kannada (RTT)

- North Western syntax screening test. (NSST)

   (Lee. 1969).

I. Rhyming and alliteration (R & A):

Literature has established that acquitance with nursery rhymes might influence children's reading. (Bruce 1964, Liberman et al 1974, Liberman et al 1978, Bryant & Goswami (1987).   Hence, domain "Speech sound awareness" has been revised in Che-SLR as "Rhyming & alliteration".

II. Verbal Memory (V):

The following items have been incorporated in domain II of Che-SLR, in addition to those listed by Catts (1995).

a) Digit repetition task is incorporated to check auditory sequential memory (source ITPA 1968).

b) Letter naming activities are included, as letter naming at the beginning of the kindergarten year is highly correlated with reading real word & decoding nonsense words at the end of first grade (Share et al 1984).

c) For the assessment of both word concept and story recall abilities items from the early Reading screening instrument (Lombardino, et al 1997) are included.

ID Word Retrieval (WR):

a) In order to assess the concept of word, additional items in Che-SLR are taken from the "Early Reading Screening Instrument", (Lombardino, et al (1999)}.

b) Auditory closure task has been drawn from ITPA subtest.

c) To appraise word retrieval abilities items have been taken from the NSST, as it places emphasis on this ability in 3-8 years old children.

IV Rapid Naming (RN) :

The items under this domain includes;

a) Colour identification activity as, children in the age range of 3-3 1/2 years are able to identify five primary colours. This has been ascertained through Carrow test for auditory appreciation of language and stroop - colour word test.

b) Test of naming body parts, objects and alphabets to test rapid naming ability in children (Vander Bos, 1997; Wimmer 1993; Wolf et al 1986; Wolf et al 1994).

V. Comprehension of Languages (CL):

The additional items incorporated in this domain have been chosen from the NSST as the test focuses attention on the language abilities of 3-8 year old children.

VI. Speech Production (SP):

The following items have been added in this domain;

a) Sound blending activities from ITPA.

b) Age appropriate sounds for 3-5 years old children as per the norms established in Malayalam articulation test.   (Appendix No. 3)

c) Sound recognition task taken from NSST.

VII. Language Expression (LE):

a) Other than the items from Catts's check list grammatical closure task has been taken from ITPA.

b) Fluency test has also been introduced in this domain.

VHI. Listening Skills (LS):

For modification in this domain auditory reception and auditory association tasks from ITPA and activities from Revised Token test have been included. These tasks have been assimilated in Che-SLR as listening skill is one of the important factors in reading comprehension (Anne, 2000).

IX. Non Verbal Imitation (NVI):

Under this domain additional items are derived from QNST (Margeret et al, 1968). Which contain the following activities.

a) Sound patterns (2-1-2). 2 tap, pause, 1 tap, pause 2 taps.

b) Thumb - finger closure imitation etc.,.

X. Other important factors :

In this domain only 5 relevant items in the Catts's check list have been retained.

C. Distribution of items under each domain :

To give an equal weightage to all the domains, the number of items in each domain were kept as five. Hence, the total number of items in the check list are 50.

Test - Kit of Che - SLR includes materials and illustrations for evaluating various parameters in the 10 different domains.

- The final Check list was subjected to scrutiny by a speech language pathologist, a linguist and a psychologist.

- A pilot study was undertaken on 5 Malayalam speaking children.

D. Procedure:

The "Che - SLR" is presented in (Appendix. 4)

The Che - SLR was administered in Kerala (South Indian State) on children who are native speakers of Malayalam. Testing was carried out in a the pre-schools / the play houses, in a noise and distraction free environment. Administration of the Che - SLR was done in the presence of the teacher or the parent.

The Che - SLR was administered during middle of the academic year (month of Novemebr - December) when no curricular teaching had been done. During this time, the socialization skills were focused in the preschools.

Duration of Administration of the Che - SLR was approximately 1 hour. It was either done in a single sitting or for 2 - 3 sittings of 30 mins, each sessions depending on the motivation and co-operation of the child.

Before the administration of the Che - SLR, rapport was established with each child. After testing, appropriate rewards were given to the child.

E. Scoring:

The responses were scored by adopting the arbitrary scale that was devised for the purpose.

Table 3: The Scale adopted is as under.

0	1	2	
Could not do	Able to do with 2 - 3 demonstration	Able to do with one demonstration.	Able to do

Discriptions/remarks on the qualitative performance were also recorded in the data sheet.

Response sheet comprising the above scale is enclosed in (Aappendix 5)

F. Statistical Analysis :

The data obtained was subjected to statistical analysis. The performance of children was also qualitatively analysed and discussed.

CHAPTER 4

RESULTS AND DISCUSSION

The present investigation was aimed to identify children with language based Reading disability in their pre-school years. 24 children (12 male and 12 female) who were native speakers of Malayalam participated in this study. The data collected from 3-5 years age group, was categorized into 4 groups each with 6 months gap.

Quantitative Analysis:

Means and standard deviations for all the tasks were computed and a comparison of these means and S.Ds across groups is shown Table 4 and between sex in Table 5.

Analysis of scores revealed that on **word retrieval** and **comprehension of language** tasks mean scores of the all the 4 groups approximated the maximum (45), while SD range was also low suggesting that these two skills are almost achieved at *3-3 1/2* year level itself.

Mean scores on majority of tasks, i.e., listening skills, non-verbal imitation, speech production also approximated the maximum scores in group IV with very low SD range, suggesting a stable performance on all these tasks by *4 1/2 - 5* year age.

Comparison of mean scores of various domains of the Che -SLR revealed that for rhyming and alliteration task the mean scores in all the groups have been consistently low with high SD range. This suggests that even by 5 years, Malayalam speaking children are not proficient in rhyming and alliteration and that they also show high variability in contrast to that of word retrieval and comprehension of language.

The pattern of results on mean and SD analysis in general indicate that the younger children (Group I) always differ from the older children (Group II, III and IV) except on rhyming and alliteration task. In rhyming and alteration task all the children showed relatively poor performance.

Table 4 also indicates rapid raise in the mean scores on majority of the skills with a decrease in SD range from group I through group IV suggesting that there would be a improvement and also uniformity in the acquisition of most of these skills.

The gradual improvement in performance in the various skills could be attributed to the spurt of language maturation, that is reported to occur at this age.

In the present study an additional variable i.e., admission to preschool by 4 years seems to be a potential factor that could explain the consistent progression seen in almost all the skills.

Table 4: Group mean and SD scores for the skills under study

Groups /Tasks	I 3 - 3 1/2 Yr.		n 3 1/2- 4 Yr.		in 4 Yr-4 1/2Yr..		IV 4 1/2- 5 Yr.	
	Mean (0-45)	SD	Mean (0-45)	SD	Mean (0-45)	SD	Mean (0-45)	SD
R	11.83	8.43	28.00	6.42	25.83	4.96	32.17	6.79
V	24.50	*4.68*	35.83	1.72	36.33	4.59	40.83	2.48
WR	42.00	3.46	43.33	1.03	42.17	1.72	44.50	0.84
RN	32.00	7.97	38.17	2.56	36.17	5.49	40.50	2.74
CL	40.00	4.47	41.33	2.80	43.00	1.26	44.33	0.52
SP	30.00	9.61	42.67	1.97	37.83	2.93	42.33	4.18
LE	21.83	2.56	30.00	2.90	29.17	3.54	32.67	2.58
LS	21.83	8.54	30.50	5.82	31.83	9.79	41.50	3.99
NVI	26.17	4.49	32.83	3.49	34.50	2.88	41.00	4.15
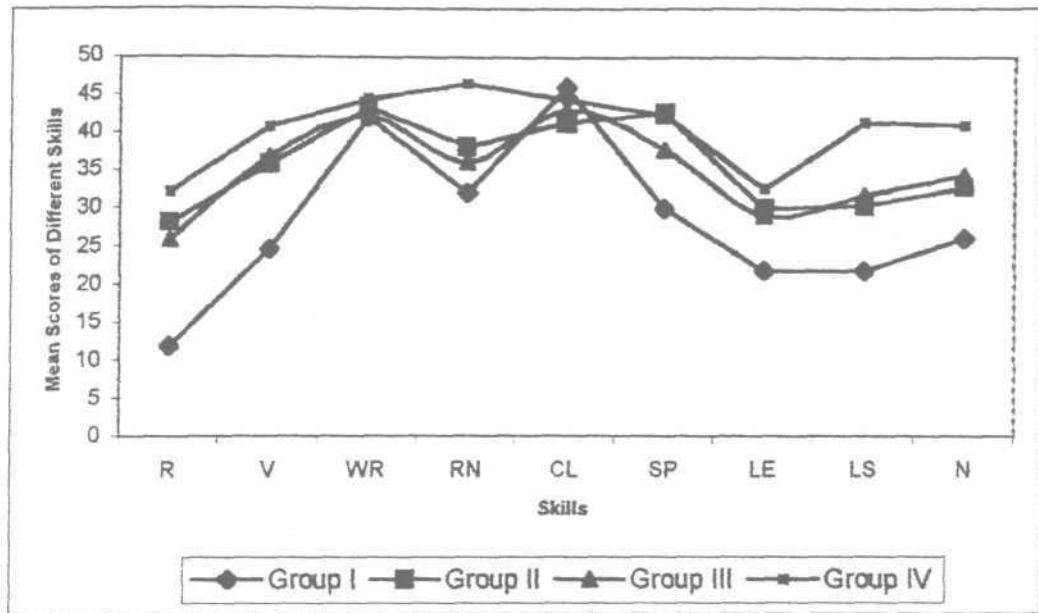
Graph-I shows group I considerable, difference between other groups. The Group II, III and IV shows almost similar pattern.

The best performance on word retrieval and comprehension of language across all the groups could be either because the difficulty level of the tasks was not too high or that these skills are achieved much earlier by children. To check for this 3-way ANOVA was carried out.

The scores on rhyming and alliteration task are not in agreement with either the pattern obtained for the rest of the skills or with the western studies. While the western studies emphasize that good knowledge on rhyming and alliteration is evident by 3 years (Maclean, Bryant Bradley, 1987) and shows continued progress upto school years, the present study revealed that only on this skill, the performance was relatively poor in comparison to all other skills under study. This contradictory results could

be supported by Naslund and Schneider et al 's (1991) observation that in languages where regular structure can be decoded using relatively lower levels of phonological skills than needed in English, then the factor of phonological awareness (required for rhyming and alliteration) would not be of significance and hence should not be considered as an important precursor of children's reading. The result of the present study suggests that the processing of such skills should be considered from a different perspective, particularly for languages like Malayalam.

Table 5: **Mean and SD scores of children (including males and females)**

Group	I				II				III				IV			
Task	Mean		S.D		Mean		S.D		Mean		S.D		**Mean**		S.D	
Gender	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Total R	9.67	14.00	11.93	4.58	27.00	29	3.00	9.54	25	26.67	7.55	1.53	30.33	34	5.51	8.36
Total V	25.67	23.33	5.03	5.03	36.33	35.33	0.58	2.52	39.33	33.33	3.06	4.04	38.67	43.00	0.58	1.00
Total W	43.67	40.33	0.58	4.62	43.00	43.67	0.00	1.53	43.00	41.33	0.00	2.31	44.67	44.33	0.58	1.15
total RN	33.00	31.00	7.94	9.64	39.33	37.00	0.58	3.46	40.33	32.00	4.51	1.73	38.67	42.33	2.08	2.08
Total CL	40.67	39.33	2.08	6.66	43.00	39.67	1.00	3.21	43.67	42.33	1.53	0.58	44.33	44.33	0.58	0.58
Total SP	31.00	29.00	5.20	14.18	44.00	41.33	1.73	1.15	39.67	36.00	2.08	2.65	41.00	43.67	6.08	1.15
Total LE	21.33	22.33	1.15	3.79	28.33	31.67	1.53	3.21	31.33	27.00	4.16	0.00	32.67	32.67	4.04	0.58
Total LS	25.67	18.00	10.01	6.08	31.00	30.00	4.58	7.94	38.00	25.67	4.58	10.21	40.00	43.00	4.58	3.46
Total NI	24.67	27.67	1.15	6.51	34.00	31.67	4.58	2.31	36.33	32.67	3.06	1.15	41.00	41.00	5.20	4.00

Table 6 : ANOVA SCORES FOR FOUR GROUPS

Dependent Variable	4 Groups		
	Mean Square	F	Significance
R	466.486	8.719	0.001
V	29.375	27.545	0.000
W	8.111	2.093	0.143NS
RN	77.931	3.112	0.056
CL	21.556	2.723	0.079 NS
SP	21.556	5.924	0.006
LE	128.944	16.549	0.000
LS	389.056	8.176	0.002
NI	222.819	14.414	0.000

NS = Not Significant.

Table 7: ANOVA SCORES FOR GROUP Vs. SEX

Skills	Group Vs Sex		
	Mean Square	F	Significance
R	2.486	0.046	0.986
V	27.486	2.607	0.087
WR	4.500	1.161	0.355
RN	36.042	1.439	0.268
CL	2.833	0.358	0.784
SP	11.819	0.335	0.800
LE	10.444	1.982	0.157
LS	69.944	1.470	0.260
NVI	12.819	0.829	0.497

3 WAY ANOVA:

To study the variations among the mean scores on various domains, in all the groups of children of both the sex 3-way ANOVA was employed. In order to compute the ANOVA's, the raw scores of the different domains were summed up to get a section wise composite score. Table 6 & Table 7 show the results of 3 way ANOVA's. the F-ratio and its significance are also tabulated. The results indicated that there is no significant difference in variance between males and females of all the 4 groups (Table 7). However, a significant difference was found in performance of children of all the 4 groups for all the skills under study except for word retrieval and comprehension of language (Table 6). The significant difference among the groups on most of the skills is suggestive of the rapidity in the acquisition of these skills by children.

Similar results were obtained on analysis of Mean and SD, also excepting that on RN tasks, performance of Group I was significantly different from that of Group IV (Table 6), but Group II and Group III did not show any significant difference. While the literature shows that children with reading disability are poor in raid naming tasks that required word retrieval skills, yet do not manifest blatant word finding deficits, in the present study as pre school children, a significant difference between the youngest (Group-I) and the oldest group (Group-IV) was seen for rapid

naming tasks. Geshwind (1965)suggested that ,certain tasks that involve cognitive components like color naming ,attaching verbal label to an abstract word make the task difficult for the child. Hence, certain tasks that involved cognitive components in rapid naming tasks could have compounded the results obtained on Group I and Group IV.

After comparing the performance of 4 groups of children employing 3 way ANOVA, Duncan's multiple range test for post-hoc analysis was done to check for significance of difference in variance.

The results again indicated that only on word retrieval or comprehension of language task, there was no significant difference in variance among the groups. Also, while for majority of skills like verbal memory, listening skills, non-verbal imitation and rapid naming, Group I differed from Group IV with the intermediate groups performance being very similar, for rhyming and alliteratoin, language expression and speech production, the youngest group differed significantly from the other groups.

Results from Duncan test revealed the following

R - Group I differ from other groups.

V - Group I differ significantly from Group IV

LE - Group I differ from other groups

LS - Group I differ from group IV

NI - Group I differ from Group IV

RN - Group I differ from Group IV

SP - Group I differ from other groups.

Good performance on rhyming & alliteration and language expression have been consistently discussed in the literature on reading disability as one of the foremost indicators of good reading and hence would act as precursors of reading disability. Parallelly, it is also stated that the precursors fade out with maturation (Turner, 1997). Similar results are obtained in the present study where the youngest differed from the oldest in the above skills but not the others. This suggests that the precursors need to be tapped at the earliest age possible, otherwise they tend to be missed out, probably because of masking that occurs due to so many other intervening developmental phenomena. One of the objectives of the study was to check for age & sex differences in performance. The results of ANOVA did not indicate any sex difference, but differential performance was seen across groups.

Correlational Analysis:

To evaluate the pattern of relationships that exists among the various tasks, Pearson's co-efficient of correlation was computed. Two tailed test was employed to check for the significance of correlation.

The correlation that exists among the skills under study are presented in Table 8.

Table 8: Correlation Matrix

		Total R	Total V	Total WR	Total LE	Total LS	Total NI	Total RN	Total CL	Total SP
Total R	Pearson Corrclation	1.000	0.706**	0.242**	0.590**	0.559**	0.556**	0.327	0.301	0.468*
	Sig. (2 tailed)		0.000	0.254	0.002	0.005	0.005	0.119	0.154	0.021
	N	24	24	24	24	24	24	24	24	24
Total V	Pearson Correlation	0.706**	1.000	0.561**	0.806**	0.751**	0.765**	0.705**	0.667**	0.694**
	Sig. (2 tailed)	0.000		0.004	0.000	0.000	0.000	0.000	0.000	0.000
	N	24	24	24	24	24	24	24	24	24
Total WR	Pearson Correlation	0.242	0.561**	1.000	0.501*	0.407*	0.435*	0.585**	0.586**	0.693**
	Sig. (2 tailed)	0.254	0.004		0.013	0.048	0.033	0.003	0.003	0.000
	N	24	24	24	24	24	24	24	24	24
Total Lli	Pearson Correlation	0.590**	0.806**	0.501*	1.000	0.633**	0.726**	0.560**	0.546**	0.693**
	Sig. (2 tailed)	0.002	0.000	0.013		0.001	0.000	0.004	0.006	0.000
	N	24	24	24	24	24	24	24	24	24
Total LS	Pearson Correlation	0.559**	0.751**	0.407*	0.633**	1.000	.744**	0.572**	0.713**	0.586**
	Sig. (2 tailed)	0.005	0.000	0.048	0.001		0.000	0.003	0.000	0.003
	N	24	24	24	24	24	24	24	24	24
Total NI	Pearson Correlation	0.556**	0.765**	0.435*	0.726**	0.744**	1.000	0.628**	0.656**	0.722**
	Sig. (2 tailed)	0.005	0.000	0.033	0.000	0.000		0.001	0.001	0.000
	N	24	24	24	24	24	24	24	24	24
Total RN	Pearson Correlation	0.327	0.705**	0.585**	0.560**	0.572**	0.628**	1.000	0.587**	0.630**
	Sig. (2 tailed)	0.119	0.000	0.003	0.004	0.003	0.001		0.003	0.001
	N	24	24	24	24	24	24	24	24	24
Total CL	Pearson Correlation	0.301	0.667**	0.586**	0.546**	0.713**	0.656**	0.587** 0.003	1.000	0.644**
	Sig. (2 tailed)	0.154	0.000	0.003	0,006	0.000	0.001	24		0.001
	N	24	24	24	24	24	24		24	24
Total SP	Pearson Correlation	0.468*	0.694**	0.656**	0.693**	0.586**	0.722**	0.630**	0.644**	1.000
	Sig. (2 tailed)	0.021	0.000	0.000	0.000	0.003	0.000	0.001	0.001	
	N	24	24	24	24	24	24	24	24	24

** Correlation is significant the 0.01 level (2 tailed)

* Correlation is significant the 0.05 level (2 tailed)

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The correlation matrix indicates that there is a high correlation among most of the variables (P<0.001 and P>0.05). The significant inter-relationship among the variables suggest the tasks exhibit considerable degree of homogeneity. Further it can be noted from the correlation matrix that while all the skills under study show high correlation (P 0.01) among each other, only word retrieval skills show correlation at P>0.05 level with the rest of the skills. Also rhyming and alliteration skill shows correlation with all other skills except for word retrieval, rapid naming and comprehension of language..

The absence of relationship of rhyming and alliteration with word retrieval, comprehension of language and rapid naming further substantiates the earlier findings that rhyming and alliteration should be considered from a different angle in languages like Malayalam.

Another interesting finding is the high correlation that exists between rhyming & alliteration and nonverbal imitation which leads one to speculate whether the nature of rhymes in Malayalam. in contrast to English, could be a sensitive indicator of syllable skills rather than phoneme skills. The specified tasks under nonverbal imitation to tap, clap, count, imitate relate well with rhyming & alliteration. It can be inferred from the high correlation that exists between the two that rhyming & alliteration and Non verbal imitation could be conceived as parallel task that tap the same

underlying strategy. The findings also suggest that non-verbal imitation could be one of the important skills to be incorporated in test for reading.

Study by Hardy (1962) suggests that the ability to perceive, the process, and to reproduce sequences is a pre-requisite for spoken and printed language. Some children experience difficulty even with nonverbal sequences. Ability to imitate tapped patterns, according to Stamback (1951), increase with age and Myklebust (1963) maintains that this ability differentiates normal children from those with learning disorders. Anderson (1953) observes that the ability to recall pattern of sounds and to organize them into language units matures slowly in a number of children. Similar findings have been noted in the present study.

The results of the present study indicate a large difference between group-I Vs all other groups which supports the premise that precursors,if any, should be tapped at the youngest age possible. The results also revealed that rhyming & alliteration (which is now evident that it has a different connotation for Malayalam language).rapid naming, language expression and listening skills(refer the graph 1) could be the salient components of tests for identification of language based reading disabilities. These results support the objective to find out the potential parameters to find out language based reading disabilities.

Qualitative Analysis:

The frequency Table 9 shows that considering -2 SD as a criterion for defining reading disability, one child out of 24 is i.e,4% emerged as the incidence of language based reading disability. This result in agreement with this study done on Kannada speaking children(Prema,1997).

FREQUENCY TABLE 9.

Rhyming & Alliteration:

	Frequency	Percent
Valid 1	1	4.2
3	23	95.8
Total	24	100.0

Verbal Memory:

	Frequency	Percent
Valid 1	1	4.2
3	23	95.8
Total	24	100.0

Rapid Naming:

	Frequency	Percent
Valid 1	1	4 2
3	23	95.8
Total	24	100.0

Comprehension of Language:

	Frequency	Percent
Valid 1	1	4.2
3	23	95.8
Total	24	100.0

Speech Production:

	Frequency	Percent
Valid 1	1	4.2
3	23	95.8
Total	24	100.0

Language Expression:

	Frequency	Percent
Valid 1	1	4.2
3	23	95.8
Total	24	100.0

Listening Skills:

	Frequency	Percent
Valid 1	1	4.2
3	23	95.8
Total	24	100.0

Non Verbal Imitation:

	Frequency	Percent
Valid 1	1	4.2
3	23	95.8
Total	24	100.0

In addition, the child identified in this group is from Group I, i.e. in the youngest age group which again supports the premise that the precursors fade out with maturation. The qualitative findings substantiate the proposition that identification measures for language based reading disability should be implemented at an early age.
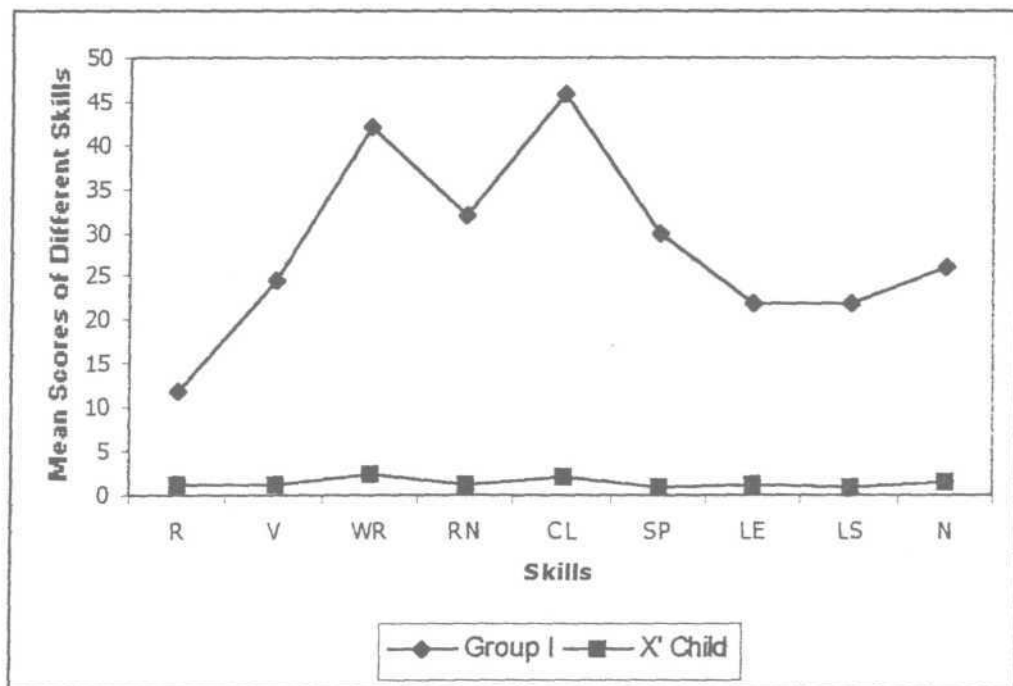
The child (x) of this study could be compared to the subgroup of children who have preschool language impairment as suggested by Aram and Nation (1980). The above results are in support of the objective of this study which stated that to screen at risk children with the help of this Che-SLR.

Other Important Factors

The last domain in che-SLR, though was included, could not be tested as data was collected most of the time from school teachers .Yet, the investigator feels that this has an important bearing in the identification of language based reading disabilities, apart from those that already discussed Hence, it is suggested that this may be retained in che-SLR for screening and clinical purposes.

CHAPTER 5

SUMMARY AND CONCLUSION

Reading is essential for educational and vocational success in our society, and the ability to read newspaper, magazines, books adds greatly to the quality of life. Reading proficiency is rooted in language abilities. For more than 30 years, researchers have been investigating aspects of language knowledge as well as discrete language processing abilities in an attempt to specify those abilities that contribute to reading acquisition. Current research shows that children at risk for reading disabilities may demonstrate early problems in expressive morphology or syntax, difficulties in understanding words and sentences comprehension of language etc.,

The present study was aimed at developing a language based checklist to identify the 'at risk'. Because as mentioned earlier identification of children with RD has an important bearing an eventual school success. Hence the objective of the present study were,

1. To develop a checklist in Malayalam to identify language based RD and administer the check list on normal children who are native speakers of Malayalam.

2. To assess linguistic skills in pre-school children from 3-5 years of age to look out for age & sex related changes if any in performance on the skills enlisted in checklist.

3. To identify the 'at risk' children for language based reading disabilities, with the help of Che-SLR.

4. To identify the variables if any, that would help in identification of 'at risk' children for language based reading disabilities.

A cross sectional population of 24 children (M=12, F=12) from 36 months to 60 months (3-5 years) taken for the study. The Che-SLR administered on these children and scoring was done as per the instructions given in the Che-SLR.

The data obtained on 24 children was analyzed by employing various statistical techniques such as means and standard deviation, Anova and correlation analysis. The data was also qualitatively analyzed.

The major findings of the study are,

1. There was an increase in the mean scores with decrease in S.D across group-I through group-IV. The findings suggest that there is a rapid acquisition of the various parameters under study.

2. The study did not reveal any sex difference in the performance on Che-SLR.

3. A statistically significant difference across groups was not seen for most of the parameters. But on rhyming & alliteration tasks, there was a significant difference across all the age groups. Also on RAN task group-I differed from Group-IV. These findings suggest that certain tasks that involve cognitive components like color naming, attaching verbal label to an abstract word make the task difficult for the child (Geshwind, 1960). Hence, the youngest differed from the oldest children of the study

4. A high correlation was found between rhyming and alliteration task and nonverbal imitation. These could be considered as parallel task. This suggests that the underlying strategies used for both could similar. Further, it implies that NVT tasks would be one of the salient components of tests for language based reading disability..

5. The Che-SLR could identify one child in a group of 24, i.e., 4% of the group as language based reading disability. This finding is in agreement with that of Prema (1997).

6. Che-SLR revealed that rhyming and alliteration, rapid naming, language expression and listening skills and non verbal imitation were identified as potential variables to identify language based reading disability.

7. The Che-SLR also suggests that some of the precursors could fade out with maturation.

8. The results of the present study strongly emphasize that identification of 'at risk' children for reading disability could be done at the pre school age.

IMPLICATIONS OF THE STUDY

1. The checklist can be used to screen children for language based reading disabilities in the age range of 3-5 years.

2. The present checklist can be further extended to lower age group i.e., below the age group of 3years , as the precursors of language based reading disabilities fade away with maturation.

3. The study enriches the literature from the perspective of cross-linguistic data.

4. "Prevention is better than Cure". Hence this checklist can be used as a good tool for primary prevention of language based reading disability.

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APPENDIX-1

ALL INDIA INSTITUTE OF SPEECH AND HEARING

Manasagangothri, MYSORE - 570 006.

DEPARTMENT OF AUDIOLOGY

Checklist to be filled out by parents / guardians.

Name of the child————————————————————————————

Name of the person filling out the form——————————— ————— ——

Relationship to the child : Mother/Father/Grandmother/Grandfather/Brother

Sister or Friend or Others (Specify) —————————

Instructions : Each form is applicable to one child. If you need more forms, you may

Procure them from the above given address.

Read the following questions and circle 'Yes' or 'No'.

1. Is any one in the (child's) family, on the father's side or

   mother's side, having a severe hearing problem since childhood   YES   NO

2. Is any one on the (child's) father's family or mother's family

   having a speech problem?   YES   NO

3. Is any one in the (child's) father's family or mothers who has

   a cleft lip and / or cleft palate ?   YES   NO

4. Does the child have ears which look different i.e., abnormal

   (too small, rather big, slightly away from where ears are

   normally found)   YES   NO

5. Does the child have ears which look different i.e., abnormal (too

   small, rather big, slightly away from where ears are normally

   found)   YES   NO

6. Is the child's jaw or tongue different i.e., abnormal?   YES   NO

7. Did the (child's) mother take any drugs during pregnancy ?   YES   NO

(i)

8. Did the (child's) mother have illness such as measles, mumps,

   chicken pox, etc., during pregnancy?   YES   NO

9. Did the (child's) mother require treatment for conditions such

   as high/low blood pressure during pregnancy?   YES   NO

10. Did the (child's) mother notice bleeding during

    Pregnancy?   YES   NO

11. Was the child's mother exposed to radiations, such as X-rays,

    during pregnancy?   YES   NO

12. Was the (child's) mother hospitalized for long prior to

    delivery of the child?   YES   NO

13. Did the child weigh much less than normal at the time of

    birth ?   YES   NO

14. Was the child born prematurely ? By how many weeks?

    If yes, say the number   YES   NO

15. Was the child's appearance blue at the time of birth?   YES   NO

16. Did the child not cry immediately after birth but did so

    after some time?   YES   NO

17. Was the child given blood transfusion soon after birth?   YES   NO

18. Was the child's appearance yellow at the time of birth?   YES   NO

If the answer to any one of the above questions is 'Yes', then contact any speech and Hearing Center.

If you don't remember details regarding any of the above, can you get it from the person who assisted you at the time of delivery?

(i i)

APPENDIX-2

EARLY IDENTIFICATION OF LANGUAGE-BASED READING DISABILITIES :

A CHECKLIST £dev/clo<p^ ^ *CeMs* - H-V^H*"])

Child's Name :   Birthday :

Date Completed :   Age :

This checklist is designed to identify children who are at risk for language based reading disabilities. It is intended for use with children at the end of kindergarten or beginning of first grade. Each of the descriptors listed below should be carefully considered and those that characterize the child's behavior/history should be checked. A child receiving a large number of checks should be referred for a more in-depth evaluation.

Speech Sound Awareness:

- • Doesn't understand and enjoy rhymes

- a Doesn't easily recognize that words may begin with the same sound

- a Has difficulty counting the syllables in spoken words

- a Has problem clapping hands or tapping feet in rhythm with songs and/or rhymes.

- • Demonstrates problems learning sound-letter correspondences.

Word Retrieval

- a Has difficulty retrieving a specific word (e.g. calls a sheep a "goat" or says "you know, a woolly animal").

- • Shows poor memqry for classmate's names

(iii)

- Speech is hesitant. Filled with pauses or vocalizations (e.g. "um". "you know").

- Frequently uses words lacking specificity (e.g. "stuff', "thing", "what you call it").

- Has a problem remembering/retrieving verbal sequences (e.g. days of the week, alphabet).

Verbal Memory

- Has difficulty remembering instructions or directions

- Shows problems learning names of people or places

- Has difficulty remembering the words to songs or poems

- Has problems learning a second language

Speech Production / Perception

- Has problems saying common words with difficult sound patterns (e.g., animal, cinnamon, specific)

- Mishears and subsequently mispronounces words or names

- Confuses a similar sounding word with another word (e.g. saying "The Entire State Building is in New Yor")

- Combines sound patterns of similar words (e.g. saying "escavator" for escalator)

- Shows frequent slips of the tongue (e.g. saying "blue blush" for blue brush.)

- Has difficulty with tongue twisters (e.g. she sells seashells).

Comprehension

- Only responds to part of a multiple element request or instruction

- Requests multiple repetitions of instructions/directions with little improvement in comprehension

- Relies too much on context to understand what is said

- Has difficulty understanding questions

- Fails to understand age-appropriate stories

- Has difficulty making inferences, predicting outcomes, drawing conclusions

- Lacks understanding of spatial terms such as left-right, front-back.

Expressive Language

- Talks in short sentences

- Makes errors in grammar (e.g. "The goes to the store" or "me want that")

- Lacks variety in vocabulary (e.g. uses "good" to mean happy, kind, polite)

- Has difficulty giving directions or explanations (e.g. may show multiple revisions or dead ends)

- Relates stories or events in a disorganized or incomplete manner.

- May have much to say. But provides little specific detail

- Has difficulty with the rules of conversation, such as turn taking, staying on topic. Indicating when he/she does not understand.

Other Important Factors

- Has a prior history of problems in language comprehension and/or production

- has a family history of spoken or written language problems

- has limited exposure to literacy in the home

- lacks interest in books and shared reading activities.

- Does not engage readily in pretend play.

APPENDIX – III

Age in years
3.0 – 3.6

Phoneme to be tested	check word	Response
|a|	|aɳɳaːn|	അണ്ണാൻ
|a:|	|a:na|	ആന
|i|	|i:tʃa|	ഈച്ച
|u|	|uri|	ഉരി
|u:|	|u:ɲaːl|	ഊഞ്ഞാൽ
|e|	|eli|	എലി
|o|	|onnə|	ഓന്ന്
|ō:|	|o:la|	ഓല
|k|	|kuda|	കുട
	|ta:kɔl|	നാക്കോൽ
|g|	|gaɖa|	ഗഡ
	|ba:gə|	ബാഗ്
|ŋ|	|ma:ŋa|	മാങ്ങ
|tʃ|	|tʃi:ppə|	ചീപ്പ്
	|pu:tʃa|	പൂച്ച
|ɲ|	|janal|	ജനൽ
|n|	|nandə|	നന്ദ്
	|na:nnul|	നാന്നൂൽ

/ʈ/	/ʈaːppəl/	ടാപ്പൽ
	/doːkʈərə/	ഡോക്ടർ
	/roːɖə/	റോഡ്
/ɳ/	/kiɳar/	കിണർ
	/tuɳ/	തൂൺ
/t̪/	/t̪at̪t̪a/	തത്ത
	/moː̪t̪iram/	മോതിരം
/d̪/	/d̪iːpam/	ദീപം
	/mad̪d̪aɭam/	മദ്ദളം
/n/	/nakʂ̪t̪ram/	നക്ഷത്രം
/p/	/puːvə/	പൂവ്
	/uduppə/	ഉടുപ്പ്
/b/	/baṣṣə/	ബസ്സ്
	/riban./	റിബൺ
/m/	/maːla/	മാല.
	/aːma/	ആമ
	/maram/	മരം
/y/	/yɛsu/	യേശു.
	/muyal/	മുയൽ
/l/	/loːri/	ലോറി
	/alamaːri/	അലമാറി
	/viral/	വിരൽ
/ɭ/	/vaɭa/	വള
	/vaːɭ/	വാൾ

|v|	|vida|	വിട
	|ʧʃevi|	ചെവി.
|h|	|simham|	സിംഹം.
|–nt|	|pa:ntə|	പാന്ത്
|–t|	|pu:mpa:tə|	പൂമ്പാറ.
|–nt̪|	|pa:nt̪ə|	പാന്ത
|–nc|	|sanci|	സഞ്ചി.
|–nd|	|tivandi|	തീവണ്ടി.
3.7 — 4.0 |s|	|su:rian|	സൂര്യൻ
	|kasera|	കസേര
pʰ	|pʰalam|	ഫലം
|r|	|ra:ja:və|	രാജാവ്
	|ʧɛruppə|	ചെരുപ്പ്
|–t̪ya|	|int̪ya|	ഇന്ത്യ
4.0 — 4.6 |ṣ|	|ṣankʰə|	ശംഖ
	|meṣa|	മേശ
|ʒʰ|	|ko:ʒhi|	കോഴി
4.7 — 5.0 |r|	|redio|	റേഡിയോ.
	|urumbə|	ഉറുമ്പ്
	|ka:rə|	കാറ്
|–ndra|	|candran|	ചന്ദ്രൻ
|pra|	|pra:və|	പ്രാവ്
|kra|	|ʧakram|	ചക്രം.
|t̪ra|	|pat̪ram|	പത്രം

CHECK LIST FOR SCREENING LANGUAGE BASED READING DISABILITIES (Che- SLR)

1. Rhyming & Alliteration:

Sl.	Tasks	Material Used	Illustrations
1	Checking for rhyming ability	3 Popular Malayalam Rhymes Selected Eg :- ka:kʰə ka:kʰə ku:də evide: Pra:və pra:və pɔɟɛrude... Va:kuruvi Va:kuruvi	Out of the 3 rhymes, request, the child that "Can you say one rhyme for me?" Audio Record it (if possible)
2	No. of nursery rhymes the child knows	Singing rhymes by (he child.	Ask the child to recite all the rhymes he/she knows.
3	To clap hands or tap feet according to the rhythm of the song/rhyme.	Popular Malayalam rhyme or song.	Investigator will be singing the rhyme/Song with clapping hands and ask the child lo sing in same way.(demonstration can be provided by the investigator before starting this task) Then checking whether child can tap or clap according to the rhyme.
4	Recognition of words that begin with **the** same sound.	Material from rhyme. ka:kʰə kakʰə ..... ka:kʰa , kaɲi , pu:və, ku:də	Ask the child lo say words beginning with similar sounds, (can have clinician's help) Ask him to identify the word which is different from the other words.
5	Ability of counting the syllables in spoken words	Bisyllables, trisyllables, Multti syllables pu:tʃa, kuʒhuṭa, ka:ṭupo:tt̪ə paṭṭi , t̪aka:li, kuɲɲi-va:va pa:mbə, t̪ivala , kappa landi	Teach (lie child how to count the syllables using fingers. First demonstrate trisyllables words. Then ask the child to count the syllables using fingers for other test words.

2. Verbal Memory:

SI.	Tasks	Material Used	Illustrations
1.	Ability to remember instructions or direction	1. Close the door & take pencil from the box 2. Clap your hands & jump 2 times 3. turn around, take red pencil & draw a flower	Give instructions & check the child's performance
2	Ability to remember/ retrieve verbal sequence	kadakada vandi (noisy vehicle) tʃuk tʃuk vandi (noisy train) pɔkro:m pɔkro:m ʈavala (the sound of how frog cries)	Ask the child to repeat the way the noisy train goes and how the frog cries.
3	Repetition of Digit sequence	Ask child to count and repeat -8,10,15 -11,12,13 -2,5,11,17	Check ability to reproduce orally a sequence of digits from memory
4	Ability to repeat series of sense words	Sense words taʈʈamme pu:tʃa pu:tʃa. pu:tʃa, paʈʈi, pa:ta. kuɖira, kuraya, kaɹhuʈa.	Ask the child to repeat the same words in scries first.(Disyllabic words) After doing this go to trisyllabic word repetition. Check how many trials after child s repeating, how well child repeat this.
5	Story recall	Kutty "s story (Pictures provided along with the checklist)	Show the pictures and teach the story. Ask the child to name the characters of the story and ask questions like what kutty was holding in hand? Why kutty got scared? What dog did at the end?

3. Word Retrieval:

Sl.	Tasks	Material Used	Illustrations
1.	Ability to retrieve specific word	What do you use to draw pictures? What do you use to drink milk? What do you use to play cricket?	Ask the questions and note down the response
2	Memory for name of classmates & teachers	Ask the name of teachers, Classmates & best friend?	Ask the child to name class teacher & friends they have
3	Ability to tell names of family members & house Address	Ask the name of the parents, names of the family members and address of the house	
4	Oral cloze task	Sentence 1. Tooth brush is used for................ 2. Comb is used for..................... 3. Pen is used for........................ Word Phrase 1)sim___ (Lion) • palla........ (brush teeth) 2)pinx___ (pine apple) • mudi........ (comb hair) 3)ţakʰ___ (tomato) • pen........ (write pen)	Tell the child to complete the sentence, phrase, word presented to them
5	Identification of words (names) in context	Use pictures of Kutty's story	Ask him to show where it is raining? Where is the Umbrella. Where is the dog

4. Rapid Naming:

sl.	Tasks	Material Used	Illustrations
1	Ability to name the colours	Colour Pictures (Red, Blue, Green)	First ask the child to name all the colours he/ she knows. Then show the pictures, child has to name the colours quickly.
2	Ability to name the objects	Chair, table, pen	Point towards the object and ask the child to name
3	Ability to name body parts	Head, Leg, Stomach	Pointing towards body parts and ask the child to name
4	Ability to name alphabets	Malayalam Alphabet a , a: , i, i: k , kʰ, g, gʰ k, ɛʃ, ʈ, ʈʰ, P.	Tell the child torn say orally the alphabet
5	Name tasks within category	Pictures Shown Vegetables Tomato Carrot Lady finger **Animal** Monkey Lion Horse **Vehicles** Bus Train Car	Show the pictures alternatively to the child and ask the child to name them quickly.

5. Comprehension of Language:

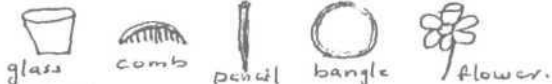| Sl. No	Tasks	Material Selected	Illustration
1.	Ability to understand stories	Pictures of thirsty crow story provided.	After teaching the story by showing flash cards ask the child to say story and also ask question like. Why crow searched for water? What did crow put into water? What happened after putting stones into water?
2.	Ability to respond to multiple element request or instruction	Eg:- Put the pencil between the eraser and key. Take the pencil & key and keep it in the box. Close the door & come and sit on the chair.	Checking whether only he can respond to part of a multiple element request or instruction.
3.	To check for context dependency.	Abaiptly shifting the subject and asking What will you do if it start raining suddenly? If mother beats/scolds you what will you do? When do you drink Payasam (Sweet)?	Suddenly shifting topic and asking questions like this and note down the response that whether they need any other contextual clues to understand this.
4.	Story reading comprehension:- assess the childs ability to comprehend a short reading story and identify a key word missing from it.	A portion of the story i.e. one sentence long and accompanied by pictures related to the sentences. Eg:- crow is putting stones in to a——————— After putting stones the water ——————— What did crow do with stones———————	Sentences presented with the corresponding pictures.
5	Ability to make reasoning or inference	Asking questions like, If everyone are sitting with candle at home, what is the reason? When you go to doctor? When will mother scolds you?	

6. Speech Production:

Sl.	Tasks	Material Selected	Illustration
1.	To assess whether the child has age appropriate articulation	Eg:- Age appropriate articulation sounds list (Malayalam Articulation test has provided along with the checklist.)	According to the child's age check how many speech sounds he has acquired
2.	Ability to say common words with difficult sound patterns	Eg:- Words like, → va:ʒʰa paʒham (banana) → vaʒʰŭ ṭinaya (brinjal) → kaʃṭa peṭṭu (struggled)	Ask the child to repeat the mentioned words
3.	Problem with tongue twisters	Phrase like → a:na alaralo:de alari (elephant) → malaya:lam paḍiʧu (trumpted) → vellaṭṭil hi:nḍi [studied Malayalam] [swam in water]	∧Ask the child to repeat the phrases
4.	Confuses a similar sounding word with another word	→ kaliʧu, kuʒhiʧu (play ɤeat) → oliʧu, oḍiʧu (hide ɤ break) → kuliʧu, kuḍiʧu (bath ɤ drink)	Show the picture of the child who is eating and playing and ask them to say correctly
5.	Sound blending: Ability to synthesize into words. Syllable spoken at half second intervals	ka .... ʒu ..... ṭa pu .... ʧa ..... ku ..... ṭṭi ha .....lla .... mo:.... lu	Ask the child to combine the syllables into words.

7. Language Expression:

Sl.	Tasks	Material Selected	Illustration
1.	To check for the length of utterance.	Ask what all you did at home before coming to school ? How did you come to school? How did amma & appa (Parents) go to work?	Check he/she can short sentences or long sentences. If, he can use one (SOV) simple sentence correctly or not.
2.	To check for grammatical errors	Ask about tenses 1) Yesterday what did you do? 2) What are you doing now ? 3) Tomorrow what will you do at this time?	Check the usage of the tenses are correct or not.
3.	Ability to give directions or explanations	Describe the way to the house / school, play ground.	Check how correctly child says the directions.
4.	Grammatical closure: Ability to use proper grammatical forms to complete statements	E.g.: Here is a flower. Here are two............... Here are two...............(Card) Here are two...............(Pen)	
5.	Verbal fluency:	E.g. ask animals name, food items, vehicles name, etc.	Fluency test the child has to name as many animals and as many things to cat or drink as he/she can think in a minute.

8. Listening Skills:

SI.	Tasks	Material Selected	Illustration
1.	Auditory Comprehension : Ability to understand spoken words	E.g. Do chairs cat ? Do we wear bangles on neck ? Do we put chappci in hand ?	Ask these questions to the child.
2.	Auditory' association: Ability to relate concepts presented orally	E.g. Verbal - analogies test. Grass is............. Hair is............. Teeth is.............	Tell the child about colour of the grass and ask about colour of the hair •
3.	RTT Sub Test -I	Touch the red comb glass comb pencil bangle flower.	If child can do the task score as 3, if, providing two or three demonstrations score as 2, and only with one demonstration score as 1.
4.	Sub Test - II	Touch the red flower	
	Sub Test - III	Touch the yellow flower yellow comb	

9.Non Verbal Imitation:

SI. No	Tasks	Material Selected	Illustration
1.	Ability to imitate environmental sounds	E.g. Dog barking — bau , bau . . . . . . Cat mewing — mia:u , mia:u . . . . Cow crises — mbe mbe . —. . . .	Investigator make the sound and child has to imitate it.
2.	Ability to count number of taps	E.g. Tapping on the table or clapping 3-4 times (with Clues) 1-2, 1-2 & 1-2, 1-2 & 1-3,	Whenever investigator tapping child has to count number of taps. First clinician does 2 taps then it he increases it to 3 or more
3.	Closure		Checking it is poor closure or abnormal closure
4.	Thumb - Finger imitation	How fish moves How do you click camera Thumb - finger circle	Clinician demonstrates and child has to imitate it
5.	Listening commands for imitation	E.g. touch nose with right hand and ear with left hand simultaneously	

10. Other Important Factors:

1. Has a prior history of problems in language comprehension and or production / DSL.

2.   Has a family history of spoken or written language problems / LD

3. Has limited exposure to literacy at home

4.   Lacks interest in books and shared reading activities.
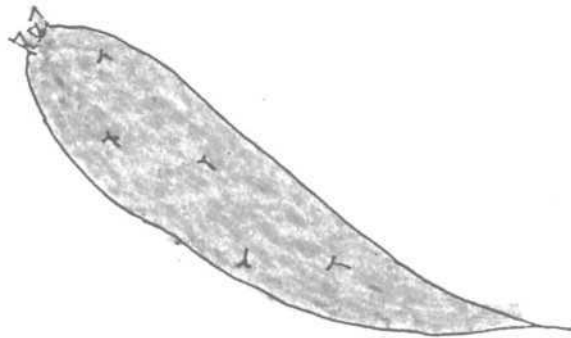
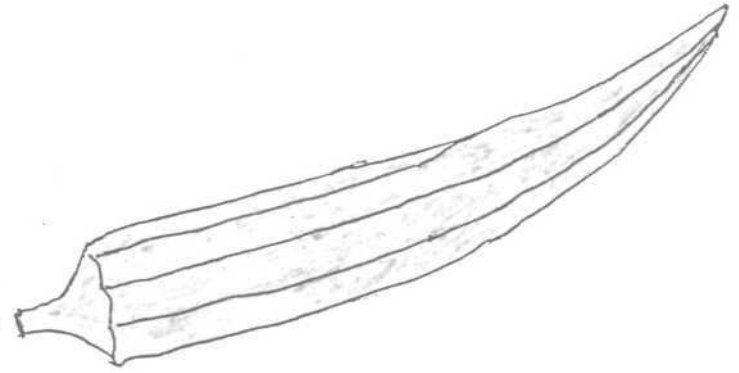5.   1 las problem in developmental milestones.

KUTTY'S STORY   (XIX)

IV. Rapid naming (Item No: 1)

(xx)
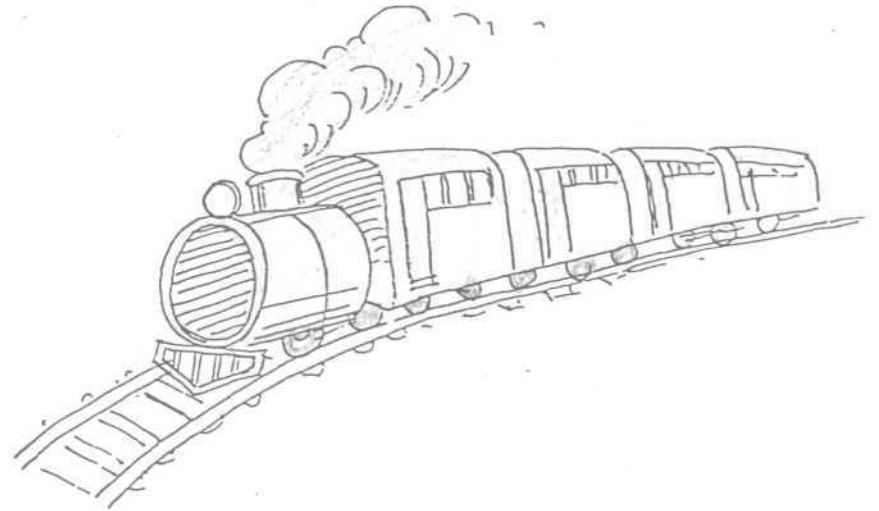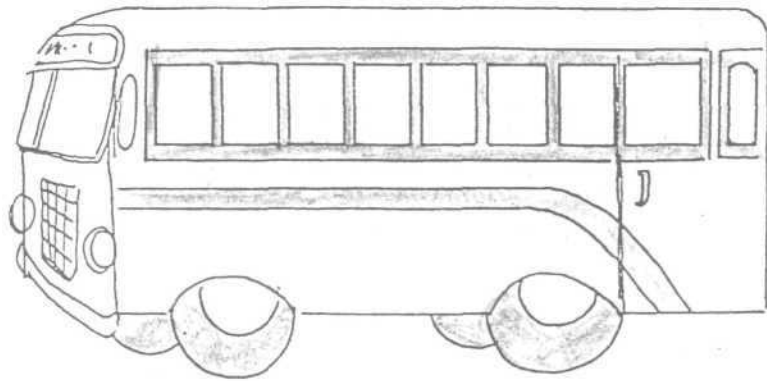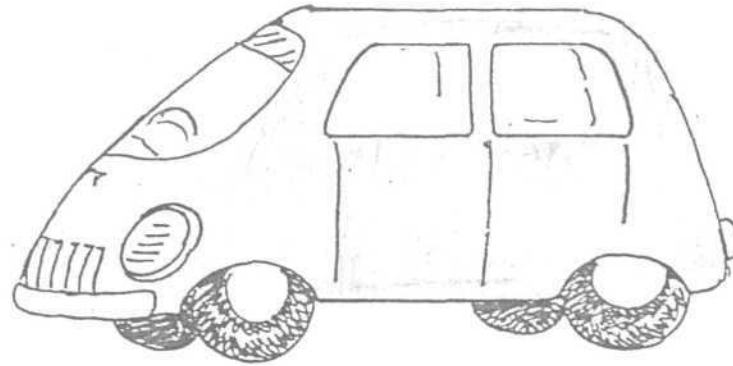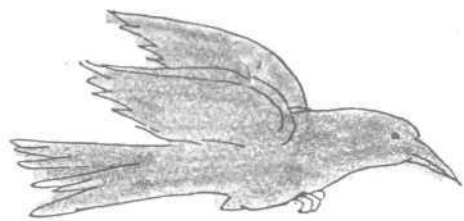
IV. Rapid naming (Item No: 5. vegetables)

IV. Rapid naming (Item No:5
ANIMALS)

(xxii)

IV. Rapid naming (Item No: 5 - Vehicles).

VII. Speech productions (Item No. 4)
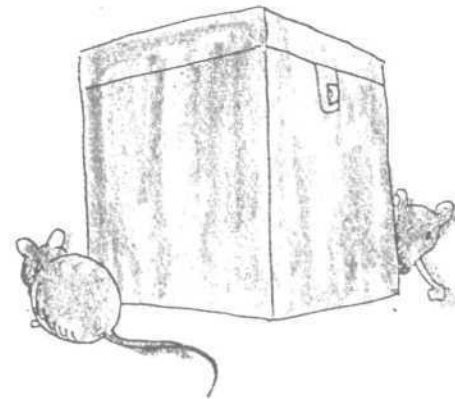
VII. speech production (Item No: 4)

(xxvii)

APPENDIX – V

CHECKLIST FOR SCREENING LANGUAGE BASED READING DISABILITIES (Che-SLR)

RESPONSE SHEET

Child's Name: Date of Birth:
Date on Test Completed: Sex:

Keys for Scoring: 0- Could not do, 1- Able to do with 2 or 3 demonstrations.
2- Able to do with 1 demonstration, 3- Able to do.

Sl	Tasks	Item No.		0	1	2	3	REMARKS
I	Rhyming & Alliteration	1	a.					
			b.					
			c.					
		2	a.					
			b.					
			c.					
		3	a.					
			b.					
			c.					
		4	a.					
			b.					
			c.					
		5	a.					
			b					
			c.					
II	Verbal memory	1	a.					
			b.					
			c.					
		2	a.					
			b.					
			c.					
		3	a.					
			b.					
			c.					
		4	a.					
			b.					
			c.					
		5	a.					
			b.					
			c.					

III	Word Retrieval	1	a.			
			b.			
			c.			
		2	a.			
			b.			
			c.			
		3	a.			
			b.			
			c.			
		4	a.			
			b.			
			c.			
		5	a.			
			b.			
			c.			
IV	Rapid Naming	1	a.			
			b.			
			c.			
		2	a.			
			b.			
			c.			
		3	a.			
			b.			
			c.			
		4	a.			
			b.			
			c.			
		5	a.			
			b.			
			c.			
V	Comprehension of Language	1	a.			
			b.			
			c.			
		2	a.			
			b.			
			c.			
		3	a.			
			b.			
			c.			
		4	a.			
			b.			
			c.			
		5	a.			
			b.			
			c.			

VI	Speech Production	1	a.				
			b.				
			c.				
		2	a.				
			b.				
			c.				
		3	a.				
			b.				
			c.				
		4	a.				
			b.				
			c.				
		5	a.				
			b.				
			c.				
VII	Language Expression	1	a.				
			b.				
			c.				
		2	a.				
			b.				
			c.				
		3	a.				
			b.				
			c.				
		4	a.				
			b.				
			c.				
		5	a.				
			b.				
			c.				
VIII	Listening Skills	1	a.				
			b.				
			c.				
		2	a.				
			b				
			c.				
		3	a.				
			b.				
			c				
		4	a.				
			b.				
			c				
		5	a.				
			b.				
			c				

(xxx)

IX	Non Verbal Imitation	1	a.			
			b.			
			c.			
		2	a.			
			b.			
			c.			
		3	a.			
			b.			
			c.			
		4	a.			
			b			
			c.			
		5	a.			
			b.			
			c.			
X	Other Imp. Factors	1.				
		2				
		3				
		4				
		5				